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Classworks as a Means to Gaining Equity in the General Education Math Classroom: Perceptions of Students Receiving Special Education Services

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CLASSWORKS AS A MEANS TO GAINING EQUITY IN THE GENERAL EDUCATION MATH CLASSROOM

PERCEPTIONS OF STUDENTS RECEIVING SPECIAL EDUCATION SERVICES

by

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ABSTRACT

With the importance of math steadily increasing, researchers in the field of special education have made efforts to increase the performance of students with disabilities (Fuchs et al., 2008; Gersten, Jordan, & Flojo, 2005). Despite the deficits these students face, the trend has been for many years that most students with disabilities in math receive their instruction in the general education classroom. The purpose of this study was to examine the perceptions that students receiving special education services have regarding the effectiveness of Classworks, a computer-assisted instructional program, in helping them gain equity in the general education math classroom. Critical Disability Theory (CDT) provided the theoretical framework for the study. One of the elements important to CDT is giving voice to persons with disabilities. Traditionally, the voices of persons with disabilities have been suppressed and marginalized when the person speaks out against the mainstream views of disability. CDT allows the voices of persons with disabilities to be heard and valued. Critical Pedagogy was a second theoretical framework for this study. Critical Pedagogy seeks to end the oppression and marginalization of specific groups of students. The researcher explored students; perspectives of Classworks through individual interviews and group observations.

This study found that students viewed Classworks as an effective method of improving computational math skills. Students appreciated the immediate feedback and self-paced environment that Classworks provided and reported that these features gave them more confidence in their math skills. Students also reported, however, that these features were not available to them in the general education classroom, causing them to fall behind their peers. Classworks also does not provide advanced problem-solving lessons to prepare students for the rigorous problems that the math curriculum requires them to solve.

From this study, it can be concluded that Classworks provides many elements that can lead to greater access to the general education mathematics curriculum. However, while Classworks' focus on computational skills supports students' learning of basic mathematical knowledge, there was little evidence to support students' ability to generalize those skills to similar problems encountered in the general education curricula.

INDEX WORDS: Special Education, Computer-Assisted Instruction, Mathematics, Curriculum, Elementary, Critical Disability Theory

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CHAPTER I

INTRODUCTION

We live in a world in which mathematical knowledge is seen as vital for success, both in the workplace and in our everyday lives (Ginsberg, Klein, & Starkey, 1998). In *Principles and Standards for School Mathematics* (2000), the National Council for Teachers of Mathematics (NCTM) stated that the need to understand and use mathematics will only continue to increase over time. In their vision for mathematics education, NCTM (2000) contends that everyone should have the opportunity and the support necessary to learn math with depth and understanding, because those who are successful in math will have enhanced opportunities and options for their futures. Although students have different abilities and interests, it is imperative that all students receive the skills necessary to successfully use mathematics on a daily basis.

With the importance of math steadily increasing, researchers in the field of special education have made efforts to increase the performance of students with disabilities (Fuchs et al., 2008; Gersten, Jordan, & Flojo, 2005). By definition, students with disabilities do not achieve satisfactorily for their age or grade level standards in a variety of academic areas, which may include mathematical problem-solving and computation. Despite the deficits these students face, the trend has been for many years that most students with disabilities in math receive their instruction in the general education classroom. Unfortunately, research indicates that students with disabilities in math may not benefit fully in the general classroom setting (Cawley & Miller, 1989; Cawley, Parmar, Yan, & Miller, 1998; Lock, 1996). In an effort to meet the instructional needs of students with disabilities, technology has been recommended as a way to provide flexibility and more individualized instruction in the general education classroom (Bryant & Bryant, 1998; National Council of Teachers of Mathematics, 2000). NCTM (2008) supports technology as a vital component of a high-quality mathematics education. Students at all levels, including students with disabilities, can use various forms of technology (i.e. calculators, interactive software, and computer-assisted instruction programs) to support mathematical reasoning, gain access to mathematical content and problem-solving contexts, and enhance computational fluency. The use of technology also contributes to mathematical reflection, problem identification, and decision making.

Over the last several decades, technology has become an integral part of schools. Computers are used almost daily in most schools, helping teachers analyze data and providing individualized instruction to students. Through the use of interactive computer assisted instruction (CAI) programs, schools can now offer students the opportunity to work toward mastery of specific skills in an individualized, self-paced manner. According to Hasselbring, Lott, and Zydney (2006), technology based innovations can be effective approaches for helping all students who struggle with math difficulties. Jackson (2004) was more specific, stating that technology can support the effort toward curriculum access, participation, and progress, while increasing independence, personal productivity and empowerment of students with disabilities.

Context of the Study

Today's mathematics curriculum is more rigorous than ever before. The current trend of inclusion requires students with disabilities to receive most, or in some cases all, of their instruction in general education classrooms with their non-disabled peers. For some students, inclusion may not be beneficial. According to Salend (1994), students with disabilities may struggle with the rapid introduction of new concepts, as well as insufficient examples, explanations, practice, and review of critical math concepts. Research indicates that, because of the abstract nature of math, students with disabilities require an increased number of practice opportunities, extensive modeling, and immediate feedback (Fuchs, et al., 2008; Swanson, Hoskyn, & Lee, 1999). Although many teachers are willing to provide additional instruction, the increasing number of students in a classroom, along with limited instructional time and resources, cause many challenges for the general classroom teacher (Busch, Pederson, Espin, & Weissenburger, 2001; Schumm et al., 1995). Technology, with its ability to provide more individualized experiences and a more engaging environment for students, has been suggested as a way to combat some of these challenges.

NCTM (2000) contends that technology allows mathematics instruction to be individualized and adapted for students with disabilities. Learners are exposed to a variety of instructional and interactive lessons and are provided instructional strategies such as immediate feedback, repeated opportunities for practice, and mnemonics that can enhance the mathematics performance of students with disabilities (Tzuriel & Shamir, 2002; R. Wilson, Majsterek, & Simmons, 1996). Several studies have concluded that CAI positively impacts student achievement. An early study by Kulik and Kulik (1991) found that 81% of students who participated in CAI had higher exam scores than those who did not participate. In more recent studies, Christmann and Badgett (2003) found that 63% of students who received CAI had higher academic achievement than those who received only traditional instruction, while Slavin and Lake (2007) concluded that CAI can result in positive effects on achievement even when used as little as 30 minutes a day, three times a week.

Purpose of the Study

The purpose of this study was to examine the perceptions that students receiving special education services have regarding the effectiveness of Classworks in helping them gain equity in the general education math classroom. Developed by Curriculum Advantage in 1993, Classworks contains over 1,000 units of instruction and allows teachers to manage, assess, and individualize student learning. The Council of Administrators of Special Education (CASE) has endorsed Classworks, saying that the depth, flexibility, and customization features found in Classworks give teachers access to targeted instruction for struggling learners, helping them to successfully address the challenges of special education, thereby helping to raise achievement at all levels (Council of Administrators of Special Education, 2010). While there is abundant research on the effects of CAI on student achievement in reading, there is less research available specific to mathematics. Also, there is little research specific to Classworks and its effects on students with disabilities. This study will add to the body of research regarding use of CAI in mathematics achievement, using CAI for students with disabilities, and examining a specific CAI program that is currently used in 21 states.

Research Questions

This study examined the perceptions that students receiving special education services have regarding the effectiveness of Classworks in helping them gain equity in the general education math classroom. The research questions to be explored are:

1) How do students receiving special education services perceive Classworks as a means to gaining equity in the general education math classroom?".

2) In what ways does Classworks provide equal opportunities for students receiving special education services?

3) What features of Classworks do students receiving special education services perceive as most supportive in helping them gain equity in the general education math classroom?

Significance of the Study

Because of the importance of mathematics in daily life, it is crucial that students gain a strong foundation of mathematical skills in elementary school. For students with disabilities, learning important mathematical concepts can be especially daunting. These students often have trouble recalling basic number combinations, use inefficient counting strategies, and have limited number sense (Fuchs et al., 2005; Jordan & Montani, 1997). Appropriate interventions, including technology, are imperative to the increasing the success of these students.

For students with various disabilities, technology can offer a variety of instructional methods that can meet their learning styles and help to ensure a greater level of success in mathematics achievement. In the Principles and Standards for School Mathematics, NCTM (2000) states that "Electronic technologies…are essential tools for teaching, learning, and doing mathematics. They furnish visual images of mathematical ideas, they facilitate organizing and analyzing data, and they compute efficiently and accurately...When technological tools are available, students can focus on decision making, reflection, reasoning, and problem solving" (p. 24). Computer-assisted instruction has been suggested as a promising instructional method to help students with disabilities learn mathematical concepts (Aydin, 2005).

This study allowed the researcher to determine the perceptions of students receiving special education services regarding the effectiveness of Classworks in helping them gain equity in the general education math classroom. This study would be significant to both general education classroom teachers as well as special education teachers by presenting them with a viable option to help students with mathematical difficulties be more successful. This study also provided information about the successfulness of Classworks, specifically with students who receive special education services for various disabilities. Two previous studies (D. Patterson, 2005; Whitaker, 2005), although small, have shown the success of Classworks with elementary aged students in general, but neither study focused on students with disabilities.

Limitations of the Study

A significant limitation of this study is that it consisted of only 5-7 students from one elementary school. Therefore, the generalizability of the results were limited. The case study design of the study also raises ethical concerns, including the integrity and biases of the researcher that could affect the information included or left out of the final report. It is also possible that the participants may not be completely honest during interview sessions because of worries that their responses will be shared with others, including their parents and general classroom teachers.

CHAPTER II

REVIEW OF THE LITERATURE

Critical Theory

Critical theory evolved from the work of scholars, including Adorno, Eromm, Horkheimer, and Marcuse, who were members of a group that formed the Frankfurt school in Germany in the early 1930s. By building on Marx's critique of the political economy and Freud's discussion of the role of the unconscious in the formation of the human psyche, these early theorists attempted to explain the domination of capitalism and liberate human beings from "the circumstances that enslave them" (Horkheimer, 1982, P. 244). The term "critical theory" was first used by Max Horkheimer in 1937 when he compared it to "traditional theory." Horkheimer explained traditional theory as disinterested researchers who simply describe what happens in the world. In opposition to this type of theoretical framework, he described critical theory as an approach that could explain the social forces of domination by understanding the interactive relationship between the researcher and the object of the research.

Supporters of critical theory aim to maximize human freedom and restrict the dominant group's ability to control others based on race, class, power, or any other social construct. Although there is no homogenous set of beliefs among critical theorists, they are united in their objectives to "empower the powerless and transform existing social inequalities and injustices" (McLaren, 2007, p. 186). According to Bohman (2005), critical theorists must "explain what is wrong with current social reality, identify the actors to change it, and provide both clear norms for criticism and achievable practical goals for social transformation" (p. 5).

