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## Secondary Math Placement Decisions for Students in Special Education

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**Secondary Math Placement Decisions for Students in Special Education**

by

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A Starred Paper

Submitted to the Graduate Faculty of

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## **Chapter 1: Introduction**

Minn. Stat. 120B. 021, subd. 4, enacted for full implementation in the 2011-2012 school year, was a significant change to the academic requirements for Minnesota K-12 students. This has had a major impact on special education students. These statutory changes required a minimum of the following coursework: three credits of mathematics, including an algebra II credit or its equivalent, sufficient to satisfy all of the academic standards in mathematics, and an algebra I credit by the end of 8th grade sufficient to satisfy all of the 8th grade standards in mathematics (Minnesota Department of Education, n.d.). Thus, students placed in lower special education math classes may not have enough time each year to earn the required credits and graduate on a standard credit-driven diploma. If this does happen, they could graduate on an IEP driven diploma and may be placed on a lower academic track than their peers.

The process of revision and implementation of the Minnesota K-12 Academic Standards in Mathematics has been a process that has been slow and has evolved over multiple school years. As of 2017, the math standards review has been postponed until the 2021-22 school year. The 2007 revision raised the level of mathematics that each student needs to accomplish in order to receive a high school diploma. The three credits now required to graduate include algebra, geometry, statistics and probability sufficient to satisfy the standards, and algebra II. As a result, schools have had to adjust math courses in order to meet the new graduation requirements. In the Osseo Area School district, the graduation requirements for math are: Nonlinear Algebra, Geometry and Algebra 2.

### **Case Studies**

The two case studies involve fictitious students, however, the factual scenarios are similar to those encountered by students, their families, and their professional educators.

**One.** “Demarcio” is in 9<sup>th</sup> grade and has been a special education student since the 3<sup>rd</sup> grade. He has received direct math instruction from a special education teacher. He attended a middle school as an 8<sup>th</sup> grader when during that year, he was also in a special education math class. His IEP team decided as a 9<sup>th</sup> grader he should be placed in a special education math class that provided additional special education direct instruction minutes. When Demarcio began the 9<sup>th</sup> grade, he was enrolled in a remedial, “Algebra Explorations” math class. This placed him on a track to take Nonlinear Algebra in 10<sup>th</sup> grade, Geometry in 11<sup>th</sup> grade, and Algebra II in 12<sup>th</sup> grade. Further, if he is able to pass those classes, he would graduate with the 3 years of required math credits to graduate in Minnesota. Since his IEP states he should have direct special education math instruction he needs to change classes or have an IEP meeting. Without knowing the student or his skills and abilities because he is new to high school, it would be difficult for the team to properly evaluate his academic abilities and to provide an appropriate placement decision.

**Two.** “Drake” is a student who has been enrolled in math skills, a special education math class. He has direct math instruction minutes listed on his IEP. However, his academic skills are much higher than those of his peers in the same special education math skills class. This is the problem that some special education students encounter. This concern needs to be addressed at his IEP meeting which sometimes takes place too late in the school year in order to move him and other students in similar situations into a general education math class. It is also up to each individual case manager and his IEP team whether to move the student or not.

This raises questions about placement decisions of both students. It seems as if each decision was not made based on the students’ skills, but it was based on the vision of the middle

school case manager, teachers' perceptions, class registration errors, test scores, and other factors.

### **Research Question**

What are the implications of how secondary math placement decisions are made for students with disabilities and how do these affect achievement?

### **Focus of the Paper**

This paper examines the consequences of using these criteria to determine placement decisions. The secondary math placement decisions are based on teacher judgement, standardized achievement tests, grades and other factors. The focus of this paper is to explore and analyze what happens to students using those criteria and what educational and emotional implications these decisions have on the students.

### **Importance of the Topic**

The purpose of this starred paper is to review the literature concerning the different aspects of the special education math class sequence in the secondary setting. If students are not able to move out of special education math, they will not earn the required high school math credits, and as a result they will not graduate on a standard credit driven diploma.

