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Learning Disabled Special Education Students and General Education Opportunities

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by

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Abstract

This study examined the relationship between the amount of time a student receives in general education and achievement scores for reading and math. Students selected were previously identified with a learning disability in the Newberg School District, and they were enrolled in classes during the 2014-2015 school year. Using a Multivariate Analysis of Variance (MANOVA), this study observed the correlation between students' federal placement code and student achievement scores for both reading and math. For students with disabilities who also have an Individual Education Plan (IEP), the federal placement code identifies the amount of time a student spends in general education. In addition to the relationship between placement and achievement scores, this study examines other variables in association with placement including gender, race, socioeconomic status, and grade level. This study provides correlational information showing a predictable increase in student achievement scores as students spend more time in general education. There is also an observed decrease in student achievement scores the more students are removed from general education classes and instruction. The results of this study may guide IEP teams and decision makers in students' future placement decisions.

Keywords: Individual Education Plan, inclusion, student achievement, federal placement code

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Chapter 1

Introduction

Tyler's Story

I first met Tyler on the day of his annual Individual Education Plan (IEP) meeting. I came to the school early to observe him in class before the meeting started. I saw an energetic and enthusiastic student. He was working through a reading assignment and receiving help from an assistant in the classroom. It was clear that he struggled with the content of the reading material, but he displayed a ferocious determination to understand the text. As I watched him for the hour, he looked for clues in the material, reread, and wrote notes in the margins of the article. He used every tool that had been taught to him for comprehension. At the end of the class, I introduced myself and inquired about his strategies and reading material. He shared that his Learning Resource Room (LRC) teacher had taught him the strategies he was using. In fact, he carried a checklist of strategies to use when he did not understand something. I admired the work and tenacity of this young man and was proud of the teacher and school for giving him such great skills.

Unfortunately, this joy turned to dismay as I sat through Tyler's IEP meeting. The meeting began as all IEP's do with a review of the strengths of the student. Each team member spoke of his energy and his desire to truly understand new information. The meeting continued with a review of his present levels of functional and academic performance. All of the information presented matched the student I had observed earlier in the day. When the meeting turned towards Diploma Options I was shocked to see "Modified Diploma" selected as Tyler's best choice. When I asked the team, both the teacher and his parents informed me he had been on–track for a modified diploma since 7th grade. His coursework was presented in the LRC room and he was removed from most of the general education classes due to his low reading level. They continued to share that opinion for most of middle school and all of high school. He had never been in an English or Social Studies class that was not taught by a Special Education teacher, and, in fact, had most coursework in the Learning Resource Center or Intensive Learning Center. I knew immediately the implications of those decisions. Without earning a credit from a "general education" teacher in typical courses, Tyler was not eligible for a regular diploma. As I sat with the team, the teacher explained the implications of earning a modified diploma. Tyler would not be eligible for the armed services, he would not receive financial aid for post–secondary education, and he would not be eligible to enter a four–year college or university. This diploma option did not seem to match the bright and hard–working student I observed earlier in the day. Unfortunately for Tyler, his path had been laid out prior to his own understanding of course offerings and post–secondary choices. The school team, acting in an attempt to make life easier on a struggling reader, determined that modifying curriculum and coursework would improve his chances for success.

As I struggled with the limitations the school system of well–intentioned adults had created for Tyler, I became more aware of students similar to Tyler across the district. I requested and reviewed records for the students with learning disabilities in grades 6–12 in my district. From these records I found additional students who had some or all coursework modified. The modified coursework ranged from core content such as math and science to electives and graduation requirements. Each of these students demonstrated learning difficulties, were identified with a learning disability, and subsequently placed in an alternate course for learning content. As I worked with special education staff to understand this process, I noticed three trends that had developed into the practice of modifying courses or coursework for students. First, many adults had allowed students to develop a sense of learned helplessness. They assisted the student with such frequency and duration that many students were unable to complete the required coursework without assistance. They had few entry points for starting on their own, and most, like Tyler, lacked tools to trudge through the difficult journey of learning. Another common theme that emerged from my work with the special education teachers was their lack of trust that general education teachers could implement a student's IEP and accommodations to account for students' unique learning needs. Most agreed that secondary teachers were adept at delivering content to most students but were incapable or unwilling to meet the needs of a student like Tyler who really struggled. Lastly, most special education teachers made decisions for modifying courses or removing from general education because they were genuinely concerned for the welfare and feelings of the student. Tyler's teacher shared with me the team's frustration in middle school and Tyler's fear of the traditional classes. She had recommended for the team to remove him because she felt he would be protected from hurtful peers, receive instruction at his level, and get to walk at graduation ceremonies.

Obstacles and Barriers

Students with learning disabilities face a number of challenges in school. The first hurdle they face is misrepresentation of their disability. Many students with such a disability are treated as unintelligent or slow to learn. However, for a students to be identified with a learning disability, a team must first determine that the student has average or above average intelligence. This fact is often glossed over or misunderstood by the general public as well as by education professionals. Specific Learning Disabilities (SLD) can include a variety of academic struggles, including areas of reading, writing, and math. Kavale, Spaulding, and Beam (2009) state the general definition of a specific learning disability is “a disorder of one or more of the basic psychological processes involved in understanding or in using language, spoken or written” (p. 40). This includes dyslexia, dyscalculia, developmental asphia, minimal brain dysfunction, and perceptual disabilities. However, SLD does not include a learning problem that is the result of another disorder such as a hearing, visual, or motor disability, lack of instruction, or the result of environmental, economic, or cultural disadvantage (Kavale et al., 2009). Students with a learning disability may struggle with decoding, processing, calculation, and organization, but they are not affected by limited cognitive capacities.

Students with a Specific Learning Disability often have less success on standardized assessments than typical peers. This creates the achievement gap for students with disabilities. In regular education, the achievement gap is defined as the disproportionate growth between the student population as a whole and certain sub–populations. The special education achievement gap is similarly defined as the disproportionate growth between students in regular education and those students in special education programs. Teachers and researchers have proposed many remedies to close the special achievement gap, including “after–school tutoring, extended school years, and remedial English and math classes” (Fisher, Frey, & Lapp, 2011, p. 57).

Unfortunately, while these measures can affect positive change in underachieving students in regular education programs, researchers such as Fisher et al. (2011) and Killinger and Boardman (2011) have concluded that when these same measures are indiscriminately applied to special education students without regard for their specific disabilities, the results are decidedly unfavorable. Schools and school districts that put these measures in place without specific procedures to accommodate special education students see less improvement in special education students than their regular education peers (Chung et al., 2008). McGee (2004) rejects the idea that this failure to thrive is somehow the fault of special education students, stating that the achievement gap is not caused by students that fail in their education but by a system of education that has failed them. He continues by arguing that this gap is about more than test scores; it is a fundamental difference in "opportunity and choices that some students have and some never will" (p. 106). Students who experience specific learning disabilities face discrimination of their cognitive ability as well as poorly implemented intervention systems designed for non–disabled peers.

Placement

Placement of educational services is a key obstacle for students with learning disabilities. Laws governing education for students with disabilities ensure that all students who experience a disability are afforded the benefits of education including a highly qualified teacher, access to the least restrictive setting possible, and interaction with typical developing non–disabled peers. Public Law (PL) 94–142, first signed into law in 1974, requires schools and districts to appropriately educate students with disabilities in the least restrictive setting possible. The least restrictive setting is the location where the student will receive the most educational benefit. For students with disabilities, LRE is presented as a continuum of placement opportunities ranging from full–time general education, part–time general education and special education, to full–time special education classes. Removing students with disabilities from general education classes is a practice often used by well–intentioned educators. These teachers strive to teach students the skills they are missing and desire to protect the student from feeling overwhelmed, stupid, or incapable of the work presented. Unfortunately, this educational practice limits the potential and ability of students with disabilities to struggle, learn, and then grow at rates commiserate with their peers.

For students who are removed from general education courses, their placement in education predetermines their options beyond high school. Students who are working on modified courses may be eligible for a modified diploma. In Oregon, this diploma includes similar content requirements to the standard diploma but allows for modified requirements of coursework, credits, and essential skill passing scores. Students who receive a modified diploma are generally not eligible for branches of the military, are not eligible for a four–year college or university, and often are required to complete remedial coursework at the community college level. In 2014, the state of Oregon reversed its previous stance and now allows students with a modified diploma to receive financial aid services for post–secondary education.

Inclusive Placement

The Individuals with Disabilities Act (IDEA) requires school teams to consider placement of students with disabilities into the least restrictive environment. This placement is considered inclusive since it includes students with disabilities into the general education setting. Historically, the practice of inclusion was not followed and several students with disabilities were moved into specialized classes or settings. The theory of inclusion supports placement in the least restrictive setting possible for student benefit. This has been cited in case law as well. In N.R. v. Kingwood Township (2000) the judge stated the least restrictive environment was one that, to the greatest extent possible, educated children with non–disabled peers at the same school they would attend if the child did not have a disability. This law now upheld by courts is in sharp contrast to several education practices. Traditional educational systems have offered special education students separate classes from their peers in resource rooms, modified courses, or separate schools. For learning disabled students, this practice is particularly ineffective at closing the achievement gap and reduces the ability to graduate with a standard diploma.

Inclusive classes contain the selection of courses offered to all students across all settings. For learning disabled students this placement can effectively provide instruction to reduce the achievement gap and provide access to regular diploma opportunities. In a study completed in an urban New York high school, administrators partnered with a school of education professor to dismantle the out–of–date tracking system that was keeping students with disabilities out of mainstream classes. Burris and Welner (2005) reported that with high expectations students at the bottom of the achievement gap improved academically. They hypothesized that all students, regardless of economic status, disability, or prior achievement would improve academically with rigorous content courses. The special education students were placed in regular courses and graded with alternative assessments to demonstrate proficiency. The results of this heterogeneous grouping showed increases in academic passing rates from 48% to 77%. From 1998 to 2003 when the students were de–tracked, the number of students, in disadvantaged groups earning diplomas after four years, rose by 56% (Burris & Welner, 2005).

Thomas and Collier (2003), in a longitudinal study, found students with disabilities included with typical peers outperformed students who were removed from inclusive classes. This included students with disabilities like Communication Disorder, Learning Disabilities, and Autism as well as low incidence disabilities like Intellectual Disability and Severally Orthopedically Impaired. Thomas and Collier cited the tremendous growth of students in the program to the culturally responsive staff, integration of home cultural practices and understandings in the classroom, and the integration of students with disabilities into the mainstream and inclusive classrooms. For students with disabilities, the ability to participate with typical peers is most often the setting where students can make significant gains.

For Tyler, having a learning disability limited his opportunities in public education inside K–12 school doors and beyond. His options for post–secondary do not include branches of the military or college or university time. If he chooses to attend a community college, he will have to start with remedial coursework since he has not had a standard English or math class. His employment options will be limited to the skills he has acquired in school where courses were modified and adults assisted his task completion. His preparation for future plans was determined not by his intelligence, ability, determination, or passion, but by the empathy of educators and the pathway for a modified diploma.

Statement of the Problem

In schools and districts across Oregon, students with learning disabilities have received instruction in different settings, and, at times different curricula than non–

disabled peers. The difference in instructional services limits potential options for students with disabilities. This study examines the relationship across groups of students in different placement categories of inclusion. Specifically, I will use existing placement category data to examine three types of special education placement and Oregon Assessment of Knowledge and Skills (OAKS) scores for reading and math. Additionally, the data will be disaggregated by race, gender, and socioeconomic status and controlled for by grade level. An objective of the research is to examine the utility of inclusion theory as well as to provide data that could be useful for district and state decision makers.