Early Critical Theorists

The early critical theorists of the Frankfort School placed history at the center of their approach to philosophy, but addressed issues that went beyond a focus on the past. They focused on research that could ensure a free and just life, they sought to expose and analyze obstacles to radical change, and they were concerned with the transformation of society. Although the early work of these theorists, including Adorno, Horkheimer, and Marcuse, was influenced by the work of Marx, their beliefs differed from his on the issue of education. They argued that schooling withholds opportunities for students to form their own goals, which essentially de-skilled students. Additionally, they believed that schools encouraged dependency on authority and provided a distorted view of history (Apple, 1982; Eisner, 2002). Marcuse, specifically, argued that school had become an increasingly contradictory institution. He posited that while promising equality and freedom of access to information for all social classes, the educational system holds "knowledge and reason within the conceptual and value universe of the established society" (Marcuse, 1968, p. 34). According to Marcuse, a critical classroom should encourage students to research the history of struggles against exploitation and oppression, including racial and social class, as a means of understanding past domination and applying that knowledge to changing current marginalization (Kellner, Lewis, & Pierce, 2009). The perspectives on education held by these early theorists provided the foundation for the philosophical principles later proponents of critical theory would build upon to create the ideas of critical pedagogy (Darder, et al., 2003).

Contemporary Critical Theorists

The early work of Horkheimer was influential in shaping the beliefs of many theorists in the 1960s and 1970s. With the various social and political changes occurring during this time, many scholars saw critical theory as a way of freeing academic work from the dominance of the capitalistic culture. They also focused on the social construction of knowledge, arguing that knowledge is neither neutral nor objective, but linked to an individual's interests and assumptions (Giroux, 1988). Some critical theorists argued against the earlier argument made by Bowles and Gintis, that schools were agencies of social, economic, and cultural reproduction. They suggested instead that schools were venues of hope and could become sites of resistance and democratic possibility if teachers and students work together in a liberating pedagogy. These scholars and educators were committed to the ideal and practice of social justice within schools and to the transformation of schools to include the democratic participation of all students. From this commitment came critical pedagogy, a theory of principles, beliefs, and practices that contribute to the idea of emancipation and democratic schooling in the United States by educating students to become critical agents who actively question and come to terms with their own power (Darder, et al., 2003).

Critical Pedagogy

Giroux first used the term critical pedagogy in 1983, linking the practice of schooling to the democratic principles of society and to transformative social action in the interest of oppressed communities (Darder, et al., 2003). Critical pedagogists view school knowledge as a "social construction deeply rooted in a nexus of power relations" (McLaren, 2007, pp. 196-197). This view causes theorists to question how and why knowledge is constructed the way it is and why some knowledge is celebrated and other knowledge is not. As knowledge is created and deemed legitimate, certain groups are excluded and marginalized while others are given more power. Students with disabilities are one such marginalized group. With the introduction of standardized testing, students with disabilities were more and more often segregated to "special" classrooms so as not to interfere with the learning of "normal" students. Inclusion and differentiated instruction are practices that can allow students with disabilities to gain "legitimate" knowledge and reduce the marginalization they currently experience.

Critical pedagogy, though formed by a heterogeneous set of ideas regarding education, has several underlying principles that link the various belief systems in a commitment to the liberation of oppressed populations. These principles include cultural politics, political economy, historicity of knowledge, dialectical theory, ideology, and resistance (Darder, et al., 2003).

Cultural politics. A commitment to developing a school culture that supports the empowerment of culturally and economically marginalized students is a fundamental component of critical pedagogy. Critical pedagogists seek to transform the structures of classroom that influence an undemocratic life, while legitimizing student's experiences and giving meaning to how students construct their perceptions of truth.

Political economy. Critical pedagogists contend that schools work against the interests of those students who are most economically vulnerable within society. Economically, schools replicate the values and privileges of the dominant class. It is the claim that education provides equal opportunity and access for all students that critical pedagogy challenges.

Historicity of knowledge. All knowledge is created within a historical context that gives meaning to human life. Students bring knowledge into the classroom that should be understood to be historical. Teachers need to create opportunities in which students can discover that "there is no historical reality which is not human" (Friere, 1970, p. 125) so that students will understand that they are subjects of history and can transform societal injustices.

Dialectical theory. Traditional theories of education reinforce conformity and control of power and knowledge. In opposition to traditional theories, dialectical theory reveals the connection between knowledge and the cultural values and standards of society. The problems of society are seen not as isolated events, but as moments that arise from the interaction between individuals and society (McLaren, 2007). Students are encouraged to construct thought beyond what already exists.

Idealogy. Ideology can be described as "the framework of thought that is used in society to give order and meaning to the social and political world in which we live" (Darder, et al., 2003, p. 13). It can be used to uncover the contradictions between the culture of school and the lived experiences and knowledge that students already have. In critical pedagogy, ideology serves as a starting point for asking questions that will help teachers evaluate their practices and recognize how the culture of the dominant class becomes embedded in the curriculum.

Resistance. The theory of resistance seeks to explain why so many students from marginalized groups consistently fail in school. It assumes that all people have the ability to produce knowledge and resist domination. How they choose to resist, however, is limited by the social conditions they are in and the ideological formations they have been taught.

Although the concept of disability has not been specifically included in critical pedagogy, the theoretical foundation of ending oppression and marginalization of certain groups can be extended to persons with disabilities. Disability is related to other sources of social oppression, such as race, gender, and socioeconomic status (Gabel, 2002).

Race. It has been extensively documented that there is an overrepresentation of students from minority groups who have been identified with disabilities (Gabel, 2002; MacMillan & Reschly, 1998). Federal data indicated that African-American students make up approximately 17% of the school population across the United States, but over 20% of the special education population. In most states, African-American students are twice as likely to be placed in special education than white students. Similarly, Hispanic students make up about 20% of the school population, but over 24% of the special education population (Rebora, 2011).

In the state of Georgia specifically, the 2011 school population was 37% African-American, while the special education population was 39% African-American. Similarly, the school population was 44% White with a special education population that was 46% White. Conversely, the school population was 12% Hispanic, but the special education population was only 9% Hispanic. Interestingly, as students progressed through the grade levels, the White and Hispanic special education populations decreased, while the African-American population steadily increased to over 40% in both middle and high schools (Georgia Department of Education).

Gender. Since the 1960s, the ratio of males to females in special education has ranged from 2:1 to as high as 3:1. Males especially dominate in eligibility areas such as specific learning disabilities (73%) and emotional disorders (76%). In the area of mental impairments, the ratio of males to females is almost 2:1 (Oswald, et al, 2000; American Psychiatric Association, 2000).

Socioeconomic status. A close relationship between poverty and disabilities has also been identified (Elwan, 1999). Donovan and Cross (2002) maintain that minority students are more likely to be affected by poverty, which leads to compromised early development and the need for special education services. Earlier research found that socioeconomic status is linked to cognitive ability, achievement tests, and grade retention rates, all of which are in some ways related to special education eligibility (Liaw & Brooks-Gunn, 1994; Smith, Brooks-Gunn, & Klebanov, 1997).

According to Liasidou (2012), critical pedagogy's focus on issues of marginalization, power, oppression, and social transformation can create new theories focusing on the complex nature of disabilities and the ways in which students with disabilities are educationally positioned. Critical

Disability Theory has emerged as an extension of critical theory and critical pedagogy that focuses on persons with disabilities and their marginalization within schools and society.

Critical Disability Theory

Critical Disability Theory (CDT) is a theoretical framework for the study and analysis of disability issues. It relates to the civil action known as the Disability Rights movement, whose followers seek to gain equity for people who have experienced oppression based on their disabilities (Baglieri & Shapiro, 2012). According to Longmore and Umansky (2001), the field "has risen in response to the medical model's deficiencies in explaining or addressing social marginalization and economic deprivation of many people with disabilities" (p. 12).

CDT does not represent a single perspective. Rather, it includes views from social constructionism to postmodernism and draws from sociology, history, law, and many other disciplines. Despite the diversity, there are core themes within CDT. One important focus for critical disability theory is developing an inclusive concept of disability that encompasses a diverse population of individuals. Several definitions of disability have been used over time. Liberalism has characterized disability as "personal misfortune preferably to be prevented and definitely to be cured," as well as indicating the privilege of 'nomalcy' over 'abnormal' (Hosking, 2008, p. 6). The last century has seen the dominance of the medical model of disability, which identifies the source of disability as a medical condition. Additionally, the essentialist model sees disability as "the inherent characteristic of a person arising from an objectively identified impairment of the mind or body" (Hosking, 2008, p.7). With all of these possible definitions of disability, proponents of CDT have chosen to adopt a version of the social model and define disability as "a social construct, not the inevitable consequence of impairment", adding that disability "is best characterized as a complex interrelationship between impairment, individual response to impairment, and the social environment" (Hosking, 2008, p. 7). The social disadvantage experienced by disabled people is caused by the physical, institutional, and attitudinal (together, the 'social') environment which fails to meet the needs of people who do not match the social expectation of 'normalcy'.

Two additional key themes important to disability theory are power and context (Pothier & Devlin, 2006). These themes help to explain the relationship between students with disabilities and their school environment.

Power. The study of disabilities does not only include issues of impairment, functional limitations, or enfeeblement, but also those issues of social values, institutional priorities, and political will. These issues lead to questions of who and what gets valued, as well as who and what gets marginalized. Pothier and Devlin (2006) state that the central arguments of critical disability theory revolve around questions of "politics and power(lessness), power over, and power to" (p. 2).

Context. CDT is a theory that emerges from the bottom up, from the lived experiences of persons with disabilities, rather than from the top down, from those who have political power. CDT states that disability, in and of itself, has no essential nature. It is only within the context of society that people are determined to be "disabled," based on what is valued or deemed to be defective (Pothier & Devlin, 2006). Taylor (2008) agrees, stating that "disability is not a characteristic that exists in the person so defined, but a construct that finds its meaning in social and cultural context" (p. xiv).

Scholars in Critical Disability Theory challenge the idea that parallel systems of education, such as separate classrooms, are an acceptable answer to differences among children. When determining what students with disabilities need, want, and deserve in education, conversations generally center on inclusion and strategies that will create equal opportunities for students.

Inclusion. The Individuals with Disabilities Education Act specifies that students with disabilities must have instructional opportunities that ensure access to and progress in the general education curriculum (Rothstein & Johnson, 2010). As a result, inclusive education has been one of the most important developments in special education over the last several decades. According to Artiles, Harris-Murri, and Rostenberg (2006), the term inclusion has meanings ranging from the placement of students with disabilities in the general education classroom to transforming the values and practices of entire educational systems. They contend, however, that the focus of inclusive education must be on transforming education if inclusion is to be used as a means to achieving social justice for students with disabilities. Westwood (2001) agrees, stating that any approach that suggests giving less to some students is open to criticism under principles of equity and social justice. The aims of inclusive education should be to remove barriers to participation in the general curriculum and provide access to learning, while celebrating differences, recognizing individual needs, and removing all forms of oppression (Liasidou, 2012).