A very important aspect of placement decisions made is that parents and students are not always informed about what future programming involves and the potential implications and ramifications for students. Parents and students need to be explicitly informed of the differences between an IEP driven diploma and a standard diploma. All parties involved need to know what the impact of what these decisions have on life during and after high school.

## Definition of Terms

The following section contains terms used frequently in this paper. The terms are defined as they relate to the educational context and are organized alphabetically.

*Individual Education Plan/Program (IEP).* A legal document that outlines the program of special education instruction, supports, and services kids need to make progress in school.

*IEP driven diploma.* A high school student is still able to obtain a high school diploma but is not graduating on the required credits but graduates on accomplishing his/her IEP goals.

*Inclusive setting.* Educational programs that serve special education students in the regular classroom with non-disabled students.

*Non-inclusive setting.* Educational programs that specifically serve special education students.

*Post-secondary.* Any education beyond high school.

*Secondary education.* Primarily grades 9-12 for the purposes of this paper.

*Standard credit driven diploma.* A high school diploma that general education students receive and is based on a credit system.

## Chapter 2: Review of Literature

This review examines how mathematical placement decisions of secondary students in special education are made. Two questions guide the analysis: What are the differences in overall student placement in course of study with an emphasis on mathematics tracks of study and how do professional educator and system biases and predispositions influence placement in courses of study for students based on special education labeling.

I identified nine studies for the review of literature in chapter II. This research includes studies ranging from 1997-2016. I used the Academic Search Premier to begin finding articles on my topic. I began using broad terms then as I began to find articles closer to my topic I began to find more specific articles that I needed.

### Literature Review: Mathematics

I researched multiple studies that reviewed the impacts and effects of teachers' individual perceptions of special education students' abilities and aptitude. These studies were importantly correlated to teachers' influences in decision making based upon students' perceived educational efforts and overall attitudes toward school. These placements decisions were analyzed as to their impacts on both the students' current educational settings and future post-secondary opportunities. The review and studies were organized in a chronological format.

**Perception biases.** Clark (1997) identified the significance of perceptions general education teachers hold toward academic outcomes and abilities of students with disabilities. When teachers perceive student performance due to factors such as lack of effort, this can evoke a range of emotions from frustration to pity from the teacher toward the student. Thus, rather than focus on methodologies and practices designed to improve and increase student



achievement, teachers can become focused on personal and emotional factors that are not necessarily connected to student performance.

Importantly, Clark (1997) discussed how this range of emotions is typically connected directly to the teacher's perception of the student's overall ability. When a student has high ability and displays low effort, teachers commonly react with frustration, or even anger or disgust. Yet in class settings of students with lower abilities, teachers more typically have sympathy or pity toward the students. These factors influence how teachers communicated their level of satisfaction toward their students.

This is important due to students' overall interpretations of how teachers react to their learning and academic performance. Students tend to form strong feelings of personal ability and confidence based on teacher reactions and interactions. Many of these influences and student interpretations come from cues and other observations students make of teacher interactions toward them and other students (Clark, 1997). The classroom teacher was identified as among the strongest source of influence on students and their overall feelings toward success or failure in school. This type of feedback and influence from teachers toward students can have detrimental or positive effects depending on the type of feedback given. When students are given positive feedback, they tend to believe they are competent and effective in school, whereas when the feedback is negative, students see themselves as unable to be successful in the classroom (Clark, 1997). Thus, how and what teachers communicate to their students becomes a foundational part of how students view not only their performance in school, but their potential for growth and success as well.

The purpose of the study was to determine if a causal link existed between student learning disability and teacher perceptions of student ability combined with student achievement

and outcomes. The study further identified whether or not teachers knew if students with learning disabilities would be influenced by the following factors: rewards and punishments teachers give students, feelings such as sympathy or hostility toward students based on specific and overall performance, and expectations for student growth and future performance (Clark, 1997, p. 71).