Research Questions

1. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by Special Education placement options in NSD?
    a. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by gender in NSD?
    b. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by race/ethnicity in NSD?
    c. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by socioeconomic status in NSD?
    d. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by grade level in NSD?
2. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by Special Education placement options in NSD?

a. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by gender in NSD?
b. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by race/ethnicity in NSD?
c. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by socioeconomic status in NSD?
d. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by grade level in NSD?

3. Is there a statistically significant difference in OAKS math scores for students identified and not identified as special education in NSD?
4. Is there a statistically significant difference in OAKS reading scores for students identified and not identified as special education in NSD?

Key Terms

Core – Core instruction refers to the first instruction provided all students in a general education classroom. In Oregon, this is instruction based on common standards.

Free Appropriate Public Education (FAPE) – The federal requirement to ensure that all students have access to education regardless of barriers, challenges, or disabilities.

Individuals with Disabilities Act (IDEA) – The federal law requiring educational access to students with disabilities.

Least Restrictive Environment (LRE) – The least restrictive environment is the educational setting for students with disabilities that is most closely associated with typical non–disabled peers.

Oregon Assessment of Knowledge and Skills (OAKS) – The state assessment used in Oregon for students in grades 3–8 and 10.

Placement – Placement in special education is the location where the services will be provided. Placement includes three categories that are separated by the amount of time a student is removed from the general education classroom. The first is 80% or greater, next is 40%–79%, and third is 39% or less the general education setting.

Specially Designed Instruction (SDI) – The specific instruction tailored to a student to ensure progress can be made towards IEP goals.

Specific Learning Disability (SLD) – A disability of processing, reading, writing, math or generalized thinking not attributable to any other disorder or disadvantage.

Limitations and Delimitations

Limitations for this research start with the inherent bias of the researcher. I am a Director of Special Programs at the district level whose employment responsibilities include directing and overseeing special education programs across the district. I have a personal goal to see every student who experiences disabilities achieve their highest potential. Additionally, I am limited by the district level data and sample size of students with learning disabilities in Newberg School District (NSD).

This study includes pre–existing data sets of information. This limits the variables available for study to previously gathered information collected in the student information system (Synergy) and OAKS scores. Additionally, the coding and entry of the data is previously established and cannot be manipulated. The three placement options, gender, race, and socioeconomic data do not have numeric representations; this type of categorical data limits the design of the study to appropriate tests for nominal categories. Other limitations exist with the state test scores, as those are ordinal achievement data. In Oregon, students are only assessed in grades 3–8 and 10 using the Oregon Assessment of Knowledge and Skills (OAKS), leaving Kindergarten through second grade and ninth, eleventh, and twelfth grade missing from this data. Other limitations include the exemption of the personal story following each student's placement. The data do not offer opportunity for explanation or justification for teams and their decisions for less or more inclusive placement choices.

Delimitations include the restriction of only selecting students with a specific learning disability (SLD) for the research study. Choosing to focus on SLD students allows the research to focus on students with average or above average intelligence and align that to performance on a standardized measure of academic achievement. Additionally, I am focusing exclusively on students with learning disabilities enrolled in the Newberg School District for 2013–2014.

The decision to use the OAKS data from 2013–2014 is due to a shift in the test given in 2014–2015. The state of Oregon, along with several other states, began testing with the Smarter Balanced Assessment System. By using OAKS data, the research can include multiple year connections for future examination.

Significance of the Research

The topic of inclusion is highly debated in public schools today. As parents begin to request less restrictive placement options, special education directors and school principals are challenged with finding appropriate instructional support in the general education classes. The results of this study can assist leaders in instructional decision–making regarding the appropriate placement for students with learning disabilities.

It is critical for districts and schools to offer a continuum of services with regular education instruction and special education support to ensure that students who experience learning disabilities are afforded every possible opportunity for post–secondary success.

Chapter 2

Literature Review

Introduction

A cornerstone in modern American society is guaranteed access to quality education for all. Despite this American ideal, there exists a stubborn and persistent educational achievement gap between different races, economic levels, and geographic locations of students across the country. For the last three decades, educators have studied these achievement gaps, aiming to understand why specific groups of students are failing to thrive in an educational system designed to help all succeed. While there exists an exhaustive amount of research on specific achievement gaps, notably the gaps between races (Fisher et al, 2011; Hanushek & Rivkin, 2009) and socio–economic statuses (State, 2012; Snow & Biancarosa, 2003), little research exists on the achievement gap between students in special education programs and their regular education peers. In fact, Klingner and Boardman (2011) refer to this apparent lack of interest in the special education achievement gap as a “research gap” (p.1) where an important and vast field of study has been largely ignored by mainstream educational research for the last thirty years.

In regular education, the achievement gap is defined as the disproportionate growth between the student population as a whole and certain sub–populations. The special education achievement gap is similarly expressed as the disproportionate growth between students in regular education and those students in special education programs. Researchers like McGee (2004), Stuart and Rinaldi (2008), and Carbonaro (2013) found that if the American educational system is going to effectively narrow or close the special education achievement gap, it must improve in three critical areas. First, students must be effectively educated prior to being referred to a special education program (McGee, 2004; Stuart & Rinaldi, 2008; Wanzek & Vaughn, 2010). Second, students in special education programs must receive education that is tailored to students with disabilities (Benner, Kutash, Nelson, & Fisher et al., 2013; Camilli, Vargas, Ryan, & Barnett, 2010; Fuchs, Fuchs, & Stucker, 2010). Finally, these students must be included in mainstream educational classes (Burris & Welner, 2005, Carbonaro, 2013; Hubberman, Navo, & Parrish, 2012).

This literature review will examine the existing research to determine how best to provide inclusive opportunities for students with disabilities in schools and districts. This review of current research will outline three significant components of education for students with disabilities, including instruction prior to referral for special education, targeted instructional strategies for students with disabilities, and inclusive placement opportunities for students with disabilities. The focus of this review is to provide current research and findings for decision makers regarding instruction, curricula choices, and placement options for students with disabilities.

Instruction Prior to Referral in Special Education

Before most students enter the arena of special education they are provided instruction in the general education setting. Often cited as the most crucial point of teaching, this early instruction is vital to increasing student achievement and purposefully closing this achievement gap. When students receive quality core instruction and targeted interventions the special achievement gap shrinks appreciably (Dexter & Hughes, 2011; Fuchs et al., 2010; McGee, 2004). For all students, regardless of disability, quality early instruction can improve educational outcomes later in students’ academic careers.

Core instruction

Core instruction is defined as the first instruction that a student receives. Dexter and Hughes (2011) extend this definition by stating that core instruction is an evidenced–based curriculum taught to all students by a well–trained teacher. Schools with successful core instructional programs place a heavy emphasis on literacy, instructional time, and daily decisions made with relevant and reliable data (Hubberman et al., 2012; McGee, 2004). There are three defining components for a successful core instructional program and Dexter and Hughes (2011) state that the first is a curriculum based upon scientific research that "employs systematic or empirical methods of observation, involves rigorous data analyses, relies on measurements of observational methods, is evaluated using experimental designs, and ensures experimental studies are presented for replication" (p.1). The second component of quality core instruction is a specific instructional strategy that is implemented in a well–managed classroom. These strategies are explicitly taught by the classroom teacher and represent a variety of instructional techniques and modeling interwoven in the curriculum (Hubberman et al., 2012). The last component for a quality core instructional program includes the utilization of a variety of data including curriculum–based measures to modify and change instructional practice to meet the unique needs of each student in the classroom (McGee, 2004). It is the careful balance of these three pieces that represents appropriate core instruction for students.

All students in quality core general education classes are screened three times a year to determine the soundness of the instruction. This screening is usually a standardized assessment measuring agreed–upon skills by age and grade. This general education screening is given prior to any targeted intervention for struggling students. For example, a screener may identify the words per minute students are reading in first grade three times a year. The goal of the core instruction would be to ensure that at least 80% of students achieve the targeted words per minute at each interval. If 50% of the class is not making adequate progress, this points to a problem with the instruction or the curriculum and not a specific student disability. Prior to referral for special education or interventions, all students should receive core instruction that meets the needs of most students (Dexter & Hughes, 2011). This screening provides a diagnostic assessment of the general education classroom instruction as a whole. The importance of this instruction cannot be underestimated; this is the most effective intervention for struggling learners to catch up to their peers (Hubberman et al., 2012; McGee, 2004; Suart & Rinaldi, 2008). While many schools and classrooms focus on targeted groups of students, the researchers above clearly note the need for a balanced and well–taught core instructional program.

Multi–tiered targeted interventions

Another component of the pre–referral process is the multi–tiered targeted interventions provided in the general education setting. This section of the general education response is critical to closing the achievement gap for special education students and occurs in inclusive settings with non–disabled peers prior to identification in special education. As more than 50% of all students in special education are identified as having a learning disability (Burns, Appleton, & Stehouwer, 2005), the continued use of a model with targeted interventions ensures that referrals for special education are not due to lack of appropriate and adequate instruction (State, 2012). The Individuals with Disabilities Education Act (IDEA) requires the collection and use of progress–monitoring information prior to evaluation for a Specific Learning Disability and before referral for evaluation (Federal Regulations, 2009). Districts and schools that utilize this approach confirm that referrals to special education for a specific learning disability are appropriate referrals.

This aspect of general education has a multitude of names in education settings; these range from Multi–Tiered Interventions (MTI), Response to Intervention (RTI), and Response to Instruction (RtI). Wanzek and Vaughn (2010) state that the primary goal of this response is to provide timely and early intervention for struggling students. The use of this model increases both student achievement (Benner et al., 2013; Hubberman et al., 2012) and a school's systematic response to struggling learners (Burns et al., 2005; Fuchs et al., 2010). Each model includes "problem solving, close monitoring of student progress, implementation of research–based individual interventions, and consideration for special education services only after a student fails to respond adequately" (Burns et al., 2005, p. 382). This process begins with the Tier One interventions or core instruction in the general education classroom. As noted above, the quality of the core instruction is critical for student achievement. Next, Tier Two interventions provide explicit and direct instruction with progress monitoring over an established duration of time (Fuchs et al., 2010). Lastly, Tier Three is the most intensive and sustained intervention. This often serves less than 5% of the school's population for effective results. Tier Three is for students who previously have not responded to targeted instructional interventions and need intensive interventions (State, 2012).

While there are different names for these instructional interventions, they all have the same basic structure. They each rely on tiers of instructional support and interventions for struggling students (Wanzek & Vaughn, 2010). In each tier of intervention, students' progress is monitored over the duration of an established intervention with an assessment designed to determine the intervention's effectiveness. For example, if a student is a struggling reader and screening assessments show the student needs additional instruction in fluency, the student would be enrolled in a specific reading intervention for fluency. While the student received this intervention, their growth of fluently reading words per minute would be assessed (Wanzek & Vaughn, 2010). If the student failed to make adequate progress, a new intervention would be implemented. Wanzek and Vaughn (2010) further report, "multi–tiered instruction combines prevention and intervention through ongoing assessment and implementation of successive levels of instructional support increasing in intensity and specificity to assist students with reading difficulties" (p. 168). This targeted intervention requires instructors who are adequately trained in explicit instruction that is specifically designed to meet the needs of the identified struggling learners (Fuchs et al., 2010). As a component of the pre–referral process, a comprehensive multi–tiered intervention system provides sufficient instruction that reduces the academic achievement gap between students later identified with a learning disability and regular education students. Regardless of the system used to monitor progress prior to a referral for special education, a clearly defined process for schools to refer to special education in inclusive settings offers students with disabilities greater opportunities for academic achievement and improved outcomes.