Throughout history, students with disabilities have been denied the opportunity to be educated in classrooms with their non-disabled peers, have not had appropriate access to the general education curriculum, and have not been held accountable for their learning. They have been regarded as their own culture and they have been marginalized as part of that culture, discriminated against by school systems that seem to favor students without disabilities. Over the years, students with disabilities have been expected to either struggle through a curriculum clearly designed for the "typical learner" or be relegated to a classroom designed for other students "like them" (Shyman, 2012). Proponents of critical disability theory seek to change the alienation of students with disabilities by "addressing the learning needs of all children, with a specific focus on those who are vulnerable to marginalization and exclusion" through inclusion. (Vig & Kaur, 2011, p. 9). Inclusion also allows teachers to rethink how they teach and how students learn, recognizing that students learn in many different ways and their teaching can reflect those differences (Sapon-Shevin, 2007). When instruction is based on student's needs, rather than a textbook or test, teachers reduce the marginalization of students with disabilities by removing the barriers that can limit their access to the general education curriculum. Barton and Armstrong (2001) posit that

> Inclusion is not about placement into an unchanged system of provision and practice. Also, it is not merely about the participation of a specific group of formerly categorized individuals…it is about removing all forms of barriers to access and learning for all children who are experiencing disadvantage. The approach is rooted in conceptions of democracy and citizenship…Thus, inclusive education is not an end in itself but a means to an end-that of the realization of an inclusive society (pg. 708)

Classroom strategies. A prominent classroom strategy related to inclusion is the practice of accommodations. Accommodations are usually seen as changes in standard classroom practice or materials that will support learning for students with disabilities. Scholars in the field of critical disability theory prefer a different definition – "a change to suit a new purpose" (Danforth & Gabel, 2008, p. 2). The "new purpose" proposed by this definition is

the development of democratic, inclusive, accessible communities where biological and cultural diversities are not construed as deficits demanding remediation, illnesses requiring

treatment. The new purpose of one of group identity empowerment for disabled persons as disability shifts in meaning from a social problems requiring tactics of individual modification and personal adjustment to an oppressed group with a history, an identity, and a just cause. (Danforth & Gabel, 2008, p. 2)

Computer Assisted Instruction (CAI)

Computer assisted instruction has been defined as the use of a computer to provide instructional content (Seo & Woo, 2010). CAI can increase student learning by affecting cognitive processes and enhancing motivation. According to Frenzel (1980), the primary benefit of CAI is "the automatic interaction and feedback that the computer can provide" which allows for "multiple paths through the course material depending upon the individual student's progress" (p. 86). Research has indicated four ways in which CAI works to increase student achievement:

Personalizing information. Personalizing math problems can provide opportunities for overcoming difficulties in instruction (Chen & Liu, 2007). Bates and Wiest (2004) claim that personalization increases motivation and interest, both of which are critical factors in learning.

Animating objects on the screen. The animation found in many computer-assisted instruction programs holds powerful instructional potential. There are three functions of instructional animation used in computer-assisted instruction: attention-gaining, presentation, and practice. Animation can fulfill five roles in instruction: as an attention guide, as an aid for illustrating functional or procedural behavior, as a representation of domain knowledge entailing movement, as a model for forming a mental image of ideas which are not directly observable, and as a visual analogy or reasoning anchor for understanding abstract concepts (Rias & Zaman, 2012).

Providing activities that motivate students. Research has indicated that learning through computers can foster stronger intrinsic motivation than traditional classroom instruction (Rovai, Penton, Wighting, & Baker, 2007). Using computer-assisted instruction combines a self-paced environment with interesting activities, therefore increasing motivation to learn (Barger & Byrd, 2011). Self-paced instruction allows students to work at a quicker or slower pace, based on their individual needs.

Providing immediate feedback and remediation. Immediate feedback for correcting errors is essential in teaching new skills and in remediation of previously learned skills. According to Metcalfe, Kornell, and Finn (2009), when errors are not corrected immediately, they may be rehearsed and strengthened, therefore becoming more likely to occur. Butler (2007) noted that delayed feedback may not be given as much attention as immediate feedback. Many CAI programs incorporate immediate feedback techniques.

CAI for Students with Disabilities

Students with disabilities have unique characteristics that affect their learning. Research has shown that students with disabilities have problems with attention and memory, are not able to connect their successes to internal factors that they control, and generally do not possess an effective set of cognitive strategies to use when tasks become difficult or confusing (Gettinger, 1991; Reid & Lienemann, 2006; Swanson, 1996). Some educators, administrators, and researchers consider technology to be one possible solution to the poor mathematical performance of students with disabilities. Technology has the potential to improve teachers' ability to individualize instruction, provide immediate feedback, maximize practice, and motivate students (Riccomini, 2008).

Computer-assisted instruction is the most typical application of technology in the classroom and has become a promising instructional method for teaching math to students with disabilities in math (Aydin, 2005). NCTM (2000) states that "students who are easily distracted may focus more intently on computer tasks, and those who have organizational difficulties may benefit from the constraints imposed by a computer environment" (p. 25). Several research studies have concluded that CAI can indeed help students with disabilities be more successful in the mathematics curriculum. CAI instruction can increase math fact fluency, especially when the software features optimize practice and retention (Christensen & Gerber, 1990; Irish, 2002; Okolo, 1992). Increases in problem-solving have also been documented (Bottge, Heinrichs, Chan, Mehta, & Watson, 2003; Calhoon, Fuchs, & Hamlett, 2000; Shiah, Mastropieri, Scruggs, & Fulk, 1995).

Despite the research in support of using CAI to improve the mathematics achievement of students with disabilities, additional studies have determined that the majority of teachers do not use CAI as part of their instructional routine (Barron, Kemker, Harmes, & Kalaydjian, 2003; J. Wilson & Notar, 2003). A study conducted by Benson, Farnsworth, Bahr, Lewis, and Shaha (2004) found that many teachers were unwilling to use CAI programs as a result of a lack of funding to support training on how to use them effectively. Knowing how to effectively use and apply technology in the classroom is, however, the key factor in increasing student achievement (Carlson, 2002). Unfortunately, funding teacher training is generally seen as a low priority compared to purchasing more hardware and software, especially since many view professional development for teachers negatively due to its cost and problems measuring actual outcomes. Carlson (2002) argues, however, that a well-planned, on-going professional development program that is linked to curricular standards is a critical element in technology initiatives if teachers are to use technology to increase student achievement.

Learning Math

Hasselbring, Lott, and Zydney (2006) contend that a major goal of school is the development and understanding of basic mathematical concepts and principles. In order to effectively enhance mathematical thinking and learning through CAI, it is important to understand how mathematical knowledge is gained. Goldman and Hasselbring (1997) describe three types of mathematical knowledge that have been identified by cognitive scientists, all of which are necessary for developing mathematical literacy.

Declarative knowledge can best be described as facts about mathematics. It is a network of relationships containing basic facts and their answers. Ideally, these facts can be retrieved from memory quickly, effortlessly, and without error. Declarative knowledge serves as the building blocks of further mathematical knowledge. Students who possess a strong declarative knowledge of mathematics are able to focus their attention on higher aspects of mathematical problem-solving, rather than on solving basic facts (Goldman & Hasselbring, 1997). If students are not able to develop fluency in fact retrieval, the development of higher-order mathematical skills, and even everyday life skills, may be severely impaired (Loveless, 2003; Resnick, 1983). Royer, Tronsky, Chan, Jackson, and Merchant (1999) argue that fluent math fact retrieval is a strong predictor of performance on mathematics achievement tests.

A second type of mathematical knowledge is procedural knowledge. Procedural knowledge consists of step-by-step instructions on how to solve problems. The steps must be performed in a predetermined sequence. Procedural knowledge consists of two parts: the symbolic representation of mathematics, such as whole number operations symbols, and the rules for completing tasks. It is primarily concerned with an awareness of how mathematical computations are to be performed (Goldman & Hasselbring, 1997).

The final type of mathematical knowledge, conceptual knowledge, determines understanding rather than the steps in mathematical computation. Conceptual knowledge requires constructing relationships between separate pieces of information. Relationships can be formed between two pieces of information that have been committed to memory or between one existing piece of information and one newly learned fact. When those relationships are formed, students are able to be more successful in understanding mathematical concepts (Goldman & Hasselbring, 1997). Many students struggle to make these relationships between the concrete and the tangible mathematical concepts, often because declarative and procedural knowledge were not taught within the same context (Hasselbring, et al., 2006).

The development of all three types of knowledge is crucial for accessing and using knowledge to solve problems. Students need to understand the "how" and "why" of using a procedure to solve a problem so that they will be able to select the appropriate procedure to use in various situations. Goldman and Hasselbring (1997) state that

> declarative knowledge that is not tied to procedural knowledge, and procedural knowledge that is not tied to conceptual knowledge are, at best, limited in their usefulness and, at worst, useless for the student. If students do not understand why they are using specific procedures in particular contexts, then there can be little possibility of transfer to other contexts. (p. 201)

Technology may be an answer in helping students learn and process the three types of mathematical knowledge. The National Mathematics Advisory Panel (2008) recommended the use of computer-based software to develop automaticity in math facts. Murray, Silver-Pacuilla, and Helsel (2007) contend that technology can represent mathematical concepts in different ways and help students form mental representations of those concepts in ways that are meaningful to them. For students who have trouble remembering basic facts (declarative knowledge) or mathematical procedures (procedural knowledge), technology such as computer-assisted instruction programs can provide support through flexibility and interactivity.

Unfortunately, students with disabilities too often learn mathematics by learning isolated skills and then applying those skills to math problems that are meant to practice that skill. This instructional strategy leads to the practice of rote procedural skills with no conceptual knowledge of why the procedure is being used (Hasselbring, et al., 2006). It is the responsibility of teachers to ensure that instructional strategies are used that will promote success in the classroom. It is likely that inadequate instruction of students with disabilities has led to their difficulties in developing and connecting the three types of mathematical knowledge. To ensure that students receive appropriate educational experiences, Riccomini (2008) identified eleven instructional components that he contends are essential for effective instruction: (a) appropriate math content, (b) concept and application instruction, (c) problem-solving instruction, (d) systematic and explicit instruction, (e) instruction for broadening the case, (f) progress monitoring, (g) corrective feedback, (h) high success rate, (i) guided practice, (j) independent practice, and (k) cumulative review.

How Students with Disabilities Learn Math

For students with disabilities, difficulties in math can emerge early and continue throughout their education (Witzel & Riccomini, 2007). One consistent finding is that students with disabilities tend to have difficulty with the storage and retrieval of basic facts (Jordan & Montani, 1997; Ostad, 1998). Geary (1993) defines this difficulty as the defining characteristic of students with disabilities in math. Beyond the difficulties with fact retrieval, students with disabilities also have a limited working memory. They are unable to keep abstract information in their memory to aid them in solving problems (Geary, Hoard, Byrd-Craven, Nugent, & Numtee, 2007; Swanson & Sachse-Lee, 2001).

Another common characteristic of students with disabilities in math is the delayed development of effective counting strategies. They will count on their fingers long after their same-age peers have stopped and are slower to understand the "counting on" strategy. For example, when solving the problem 2+9, many children will come to understand that the problem is the same as 9+2 and will start counting up with 9. Students with disabilities, however, do not make that connection and often count up starting with 2 (Gersten et al., 2008).

In their meta-analysis of research on mathematics instruction for students with disabilities, Gersten et al. (2008) identified eight instructional practices that could enhance the mathematics performance of students with disabilities.

Explicit instruction. Math instruction that incorporates step-by-step, problem-specific instruction resulted in increased gains in math performance for students with LD. Teachers should model each step in the process of solving a problem and think aloud about the strategies they use during problem solving. Students should be given many opportunities to solve problems using the strategies being taught, and should receive corrective feedback from the teacher when they experience difficulty (Jitendra et al., 1998; Owen & Fuchs, 2002; Ross & Braden, 1991; Tournaki, 2003; Xin, Jitendra, & Deatline-Buchman, 2005).

Student verbalization of their mathematical reasoning. Student verbalizations of the solutions to math problems resulted in gains in their math performance. Students can verbalize the steps in a solution format or in a self-questioning/answer format. Students can verbalize during initial learning, while they solve the problem, and after they have reached the solution.