Next, Hurwitz, Elliott, and Braden (2007) discussed the roles of general education teachers and their students with and without disabilities in fourth-grade classrooms. In this study, teachers were invited to participate, from schools around the test city. Students were also invited to participate however only two (one with a disability and one without a disability) from each classroom were invited to participate. Teachers more accurately judged the performances of students without disabilities than performances of students with disabilities. Teachers were more likely to underestimate students with disabilities than students without disabilities. This includes where teachers thought students with disabilities would underperform on standardized tests while students without disabilities would perform substantially higher on same tests. Also, overall student outcomes were directly attributed to teacher judgement in these same testing environments (p. 130).

Additionally, Wilson, Hoffman, and McLaughlin (2009) identified the role and importance of course offerings and their impacts on students' choices and teacher selection. The section most relevant to this research was the discussion on the second study which found findings schools available math classes have an effect on what students with disabilities end up taking. As a result, this impacts their access to colleges and universities. This suggests that if schools raise course-taking expectations in mathematic students may raise their achievement

through high school. Raising (and lowering) expectations was found to be directly correlated to overall student achievement during their course of secondary studies.

Montague, Enders, Cavendish, and Castro (2011) studied the role and influence of student assessment data and the relationship to graduation track decisions made by schools and educators. For instance, a sample of students who took high stakes tests in order to graduate on a standard diploma revealed that of the students in special education, only 5% passed. These special education students also had less school commitment than the at-risk students not placed in special education. School commitment as referenced by Montague et al. (2011) was the level of overall engagement and involvement in school academics, activities, and associations with peers. This lack of commitment frequently led to a failure to complete formal secondary schooling and an overall high dropout rate. Further, the at-risk students in special education overwhelmingly had lower scores on these standardized assessments. This was found to have occurred when similarly compared to at risk students who were not designated as special education. Failure to meet proficiency levels on these standardized tests led to at risk special education students unable to qualify for a standard driven diploma. Importantly 30% of these students disagreed with the diploma track decision made by the school (Montague et al., 2011, p. 153). These preferences and decisions could result in decreased student post-secondary achievement and have further frustrations for students and a resulting belief in fewer opportunities for students. All of this was found to result in negative outcomes for students in their current and future academic settings.

Montague et al. (2011) further identified a specific link between achievement and growth for special education students after middle school when they did not have opportunities to take higher level mathematics courses. Growth was identified as “static” for these students despite

early math achievement as predicative of FCAT scores across both math and reading (p. 154). Static growth was described as an overreliance on the “wait to fail” model and a need for ongoing interventions as an effective means of support.

The Shifrer, Callahan, and Muller (2013) study compared LD labeled students to similar students not designated as learning disabled. These findings suggest that their course-taking outcomes are considerably poorer than those non-labeled students. In this case, poorer is used as an analysis of educational outcome and achievement and not in the socioeconomic context. Thus, this analysis focused on the stigma of a learning disability designation in secondary settings as applied to methodologies faculty and staff use when suggesting or assigning school classes for students.

“Results [from this study] are consistent with the hypothesis that the LD label itself defines a status group that limits educational opportunities, possibly through stigma or other marginalizing processes” (Shifrer et al., 2013, p. 676). This is significant in both research and in professional practice, as many special education students are already stigmatized by their peers, their families, and sometimes even themselves. The role and influences these professional educators place on positively or negatively influencing these students and their choices cannot be understated.

Faulkner, Crossland, and Stiff (2013) examined the relationship of teacher perception of math performance, actual math performance, and eventual Algebra placement in eighth grade. The academic placement in middle school is highly influential in high school educational outcomes for these students. Despite very high performance in math classes, students with an IEP whose teachers formed low perception of ability were almost never placed in algebra classes. Due to these placement decisions students have less opportunities to access courses that

have increased academic success. Also, these more advanced math classes are typically the ones students who show interest in strong professional occupations such as medicine and engineering must necessarily take at the secondary level. Thus, foreclosing even the opportunity to take these courses in high school may well shut out these occupation opportunities prematurely. “Students with IEPs who demonstrated inconsistently high performance were the group of students who were hardest hit; their odds of placement in algebra by eighth grade were one fifth those of their inconsistently high performing peers without IEPs” (p. 341). The unfortunate irony in this example is that very often, students are provided IEPs to increase their level of academic access and opportunity and to have academic supports in place to address inconsistencies in learning and performance. Decades of research and summaries have identified similar findings with teacher perception with little to no change in practice. Teachers need to ensure that students with IEPs have access to take classes to advance them to algebra in 8th grade earlier, such as in middle school, as this will lead to more choices for high school math courses. These placements were found to be indicative of high school and postsecondary opportunities and successes.