Specially designed instruction

A core component of special education services is the specially designed instruction students receive. Specially Designed Instruction (SDI) is the "adaptation of content, methodology, or delivery of instruction to address the unique needs of a student with a disability to ensure access to the general curriculum" (Fredrick County Public Schools, 2013). This instruction can occur in a variety of settings, including the regular education classroom, special education resource rooms, or self–contained classrooms. If this instruction is effective, it can help improve special education students' academic achievement and graduation options. Effective instruction designed for special education students includes early explicit and direct instruction in primary grades (Camilli et al., 2010; Kirshner, Sweller, & Clark, 2006) and access to content in secondary grades (Patterson, 2005) that includes culturally responsive teaching (Griner & Stuart, 2012). This specially designed instruction should be as inclusive as possible with a focus on targeting the students' lagging skills.

Direct instruction

Effective instruction for special education students is most beneficial for those in the primary years of education. In fact, Camilli et al. (2010) and Clarke, Smolkowski, and Chard (2008) cite early instruction in the primary years as a significant positive indicator for increasing students' achievement later in education. Yet, it is not simply providing early instruction that can close the achievement gap; it is instruction that is specific in design and explicit in delivery (Clarke et al., 2008). Kirshner et al. (2006), in an analysis of research on instructional techniques, states, "Direct instructional guidance is defined as providing information that fully explains the concepts and procedures that students are required to learn as well as learning strategy support that is compatible with human cognitive architecture" (p.75). For students with learning disabilities, instruction should be explicit and direct to the targeted or lagging skill of the student.

In their meta–analysis, Kirshner et al. (2006) outline the competing models of instructional delivery that include discovery, problem–based, experiential, and inquiry–based. As a result of their analysis, they conclude that direct and explicit instruction is the only method of teaching that allows novel information to pass from short–term working memory to long–term storage for retrieval. In their examination of controlled experiments, almost all studies indicate that when students are learning new information, they should be shown explicitly what to do. Conversely, the discovery method has been popular among educators and curriculum designers, yet when students were presented new information in this format, learners created erroneous beliefs about the content. Additionally, students would become more frustrated with discovery or problem solving than when novel information was presented with clear instructions and modeling.

Kirshner et al. (2006) also conclude that failure to provide direct instruction could result in regression of content as known information is replaced with faulty material, producing a loss in knowledge. The conclusion of their study recommends that educational reform efforts move from the "fuzzy and unproductive world of ideology—which sometimes hides under the various banners of constructivism—to the sharp and productive world of theory–based research on how people learn" (Mayer, 2004 as cited in Kirshner et al., 2006, p. 8).

Guided notes.

As all students travel through grades in the educational system, it is important to provide alternate models of instructional tools. Just as direct instruction of discrete skills is important in the primary grades, accessing lectures and texts is critical for student success in secondary grades. One successful method is the use of guided notes during lectures and reading (Bon, 2011). Guided notes are described as teacher–created materials that assist students, along with a lecture or text, by drawing particular attention to important details and events. These notes can provide an effective way for students to learn and understand novel material. Konrad, Joseph, and Eveleigh (2009) reviewed studies of students with learning disabilities, academic achievement, and guided notes as the independent variable for study. They found 32 scholarly articles where guided notes were utilized as part of an intervention process, and eight of these articles met their criteria for review. The results indicated that guided notes were particularly effective for students with learning disabilities in middle and high school content courses such as Social Studies and Science. When students were explicitly taught how to use guided notes, the findings included students' greater knowledge of new information and content than when using their own notes (Konrad et al., 2009). Patterson (2005) found similar results for students with disabilities. In her study, male middle school students increased the amount of notes taken and had a greater score on summative quizzes when guided notes were used as the primary intervention strategy. In fact, the students' quiz scores increased from a mean of 33% to 91% during the guided note intervention. Patterson (2005) reviewed the successful intervention and offered reasons for its success. First, a review of the student's original notes showed significant spelling errors and illegible handwriting. This would have made studying the notes difficult. Second, when the students were observed prior to the intervention they could not differentiate what important information to gather, so they began to write everything down. This often led to frustration and refusal to continue with the note–taking process. The results of this study corroborate the outcome of Konrad et al. (2009): the use of guided notes for text readings and lectures provide students with opportunity for success in content classes.

Culturally responsive teaching

Since the numbers of culturally and linguistically diverse students in schools are increasing, improving educational outcomes for special education students must include culturally responsive teaching. Griner and Stewart (2012) state that culturally responsive teaching intentionally incorporates the students' diverse backgrounds, experiences, and heritage into the daily lessons. For students with disabilities, these connections must be illustrated through instruction. Failure to clearly identify these networks of experiences and knowledge leave special education students further behind peers in equitable education. In a mixed–methods study of effective teaching for diverse learners, Griner and Stewart (2012) examined school practices and processes related to educational equity. The researchers questioned the equity and achievement gap for students in urban schools studied. They defined culturally responsive teaching as "using the cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning encounters more relevant to and effective for them (p. 589). Teachers who employ culturally responsive practices build meaningful connections between home and school and acknowledge the cultural differences of their students. These teachers also utilize a wide variety of instructional strategies to scaffold information to experiences and learning.

In *Theoretical Perspectives on American Indian Education,* Huffman (2010) describes the role of Cultural Discontinuity Theory on students with different cultures than their teachers. Essentially, this theory is the difference in cultural attributes, values, and perspectives of typical Anglo teachers and Native American students. The differences between the cultures of the students and the teachers lead to conflicts, disagreements and misunderstandings. For example, when students from Native American homes enter school, they have been trained and exposed to a much different communication style than they are expected to participate in during the school day. Also, the lack of cultural understanding creates lower expectations for student achievement that is translated through the grade levels. For students identified with a disability, this theory is an especially important consideration. Modifications and adjustments for instruction should account for the cultural differences of the students and the skills the teachers need to mitigate those differences. "Cultural discontinuity theory attributes much of the frustration in the nature and consequences of American Indian educational endeavors to opposing Native and mainstream cultural patterns, especially those in the form of communication and interaction styles" (Huffman, 2010, The Premise of Cultural Discontinuity Theory section, para. 2). The focus of this theory is the day–to–day interactions between students and teachers and emphasizes the need for culturally appropriate teaching practices. For students who speak a language other than English, this cultural difference can inhibit access to instruction, available settings, and limit their ability to meet equitable outcomes.

Smith (2009) offers perspective and advice for how teachers should interact with and relate to other people from different cultures, languages, and nations. He provides a framework for teachers to analyze their own cultural responsiveness and their ability to respond to others. Culturally responsive teaching provides work for teachers to change their practices to include the additive quality as well as an understanding of their own thoughts and beliefs. Smith makes clear that this oversight is not because people are devious wrongdoers; rather, they simply do not consider the idea or concept that they can learn from others rather than be teachers. If people are part of the dominant society, in the United States, then they almost always believe that they have something to teach and others have something to learn. Smith convincingly displays the many ways that people can insult other cultures with their personal thoughts and opinions; while their intentions might be good, their message is lost in their inability to communicate their desires. For students with disabilities, this area cannot be neglected for students to succeed. The barriers for learning are high between mono–cultural teachers and diverse students. For students who have a different cultural perspective than their teacher, the chasm between learning and success grows wider apart (Smith, 2009).

Inclusive Placement

Placement for students with disabilities is both difficult and heavily debated in schools. Prior to Public Law (PL) 94–142, students with disabilities were often not afforded a public education. The seminal law forced schools and districts to offer a Free Appropriate Public Education (FAPE) to students with disabilities in the least restrictive placement. In Oregon, students are placed into three categories of inclusion based on the number of minutes they are instructed in the general education classes. A students' IEP team at an annual meeting agrees upon this placement decision.

Inclusive classes

Inclusive classes include the selection of courses offered to all students across all settings. For special education students, this placement can effectively provide instruction to improve academic achievement. Traditional educational systems have offered special education students separate classes from their peers in resource rooms, modified courses, or separate schools. For learning disabled students, this practice is particularly ineffective at closing the achievement gap or improving educational outcomes. To make adequate and appropriate academic gains, students must be taught in mainstream classes with accommodations and modifications (Burris & Welner, 2005; Carbonaro, 2005) that are heterogeneously grouped for instruction (Hanushek & Rivken, 2009). Thomas and Collier (2003), leading researchers in Dual Language, found in a longitudinal study that students in blended heritage language or dual language programs achieved far greater results than students in traditional English only programs. The students with disabilities outperformed the students taught in traditional models of homogeneous ability grouping in every classroom studied. This study confirms the positive effect on student achievement when students with disabilities are included in the regular education instruction, curricula, and expectations.

Heterogeneous grouping

In education, there are varied and numerous approaches to literacy instruction. This is especially true in special education, where teams work to debate and define the best approach to help students achieve high levels of literacy. One of the most argued debates for literacy instruction for students with disabilities is the homogenous versus heterogeneous grouping. This debate has grown, changed and added flexible grouping and mixed–ability grouping to the discussion.

Heterogeneous grouping is the mixing of students in classes regardless of race, social economics, disability, or prior student achievement. In his research on Texas schools, Rivken (2009) found heterogeneous grouping to be the greatest contributing factor to closing the achievement gap. This gap specifically included math achievement results from 1993 to 2000. The most notable discovery Rivken made was that classes with higher the concentration of one population of students, like students with disabilities, in a single class negatively affected the achievement, and conversely, that diverse classrooms showed greater student achievement data.

Chorzempa and Graham (2006) argue that students placed in low–level ability groups often read less than those in higher ability grouped students. Students in low–level ability groups spend time in a variety of reading related activities such as learning decoding rules, multisyllabic and phonics instruction, and oral reading comprehension. However, these groups are most often associated with less time in oral reading fluency practice. In addition to having less reading time, students in these groups are interrupted and engage in less authentic reading activities more often than other peers.

Poole (2008) suggests a major objection to homogeneous ability grouping is that students are often stuck in the same low–level group and unable to move over time. This stagnant placement in the lowest reading group stigmatizes students for much of their school career. Additionally, students in these groups often represent special education, English Language Learners, and students of poverty at higher rates than their white middle–class, non–disabled peers.

Tracking

Carbonaro (2013) noted that "curricular tracking is the most prominent structural aspect of schools" (p. 27), and the majority of research related to this practice has proven it to be an ineffective model for the majority of students. He continues to cite research that higher tracked classes are often characterized by higher quality instruction, more instructional time, and greater depth in content. Additionally, he notes that schools that track one group of students, in effect, track all students. Students in lower–tract classes have the inverse relationship to those in higher classes and actually receive inferior instruction, little alignment to standards, and less quality time grappling with difficult content. He contends, "curricular tracking is a social structure that differentially provides opportunities and imposes constraints upon what students have the potential to learn" (Carbonaro, 2013, p. 27). In his own analysis of curricular tracking and learning, he found that the more rigorous the students' course, the more effort the student exerted in the course. This finding was consistent regardless of the student's prior achievement. Students with disabilities consistently perform at higher levels when provided intentional teaching, rigorous coursework, and heterogeneously grouped classes.

Blankstein and Noguera (2015) studied several schools that de–tracked students to find success. They note that tracking students often results in the lowest performing, minority, disabled, and poor students being assigned to or being placed in the lowest tract classes. They also, like Carbonaro, mention that when one particular subject or group is tracked, then all students inadvertently become tracked. "The research is clear, low–track classes depress student achievement rather than help students catch up, students in low track classes fall further behind" (Blankstein & Noguera, 2015, p. 69). One example they mention is Regents High School in the state of New York where efforts to de–track students were noted in the raising test scores and increased graduation rates for both minority students and students with disabilities. For students with disabilities, being tracked into separate classes by ability has detrimental effects.