Visual representations. Visually representing math problems through graphics or diagrams had positive benefits on students' mathematics performance. Students who completed a visual representation prescribed by the teacher, rather than a self-selected representation, achieved somewhat larger gains. Visual representations appear to be more beneficial if both the teacher and the students use them (Owen & Fuchs, 2002; D. H. Schunk & Cox, 1986; Woodward, 2006).

Range and sequence of events. Lessons with carefully selected examples that cover a range of possibilities or are presented in a particular sequence resulted in higher mathematical gains for students with LD. Carefully sequenced examples are beneficial for initial learning of skills, while a range of examples helps students transfer their newly acquired skills to new performance situations (F. M. Butler, Miller, Crehan, Babbitt, & Pierce, 2003; Fuchs, Fuchs, & Prentice, 2004; Kelly, Gersten, & Carnine, 1990; Owen & Fuchs, 2002; Witzel, Mercer, & Miller, 2003; Woodward, 2006; Xin, et al., 2005).

Multiple and heuristic strategies. Multiple and heuristic strategy instruction is an important enhancement to explicit instruction. Like explicit instruction, using heuristics and teaching multiple strategies resulted in the strongest effects. A heuristic strategy is a generic problem-solving guide in which the strategy is not problem-specific. Students could be exposed to multiple strategies and then be guided towards selecting and using the strategy of their choice (Hutchinson, 1993; VanLuit & Naglieri, 1999; Woodward, 2006; Woodward, Monroe, & Baxter, 2001).

Giving teachers ongoing formative assessment data and feedback on students' mathematics performance. Providing teachers with information about students' math performance led to gains in performance. Stronger impacts were observed when teachers also received instructional tips and suggestions that helped them decide what to teach, when to introduce the next skill, and how to group/pair students, as informed by performance data (Allinder, Bolling, Oats, & Gagnon, 2000; Calhoon & Fuchs, 2003; Fuchs, Fuchs, Hamlett, Phillips, & Bentz, 1994; Fuchs, Fuchs, Hamlett, & Stecker, 1991; Fuchs, Fuchs, Phillips, Hamlett, & Karns, 1995).

Providing data and feedback to students with disabilities on their mathematics performance. Providing feedback to students with disabilities about their math performance, while not being detrimental, did not result in large gains in achievement. Giving students with disabilities opportunities to set and review goals periodically based on their math performance feedback did not appear to have any added value over only providing them with feedback. On the other hand, providing students with feedback on effort expended appears to be beneficial for students with disabilities (Bahr & Rieth, 1991; Fuchs, Fuchs, Hamlett, & Whinnery, 1991; Fuchs et al., 1997).

Peer-assisted mathematics instruction. Cross-age peer tutoring appears to be more beneficial than within-class peer-assisted learning for students with disabilities.
It is possible that students with disabilities may be too far below grade level to benefit from feedback from a peer. Older students, however, could be taught how to explain concepts to a student with a learning disability who is several years younger (Bar-Eli & Raviv, 1982; Beirne-Smith, 1991; R. E. Slavin, Madden, & Leavey, 1984).

Classworks

Developed by Curriculum Advantage in 1993, Classworks contains over 1,000 units of instruction and allows teachers to manage, assess, and individualize student learning. Each learning unit is designed to help students master important math skills through research based strategies, including the following components:

Mini-lessons. Mini-lessons introduce or review the skill with the student. Each mini-lesson is 3-5 screens long and consists of three parts: learn, apply, and review. During the "learn" phase of the mini-lesson, the program guides students through the process of how to solve the problems they are about to be given. Students click on each step and that step is solved for them on a sample problem. During the "apply" phase, students are given the opportunity to solve similar problems on their own. If they answer incorrectly, they are prompted to "Try again". They are able to choose an answer until they choose the correct one, but the program does not guide them through the problem to help them. The "review" phase guides them through the steps of solving the problems again. Students are able to study each phase as many times as needed before they end the mini-lesson session.

Instructional practice activities. After completing the mini-lesson, students work on practice activities. The activities engage students in various ways to practice a skill, including games and drill-and-practice. The variation of skill presentation allows for differentiated instruction and helps to facilitate mastery of the concept. A unit may contain several activities. Time-on-task is recorded for activities, and students receive a score for each activity. During the practice, students receive written messages regarding their progress. If they give an incorrect answer, they are prompted to "Try again". If they give a second incorrect answer, the program will give them the correct answer. In some lessons, students will be shown how to solve the problem, while others simply give the correct answer and move to the next problem. Students are able to track their progress across the top of the screen with symbols used for correct and incorrect answers. Symbols may as simple as a check mark for correct and an X for incorrect, or they may match the theme of the lesson. For example, a beach themed division lesson used crabs to indicate correct or incorrect - a moving crab meant a correct answer while an upside down crab meant incorrect. Lessons also contain a “?” at the bottom of the screen that will direct students to a help screen explaining how to solve the problems if they need additional assistance.

Quick quiz. When a student completes the activities, they take a 10 question quick quiz. This helps the teacher determine if the student has mastered the skill. For mastery to be achieved, students must score 70% or better. Students are not notified of correct or incorrect answers as they take the quiz. They receive their score after the quiz is completed.

Remediation activities. When a student passes the quiz, the remediation activities are automatically skipped. If a student does not pass the quiz, he/she will automatically be given the remediation activities. After completing the remediation, he/she will be given a second opportunity to take the quiz. If the quiz is failed a second time, Classworks will move the student to the next skill. Teachers, however, have the option of reassigning activities or quizzes if the students’ scores continue to fall below mastery. According to Wormeli (2006), allowing students to do assignments over until they reach mastery is the “key to a thriving classroom” (p. 135).

Performance tasks. Performance-based projects provide students with the opportunity to apply their newly learned skill in a real world application. The project lesson plans can be used in many ways, and require students to employ higher order thinking skills rather than basic recall. Performance tasks are not presented to the students on the computer. These tasks must be printed out and provided to the students by the teacher. The projects presented are not computer based.

CHAPTER III

METHODOLOGY

In this study, I utilized a qualitative research design, specifically case study, to examine the perceptions of students receiving special education services regarding the computer-assisted instruction program Classworks and its effectiveness in leading them to success in the general education classroom. This case study attempted to answer the following research questions:

1) How do students receiving special education services perceive Classworks as a means to gaining equity in the general education math classroom?

2) In what ways, if any, does Classworks provide equal opportunities for students receiving special education services?

3) What features of Classworks do students receiving special education services perceive as most supportive in helping them gain equity in the general education math classroom?

The case study is the most widely used form of qualitative research. It is defined as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18). According to Gall, Gall, and Borg (2007), case studies can be used to study almost any phenomenon with a wide range of methods to collect and analyze data. One important characteristic of a case study is that it exists within what researchers have termed a "bounded system." A bounded system is a single phenomenon that has specific boundaries, such as "one particular program or one particular classroom of learners," or that can be, in Merriam's (2009) words, "fenced in" (p. 40). In other words, without a bounded system, a study is not a case study.

Case studies can be particularly valuable in program evaluations when the program is individualized because the researcher is able to capture individual differences among several participants using the same program. A common activity such as a computer-assisted instruction (CAI) program can result in dramatically different outcomes for different students. Case study allows for the reporting of those individual outcomes (Patton, 2002). When evaluating a program's effect on a diverse population of students, the ability to study the variety of outcomes that can occur becomes important. Teachers and administrators need to understand how different populations react to programs that are available to them and how those programs may affect student achievement.

Theoretical Framework of the Study

Critical disability theory. The primary theoretical framework for this study is critical disability theory (CDT). CDT's central theme is that disability is a social construct, not the inevitable result of impairment. Disability is considered to be a complex relationship between impairment, an individual's response to that impairment, and the social environment. The social disadvantage experienced by persons with disabilities is the result of the failure of the social environment to respond adequately to the diversity presented by disability.

According to Hoskins (2008), one of the elements important to CDT is giving voice to persons with disabilities. Traditionally, the voices of persons with disabilities have been suppressed and marginalized when the person speaks out against the mainstream views of disability. CDT allows the voices of persons with disabilities to be heard and valued. Non-disabled persons see disability as "unmanageable suffering, a life subject to constant dependency and without value" (Hosking, 2008, p. 9). Listening to and valuing the perspectives of those who have disabilities can help non-disabled individuals begin to understand that having a disability does not have to prevent a joyful and productive life.

Another element of CDT is how language influences the concept of disability. In a school setting, labels are used to identify the type of disability a child has. The idea of labeling in special education has two main purposes: 1) to provide reasonable access to extra support within the standard school system for those that are deemed to require it, and 2) to indicate the needs and/or learning styles that can inform and strengthen teaching practice (Boyle, 2013). It is necessary to provide schools with a mechanism in order to acquire additional funding so that they are able to support the range of needs in an educational setting. However, there is a potential negativity attached to labeling in the school system in that the focus may be on what the student is having difficulty with in school and does not recognize the strengths and individuality of that person (Blum & Bakken, 2010). Students who are "labeled" with a disability are sometimes seen as negative additions to classrooms, especially when standardized test scores are an integral part of the academic experience. CDT examines how negative attitudes toward disability can increase feelings of powerlessness and dependence.

Critical pedagogy. A secondary theoretical framework for this study is critical pedagogy. Emerging in the last two decades, critical pedagogy studies schools in a historical context and as part of the current social climate of class-driven dominance. McLaren (2007) describes critical pedagogy as a way to "heal, repair, and transform the world", a commitment to the side of the oppressed, and the transformation of social inequalities and injustices (p. 186).

The basic tenet of critical pedagogy is that there is unequal social stratification based on race, gender, class, and disability. Friere (1970) stated "Education either functions as an instrument that is used to facilitate the integration of the younger generation in to the logic of the present system and bring about conformity to it, or it becomes ‘the practice of freedom’ the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world” (p.32). In today’s educational environment, students with disabilities are forced to conform to society’s view of what a “successful” student should be able to do, rather than being allowed the freedom to excel at their own individual strengths at their own pace.

Even though critical pedagogy does not explicitly include students with learning disabilities, the notion of ending oppression and marginalization of certain groups of students is reflected in inclusive education. According to Liasidou (2012a), inclusive education “is concerned with challenging the ways in which educational systems reproduce and perpetuate social inequalities with regard to marginalized and excluded groups of students…inclusion is inexorably linked with the principles of equality and social justice in both educational and social domains” (p.168). Unfortunately, with today’s focus on academic excellence as measured by high stakes tests, the inclusion of students with disabilities in the general classroom is generally seen as counterproductive. When students begin to be assessed through state-mandated tests, which is in the third grade for the state of this study, many students with disabilities have limited inclusion in the general education classroom because they are likely to hinder high test scores. Marginalization is increased, expectations are decreased, and students with disabilities are left feeling as though they are not capable of performing as well as their non-disabled classmates.

Participants

The participants in this study were students from a Title I elementary school in a west-central Georgia district. The population of the school was approximately 94% African-American and approximately 90% of students received free or reduced lunch.

Convenience sampling was used to determine the participants in this study. It was necessary to use convenience sampling due to school district restrictions on the researcher. Because of the confidentiality of Individual Education Plans (IEPs) for students with disabilities, only those students who were directly served by the researcher could be included in the sample. As a result, all participants were students in grades three, four or five, were receiving special education services from the researcher at the time the research was conducted, and had math goals written in their Individual Education Plan. There were a total of 15 students who met these criteria. Consent forms were sent home with 12 students. Three students who met the criteria for the study were not invited to participate due to cognitive abilities that would not allow for usable data to be collected. Eight students returned the consent forms signed and chose to participate in the study. One student who returned the consent form never attended the sessions and was therefore not included in the data collection.