A multiple case study from Murzyn and Hughes (2015) focused on student mathematic placement decisions involving the IEP or multi-discipline teams. Few studies exist about the process used in making decisions about math placements. This study reports findings consistent with the lack of full participation from all members of the IEP team. Each participant has a unique view of the student and their strengths and weaknesses and needs to have input into the creation of the IEP and placement decisions. This article suggests three remedies: “Case managers need to actively engage families in the placement process, mathematics teachers need to actively engage in the placement process, administrators need to actively engage in the

placement process” (p. 55). The suggestion of a collaborative process is not a new one; rather it was identified as the critical means for an equitable review of students’ academic placements.

The Rojewski, Heok, and Gregg (2015) work shows how selection bias is inherent in educational placement decisions. This study reviewed the causal effects inclusion settings had for postsecondary outcomes of special education students. Students with a disability taught in an inclusion setting (when compared to pull-out or partial programs) tend to perform better on measures of achievement. Rojewski et al. (2015) further found students to have significantly better postsecondary education outcomes, which include many different post-graduation training opportunities and two to 4-year programs. Rojewski et al. (2015) noted that not just special educators are aware of the positive benefits of inclusive placement for students, but all secondary educators and administrators also are aware. Also, teachers need additional professional development and classroom supports to ensure that inclusive placements are successful. Because inclusion reflects a commitment to social justice and equal access to education for all students (p. 214). Further it was found that special education students were more successful in academic and social contexts when placed in inclusive settings than similar special education students who were placed in more restrictive settings (p. 214).

Shifrer’s (2016) findings demonstrated how learning-disabled students’ math teachers attribute their students’ performance to their disability. A longitudinal analysis of students with similar potential for progression in math coursework when and comparing each non-labeled vs labeled students was conducted. These results show that stigma may be a major factor of low achievements along with the idea that LD is socially constructed. Teachers may hold significantly lower educational attainment expectations for certain students than they do for similarly achieving and behaving undesignated students.

Further, Shifrer (2016) critically identified the relationship between this stigma and a predisposition to student performances in current school settings and beyond. “Finally, these findings reinforce the notion that although labels have an essential function in our society, their power to shape perceptions and experiences must be a constant consideration” (p. 55). The role and influence of labeling in the secondary education system, particularly as applied to students with identified disabilities, has profound meaning and implication for academic success.

The studies in this Chapter 2 were examined to understand how placement decisions are made and how it affects achievement for secondary students. Table 1 (in Appendix) summarizes the studies used and their procedure and findings. These findings are critically examined in Chapter 3.

### **Chapter 3: Conclusions and Recommendations**

Three foci guided this paper. First, the process of making placement decisions at my school was examined. Second, the effects of teacher perceptions of individual student's mathematical ability was analyzed. Finally, the consequences of placement decisions upon the long-term outcomes for special education students were reviewed. While I was initially concerned with how placement decisions were made, my research identified several troubling trends these decisions had on students in both their present and future academic settings. I also was curious as to what kind of correlation this had on students' overall educational experience and future life and professional choices. The word "choices" is an unfortunate paradox. The more I researched and reported on this topic, the more I discovered that students in this position did not have many "choices" at all. Oftentimes, when placement choices or decisions were made for students, the placements had the relative or cumulative effect of limiting options of study or opportunity for students, or worse yet, becoming prematurely determinative of future academic and professional opportunities for these students.