Race and socioeconomic status

Much discussion and educational research has centered on students of color and students who live in poverty. When these effects are coupled with a student experiencing a disability, the academic outcomes are disastrous. In addition to the need for culturally responsive teaching, Shannon (1998) found that when monolingual teachers of the dominant culture teach students of color without adherence to cultural sensitivity, the reading instruction and testing given is discriminatory. This is aggravated further when the students come from low–income families. Students who come from families experiencing poverty according to Kumanyika and Grier (2006) watch more television and have fewer books in the home than their middle–class peers. Also, students from lower income homes are read to less often by parents and experience less social learning over the summer months. The loss of learning over the summer months has emerged as a critical component in discussions of students in poverty. In a longitudinal study at John's Hopkins University, Entwisle and Alexander (1992) found that students of color experienced more significant delays in mathematical reasoning, problem solving, and computation than their white peers even when they began in similar places for achievement. This difference started small, with only six points separating white students' scores on a verbal comprehension subtest in first grade. By third grade the difference was 14 points between the groups. These are critical factors when coupled with a disability. According to Fram, Miller–Cribbs, and Van Horn (2007), the gap in school achievement between poor and non–poor children is troublingly high. In addition to cultural and socioeconomic differences, race has played a large part in the over–identification of students with disabilities. Hibel, Farkas, and

Morgan (2010) note that certain groups of students are found to be overrepresented in special education identification across the country; they argue that this overrepresentation is tied to poverty, as some studies suggest 60–80% of students identified as special education are students experiencing poverty. Hibel et al. claim that the overrepresentation of students from a minority population in special education identification may be due to factors beyond race. These include insufficient health care, environmental, nutritional, economic and social factors that relate to attributes of disabilities in education. In their final recommendations, they note the need for research relating to race and special education placement options and the growing trend of segregating students with placement options. “Black students were more likely to be educationally segregated in that they less often received instruction in the general education classroom” (Hibel et al, 2010, p. 328). Students of color or poverty who also experience a disability are at greater risk for segregation from peers in more restrictive placement settings.

Conclusions

The achievement of special education students is a growing concern for educational policy makers, districts and schools, and students. Traditional approaches to increase student achievement for students with disabilities have focused on isolating students early in school and providing remediation to the skill deficit. Quality instruction and academic inclusion are critical for students with disabilities to achieve at similar academic rates as their non–disabled peers. The systematic approach of providing a high-quality core instructional program prior to referral for special education is the first step. Next, targeted instructional techniques like direct instruction and guided notes offer high yield strategies. Lastly, placement in heterogeneous and inclusive classes with rigorous coursework can provide students with disabilities the greatest opportunity to learn. The achievement gap is more than simple test results; it is the opportunity for students to succeed in the educational system.

Further research is needed in the achievement gap and effective gains for special education students. Specific comparisons are needed with students who have been through an extensive multi–tiered pre–referral process and students who have been identified with alternate eligibility methods. Also, research showing correlational data between students with disabilities academic achievement gains and specific instructional strategies is needed. Lastly, further information comparing the results of student achievement for students with disabilities placed both in mainstream classes and traditional resource rooms would provide educators with practical solutions for closing the achievement gap for special education students.

Chapter 3

Methodology

Introduction

Decision makers in education routinely face challenging choices. In the field of special education, IEP teams manage difficult decisions regarding the educational components for a student with a disability. One of the most contentious choices for an IEP team is the student's placement for instruction. Student placement in an IEP refers to the amount of time a student is included with typical non–disabled peers in the general education setting. The IEP team must consider many factors in this decision. These include evaluating the benefits of including time and small group instruction to make adequate growth towards a goal against the harmful effects of removing the student from typical peers and access to the core instruction.

This study examined the impact of placement on student achievement scores. Additionally, the study will look at the relationship across groups of students in different placement categories and (OAKS) Oregon Assessment of Knowledge and Skills scores in reading and math for students in Newberg School District (NSD).

Research Questions

1. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by Special Education placement options in NSD?
    a. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by gender in NSD?
    b. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by race/ethnicity in NSD?

c. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by socioeconomic status in NSD?

d. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by grade level in NSD?

2. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by Special Education placement options in NSD?

a. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by gender in NSD?

b. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by race/ethnicity in NSD?

c. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by socioeconomic status in NSD?

d. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by grade level in NSD?

3. Is there a statistically significant difference in OAKS math scores for students identified and not identified as special education in NSD?

4. Is there a statistically significant difference in OAKS reading scores for students identified and not identified as special education in NSD?

Sample Characteristics

The Newberg School District is located in Newberg, Oregon and includes both Newberg and Dundee residents. In 2013-2014, the district had 5,240 students enrolled with 649 students with disabilities. Students with learning disabilities account for 260 of the 649 students with disabilities in the district. Of those 260 students, 73% (n=190) are white/Caucasian, 21% (n=54) Hispanic, 3% (n=8) 2 or more races, and less than 3% (n=8) Black, Asian, Pacific Islander, and Native American. The demographic data for students with learning disabilities is a comparative sample of the Newberg School District's data. Newberg School District has 46% of enrolled students eligible for free and/or reduced lunch indicating low socio economic status.

Variables

Dependent variable – 1) Achievement scores on Oregon Assessment of Knowledge and Skills (OAKS) Reading test 2) Achievement scores on Oregon Assessment of Knowledge and Skills (OAKS) Math test

Independent variable – 1) Federal placement category for students with disabilities 2) Demographic student data including gender, race, socioeconomic status, and grade level

The data set included several variables for study. The first categorical independent variable is the placement of students in education as designated with a federal placement code. The federal placement code provides nominal data with three categories including: 80% or greater, 40–79%, and 39% or less in the general education setting (Oregon Department of Education, 2008). The data collected related to the federal placement code does not change within the life of the IEP. If a student's amount of time in the general education setting changed, the IEP team would reconvene and the federal placement code would be adjusted. Data collected for this study included static group placement, as students could not move from one group to another. The dependent variable for the study included the state assessment scores, OAKS, for the selected students. This data included the raw score for students on a scale established by the state of Oregon. This data has student identifier information such as student specific identification numbers removed and replaced with randomized numbers. Additional data included information collected in the student information system for the school district. These variables include gender, race, socioeconomic status, and grade level of students selected for study. In the student information system, markers are flagged for each category described above. While individual student identifiers were removed, identifiers for race, gender, socioeconomic status, and grade level remained with the data set. Additional data was collected for comparing students not identified as learning disabled. This data set included the students' grade level, special education identification, and OAKS score for students in grades 3–8 and 10.

Design

This study included the nominal data for student placements in three categories and compares across groups the students' achievement on OAKS in both reading and math. Additional tests included comparing OAKS scores for students identified with and without special education identification. Due to the nature of the variables, and OAKS being an achievement test, I used multivariate MANOVA for the primary data analysis. The multivariate analysis of variance (MANOVA) is a test to compare two or more vectors of means. Carey (1998) clarifies the function of the MANOVA test is to "explore how independent variables influence some patterning of response on the dependent variables" (p. 1). Additionally, he notes that MANOVA tests the independent variables interaction and predicts the dependent variables. Like analysis of variance (ANOVA), MANOVA determines if there is a statistical difference among the groups and differs from T–tests in allowing more than two categories for comparison.

Multiple regression was not selected as the primary test for this study as it is typically reserved for experimental studies. This study and data collected is observational in nature making MANOVA an ideal choice. Also, multiple regression stresses issues of predicating outcomes while MANOVA focuses on looking across groups. Since the placement of students with disabilities occurs across three different categories, MANOVA can be used to examine the relationship across groups with OAKS scores.

The data collected for this study includes nominal data in the form of federal placement groups for learning disabled students and categorical data in the form of raw scores on the Oregon state assessment (OAKS). The comparison of three nominal groups to a test score requires an analysis of variance to determine if there is a statistically significant difference across the groups. Field (2009) argues that covariates are continuous variables, like grade–level, which have an influence on the dependent variable. Since this study includes an achievement test as the dependent variable, the related grade level will be sorted into grade bans and treated as an independent variable.

Assumptions

The analysis of data includes MANOVA and categorical data. To avoid bias, assumptions were tested prior to the MANOVA test. These assumptions include data appropriateness, normally distributed data, homogeneity of variance, homogeneity of regression slopes, interval data, and independence of the covariates. Before beginning the data analysis, the appropriateness of the data was checked to ensure that the outcome variable is continuous and the factors are categorical. The assumption of normal distribution assumes that each dependent variable should be normally distributed for each group of the independent variable. The Shapiro–Wilk test of normality was used to verify this assumption of the data. The second assumption tested the homogeneity of regression slopes using Levene's test for homogeneity. This assumption ensures that "the variance of each of the groups should be approximately equal" (Boslaugh, 2012).

Achievement tests

One of the variables used in the study is the Oregon Assessment of Knowledge and Skills (OAKS). These achievement tests are assessments designed to measure the information students know in relation to the state standards. In an Encyclopedia of assessments and measurements Salkind (2006) states an achievement test is "any test designed to measure student learning in the context of an educational or training program" (p. 7) and that achievement itself is a change in cognitive behavior that occurs with a class or program of study. Additionally, Kridel (2010) shares that achievement tests are designed to assess the information a student has learned. He clarifies that these types of tests differ drastically from aptitude tests, which look at cognitive traits for capacity. Most state achievement tests, he continues, are standardized, norm referenced, and are not predictive of student capacity to learn but can provide information on what the student has already learned. Achievement tests are valid "when it [content] has been taught to the test–taker" (p. 6). The OAKS assessment used as categorical data is reported to assess the mastery of students' knowledge of Oregon State standards (OAKS, 2015) meeting the criteria for achievement test described by Kridel.

MANOVA is considered to be a "robust procedure" even if some of the above–mentioned assumptions are violated the assessment can produce good results. This is due to the F–statistic. In the MANOVA test, the F–statistic will be used as a probability model and evaluates the model used for measurement. The F–statistic will be calculated by dividing the variance between the groups with the variance within the groups.

Analytical section

This study used existing data from Newberg School District. As Director of Special Programs, I have access to current and historical data for students with disabilities regarding federal placement codes and student demographics. These files are maintained on a central student information system that I have access to with my position as Director. The OAKS scores, I retrieved from the Willamette Education Service Districts (WESD) Toolbox application file kept by the school district for all students; I also have access to these scores as a district administrator. This database has both current and historical data. The data collected removed students in K–2, and other students in grades 9, 11, and 12 if they did not take the OAKS assessment. The anticipated sample size for Newberg students was 260 students. Before proceeding with the testing, I ensured the data contained appropriate characteristics for SPSS entry with Microsoft Excel. I identified any outliers in the data and applied a transformation if several outliers exist to confirm a normal distribution fit for the data. I used SPSS *22.0* with a statistics interpreter to complete the MANOVA analysis of the data and analyze the data with a methodologist.

Using MANOVA, I analyzed and interpreted the data to determine if there was a statistically significant interaction effect. SPSS 2.0 uses four different statistics tests based on the MANOVA table. First, the Wilk's Lambda test calculated the "determinant of the error sums of squares and cross products matrix E is divided by the determinant by the total sum of squares and cross product matrix T = H + E" (Carey, 1998, P. 12) and is represented with $\Lambda^* = |E| / |H+E|$. The second test based on the MANOVA table is the Hotelling–Lawley Trace where H and the inverse of E are multiplied as follows: $T^2_0 = trace\ (HE^{-1})$. The Pillai Trace "multiplies H by the total sum of the squares and cross products matrix T=H+E for $V = trace\ (H(H+E)^1)$" (Carey, 1998, p. 13). Lastly, Roy's Maximum Root multiplies H by the inverse of E and then computes the largest value of the resulting matrix.