Of the seven students who participated in the study, three were males and four were females. Three of the students were in fifth grade, three were in fourth grade, and one was in third grade. Six of the seven participants were African-American, and the remaining participant was White. Five of the seven participants did not meet expectations on the math portion of the Criterion-Referenced Competency Test (CRCT) that was given in the Spring of 2013.

Data Collection

The primary sources of data for this study came from participant interviews and observations.

Participant interviews. One component of case study is participant interviews. According to Patton (2002), interviews allow the researcher to gain information directly from the participant that cannot be observed, such as feelings, thoughts, and intentions. Interviews are particularly important to case studies because the researcher is seeking to gain information about human events and interviews allow first-hand access to those events. Conducting interviews begins with the assumption that the perspectives of others are meaningful and requires an interest in what is being said. King and Horrocks (2010) suggest three characteristics of qualitative interviews: 1) they are flexible and open-ended, 2) they focus on people's actual experiences rather than general beliefs, and 3) the relationship between interviewer and interviewee is crucial. For an interview to be successful, the interviewer must be able to build trust with the study participants in order to gain information that the individual may not reveal through any other method.

Two separate participant interviews were conducted. These interviews were important because student voice can be a "powerful tool to shaping educational reform and policies" as "their perspectives often capture the realities of classroom and school life in vivid detail" (Yonezawa & Jones, 2006, p. 21). For this study, a focused interview was utilized. According to Yin (2009), the focused interview should be short in duration and allow for a conversational format with follow-up questions, even though a specific set of questions is being used. The age of the participants, as well as knowledge of the characteristics of their specific disabilities, were determining factors in choosing to conduct a focused interview. It was important that the interview not last more than about 20 minutes in order to keep the attention and interest of the participants. It was also necessary to be able to ask follow-up questions based on the responses of the participants so that more information could be gained and clarifications could be made. Questions did not lead the participant to an answer, but instead allowed them to provide fresh information about the topic being discussed (Bailey, 2007).

The first interview gathered information regarding the participants' views of Classworks and whether or not it provided them with equal opportunities for learning math skills. The objective was to understand the participant's point of view and provide a way for the researcher to gain information that could not be observed, specifically the perspectives of the participants about Classworks as an instructional tool for math. The second interview focused on the participants' experiences in math in the general education classroom and their perceptions of how Classworks may have influenced those experiences. These interviews took place in the school setting before school. Interviews were done individually and took three or four 30 minute sessions per participant. Interviews were audio-recorded and written transcripts were generated.

Observations. Participants were observed while using the Classworks program. The specific skills being studied by each student was noted along with the grade level in order to document the differentiation of instruction provided. The researcher looked for and recorded predetermined actions from participants, including comments connecting Classworks to the general education curriculum, conversations among students about the different features of Classworks they encountered (i.e. games, quizzes, mini-lessons, etc.), and instances of sharing successes and/or failures with others. These specific behaviors were chosen to aid the researcher in determining if the knowledge gained during lessons in Classworks can be transferred to the curriculum being taught in the general education classroom in order to help the participants be more successful.

The researcher also looked for any instances of students asking for or offering help to other students, which provided opportunities for peer tutoring. Research indicates that conversation helps students refine their knowledge. According to Calkins (2000), talk among students “is a major motor of intellectual development” (pg. 226). By talking about their assignments, students are doing more than simply regurgitating ideas or picking answers for a grade. They are taking ownership of their ideas.

Observations were conducted in 30 minute sessions, five days per week for 12 weeks. All participants were observed using Classworks at the same time. These observations were recorded using free-style field notes. The researcher sat in close proximity to the group of participants and recorded instances of conversation among students. During these observational times, the researcher was the only adult present and did not interact with the students in any way or influence the conversations that were being held.

Procedure

After obtaining permission for this study from the participating school district and the Institutional Review Board of Georgia Southern University, information packets containing an informed consent form for parents (see Appendix B) and a minor’s assent form for student participants (see Appendix C) were distributed to 12 of the 15 students who were receiving special education services from the researcher and who had math goals written into their IEP. After consent was received from the parent and the student had also agreed to participate in the study, the students began attending a before school tutoring program that utilized the Classworks computer-assisted instruction program.

Beginning in late August 2013 and ending in December 2013, tutoring was offered each morning, Monday through Friday, for 30 minutes per day. The program was conducted in the participating school's Computer Learning Center. This computer lab has 30 computers available for student use, so each participant was able to work on their own computer during the study. The researcher assigned math instruction to each student individually based on personal and grade-level curricular needs. Students sat together in the front half of the lab and were able to ask each other questions if needed and provide assistance to other students when possible. Each participant was given a notebook to use to work out problems and find answers to various problems. As the students worked through their assignments, the researcher monitored results and reassigned skills that students struggled with. When students mastered a skill, new skills were assigned. Skills assigned in the tutoring program were related to the skills being taught in the general education classroom. For example, if the students were learning to multiply multi-digit numbers in the classroom, students were assigned similar skills on Classworks that were at their individual level and could lead them to more success with the grade level material.

Data Analysis

Interpretational analysis was used to analyze the information gained from the two interviews with participants. This form of data analysis looks for themes and patterns that could be used to describe the phenomenon being studied (Gall, et al., 2007). After transcribing the interviews of each participant, the researcher read each transcript multiple times and looked for segments of data that helped answer the research questions being studied. Based on the research questions, the segments were named as follows: Student Perceptions of Classworks, Equal Opportunities, and Features of Classworks. After analyzing each interview individually for these segments, the segments were compared across the participants to look for commonalities. Information gained from the observations was also reviewed, segmented, and coded based on the same segments. Frequency counts were created for the each of the various conversational behaviors being observed. Behaviors were labeled as: Connecting Classworks to the General Education Curriculum, Features of Classworks, Sharing Successes and/or Failures, and Asking for/Offering Help. Observational data were analyzed weekly across all participants involved in specific conversations.

Validation Strategies

Credibility for this study was achieved by using multiple data sources and collection of data on multiple occasions over time. The researcher kept a record of her thoughts and reactions in a reflective journal during the course of the study in order to be aware of her personal biases related to the study. Thoughts were recorded as soon as possible after the tutoring sessions ended to ensure accuracy. Examples of journal entries included games on Classworks that participants had particular trouble understanding, instances of participants clicking quickly through lessons, instances of incorrect thinking when helping other students, and moments of surprise (and pride) when participants unexpectedly offered help to others and were effective in bringing about understanding. The researcher also enlisted the assistance of a colleague who was familiar with qualitative data analysis to discuss the findings as they emerged and to review a draft of the report.

CHAPTER IV

RESULTS

In this chapter, the data obtained from the analysis of observations and interviews during the research period are presented. The purpose of this study was to examine the perceptions that students who are receiving special education services have regarding the effectiveness of Classworks, a computer-assisted instruction program, in helping them feel more familiar and confident with the lessons in the general education math classroom. Classworks was adopted and mandated by the researcher's school district 2 years ago, specifically as a way to support struggling students and help them be more successful with the current mathematics curriculum as instructed by the general education teachers. It is used as an intervention in Tiers 2 and 3 of the Pyramid of Interventions (which is the Georgia Department of Education's title for the Response to Intervention program), and it is also used to track the progress of students who scored below standards on the Criterion Referenced Competency Test (CRCT) in the previous year. The researcher, a special education teacher, became interested in learning about the program and its effectiveness with students with disabilities. The researcher discovered that very little research was available on the effectiveness of Classworks and none of that research involved students with disabilities. Because the majority of the researcher's students were in the group being monitored by the district for low math scores on the CRCT, she began to monitor the students more closely and compare their scores on Classworks to their work in the classroom.

Data Analysis

The data collected for this study were analyzed using interpretational analysis. Data analysis began after the first week of observations, by reading through notes on student conversations, and continued as individual student interviews were completed. After all individual student interviews were conducted and transcribed, the data were compiled into a computer database and divided into categories based on the research questions to be explored   The categories were therefore named:

Student Perceptions of Classworks. The first research question to be answered was "How do students receiving special education services perceive Classworks as a means to gaining equity in the general education math classroom?". Data assigned to this category were gained from interview questions centering on how the participants felt about math in general and about Classworks, as well as how they connected Classworks to their classroom math curriculum.

Equal Classroom Opportunities. The second research question to be answered was "In what ways, if any, does Classworks provide equal opportunities for students receiving special education services?". Data assigned to this category were gained from interview questions centering on the aspects of Classworks that were the most helpful to them in gaining equity in the general education classroom and other aspects of Classworks that did not help them in their classroom.

Features of Classworks. The final research question to be answered was "What features of Classworks do students receiving special education services perceive as most supportive in helping them gain equity in the general education math classroom?". Data assigned to this category were gained from interview questions centering on the specific features of Classworks that supported participants in gaining equity in the general education classroom.

After analyzing each interview individually and coding these categories, the categories were compared across the participants to look for commonalities.

Information gained from the observations was also reviewed and coded based on the same categories related to the research questions. Observed behaviors were labeled as:

Connecting Classworks to the General Education Curriculum. In conjunction with interview questions regarding how participants connected Classworks to the classroom curriculum, participants were observed for comments relating assignments on Classworks to what they were learning in the classroom.

Features of Classworks. In order to gain additional data for the research question regarding supportive features of Classworks , participants were observed for any comments or conversations related to specific features of Classworks, such as mini-lessons, quizzes, or games and how these features supported the classroom curriculum.

Sharing Successes and/or Difficulties. Participants were encouraged prior to each observational period to engage in conversations about their lessons on Classworks. By sharing successes and difficulties with each other as they worked, they gained confidence in their mathematical abilities which could carry over into the classroom.

Asking for/Offering Help. As participants worked through lessons, difficulties and confusion would sometimes arise. Working together to solve problems can lead to higher confidence levels and lead to more success in the classroom.

Observational data were analyzed weekly across all participants involved in specific conversations.

After coding all data concerning student perceptions of Classworks, the following categories emerged:

P-c Perceptions: Connecting to the classroom

P-pf Perceptions: Positive feelings toward Classworks

P-nf Perceptions: Negative feelings toward Classworks

P-h Perceptions: Helpfulness of Classworks in the classroom

P-nh Perceptions: Non-helpfulness of Classworks in the classroom

P- ch Perceptions: Changes to Classworks

Next, the data related to Equal Classroom Opportunities were analyzed and the following categories were identified:

ECO-cp Equal Classroom Opportunities: Classroom performance

ECO-f Equal Classroom Opportunities: Feedback

ECO-m Equal Classroom Opportunities: Monitoring work in the classroom

ECO-p Equal Classroom Opportunities: Classworks allows students to work at their own pace

Data related to the features of Classworks were analyzed and the following categories emerged:

FC-ml Features of Classworks: Mini-lessons

FC-qq Features of Classworks: Quick quizzes

FC-g Features of Classworks: Games

FC-h Features of Classworks: Helpful features of Classworks

FC-nh Features of Classworks: Non-helpful features of Classworks

Finally, the data related to student talk while using Classworks were analyzed and the following categories emerged:

ST-s Student Talk: Sharing successes

ST-f Student Talk: Sharing difficulties

ST-oh Student Talk: Offering help to others

ST-ah Student Talk: Asking for help from others

Validation Strategies

Credibility for this study was achieved by using multiple data collection methods, collection of data on multiple occasions over time, researcher reflections, and peer examination. Data were triangulated with the various forms of data that were collected in the study, including two separate individual interviews and group observations while participants used Classworks. Student interviews were conducted on multiple occasions over the course of several weeks. The second individual interview was conducted approximately one week after the first interview. In some cases, individual interviews were conducted over more than one session to allow for the needs of the participant. Participants' own words were used to present the findings of the study, providing their voice concerning the use of Classworks and its level of effectiveness.