I was also very interested in this topic as, at the time, I was a new teacher to the high school setting. I had always been an elementary teacher and I did not really know how students ended up in the classes they were taking. I also quickly found out how much closer high school students were to becoming adults. The more I taught high school math classes, I found no system or formal structure in place for how students were placed in their classes. I discovered the classes my students and many other, similarly situated US High School students were taking was based mainly on teacher perception and established practices and procedures. However, not only were these placements not the proper academic setting for the student at the time, there were negative correlations and profound implications for many students far beyond their high school education.



## **Conclusions**

The studies used varied data collection methods and were a representative sampling from around the United States. Both the studies of Faulkner et al. (2013) and Shifrer (2016) report that teacher perception has a direct impact on math class placement. Also, these studies showed that lower perception of students with disabilities had a very detrimental impact on the class placement. As a result, teachers had underestimated some students' ability, and consequentially, those students ended up in lower level classes and on a lower track of math classes. This directly impacted graduation tracks and post-secondary educational opportunities.

## **Implications on Current Practices**

The review and my professional experiences have identified a number of challenging situations for special education students. I have witnessed the placement and progression of students who have been placed in a higher track and course of study for math. Some special education students who are placed in a general education math class will need significant support. There are collaborative classes that are available in the school I am currently in and this is helpful for students in order to have extra support that may include strategies such as reteaching, more time and smaller class sizes. This setting allows for those students who struggle in some areas to have a chance to stay in the general education curriculum but still have some accommodations to be successful in those settings. However, there are some students placed in those classes who are unable to have the skills necessary to pass the required classes to graduate. This then leads the IEP team to discuss the options for the student's future. Effective and open communication open with families must be maintained by teachers and school staff. In summary, the process of identifying the proper course of study and range of academic options must be a fluid and collaborative process when working with students who have academic and other

disabilities. When students are identified and selected for only a singular course of study or track of academia, this often leads to difficulties for the students and educators alike.

Based on these research findings and my overall professional experiences, I will use these studies when advocating for my students. Sometimes students are not given a voice when classes are determined. They need to know what their path in high school will look like if they are placed in certain classes. I have seen too many shocked faces of students and parents when they are told they are not taking the correct classes in order to graduate on a standard driven diploma. These students and parents need to be involved more in the decision-making process of the IEP meetings and what the outlook is for taking certain classes. They also need to be reassured that they can control their future and make choices that directly affect their path.

### **Recommendations for Future Research**

A significant amount of bias occurs in student course placement and selection when teachers make decisions based on mere perceptions of student ability. No specific test, directions, or framework are given when making placement decisions, as a result, teacher perceptions are a significant factor when making these decisions. Yet, placement decisions by teachers are often made emotionally or upon initial impression of student academic ability. These decisions are not only frequently devoid of any analytical data, they often have deleterious impacts on students in their educational tracks or achievement, or both. Additionally, a great deal of variability and often not a lot of consistency even within the same school setting. For example, in my current professional setting I work with other special education teachers who have differing opinions on student placement decisions. I have seen a wide range of placement decisions for students despite similar academic data, identified disability, and overall student population. Thus, there is

a lack of correlation or even consistency in applying evaluative data to uniform student placement.

Students sometimes can be labeled as special education, and as a result, teachers could assume that they are unable to do the work in mainstream classes or in the general education setting. As a result, students could face a range of difficulties. For instance, teachers could give them too much help and as a result the grades could be inflated, or teachers could give them less help than general education students. The teachers may also not give them their accommodations which could make their grade lower than that of their ability. Frequently, these responses by teachers are due to a belief that the special education designation or “label” pre-disposes a student to a particular outcome, achievement level, or particular set of classes which are often limited by choices and directions beyond the student’s control.

Also, if it is decided that a student will be in a special education class this may set the student back and they may not be able to make up the math courses that are required. For instance, if a student is not placed in the required math class at the beginning of high school there may not be enough time for that student to earn the required classes to graduate high school. Many of the studies identified this exact finding. In practice, I have seen students run out of time too many times during their duration of high school study. By the time a student has arrived at their Junior or Senior year, it is very often too late or too late to alter a course or courses of study to meet both state and school/individual requirements for graduation and post-secondary eligibility. Thus, students are either forced to stay in the current course of study and face limitations on post-secondary courses or enroll in additional courses and programs in summer school or in their respective post-secondary institutions. The implications of this predicament are obvious. Requiring students who face academic struggles regularly and often daily to locate and enroll in

additional coursework leaves them frustrated or foreclosed to additional educational opportunities.