Since this study included multiple tests on a single data set, there is greater likelihood of an error. The *experiment–wise* Type I error rate has potential for being higher when multiple tests are performed on data than a single experiment (Boslaugh, 2012). To reduce the likelihood of this type of error Bonferroni's correction adjusting the p–value for multiple testing was applied. Additionally, I have elected to reduce the number of tests applied to the data set from eight to six using MANOVA instead of eight individual tests.

Using the data and MANOVA, I examined the following effects for Research Question 1a:

- The main effect of placement of math scores of students with disabilities.
    - Null: Math scores will not differ by placement among students with disabilities.
- The main effect of gender on math scores of students with disabilities

    - Null: Math scores will not differ by gender among students with disabilities.
- The interaction effect of gender and placement on math scores
    - Null: The relationship between math scores and gender will not differ for placement.

This procedure was repeated for 1b, 1c, 1d, 2a, 2b, 2c, and 2d. For research questions 3 and 4, when determining if there is a statistical difference between students identified and not identified as special education OKAS scores, I used an appropriate ratio model. Students tested in OAKS without a disability is an 8.073:1 ratio to students with disabilities. For this study, I randomly select 800 students without disabilities and 100 students with disabilities for comparison in OAKS scores in reading and math. Analyzing the impact of placement and gender, race ethnicity, socioeconomic status, and grade ban for students with disabilities gives us a clearer picture of differences in math and reading scores by categories; however, it does not give us a picture of whether special education math and reading scores differ from general education math and reading scores.

Research Ethics

The research data for this study included pre–existing data. Due to the nature of the data, the George Fox University Institutional Review Board (IRB) approval was not required for this study. IRB approval is required when students or adults are being studied. However, due to the smaller ample size and protection of student data, IRB approval was obtained from George Fox University's IRB. As Director of Special Programs, I have access to the existing data including student placement, demographic, and OAKS scores. I asked the Newberg School District's Superintendent for permission to use and publish the data citing it as NSD data. All data collected was used without student identifier information. Collection and records of the data were kept in secure files at the school district office both during and after the research was completed.

Role of the Researcher

I am a graduate student working to complete the requirements of a doctoral degree through George Fox University. The research conducted provides practical applications to my profession and general work. As a Director of Special Programs including Special Education, I have an ethical responsibility to provide accurate and authentic research results for my district as well as the field of special education.

Prior to collecting, analyzing, and interpreting the data I have bracketed the assumptions, experiences, and beliefs about the data. Burns and Groove (2003) state that bracketing is the researcher setting aside the previously known information prior to the study. As the Director of Special Education, I have specific knowledge and experiences related to the inclusion of learning disabled students. Bracketing assists in the removal of bias that may arise from my previous experiences.

Chapter 4

Results

Introduction

The purpose of this study was to investigate a relationship between the placement of students with learning disabilities in the general education classroom and student achievement test scores. Additionally, the study examined the interaction effects of demographic data such as socioeconomic status, race, gender, and grade level. An objective of this study is to better understand the impact on student achievement scores in correlation to placement in the general education classroom.

Assumptions

Prior to applying the MANOVA test to the data, assumptions were tested to reduce bias. The MANOVA analysis works if the data passes certain assumptions. The first assumption tested is assuring continuous dependent variables for MANOVA. Both reading and math scores are continuous forms of data; therefore, the collected data passes the first assumption. Second, the independent variables must be categorical for the MANOVA analysis. Independent variables in the data include gender, race, socio–economic status, grade level, and federal placement code. These independent variables meet the requirements for the second assumption. The third assumption is the independence of observations. This assumption was met by checking for duplicates in the data and observing all data represent unique subjects.

The fourth assumption is sample size. This assumption is met as each category of the dependent variable contains 20 individual samples. The fifth assumption prior to MANOVA is ensuring there are no univariate outliers. The data presented outliers in various areas. Further investigation of the raw data shows no univariate outliers in any combination groups of two independent variables for a dependent variable. This means there were no outliers in the continuous reading or math data. Since the large sample follows normal distribution and the outliers were not in the continuous dependent variables the assumption is met (Boslaugh, 2012). The sixth assumption is the tests of normality. This assumption was tested with the Kolmogorov–Smirnov and Shapiro–Wilk tests (See Appendix A). The assumption is met when the non–statistically significant tests show less than .01 for non–normality.

The seventh assumption met is Multicollinearity. This occurs when two or more independent variables are highly correlated. In the data, this would be the independent variables race, gender, SES, and grade level. Mertler and Vannata (2005) suggest collinearity statistics for two independent variables exist if $r > .9$. The test of multicollinearity is statistically significant $r = .775$. Since this is approaching .9 but does not meet the threshold, it meets the assumption that the independent variables of the study are not highly correlated with each other. The eighth assumption is linearity. Linearity is the linear relationship between the outcome variable and any continuous predictor (Boslaugh, 2012). This assumption was met by visually inspecting the data with a scatter–matrix plot. The final assumption is the homogeneity of covariance test. This is tested using Box's M test where the results of the test should be non–statistically significant. This is essentially testing to ensure the dependent variables follow a normal distribution. The test showed statistically significant equality of variance–covariance with $p < .001$. Since this was statistically significant, the assumption is met using Pillai's

Trace. This positive valued test ranges in scores from 0 – 1. This test suggests the closer the value gets to 1, the more the effects of the model are contributing to the significance.

Research Questions

1. **Is there a statistically significant difference in OAKS math scores for students with learning disabilities by Special Education placement options in NSD?**

This first primary research question is designed to explore a relationship between the placement options for students with learning disabilities and their OAKS math scores. Table 1 shows a statistically significant difference in the mean score of students across federal placement categories. Students in general education for less than 39% of their day scored an average 80 points below students in the next placement category. Students in the general education classroom for 40–79% of their day scored 13.44 points fewer than students who received more than 80% of their instruction in the general education classroom.

Table 1

Math Scores

Federal Placement Category*	N	Mean Score	Standard Deviation
39% <	12	120.17	46.87
40–79%	49	200.39	42.45
80% >	199	213.83	13.99

**Percentage of time students spend in general education*

a. **Is there a statistically significant difference in OAKS math scores for students with learning disabilities by gender in NSD?**

Table 2 examines the student achievement scores across federal placement categories and gender. Students with less than 39% of their day in general education scored lower than students in the next federal placement category. Male students scored

78.37 and female students scored 70.2 points respectively lower than students 40–79% in general education. Additionally, students who received the most instruction in general education have the highest math achievement scores.

Table 2

Math Scores By Gender

Federal Placement*	N	39% <	N	40–79%	N	80% >
Mean Score Male (SD ±)	4	126.63 ± 39.42	17	205.00 ± 0.71	113	223.71 ± 8.11
Mean Scores Female (SD ±)	8	139.00 ± 38.66	19	209.20 ± 30.09	96	224.13 ± 7.05

**Percentage of time students spend in general education*

b. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by race in NSD?

Table 3 observes the mean student achievement score in math by race and federal placement code. When accounting for race, students identified as Black, Asian, Pacific Islander, and Native American were not included in the tables as the sample size was too small to protect against personal student identifying information. The observed results show students in race categories as White, Hispanic, and 2 or more races. For each category, students in general education less than 39% scored lower than students receiving more instruction in general education.

Table 3

Math Scores By Race

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
Mean Score White (SD ±)	8	122.92 ± 2.95	42	208.91 ± 2.13	95	225.16 ± 4.01
Mean Score Hispanic (SD ±)	2	103.5 ± 1.41	4	189.75 ± 24.98	26	219.36 ± 8.73
Mean Score 2 or more races (SD ±)	-	-	2	209.00 ± 16.97	15	224.55 ±11.01

**Percentage of time students spend in general education*

c. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by socioeconomic status in NSD?

Table 4 observes the relationship between students' time in general education, noted by the federal placement category, the socioeconomic status identified, and the mean math achievement score. Students identified as economically disadvantaged, and who spend less than 39% of their day in general education scored 84.19 points fewer than students who receive more instruction in general education. Additionally, students identified as economically disadvantaged who spend the most time in general education scored 18.46 points higher than students who received 40–79% of their instruction in general education.

Students identified as not–economically disadvantaged and who spend less than 39% of their day in general education, scored 66.03 points fewer than students who receive more instruction in general education. Students identified as not–economically disadvantaged who spend the most time in general education scored 35.01 points higher than students who received 40–79% of their instruction in general education.

Table 4

Math Scores By Socioeconomic Status

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
Economically Disadvantaged (SD ±)	5	116.81 ± 23.07	22	201.74 ± 7.39	100	220.20 ± 6.41
Not–Economically Disadvantaged (SD ±)	2	124.50 ± 41.72	21	190.53 ± 11.97	84	225.54 ± 8.44

**Percentage of time students spend in general education*

d. Is there a statistically significant difference in OAKS math scores for students with learning disabilities by grade level in NSD?

Table 5 observes the math scores for students across grade levels and federal placement categories. The grade levels are identified by three different categories: K–5, 6–8, and 9–12. K–5 students who also receive less than 39% of their day in general education scored 79.39 points fewer than students in the next federal placement category. Additionally, K–5 students who receive the most instruction in general education scored 20.97 points higher than students with 40–79% of time in general education. Students in grades 6–8 who spend less than 39% of their time in general education scored 76.45 points lower than students who spend 40–79% of their day in general education. Also, students in 6–8 who spend the most time in general education scored 24.29 points higher than students in the next federal placement category. For students in grades 9–12 who also spent more than 80% of their day in general education scored 2.03 points higher on average than students with 40–79% of their day in general education instruction.

Table 5

Math Scores By Grade Level

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
K–5 (SD ±)	5	116.29 ± 43.17	13	195.68 ± 43.24	54	216.65 ± 16.13
6–8 (SD ±)	7	125.60 ± 56.40	19	202.05 ± 44.18	71	226.34 ± 10.53
9–12 (SD ±)	-	-	17	228.00 ± 9.849	74	230.03 ± 8.41

**Percentage of time students spend in general education*

2. **Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by Special Education placement options in NSD?**

This second primary research question was designed to explore a relationship between the placement options for students with learning disabilities and their OAKS reading scores. Table 6 shows a statistically significant difference in the mean score of students across federal placement categories. Students who spend less than 39% of their time in general education classes scored an average of 45.39 point less than students in the next federal placement group. Students in general education 40–79% of their day scored an average of 16.49 points fewer than students who spent more than 80% of their day in general education.

Table 6

Reading Scores

Federal Placement Category*	N	Mean Score	Standard Deviation
39% <	12	157.67	21.26
40–79%	49	203.06	21.14
80% >	199	219.55	12.99

**Percentage of time students spend in general education*

a. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by gender in NSD?

Table 7 observes the relationship for both male and female students across federal placement categories. Students with less than 39% of their day in general education scored 46.13 (male) and 43.28 (female) points fewer than students in the next federal placement category. Both male and female students who also spent more than 80% of their day in general education scored 9.37 (male) and 18.89 (female) points higher than students with 40–79% of time in general education.