During the course of the study, the researcher also kept a reflective journal to record her thoughts and reactions. Notes were included in this journal after each student interview and after each observation period. This reflection allowed the researcher to record initial thoughts about student responses and also expound on those thoughts later as the interview transcripts and observational notes were reviewed. Some responses and actions were expected, but many others were surprises and those moments were captured through journaling and reflection. The journal was also used to document any problems students may have had with various skills so that the researcher could go back at a later time and correct those inaccuracies.

During data analysis, the researcher also enlisted the assistance of a critical friend. According to Bambino (2002), a critical friend is a trusted person who provides feedback to an individual by asking provocative questions and offering critique of a person's work as a friend. A critical friend takes the time to fully understand the context of the work presented and the outcomes that the person is working toward. The friend is an advocate for the success of that work. The critical friend recruited by the researcher was familiar with the Classworks program and the general education math curriculum. She has taught 5th grade for 19 years at the same school as the researcher and has had students with disabilities included in her class for the past four years. The researcher and her colleague reviewed the interview transcripts together and determined the final list of groupings to be used for analysis. During discussion, some codes were added to the original list and some generally stated codes were written more specifically. For example, in the segment of data related to students' perceptions of Classworks, the original code was "feelings toward Classworks". After discussion with the colleague, that code was split into two more specific codes for positive and negative feelings toward Classworks. In the segment of data related to equal opportunities, the discussion led to changing a code labeled "classroom problems", which the colleague found confusing and unclear, to "how problems in Classworks relate to the classroom". After much discussion, it was also decided to combine the codes for "Connected to the curriculum" and "Related to classroom problems" into one code called "Connected to the classroom".

Findings for each research question were also discussed. As a general education teacher who is required to use Classworks with all of her students twice a week, she was interested to know how the students with disabilities in her class perceived the program. Before writing began, the researcher considered how to structure the report of findings. It had been decided to organize the findings by research question, and the colleague agreed that structuring by research question would make the report easier to read and easier to follow. As writing began, the colleague reviewed several drafts of the report and offered feedback to improve the clarity of the report.

Findings from Individual Interviews

In the following sections, the findings from the two individual interviews are discussed, organized by each of the research questions.

Students' perceptions of Classworks. In looking at the data related to students' perceptions of Classworks, three themes emerged: 1) Classworks does not resemble the work seen in the general education classroom, 2) Classworks helps students feel more confident in basic skills, and 3) Classworks needs some changes to help with the types of problems students are routinely asked to complete in class.

Classworks does not resemble the work seen in the general education classroom. All of the seven students participating in the study reported that the work on Classworks does not resemble the work they are seeing in their general education classroom. During the individual interviews, Leslie described her classroom experience as "a lot of word problems that I don't understand" while saying that "Classworks doesn't have too many word problems – just a lot of games." Jane agreed, saying that "I like working on Classworks ok, but it's not like my classroom work at all." Five students reported that the skills they work on in Classworks are the same as the skills they are being taught in the classroom, but they are not presented in the same way. According to Kathy, "Mrs. B is teaching fractions and I'm doing fractions on Classworks, but it doesn't look the same at all. I do ok on Classworks, but then I can't do the stuff in class." Kevin agreed, saying "I just don't know how to do what Mrs. B is showing us. Doing the fractions on Classworks isn't the same as what she does and I get confused."

During observational periods, participants made comments such as "This is not how we do it in class" and "This looks different. What do I do?" On several occasions, the participants asked the researcher for help on activities.

Classworks helps students feel more confident in basic skills. Five of the seven participants said that Classworks helps them feel more confident in basic math skills. Mike said, "I have trouble with subtraction when I have to borrow. I can't remember all the steps, but Classworks shows the steps as I go and that helps. It helps me through the problems and I feel like I can do them better." Kevin reported that he was "getting better at multiplication" because "Classworks just keeps making me do it 'til I get it right." Other students also commented that Classworks makes them feel better when they are working on "the easy stuff like adding and subtracting" and Kathy stated that "I like doing the stuff on Classworks because it's not those hard word problems like the teachers make us do. I can just work out the problems and if I get stuck it will give me hints sometimes. I can't do word problems, but I can do the stuff I have to do on Classworks a little better."

Classworks needs some changes. During the individual interviews, all of the students stated that Classworks needed to have more word problems "where we have to do a bunch of different things to get the answer." All of the participants agreed that they "hated" word problems, with Leslie commenting that they were the "worst things ever and I just don't get them." However, they all also agreed that for Classworks to be more connected to the classroom, there needed to be more word problems. Jane pointed out that "I don't really get word problems at all and Classworks doesn't help me with those. If I have to do them in class it would be good if I could do them in Classworks, too. Then I could go slower and try to figure it out better." Mike agreed, saying that "word problems stink and I always feel bad in class when I don't get them. Classworks hardly ever has any word problems so it just doesn't help me…maybe they should have more, but I don't really want them."

Equal classroom opportunities. In looking at the data related to equal classroom opportunities Classworks affords to students with disabilities, two themes emerged: 1) Classworks provides some feedback that is helpful to students in the general education classroom and 2) Classworks lets them work at their own pace.

Classworks provides some helpful feedback. Six of the seven participants felt that Classworks provided feedback during instruction that carried over into the general education classroom. Classworks provides visual messages to students after each problem, telling them if they were correct or incorrect. Students are encouraged to try again after incorrect answers before step-by-step instructions are given. Jane and Kevin both commented that they like how Classworks helped them step-by-step through problems. According to Jane, Classworks "helps me with division because it shows me what to do next. I can't always remember all of those steps, but it shows me the next thing to do. If I put the wrong thing, it tells me what the right answer was and why and then lets me try again. I'm getting a little better at it when I have to do it in Mrs. W's room. I still can't do it all right, but I'm getting better." Kevin said that he was getting better at subtraction because "it reminds me to borrow when I'm supposed to….I don't always borrow because I don't know when I'm supposed to, but it shows me to do it if I don't. Then I can get it right sometimes...because it tells me when I don't and it helps me." Sean agreed, saying "I can't always do stuff with lots of steps. When I do it on Classworks, it shows me the next thing to do so I don't get so confused."

All of the participants mentioned that they like seeing their scores immediately upon finishing a lesson or quiz. Becky said that it helped her know how she was doing and what she needed to work harder on. Derek stated that "I like knowing when I did it right. It makes me feel better about how I'm doing", while two other students said that it was good to know how they did, good or bad. According to Kathy, “I don’t like getting bad scores, but at least I know I need to work on it more while I’m still there. And if I do good, I like knowing that, too.” Kevin agreed, saying “I get a lot of bad scores sometimes, but I know I can ask for help and do it over. Mrs. M doesn’t let us keep bad scores…we have to do it over until we get it right…so we get to see good scores one day.”

Classworks allows students to work at their own pace. Six of the participants said that Classworks let them work at their own pace, but the pace of instruction in their classroom was too fast. Becky and Derek both said that they liked being able to work slowly and do things over if they needed to. Kevin liked the fact that “stuff isn’t always timed in Classworks so I don’t feel rushed. I can just think about it and ask questions….and I don’t feel like I have to keep up with other people.” In the general education classroom, Mike wanted his teacher to “take more time showing me how to do stuff. Once or twice doesn’t help me much” and Jane said “don’t go so fast…please. Go slower so I can keep up.” Kathy agreed that slowing down might help, saying that “ in Classworks I’m not in a hurry. My teacher even fusses if I go too fast, which is kinda weird ‘cause she fusses at me in class for being too slow. But I can’t do math that fast, so I like going slow.”

Features of Classworks. In looking at the data related to the specific features of Classworks, two themes emerged: 1) Mini-lessons and quick quizzes are most helpful to students, and 2) students do not feel that the games are helpful.

Mini-lessons and quick quizzes are helpful. All of the participants reported that the mini-lessons or the quick quizzes were the most helpful features of Classworks. Kevin stated that “the mini-lessons teach me what I’m supposed to learn and show me how to do the lessons. I like that I can do them a bunch of times if I need to.” Derek agreed, saying “the mini-lessons are kinda short sometimes, but I guess that's good. If they were longer I may not read them so much and then I wouldn't understand. They help me." Kathy admitted that "I don't always read the mini-lessons. They are kinda dumb sometimes and I just go through them quick. But then sometimes I can't do the work after that and I have to go back. My teacher showed me how to go back if I need to. I still skip them sometimes, but sometimes they help me." Becky liked the quick quizzes, saying "that's how I know if I learned anything. If I get 10 out of 10 or 8 out of 10, I know I did good, but if I get like 4 out of 10 or 5 out of 10, I know I'm gonna have to do it over. But I know it right then and Mrs. M can help me with it." Leslie liked both the mini-lessons and the quizzes, stating that "the mini-lessons are usually helpful at the beginning, even if they are kinda boring…the quizzes are like a test in class and I like seeing how I did…especially when I do good."

Games are not helpful. Five of the participants did not find the games to be helpful to them. All five said that the games could be confusing and they didn't know how to play them. According to Jane, "some of the games are cool and fun to play, but a lot of them I don't know what to do. They don't make any sense to me." Kevin agreed, saying "I wish some of the games weren't there. I don't know how to play them and some of them don't give me enough time to figure stuff out. It runs out of time and then I do bad, but it's because I didn't know what it wanted me to do." Two other students said that the games were sometimes fun to play, but they would rather just have "normal lessons" instead. Leslie commented that even the teachers could not figure some of the games out in order to help them. "I ask my teacher what I'm supposed to do and they look at it but don't know what to do. Sometimes they just go and take the game off so I don't have to do it - just because they don't know how to do it either."

Findings from Observations

In this section, findings are presented from the observations conducted while the participants were using Classworks to work on math. During these observations, participants used Classworks to practice both grade level material as well as lower level skills they needed to master. The focus was on student conversations with each other about their successes and difficulties, as well as whether or not they asked for or offered help, in an effort to reveal more information regarding their perceptions of Classworks and its effects on their classroom experiences.

Sharing successes and difficulties. In looking at data relevant to how students shared successes and difficulties, two main groupings emerged: 1) students shared successes predominantly through scores on lessons and quizzes, and 2) students were reluctant to share difficulties.

Students shared successes through scores. All participants consistently shared successes on Classworks by announcing scores verbally to the group. Scores are shown at the end of each lesson and quiz as the number correct out of total number of problems. Participants have learned over time which are “passing” scores and which are not. Throughout each 30 minute observation session, participants were constantly sharing “I got 7 out of 10” or “I got 5 out of 6”, and other similar expressions. After each announcement, at least one other participant would congratulate them through phrases such as “Good job!”, “Way to go!”, and “Yeah!”.

Although successes were predominantly shared through scores, participants also shared success on individual problems with comments such as “I did it!”, “I finally got it right!”, and “YES!”. Most students shared with the group as a whole, although others shared more quietly with the person sitting next to them or specifically with me.