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## Appendix A

**Table 1**

*Summary of Secondary Math Placements for Special Education Research Papers*

Authors	Study Design	Participants	Procedure	Findings
Clark (1997)	Qualitative	97 general education classroom teachers in a public elementary K-6 in CA	Teachers were given an instrument to complete during a faculty meeting.	Learning disability on ability and effort attributions can be seen in the results. Learning disability does influence teachers' responses to a boy's test failure.
Hurwitz (2007)	Quantitative	General education teachers and their students with and without disabilities in fourth-grade classrooms.	Invited teachers from around the test city. Students were also invited to participate however only 2 (one with a disability and one without a disability) from each classroom were invited to participate.	Teachers more accurately judged the performances of students without disabilities than the performances of students with disabilities. Teachers were more likely to underestimate students with disabilities than students without disabilities.
Wilson, Hoffman, McLaughlin (2009)	Quantitative	4 sections: reviewed the evolution of federal transition policy; overview of research related to the transition of youth with disabilities to college; then discuss two studies.	Two studies conducted utilizing the multilevel longitudinal study of the high school and post secondary experiences of the 2002 cohort of 10th graders.	The second study discussed had findings that schools available math classes have an effect of what students with disabilities end up taking. As a result this impacts their access to colleges and universities. This suggests that if schools raise course-taking expectations in mathematics may raise their achievement through high school.
Montague, Enders, Cavendish, Castro (2011)	Qualitative	4-year research project screening Kindergarten and first graders to identify children at risk for developing EBD.	Woodcock-Johnson Reading and math given annually then in middle school and also given was behavior rating scales.	Higher elementary ratings were associated with higher behavior problem ratings by high school teachers. Discussion of the ability to predict achievement and behavior in high school from individual achievement test scores and teacher ratings of learning and behavior problems in primary school.

**Table 1 (Continued)**

Shifrer, Callahan, Muller (2013)	Quantitative	Uses data from the Education Longitudinal Study of 2002.	Independent variable- School label of LD; Sociodemographic background and school characteristics; Academic history; Ninth-grade course placement; early high school attitudes, behaviors and academic achievement.	Students labeled with LD lose ground in the completion of college preparatory coursework compared to similar unlabeled students.
Faulkner, Crossland, Stiff (2013)	Quantitative	Secondary analysis of the Early Childhood Longitudinal Study-Kindergarten (ECLS-K) 1998-1999. 21,260 children and the fifth- and eighth-grade waves of data were used.	Dependent variable is student placement in algebra or above by eighth grade.	For students with IEPs, low teacher perception was virtually prohibitive of placement in algebra, even in the presence of high cognitive performance. Students with disabilities had reduced odds of placement in algebra by the eighth grade compared to their peers.
Murzyn, Hughes (2015)	Qualitative	15 participants: 3 case managers, 3 general education math teachers, 3 administrators, 3 parents of high school students, 3 high school students.	Semi-structured interviews and critical incident instruments were the primary source of data collection.	Placement process was a team decision, however, a lack of parent experience was limited which resulted in a lack of meaningful participation.
Rojewski, Lee, Gregg (2015)	Qualitative	Used data from the National Longitudinal Transition Study-2 (NTLS-2)	Researchers started with 640 students (LD=400; EBD=580) who graduated high school, then 390 usable cases.	Students that are in 80% or more in gen ed settings were twice as likely to enroll and persist in postsecondary education. Causal link between inclusion and postsecondary education.
Shifrer (2016)	Quantitative	Survey of 16,370 10th grade students in the US in 2002.	Surveyed students, and English and Math teachers. Only used students with learning disabilities	Early high school math course placements contributed the most to designated youths' lower math course attainment in part because of the hierarchical nature of math course-taking in the US.