Table 7

Reading Scores By Gender

Federal Placement*	N	39% <	N	40–79%	N	80% >
Mean Score Male (SD ±)	5	158.66 ± 60.48	31	204.79 ± 3.55	116	214.16 ± 5.07
Mean Scores Female (SD ±)	6	158.39 ± 33.84	16	201.67 ± 21.82	79	220.56 ± 3.12

**Percentage of time students spend in general education*

b. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by race in NSD?

Table 8 examines the reading student achievement scores across federal placement categories and the dependent variable of race. The results for each race observed show students score higher as they receive more instruction in general education. The most notable difference in the table below is for Hispanic students who receive less than 39% of their day in general education scored 72.75 points lower than students in the next federal placement category.

Table 8

Reading Scores By Race

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
Mean Score White (SD ±)	8	164.18 ± 6.61	42	214.64 ± 7.26	95	223.71 ± 0.22
Mean Score Hispanic (SD ±)	2	135.75 ± 33.59	4	208.5 ± 4.95	26	221.08 ± 2.91
Mean Score 2 or more races (SD ±)	-		2	209 ± 16.97	15	220.62 ± 0.40

**Percentage of time students spend in general education*

c. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by socioeconomic status in NSD?

Table 9 shows the reading achievement scores for students with regards to socioeconomic status and the amount of time they spend in general education. Students identified as economically disadvantaged and not–economically disadvantaged scored higher in relationship to the amount of time they spent in general education.

Table 9

Reading Scores By Socioeconomic Status

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
Economically Disadvantaged (SD ±)	5	151.19 ± 41.81	22	208.81 ± 7.10	100	222.36 ± 7.89
Not– Economically Disadvantaged (SD ±)	2	163.70 ± 0.00	21	193.62 ± 15.28	84	224.31 ± 12.45

**Percentage of time students spend in general education*

d. Is there a statistically significant difference in OAKS reading scores for students with learning disabilities by grade level in NSD?

Table 10 shows the observed reading scores for students by grade level across federal placement codes. In grades K–5 and 6–8, students score higher in relationship to the amount of time they spend in general education. The exception is for students in grades 9–12. The average scores for students with 40–79% of their education in general education 2.9 points higher than those with the most time in general education. It is important to consider the standard deviation of ±7.21 for this mean score, which makes the difference negligible.

Table 10

Reading Scores By Grade Level

Federal Placement Category*	N	39% <	N	40–79%	N	80% >
K–5 (SD ±)	5	145.14 ± 63.16	13	196.68 ± 39.24	54	208.55 ± 27.91
6–8 (SD ±)	7	175.20 ± 67.03	19	205.81 ± 39.81	71	225.38 ± 14.79
9–12 (SD ±)	-	-	17	237.00 ± 7.21	74	234.10 ± 8.01

**Percentage of time students spend in general education*

The Interaction Effect

Each research question tested for a statistically significant difference in achievement scores for students when accounting for variables of gender, race, socioeconomic status, and grade level. The following tables show the interaction effect of the variables in multivariate tests. The F ratio is the “ratio of the variation explained by the model and the variation explained by unsystematic factors” (Field, 2013). When the value is greater than 1, the effect is beyond extraneous factors. Field also notes that of the multivariate tests, Roy’s Largest “represents the maximum possible between group differences" and Wilk's Lambda "represents the ratio of error variance to total variance" (p 165). Lambda scores vary between one and zero with numbers closer to zero showing there is less variance not explained by the independent variable. The interaction effects of the variables are noted in the MANOVA tables below.

Table 11

Federal Placement and Gender

Test	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.003	.179	4.000	420.000	.002
Wilks' Lambda	.997	.179	4.000	418.000	.002
Hotelling's Trace	.003	.178	4.000	416.000	.002
Roy's largest	.003	.354	2.000	210.000	.003

Table 12

Federal Placement and Race

Test	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.004	.127	6.000	420.000	.002
Wilks' Lambda	.996	.127	6.000	418.000	.002
Hotelling's Trace	.004	.126	6.000	416.000	.002
Roy's largest	.003	.189	3.000	210.000	.003

Table 13

Federal Placement and Socioeconomic Status

Test	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.046	2.460	4.000	420.000	.023
Wilks' Lambda	.954	2.477	4.000	418.000	.023
Hotelling's Trace	.048	2.495	4.000	416.000	.023
Roy's largest	.048	5.031	2.000	210.000	.046

Table 14

Federal Placement and Grade Level

Test	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.060	2.175	6.000	420.000	.030
Wilks' Lambda	.940	2.184	6.000	418.000	.030
Hotelling's Trace	.063	2.192	6.000	416.000	.031
Roy's largest	.055	3.883	3.000	210.000	.053

Table 15 shows a significantly significant relationship between gender, socioeconomic status and federal placement. Wilks' lambda is .913, and has an associated *F* of 4.861. Roy's largest value is .062 with an associated *F* value of 6.559. These scores show an interaction between gender, socioeconomic status and federal placement that would likely not be found to be caused by mere chance. The higher *F* value provides evidence that when observing all three variables, there is a greater likelihood of interaction.

Table 15

Gender, Socioeconomic Status, and Federal Placement

Test	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.089	4.872	4.000	420.000	4.00
Wilks' Lambda	.913	4.861	4.000	418.000	4.00
Hotelling's Trace	.093	4.850	4.000	416.000	4.00
Roy's largest	.062	6.559	2.000	210.000	2.00

The MANOVA results showed statistical significance in the interaction between variables. The Tests of Between–Subjects Effects examines how the dependent variables of race, gender, socioeconomic status, and grade level differ for the independent variable of federal placement code. Table 16 shows significant relationships between socioeconomic status and federal placement with an associated *F* score for reading 4.857 and 2.694 for math. Additionally, when examining the dependent variables gender and socioeconomic status with the independent variable of federal placement the associated *F* value is 6.558 for reading and 4.410 for math (See Appendix B).

Table 16

Between–Subjects Effects

Source	Dependent Variable Score	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender and FP*	Reading	321.375	2	160.688	.229	.796	.002
	Math	344.952	2	172.476	.325	.723	.003
SES and FP*	Reading	6823.877	2	3411.939	4.857	.009	.044
	Math	2860.903	2	1430.451	2.694	.070	.025
Gender, SES, & FP*	Reading	9214.273	2	4607.137	6.558	.002	.059
	Math	4682.550	2	2341.275	4.410	.013	.040

**Federal Placement (FP) is the percentage of time students spend in general education. SES is the Socioeconomic Status of students.*

Post hoc analyses were conducted since there were observed statistical significance in the MANOVA results and the interaction effects of variables. Tukey HSD is a post hoc test used to determine which variables differ in the interaction. The Honest Significant Difference (HSD) is the distance between groups (Field, 2013). The results of the post hoc test show there are differences in the reading and math scores across all levels of federal placement code (See Appendix C).

3. **Is there a statistically significant difference in OAKS math scores for students identified and not identified as having a learning disability in special education in NSD?**

Primary Research Question 3 is designed to determine if there is a statistically significant difference in achievement scores for students identified as having a learning disability and students who are not identified with a disability. For math, students without disabilities have statistically significant higher achievement scores than students who experience a learning disability. On average, students without disabilities scored 25.95 points higher than students with learning disabilities.

Table 17

Math Scores

N	Students with Disabilities	Standard Deviation	N	Students without Disabilities	Standard Deviation
260	211.12	38.22	800	237.07	9.79

4. **Is there a statistically significant difference in OAKS reading scores for students identified and not identified as having a learning disability in special education in NSD?**

Primary Research Question 4 is designed to determine if there is a statistically significant difference in achievement scores for students identified as having a learning disability and students who are not identified with a disability. For reading, students without disabilities have statistically significant higher achievement scores than students who experience a learning disability. On average, students without disabilities scored 24.48 points higher than students with learning disabilities.

Table 18

Reading Scores

N	Students with Disabilities	Standard Deviation	N	Students without Disabilities	Standard Deviation
260	211.58	38.09	800	236.06	10.32

Conclusion

Inclusion for students with disabilities is a challenging and often times contested decision. Various stakeholders in an IEP meeting value inclusion differently. The results of this study offer evidence that students who experience a learning disability scored higher on achievement tests in both math and reading when they received a greater amount of instruction in the general education classroom. Additionally, the study confirmed an achievement gap in Newberg School District for students who experience a disability versus students who do not have an identified disability.

One of the interesting effects of the study was the significant interaction effect between gender, socioeconomic status, and federal placement code. The high *F* statistic and significant value provide evidence that when considering placement, the variables of gender and socioeconomic status will affect the student achievement. This is noteworthy considering Newberg School District is comprised 46% of students eligible for free or reduced lunch. The study also confirms that regardless of the demographic data students enter school with, the amount of time they spend in general education has the greatest impact on their achievement in math and reading.

Chapter 5

Discussions and Conclusions

Introductions

This study used a multivariate analysis of variance (MANOVA) to examine the impact of placement in the general education classroom on student achievement scores. Additionally, the study investigated the relationship across groups of students in different placement categories and their achievement score on Oregon Assessment of Knowledge and Skills (OAKS) in reading and math. Specifically, this study explored the relationships of various students groups with regards to gender, race, socioeconomic status, and grade level and achievement scores across placement categories. In this chapter, I will summarize the findings of the study and discuss implications for practitioners. Also, I will describe the limitations of the study as well as the suggestions for further research.

Summary of Findings

The study examined the effect of placement, as described with the federal placement code, and student achievement scores. The study also examined a continuous dependent variable in achievement scores against several independent variables in gender, race, socioeconomic status, and grade level.

Research Question 1

The primary research question asked if there was a statistically significant difference in the math achievement scores for students with disabilities across placement categories. The null hypothesis is that there is not a difference in math scores across placement categories for students with disabilities. The data in Table 1 shows a statistically significant difference in the scores students achieved when examined by placement category (η = .044). Therefore, the null hypothesis is rejected. In this study, I found that students in federal placement categories with more time in general education classes scored higher in math than peers removed from general education instruction. This pattern continued throughout the study for research question 1a, 1b, 1c, and 1d. Tables 2–5 show statistically significant differences in math achievement scores across placement categories (η = .040). This was true when examining variables of gender, race, socioeconomic status, and grade level. For each variable introduced the effect of removal from the classroom, accounted for in this study by federal placement code, had the largest predicting factor for student achievement scores.

Research Question 2

The second primary research question examined the reading achievement scores of students with disabilities across federal placement categories. Like research question 1, the null hypothesis for this question is that there is not a statistically significant difference in reading achievement scores for students with disabilities across federal placement categories. Table 6 shows students in all three federal placement categories with varying scores for reading achievement. While the difference is not as pronounced as the scores in math achievement, there is still a statistically significant difference in the reading achievement scores of students in the study across the three placement categories (η = .059). Consequently, the null hypothesis is rejected, and the findings provide evidence that students removed from general education classes scored lower in reading achievement through placement groups. In other words, the more students were removed from the general education classes, the more their reading achievement scores fell as compared to peers not removed with the same frequency. Just as Research Question 1 found, Tables 7–10 provide evidence that the variables for gender, race, socioeconomic status, and grade level did not change the answer for research question 2. When accounting for each variable across federal placement categories, students with more time in general education classes scored higher than peers removed from general education with greater frequency ($\eta = .040$). Also, the results show there is a detrimental effect on student achievement when students are removed from general education.

Research Questions 3 and 4

Research questions 3 and 4 ask if the overall scores for math and reading differ for students who experience a disability and students who are not identified as special education. The students not identified in special education scored higher than students identified as special education in both math and reading achievement scores. This is confirmed in the literature repeatedly and often identified as the achievement gap (Carbonaro, 2013; McGee, 2004; Stuart and Rinaldi). In addition to the literature, the study does confirm a difference in the overall mean scores of students with a disability and students without disabilities. This can be identified as an achievement gap for students in Newberg School District.