Students were reluctant to share difficulties. Participants were less likely to share difficulties, whether to the group or quietly to individuals. Indications of trouble with specific problems or bad scores were mostly nonverbal sounds such as groans and sighs or under the breath comments such as “Dang”, “Not again”, and “I don’t know how to do it” that were not directed at anyone specifically. Only one participant shared her difficulties with others, asking for help when needed and asking me to reassign lessons that she received a bad score on.

The one exception to not sharing difficulties was with the games. Participants were much more willing to share that they didn’t understand games with comments such as “It’s this game again….how do I do it?”, “Does anyone know how to play this game?”, and “Mrs. M, can you take this game off? I don’t know how to do it.”

Asking for and offering help. In looking at the data related to how often students asked for or offered help, two groupings emerged: 1) students asked for help on games more often than on specific problems, and 2) students helped others with and without being asked.

Students asked for help on games more than on problems. Every participant asked for help on how to play games at some point during the observational period, most students more than once. Table 1 indicates the number of times each participant asked for help on games and during lessons, as well as the specific skills they were working on when they asked for help. When working on a game, they would attempt to complete the games, but would ask for help if they did not understand what to do. On several occasions, they would recognize a game with which they previously had difficulty and would ask for help almost immediately upon opening the program, many times asking the researcher to remove the game completely so that they could continue on to another section. They did not seem to be hesitant to admit that they did not know how to play the games, although they seemed to be reluctant to admit that they were having trouble with specific problems and lessons. Although all participants asked for help occasionally, it was not typically the ongoing behavior of the group. Only one student consistently asked for help with working problems. Leslie had difficulty with adding with regrouping and asked for help on almost every problem and was not hesitant to admit she didn't understand it.

Table 1

Participant	# of times asked for help with lessons	# of times asked for help during games	Skills being learned when help was needed
Kevin	41	87	subtraction with regrouping
Leslie	134	66	addition with regrouping, reading graphs
Kathy	48	76	fractions
Derek	76	88	fractions
Becky	53	89	reading graphs, multiplication
Jane	32	77	multiplication
Mike	27	51	subtraction with regrouping

Students helped others. Every participant helped someone else at some point during the observational sessions. Table 2 indicates the number of times each participant helped another student and the skill with which he or she provided assistance. Although most participants rarely asked for help on working problems, they would offer help to others who expressed low scores on a task or when they heard comments such as "Dang I missed that one" and "I thought I did better". Jane spent an entire 30 minute session working with Leslie on addition with regrouping. Derek spent a great deal of time over twelve different sessions helping Kevin with multiplication. Although Mike generally kept to himself, he did like to talk about the skills he was most successful with and would help others on those skills when he was specifically asked. He worked with Kevin and Becky on multiplication and with Kathy on adding fractions. Mike spoke frequently about knowing all of his multiplication facts and how he was doing well on fractions in the classroom. One of his classmates, Jane, also told everyone that he usually did well in class with multiplication so everyone should ask him for help. The ability to notice that others need help and being willing to offer that help without being asked can aid in students gaining equity in the general education classroom. The confidence they feel in their abilities on certain specific skills may carry over into the classroom and allow them to offer help to their non-disabled peers and see themselves as an integral part of that environment. One general education teacher noted that two of her students that were a part of this study were more willing to attempt problems and worked longer before giving up.

Table 2

Participant	# of times he/she helped another student	Skills he/she helped with
Kevin	23	addition with regrouping, reading graphs
Leslie	6	basic addition facts
Kathy	21	subtraction with regrouping, multiplication
Derek	33	multiplication
Becky	19	addition with regrouping
Jane	42	addition with regrouping
Mike	17	multiplication, fractions

CHAPTER V

DISCUSSION AND CONCLUSIONS

Proponents of Critical Disability Theory seek equity for individuals with disabilities. In educational settings, this includes access to the general education curriculum through inclusive education and expectations for academic success that mirror those of non-disabled students. Having access to the general curriculum implies that students with disabilities have the right to work toward the same educational goals and that appropriate accommodations are in place to minimize the impact of the student's disability on his or her ability to meet grade level standards. The information gained from this study revealed that Classworks has elements that can support students with disabilities in gaining more access to the general education curriculum and help them gain the confidence needed to become equal members of the classroom community. The participants in this study offered insightful answers to questions regarding the obstacles they encounter with accessing the general education math curriculum successfully and their perceptions of whether Classworks helped them overcome those difficulties and be more confident in their math skills, which can lead to greater equity in the general education classroom. Their answers provided significant information that might be helpful in reviewing programs intended to improve accessibility of students with disabilities to general math curriculum.

Equal Classroom Opportunities

In today's educational climate, inclusion of students with disabilities in the general education classroom is a common occurrence and one that allows students with disabilities access to the general education curriculum. In the state of Georgia, approximately 65% of students with disabilities spent at least 80% of their day in the general education classroom during the 2012-

2013 school year (Georgia Department of Education, 2013). Proponents of Critical Disability Theory see inclusion as a pathway for students with disabilities to gain educational equity with their non-disabled peers (Barton & Armstrong, 2001; Liasidou, 2012; Sapon-Shevin, 2007). Inclusion is not simply placing students with disabilities into a general education classroom and continuing to plan, instruct, and assess as though all children were the same. General education teachers and special education teachers must be able to work together to ensure that all students are receiving instruction that meets their needs and allows them to succeed. Inclusion is about changing the beliefs of educators, parents, and students about how students learn and how teaching should occur to ensure that students with disabilities have access to and experience success with the general education curriculum. Classworks offers support for students with disabilities to promote their own access to educational equity.

As early as the 1980s, computer-assisted instruction (CAI) programs, such as Classworks, have been linked to increases in mathematics achievement for students with disabilities (Schmidt, Weinstein, Niemic, & Walberg, 1986). Research has indicated that features of CAI, including immediate feedback, a self-paced environment, and improved computation skills, allow for student success and increased motivation (Barger & Byrd, 2011; Metcalfe, Kornell, & Finn, 2009). In the current study, participants identified that these components of CAI were evident in Classworks and assisted them in the mastery of math skills. Additionally, the participants reported that, in some cases, the skills that were supported by these components of Classworks could be generalized to the instruction they experienced in general education classroom.

Immediate feedback. In computer-assisted instruction, feedback comprises information presented to the learner immediately following the learner's input, with the purpose of shaping the action of the learner (Shute, 2007). The immediate feedback provided by Classworks was one feature mentioned by participants as helpful in increasing their access to the general education curriculum. Classworks provides corrections both during the lessons as well as at the end so that students are aware of their progress toward mastery of the skill. When working in Classworks, participants were provided information immediately after responding to each question that informed them whether they had been successful or when they had made mistakes. When they correctly answered a problem, they would be given positive messages such as "There you are. Keep going," or "You've got it right!". In addition to these messages, they would be able to see their successes across the top of the screen as a check mark or other symbol that appeared each time they got a correct answer. If they incorrectly answered a problem, the first message to appear was "Try again" and they were able to try a second time. If they answered wrong a second time, the correct answer was given to them. In many lessons, participants were given specific instruction on how to correct those mistakes. When working on regrouping skills, a line would appear where the student needed to place a number as part of the answer. If regrouping was needed, a line would appear above the next column to remind the student to "carry" the digit over to the next column. After an incorrect answer, visual messages, such as "6x4=24. Please type a 2 here." would also be given to guide the student through the process of correctly solving the problem. By providing specific step by step examples of what is needed solve the problems, Classworks lessons give the extra assistance students may need and promote perseverance through problems that students may find difficult. These prompts allowed them multiple opportunities to visualize and repeat the steps involved in solving the problem, leading to higher levels of confidence and a willingness to use those skills in their classroom to attempt more difficult problems. Shute (2007) contends that feedback is one of the most powerful indicators of positive student achievement. Observational and interview data collected for this study revealed that the instructional feedback given to participants during Classworks lessons helped them improve their scores on the computational skills they were learning. Participants remarked during lessons that they were "glad it shows me how to do this because I always mess it up" and "I did a little better this time. I only got 2 out of 5 right last time". During individual interviews, participants shared that Classworks "kept showing me how to do subtraction until I figured it out" and "I was having a really hard time with those division problems with all those steps, but it (Classworks) showed me how to do it and I just kept doing it til I got it right". The actions provided through Classworks after mistakes were made, such as giving students another opportunity to find the correct answer and giving them a visual model of how to solve the problem, provided students the multiple opportunities needed to be successful with computational problems, leading to a stronger foundation for the skills necessary to solve more rigorous problems in the general education classroom and helping them become an integral part of the larger learning community.

Over the last four years, the Georgia Department of Education (2013) has allowed districts to request waivers that allow larger class sizes as a way to meet current financial constraints. The state class size limit for upper elementary grades is 28 students. The researcher's district has requested a waiver that will allow teachers in grades 4 and 5 to have as many as 33 students per classroom. With the continuous growth of class sizes, immediate feedback is not always possible in general education classrooms. However, when immediate feedback is provided that guides students to adjust their computation and leads them to the correct answer, students are more likely to take risks with their learning, and they are more likely to keep trying until they succeed (Brookhart, 2008; Shute, 2007). After answering each question in Classworks, students were given a visual and/or verbal reinforcement of correct answers, such as “That’s correct!” or “Good job!”. For incorrect answers, students were prompted to “Try again” and a visual explanation of how to solve the problem was given if a second incorrect answer was given. All of the participants noted that the feedback they had in Classworks was not always available to them in the classroom. In the classroom, it may take teachers several days to grade assignments and return them to students. Although they felt confident about their performance when they completed the task, they did not always get the good grades they had expected. They also noted that the teachers rarely retaught the material if they scored poorly, so they were offered no further opportunities to be provided remediation of the skill. In Classworks, teachers reassign skill instruction when mastery is not attained, as indicated by failing scores on the quiz. This allows students to have multiple opportunities to practice and receive further remediation on a skill until mastery is achieved. Individual unit lessons can be assigned as many times as necessary for each student, therefore ensuring mastery and increasing confidence. Students reported that they did not receive the same level of immediate feedback on assignments in the general education classroom, as evidenced by one participant’s comment, “I just want to know if I’m getting stuff right and I don’t”.

Self-paced environment. According to Morrison, Ross, Kemp, and Kalman (2008), “optimum learning takes place when a student works at his or her own pace” (p.226). Participants reported that the ability to work at their own pace was another feature of Classworks that helped them solve problems needed to be successful in the general education curriculum. The self-paced environment of Classworks allowed the participants as much time as needed to work through assigned skills, giving them the time for repeated trials they needed to become more confident in their mathematical abilities. By having the time they needed to master basic skills, students reported they were better able to solve certain types of problems and, according to one general education teacher, were more willing to attempt more complex problems in the classroom. Although the self-paced environment of Classworks was a component that participants found helpful, the instructional pace of the general classroom moved more quickly. Students were expected to take notes, solve problems, and complete assignments at a much faster pace, causing many of the students to fall behind the rest of the class who had higher levels of computational automaticity. Grade level standards require students to apply computational skills in order to solve more rigorous problems that take a considerable amount of time to complete. Rather than helping the students access the curriculum, the extra time provided by Classworks seemed to provide more of a crutch to the students as they were not presented with any time constraints for completion of particular skills and students became accustomed to working at their own pace. When they returned to the classroom, however, they were given specific time limits to complete assignments and had difficulty following those timelines.