Placement

For this study, placement is defined as the amount of time a student spends in the general education classroom. The results of the study show overall that students score statistically significant higher in both reading and math when they receive more than 80% of their instruction in the general education classroom. For math, students removed from the general education class more than other groups scored significantly lower than peers in other placement groups. On average, students in this group scored more than 80 points below students in other groups. For reading, students removed the most from general education had less detrimental score effects than math, but they still scored an average of 45 points lower than peers in the next federal placement category. Overall, without considering other factors or variables, students' placement in general education class impacts at predictable rates their scores on achievement tests.

It is important to note that when a student is removed from the general education class, they are most often receiving targeted and specific instruction related to their disability. This means if they have a disability like dyscalculia, then they are provided instruction that is both individualized and in a small group setting. The overwhelming general logic and traditional practice suggests educators trust this will improve the achievement of a student with a disability. However, this study confirms the theory of inclusion and reinforces the idea that the inverse relationship is true. In this study, students who spent more time in general education classes scored higher even when accounting for a variety of variables like gender, race, socioeconomic status, and grade level in both reading and math. The greatest predictor to improving student achievement scores is the amount of time a student spends in general education.

Implications

A key point of discussion is that this study does not search for causation of the achievement scores. Rather it is a correlational observation of two different variables related to students in schools. The achievement of students' OAKS scores for math and reading as well as the federal placement code they are assigned based on the amount of time they receive instructional in general education. This study does not prove that students taught in general education classes caused the increase of achievement scores; it simply shows the correlated relationship between the quantities of time students received instruction in general education and the achievement scores for reading and math.

With an understanding of the correlation between the amount of time students spend in general education and the achievement in both reading and math for students with disabilities, IEP teams should consider the option of keeping students in general education for the majority instruction. This shift in practice is recommended both by the literature (Burris & Welner, 2005, Carbonaro, 2013; Hubberman, Navo, & Parrish, 2012) as well as evidenced in this study. For teachers, it is critical to balance the need of students in terms of the disability as well as understanding the impact removing a student from general education may cause. This requires collective partnership with general education teachers, professional development on inclusive practices for both teachers, and intentional time to collaborate with general education partners. For administrators, this study confirms the theory of inclusion for students with disabilities in Newberg School District. It is important to contextualize the school served and the effects of both inclusive practices and removal from general education. For policy makers, it is important to recognize the quantitative evidence of inclusive practices. Achievement tests are limiting in nature, but they can provide a snapshot of students' attained skills over time. The predictable patterns observed in this study suggest supporting and funding inclusion may likely result in higher achievement scores for students with disabilities.

Limitations

A key limitation of the study is the single math and reading achievement test administered. There are a variety of reasons students may score poorly on a single exam given annually. Additionally, this study did not look at the growth students made across years in achievement scores, but rather isolated the single year achievement score and the federal placement category of the students with learning disabilities. For students who experience a disability, there may be a longer amount of time required to acquire skills to reach grade level mastery of standards, and this study does not account for skill attainment times. Another limitation is the identification resource for economically disadvantaged students. In Oregon, students identified as eligible for Free and/or Reduced lunches is one metric for identifying students experiencing poverty. Since this does not account for the severity or frequency a student experiences poverty, there are limitations to the number of students identified and the impact that variable has on student achievement.

Additional limitations include a single school district's data for students who experience a learning disability. Students with other disabilities including speech and language, autism, other health impaired, and low incidence disabilities were not included in the study. This limitation was set as students who experience a learning disability are most likely average or above average intelligence and experience an unexpected underperformance in achievement.

A limitation of quantitative research is the reasoning or the "why" behind placement decisions. The nature of quantitative data does not provide opportunity for asking in–depth questions of students, families, and practitioners as it relates to inclusive practices. The information in this study is limited to the data collected and observable outcomes of achievement scores for students with disabilities.

Suggestions for Further Study

The study was limited to students with learning disabilities in Newberg School District. Further research would include studying students with multiple disability categories like speech/language, Autism, and other health impaired as they relate to the amount of time spent in general education. Additional factors to study would be amount of teacher training, willingness of staff to serve multiple students, parent participation, and student perceptions of inclusion.

Further research into inclusive practices and outcomes in Newberg School District as well as other districts should include a qualitative review of IEP team members. It would be important to gather information on teacher perceptions and experiences, family perceptions and experiences, as well as student voice. This information coupled with quantitative data could provide a working service delivery model for teams as they progress with decisions regarding inclusion.

Conclusions

While this study has limitations, and is only a correlation of achievement scores and placement, it does provide evidence that for students in Newberg School District the amount of time spent in a general education class impacts both reading and math scores. The literature on inclusion is vast and growing, and this study adds to the body of evidence that inclusionary practices can positively impact student achievement scores. Several studies focus on achievement gaps for various groups of diverse learners (Camilli, Vargas, Ryan, & Barnett, 2010; Fuchs, Fuchs, & Stucker, 2010), and this study attempted to take the body of research available regarding achievement gaps as apply that to the data collected for students in Newberg Schools. For this study, the evidence suggests a relationship between the amount of time students spend in the general education and their achievement scores. This is true even when accounting for variables including gender, race, socioeconomic status, and grade level. Without exception, the most predictable outcomes observed were the federal placement code for students with disabilities.

The decision to remove students from general education instruction is a choice made by educators with good intentions. Often these teachers are striving to support struggling learners and have found support from parents, administration, and general education teachers to continue these practices. The option of inclusion becomes an important choice when considering options and opportunities students will have beyond the school doors. Additionally, this study confirms that when students remain in general education classes they have higher scores on achievement tests. It is critical for teams to review the implications of decisions and choices made in the life of the IEP and well beyond the students' education in public schools.

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Appendix A

Tests of Normality

Grade Level	Race	Socio–Economic Status	Gender	Federal Placement Code	KS	Sig. Value	SW	Sig. Value
Reading								
9–12	White	E.D.	Female	30	.232	.200	.892	.331
Math								
9–12	White	E.D.	Female	30	.213	.200	.905	.406
Reading								
9–12	White	Not E.D.	Female	30	.278	.200	.878	.332
Math								
9–12	White	Not E.D.	Female	30	.402	.200	.753	.041
Reading								
9–12	White	Not E.D.	Male	30	.210	.121	.870	.052
Math								
9–12	White	Not E.D.	Male	30	.178	.200	.933	.378
Reading								
9–12	2 or more races	E.D.	Female	33	.207	.200	.945	.701
Math								
9–12	2 or more races	E.D.	Female	33	.217	.200	.968	.862
9–12	Hispanic	E.D.	Female	33	.159	.200	.970	.887
Math								
9–12	Hispanic	E.D.	Female	33	.131	.200	.992	.998
Reading								
9–12	Hispanic	E.D.	Male	33	.121	.200	.966	.767
Math								
9–12	Hispanic	E.D.	Male	33	.115	.200	.972	.877
Reading								
9–12	White	E.D.	Female	33	.180	.073	.917	.074
Math								
9–12	White	E.D.	Female	33	.161	.163	.958	.474
Reading								
9–12	White	E.D.	Male	33	.134	.193	.944	.125
Math								
9–12	White	E.D.	Male	33	.193	.007	.837	000
Reading								
9–12	2 or more	Not E.D.	Male	33	.144	.200	.976	.937

	races							
Math 9–12	2 or more races	Not E.D.	Male	33	.208	.200	.919	.462
Reading 9–12	Hispanic	Not E.D.	Female	33	.208	.	.992	.826
Math 9–12	Hispanic	Not E.D.	Female	33	.358	.	.812	.144
Reading 9–12	White	Not E.D.	Female	33	.112	.007	.949	.001
Math 9–12	White	Not E.D.	Female	33	.170	000	.911	000
Reading 9–12	White	Not E.D.	Male	33	.086	.085	.976	.079
Math 9–12	White	Not E.D.	Male	33	.149	.000	.876	.000
Reading 6–8	2 or more races	E.D.	Female	30	.196	.	.996	.878
Math 6–8	2 or more races	E.D.	Female	30	.211	.	.991	.817
Reading 6–8	Hispanic	E.D.	Female	30	.184	.	.999	.927
Math 6–8	Hispanic	E.D.	Female	30	.276	.	.942	.537
Reading 6–8	Hispanic	E.D.	Male	30	.237	.200	.902	.343
Math 6–8	Hispanic	E.D.	Male	30	.177	.200	.972	.909
Reading 6–8	White	E.D.	Female	30	.134	.200	.948	.615
Math 6–8	White	E.D.	Female	30	.167	.200	.915	.247
Reading 6–8	White	E.D.	Male	30	.295	.000	.571	.000
Math 6–8	White	E.D.	Male	30	.087	.200	.977	.852
Reading 6–8	Hispanic	Not E.D.	Female	30	.238	.	.976	.702
Math								

6–8	Hispanic	Not E.D.	Female	30	.175	.	1.0	1.0
Reading 6–8	White	Not E.D.	Female	30	.087	.200	.986	.989
Math 6–8	White	Not E.D.	Female	30	.129	.200	.960	.577
Reading 6–8	White	Not E.D.	Male	30	.119	.200	.962	.724
Math 6–8	White	Not E.D.	Male	30	.125	.200	.942	.414
Reading 6–8	Hispanic	E.D.	Female	31	.276	.	.942	.537
Math 6–8	Hispanic	E.D.	Female	31	.367	.	.793	.099
Reading 6–8	White	E.D.	Female	31	.207	.	.992	.831
Math 6–8	White	E.D.	Female	31	.232	.	.980	.726
Reading 6–8	White	E.D.	Male	31	.354	.018	.744	.017
Math 6–8	White	E.D.	Male	31	.379	.007	.616	.001
Reading 6–8	White	Not E.D.	Male	31	.410	.001	.643	.001
Math 6–8	White	Not E.D.	Male	31	.401	.001	.608	.000
Reading 6–8	2 or More	E.D.	Female	31	.163	.200	.953	.539
Math 6–8	2 or More	E.D.	Female	31	.175	.200	.935	.289
Reading 6–8	2 or More	E.D.	Male	31	.141	.200	.951	.336
Math 6–8	2 or More	E.D.	Male	31	.197	.026	.926	.099
Reading 6–8	Hispanic	E.D.	Female	31	.096	.200	.977	.424
Math 6–8	Hispanic	E.D.	Female	31	.099	.200	.976	.386
Reading 6–8	White	E.D.	Male	31	.125	.142	.966	.287
Math 6–8	White	E.D.	Male	31	.098	.200	.961	.211

Reading 6–8	Black	E.D.	Female	31	.283	.145	.919	.499
Math 6–8	Black	E.D.	Female	31	.139	.200	.983	.966
Reading 6–8	Black	E.D.	Male	31	.265	.	.953	.583
Math 6–8	Black	E.D.	Male	31	.232	.	.980	.726
Reading 6–8	White	E.D.	Female	31	.076	.166	.984	.246
Math 6–8	White	E.D.	Female	31	.062	.200	.985	.284
Reading 6–8	White	E.D.	Male	31	.093	.086	.989	.759
Math 6–8	White	E.D.	Male	31	.067	.200	.988	.703
Reading 6–8	2 or More	Not E.D.	Female	31	.135	.200	.957	.319
Math 6–8	2 or More	Not E.D.	Female	31	.145	.149	.954	.265
Reading 6–8	2 or More	E.D.	Male	31	.201	.041	.919	.107
Math 6–8	2 or More	E.D.	Male	31	.120	.200	.962	.603
Reading 6–8	Asian	Not E.D.	Female	31	.351	.	.828	.183
Math 6–8	Asian	Not E.D.	Female	31	.253	.	.964	.637
Reading 6–8	Asian	Not E.D.	Male	31	.300	.	.915	.507
Math 6–8	Asian	Not E.D.	Male	31	.181	.	.980	.902
Reading 6–8	Hispanic	Not E.D.	Male	31	.297	.008	.849	.041
Math 6–8	Hispanic	Not E.D.	Male	31	.164	.200	.925	.366
Reading 6–8	White	Not E.D.	Female	31	.089	.000	.973	.000
Math 6–8	White	Not E.D.	Female	31	.049	.200	.988	.030
Reading 6–8	White	Not E.D.	Male	31	.058	263	.993	.214

Math	6–8	White	Not E.D.	Male	31	.063	.013	.986	.012
Reading	1–5	Hispanic	E.D.	Female	30	.146	.200	.992	.985
Math	1–5	Hispanic	E.D.	Female	30	.225	.200	.958	.795
Reading	1–5	Hispanic	E.D.	Male	30	.173	.20	.922	.486
Math	1–5	Hispanic	E.D.	Male	30	.220	.200	.938	.625
Reading	1–5	White	E.D.	Female	30	.450	.000	.533	.000
Math	1–5	White	E.D.	Female	30	.397	.000	.623	.000
Reading	1–5	White	E.D.	Male	30	.192	.200	.927	.311
Math	1–5	White	E.D.	Male	30	.175	.200	.943	.495
Reading	1–5	2 or More	Not E.D.	Female	30	.293	.	.860	.262
Math	1–5	2 or More	Not E.D.	Female	30	.230	.	.939	.645
Reading	1–5	2 or More	Not E.D.	Male	30	.265	.200	.938	.650
Math	1–5	2 or More	Not E.D.	Male	30	.196	.200	.978	.924
Reading	1–5	White	Not E.D.	Female	30	.284	.002	.856	.021
Math	1–5	White	Not E.D.	Female	30	.128	.200	.927	.245
Reading	1–5	White	Not E.D.	Male	30	.317	.000	.685	.000
Math	1–5	White	Not E.D.	Male	30	.135	.200	.948	.263
Reading	1–5	White	E.D.	Female	31	.268	.	.949	.712
Math	1–5	White	E.D.	Female	31	.418	.	.679	.006
Reading	1–5	White	E.D.	Male	31	.347	.023	.751	.020
Math	1–5	White	E.D.	Male	31	.374	.009	.704	.007

Reading 1–5	White	Not E.D.	Female	31	.289	.	.804	.110
Math 1–5	White	Not E.D.	Female	31	.423	.	.691	.009
Reading 1–5	White	Not E.D.	Male	31	.301	.031	.724	.004
Math 1–5	White	Not E.D.	Male	31	.331	.010	.744	.007
Reading 1–5	2 or More	E.D.	Female	33	.096	.200	.981	.917
Math 1–5	2 or More	E.D.	Female	33	.181	.040	.896	.018
Reading 1–5	2 or More	E.D.	Male	33	.090	.200	.945	.124
Math 1–5	2 or More	E.D.	Male	33	.125	.200	.969	.518
Reading 1–5	Hispanic	E.D.	Female	33	.101	.200	.968	.209
Math 1–5	Hispanic	E.D.	Female	33	.056	.200	.985	.798
Reading 1–5	Hispanic	E.D.	Male	33	.106	.200	.984	.748
Math 1–5	Hispanic	E.D.	Male	33	.066	.200	.951	.039
Reading 1–5	Black	E.D.	Male	33	.274	.	.914	.506
Math 1–5	Black	E.D.	Male	33	.231	.	.948	.704
Reading 1–5	White	E.D.	Female	33	.099	.021	.960	.005
Math 1–5	White	E.D.	Female	33	.071	.200	.984	.290
Reading 1–5	White	E.D.	Male	33	.075	.168	.986	.376
Math 1–5	White	E.D.	Male	33	.097	.017	.974	.038
Reading 1–5	2 or More	Not E.D.	Female	33	.133	.200	.926	.212
Math 1–5	2 or More	Not E.D.	Female	33	.123	.200	.941	.362

Reading 1–5	2 or More	Not E.D.	Male	33	.150	.200	.934	.348
Math 1–5	2 or More	Not E.D.	Male	33	.201	.130	.932	.331
Reading 1–5	Hispanic	Not E.D.	Female	33	.317	.	.899	.427
Math 1–5	Hispanic	Not E.D.	Female	33	.183	.	.993	.974
Reading 1–5	White	Not E.D.	Female	33	.047	.200	.991	.128
Math 1–5	White	Not E.D.	Female	33	.052	.077	.995	.628
Reading 1–5	White	Not E.D.	Male	33	.076	.002	.988	.035
Math 1–5	White	Not E.D.	Male	33	.054	.083	.990	.103

**Kolmogrov–Smirnov, Shapiro–Wilk*

Appendix B

Tests of Between–Subjects Effects

	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	RD Score	124709.979[a]	49	2545.102	3.623	.000	.458
	Math Score	168535.166[b]	49	3439.493	6.479	.000	.602
Intercept	RD Score	1466226.560	1	1466226.560	2087.238	.000	.909
	Math Score	1362242.387	1	1362242.387	2565.995	.000	.924
Gender_Rec	RD Score	22.388	1	22.388	.032	.858	.000
	Math Score	56.257	1	56.257	.106	.745	.001
Race_Rec	RD Score	5819.661	3	1939.887	2.762	.043	.038
	Math Score	579.888	3	193.296	.364	.779	.005
SES_FRL_Rec	RD Score	2169.320	1	2169.320	3.088	.080	.014
	Math Score	1389.666	1	1389.666	2.618	.107	.012
Fed_Code_Rec	RD Score	16725.386	2	8362.693	11.905	.000	.102
	Math Score	55323.578	2	27661.789	52.105	.000	.332
Grade_Rec	RD Score	18275.270	2	9137.635	13.008	.000	.110
	Math Score	3386.133	2	1693.067	3.189	.043	.029
Gender_Rec * Race_Rec	RD Score	700.232	2	350.116	.498	.608	.005
	Math Score	284.014	2	142.007	.267	.766	.003
Gender_Rec * SES_FRL_Rec	RD Score	5338.282	1	5338.282	7.599	.006	.035
	Math Score	2894.812	1	2894.812	5.453	.020	.025
Gender_Rec * Fed_Code_Rec	RD Score	321.375	2	160.688	.229	.796	.002
	Math Score	344.952	2	172.476	.325	.723	.003
Gender_Rec * Grade_Rec	RD Score	1791.491	2	895.746	1.275	.282	.012
	Math Score	3100.335	2	1550.168	2.920	.056	.027

Race_Rec * SES_FRL_Rec	RD Score	706.826	2	353.413	.503	.605	.005
	Math Score	162.829	2	81.414	.153	.858	.001
Race_Rec * Fed_Code_Rec	RD Score	174.645	3	58.215	.083	.969	.001
	Math Score	289.272	3	96.424	.182	.909	.003
Race_Rec * Grade_Rec	RD Score	3165.767	4	791.442	1.127	.345	.021
	Math Score	2596.402	4	649.101	1.223	.302	.023
SES_FRL_Rec * Fed_Code_Rec	RD Score	6823.877	2	3411.939	4.857	.009	.044
	Math Score	2860.903	2	1430.451	2.694	.070	.025
SES_FRL_Rec * Grade_Rec	RD Score	477.684	2	238.842	.340	.712	.003
	Math Score	719.871	2	359.935	.678	.509	.006
Fed_Code_Rec * Grade_Rec	RD Score	7736.516	3	2578.839	3.671	.013	.050
	Math Score	1592.815	3	530.938	1.000	.394	.014
Gender_Rec * Race_Rec * SES_FRL_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Gender_Rec * Race_Rec * Fed_Code_Rec	RD Score	105.794	1	105.794	.151	.698	.001
	Math Score	3.030	1	3.030	.006	.940	.000
Gender_Rec * Race_Rec * Grade_Rec	RD Score	239.739	1	239.739	.341	.560	.002
	Math Score	3.312	1	3.312	.006	.937	.000
Gender_Re	RD Score	9214.273	2	4607.137	6.558	.002	.059

c * SES_FRL_Rec * Fed_Code_Rec	Math Score	4682.550	2	2341.275	4.410	.013	.040
Gender_Rec * SES_FRL_Rec * Grade_Rec	RD Score	2507.683	2	1253.842	1.785	.170	.017
	Math Score	342.754	2	171.377	.323	.724	.003
Gender_Rec * Fed_Code_Rec * Grade_Rec	RD Score	3304.459	3	1101.486	1.568	.198	.022
	Math Score	3017.119	3	1005.706	1.894	.132	.026
Race_Rec * SES_FRL_Rec * Fed_Code_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Race_Rec * SES_FRL_Rec * Grade_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Race_Rec * Fed_Code_Rec * Grade_Rec	RD Score	12.697	1	12.697	.018	.893	.000
	Math Score	1114.519	1	1114.519	2.099	.149	.010
SES_FRL_Rec * Fed_Code_Rec * Grade_Rec	RD Score	345.772	1	345.772	.492	.484	.002
	Math Score	70.717	1	70.717	.133	.715	.001
Gender_Re	RD Score	.000	0	.	.	.	.000

c * Race_Rec * SES_FRL_Rec * Fed_Code_Rec	Math Score	.000	0	.	.	.	.000
Gender_Rec * Race_Rec * SES_FRL_Rec * Grade_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Gender_Rec * Race_Rec * Fed_Code_Rec * Grade_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Gender_Rec * SES_FRL_Rec * Fed_Code_Rec * Grade_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Race_Rec * SES_FRL_Rec * Fed_Code_Rec * Grade_Rec	RD Score	.000	0	.	.	.	.000
	Math Score	.000	0	.	.	.	.000
Gender_Re	RD Score	.000	0	.	.	.	.000

c * Race_Rec * SES_FRL_Rec * Fed_Code_Rec * Grade_Rec	Math Score	.000	0	.	.	.	.000
Error	RD Score	147519.159	210	702.472			
	Math Score	111485.388	210	530.883			
Total	RD Score	12133010.000	260				
	Math Score	12168156.000	260				
Corrected Total	RD Score	272229.138	259				
	Math Score	280020.554	259				

a. R Squared = .458 (Adjusted R Squared = .332)

b. R Squared = .602 (Adjusted R Squared = .509)

Appendix C

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Fed Placement	(J) Fed Place-ment	Mean Difference (I–J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
RD Score	1	2	–45.39*	8.537	.000	–65.55	–25.24
		3	–61.88*	7.878	.000	–80.48	–43.28
	2	1	45.39*	8.537	.000	25.24	65.55
		3	–16.49*	4.227	.000	–26.46	–6.51
	3	1	61.88*	7.878	.000	43.28	80.48
		2	16.49*	4.227	.000	6.51	26.46
Math Score	1	2	–80.22*	7.421	.000	–97.74	–62.70
		3	–102.62*	6.849	.000	–118.79	–86.46
	2	1	80.22*	7.421	.000	62.70	97.74
		3	–22.40*	3.675	.000	–31.07	–13.73
	3	1	102.62*	6.849	.000	86.46	118.79
		2	22.40*	3.675	.000	13.73	31.07

Based on observed means.

The error term is Mean Square(Error) = 530.883.

*. The mean difference is significant at the