Improved computational skills. Computational skills that require many steps to solve, such as addition and subtraction with regrouping or multiplication and division of larger numbers, often cause difficulties for students with disabilities. Research has indicated that students with disabilities have difficulty remembering the steps required to solve more rigorous computational problems (Geary, Hoard, Byrd-Craven, Nugent, & Numtee, 2007). Participants in this study stated that Classworks helped them feel more confident in solving these abstract computations by providing instruction on how to solve problems step-by-step and explaining any mistakes as soon as they were made. During specific lessons, such as subtraction with regrouping, mistakes are explained as soon as they are made. If an incorrect answer is typed in, the student is asked to "Try Again", allowing them a chance to correct their mistake. If an incorrect answer is typed in a second time, the program gives a message "Let me help you" and gives a written explanation of the steps to solve the problem. These explanations are given through each step of the problem; for example, in a three-digit subtraction problem instructions are given as needed in the ones column, the tens column, and the hundreds column. This type of instructional feedback is available in many lessons, but not in all. Explicit instruction of skills correlates with research on how students with disabilities most successfully learn math. Modeling how the problems should be solved, providing multiple opportunities for learning, and giving feedback on performance have been identified as necessary components of math instruction for students with disabilities (Owen & Fuchs, 2002; Tournaki, 2003; Xin, Jitendra, & Deatline-Buchman, 2005), and, according to participants in this study, Classworks provides each of these components within their lessons. Many lessons provide step-by-step explanations of how problems should be solved, giving students the needed guidance to solve multi-step problems such as subtraction with regrouping or long division. As a result, participants were able to learn to solve computational problems with several specific steps. However, they were not always able to generalize these computational skills to the word problems they were working on in their classrooms. The expectations of the general education curriculum include using computational skills to solve multi-step word problems, but Classworks does not provide opportunities to solve more difficult problems that could be generalized to the classroom. Although they all stated that solving word problems was very difficult for them and they struggled to understand what the problems were asking them to do, they said they could complete the computation required in the problems once they knew what was needed.

Features of Classworks leading to Equity

Critical Disability Theorists promote the inclusion of students with disabilities in general education classrooms as a way to provide access to the curriculum and ensure educational equity for all students. Research has identified several ways that students with disabilities best learn, including visual representations, ongoing assessment data for students, and peer-assisted instruction, all of which can easily be incorporated into the general education classroom. Classworks can provide access to the general education curriculum and promote equity by integrating each of these strategies into lessons.

Visual representations. Mathematics instruction attempts to make abstract ideas concrete and difficult ideas understandable. Visual representations, including graphs, pictures, and number lines, help students with disabilities "see" the math and can lead to higher levels of confidence in solving math problems (Barmby, Harries, Higgins, & Suggate, 2009). Visual representations can be used in learning basic math skills such as addition, subtraction, multiplication, and division (Manalo, Bunnell, & Stillman, 2000) and mastering fractions (Butler, Miller, Crehan, Babbitt, & Pierce, 2003). Computer programs, such as Classworks, offer visual representations that are critical to helping students with disabilities learn math. Participants in this study did not acknowledge these representations during individual interviews, but observations revealed a dependence on visual cues to help them solve problems. When conversing with each other during Classworks sessions, two participants encouraged others to "look at the pictures it gives you" in lessons where visual representations were available. They were also heard to encourage the use of visual models for problems that did not offer them, saying "just draw a picture of it like the other problem had". Students with disabilities often have difficulty with abstract concepts and may need extra assistance through visual representations of mathematical concepts. Encouraging students to represent their mathematical ideas in ways that make sense to them allows for understanding at a concrete level, making the information more accessible to all students (Devlin, 2000; Maccini & Gagnon, 2000). Students were observed during Classworks sessions drawing models to help them solve computation problems and fraction problems. Although they sometimes incorrectly drew the model, they were more often correct in their visuals and were able to correctly answer the problem. When they realized they had incorrectly drawn the model, some participants would try again while others guessed at the answer and moved on. If students are able to generalize this strategy to the general education classroom, it could increase their confidence in their ability to solve various types of problems. Observations in the special education classroom revealed that some students did attempt to draw models to solve problems, with varying degrees of success.

Ongoing formative assessment. When using a CAI program, ongoing assessments allow students to monitor their own performance and increases their motivation to continue working. According to Black and Wiliam (1998), continued formative assessments help low achievers gradually overcome the belief that their struggles are a result of low ability. Through formative assessments, students begin to see progress on a daily basis and become less hesitant to begin new assignments. Classworks provides continual assessments of skills through quick quizzes after each lesson. During individual interviews, all participants named those quizzes as one feature of Classworks that provided information about their progress, primarily because they were able to see their scores improving each time they took a quiz. Observational data also revealed that participants reported their quiz scores and commented on how well they had done or how they needed to try again for a better score. It was common for participants to yell out the results of their quizzes, regardless of what the results were. Along with the results of the quiz, comments included “Hey, I can kinda do this now”, “Maybe I can do this in class, too, and Mrs. B will be proud of me”, and “Can you show this to Mrs. W?”. Leslie commented “Hey Mrs. M! You don’t have to give me that subtraction again. I finally passed the quiz - 8 out 10 that time!” and Kevin said “I got 4 out 5. That’s good right? Last time I only got 2 out of 5”. Being provided updates on their progress and having success with various skills seemed to increase the willingness of the participants to attempt the types of problems seen in the general education classroom. Although the problems in general education classroom were generally more complex than basic computation, some participants did comment that they were able to do parts of the problems before getting confused and needing help. This willingness to try problems and be able to correctly solve parts of them is not always seen in students with disabilities and indicated increased confidence and perseverance.

Peer tutoring. Classworks (2014) suggests that peer mentoring, both offered and accepted, can help increase levels of independence and responsibility, while preparing students for a future as critical thinkers and leaders. Additional research has shown that peer relationships are an important aspect of the elementary classroom that affects the academic achievements of students (Bierman, 2004). According to VanNorman and Wood (2007), high levels of peer acceptance can predict higher levels of academic achievement. Spencer (2006) identified peer tutoring as a strategy that can positively impact students with disabilities by allowing more time on task along with frequent and immediate feedback. Observational data during this study revealed peer tutoring initiated by the participants as a way to help not only the other participants, but themselves as well. Although the participants spanned grade levels, they were willing to offer and receive assistance from any other participant. Working with each other during Classworks lessons and recognizing that they were capable of helping others raised the confidence levels of the participants, as evidenced by comments such as “Hey, I think I get it now. Mrs. M let me show you what K showed me!” and “I bet I do better on the quiz next time”. This confidence carried over to the general education classroom. Participants mentioned helping other classmates when they were in their general education classroom, especially with fractions. A willingness to initiate and give assistance to others is uncommon for students with disabilities and can therefore be considered an indicator of increased confidence and self-efficacy, signifying that Classworks has provided the support necessary for mastery of the basic skills needed for classroom success.

Conclusions

The purpose of this study was to investigate the perceptions of students with disabilities on Classworks and its effectiveness in helping them gain equity in the general education classroom. Based on the tenets of Critical Disability Theory, previous research regarding how students with disabilities learn, and participant responses during this study, it can be concluded that Classworks provides many elements that can lead to greater access to the general education mathematics curriculum. However, while Classworks’ focus on computational skills supports students’ learning of basic mathematical knowledge, there was little evidence to support students’ ability to generalize those skills to similar problems encountered in the general education curricula.

According to Michalko (2002), a primary goal of Critical Disability Theory is to ensure that persons with disabilities genuinely belong in society. In educational settings, that society is the general education classroom, where students with disabilities have access to the same curriculum as non-disabled students through the practice of inclusion. Classworks aims to help students master real-world skills that are taught in the general education curriculum through skill-based instructional units that are designed for "real-world concept mastery and integrate research-based methods and strategies". This skill-based approach "ensures students truly master each concept and are ready to apply their new skills" to more complex, real-world situations (Classworks, 2014). Observational and performance data from this study indicate that mastery of specific concepts such as subtraction, multiplication, and fractions may improve, but the application of those skills to complex grade level standards that require more precise adherence to mathematical procedures was not observed. As a result, the claim that the time spent in drill and practice on computation would lead to higher level learning was not evidenced in this study.

Strengths of Classworks. Classworks units are structured to help students master basic computational skills. Through mini-lessons and practice activities, students solve problems, receive feedback on their performance, and have multiple opportunities to master the skill. Mastering computational skills is the first step in being able to solve more complex, real-world problems. Participants in this study were able to successfully master various computational skills through repeated opportunities and feedback that not only informed them of their progress, but also assisted in the learning process through guided, step-by-step examples.

Classworks also promoted increased attendance to task and perseverance through the use of visual feedback and immediate grading. Participants were immediately provided with positive messages when problems were solved correctly and visual instruction when they were incorrect. With this continual support, students were motivated to continue attempting to solve the problems and working toward improved scores. As a result, students were able to master skills and move forward to grade-level skills that could help them integrate into the general education classroom.

Weaknesses of Classworks. Although there is evidence that there are components of Classworks that lead students to improved computational skills and some degree of access to the general education instruction, Classworks does not provide computer-based lessons that allow students to apply the computational skills they have learned. The Classworks website claims to support the integration of students with disabilities in the regular classroom. Unfortunately, that integration is not fully realized through the current Classworks platform. The Common Core Math standards adopted by the state of Georgia, which students with disabilities are also expected to follow, require students to apply skills to solve rigorous, multi-step problems that generally require many types of computation within each problem. Classworks provides many opportunities to master computational skills, but does not address the application of those skills through meaningful, computer-based problem-solving activities. Although some lessons do include word problems, they are simplistic, one-step problems contained within lessons titled "addition" or "subtraction", making it clear to students what computation they are expected to complete. While students may be able to complete different types of computation successfully as a result of their work in Classworks, the program does not help them analyze problems to know what is being asked and what computation needs to be used. If students are not able to analyze different types of problems and apply the skills they have learned to solve those problems, they have not gained the access to the general curriculum that they need to be successful on grade level expectations.

Classworks does provide a component to aid students in the application of skills. Performance tasks can be completed after students have reached the expected mastery on the quick quiz and are designed to allow students to apply the skills learned within a unit of study. Unfortunately, these tasks are not computer-based. Instead, they must be printed out and monitored by the classroom teacher as students work to complete them. As a result, most students never have the opportunity to complete them. In order to ensure that students are given the opportunity to complete these types of problems, which will aid in the integration into the general education classroom, Classworks should provide computer-based opportunities to complete performance tasks that mirror those seen in the classroom.

Needs of Classworks. In order for Classworks to provide access to the general education curriculum, students need to be exposed to more lessons that require application of skills over simple drill-and-practice. Although Classworks provides application opportunities through end-of-unit performance tasks, those tasks are not computer-based and are dependent on classroom teachers choosing to print and use them. To ensure that students have a chance to apply the skills they have learned through Classworks, lessons need to include more problems that require application and units dedicated to application should be added. One of the most predominant comments made by participants was that the work they did in Classworks did not resemble the work they were expected to do in their classrooms. They agreed that they could "subtract or multiply" better, but also said that they "didn't know what to do" when they returned to their classrooms and had to complete the multi-step problems being taught there.

Classworks should provide scaffolding of the time allowed to complete problems. One of the components of Classworks that participants noted as helpful was the ability to work at their own pace. However, when returning to the classroom, students are expected to work at a much quicker pace in order to complete the expectations of the curriculum. As students progress through the Classworks lessons, time restraints should begin to be used and incrementally decreased as students become more proficient in computation skills. These time restraints will allow students to be more prepared for the fast-paced instruction and expectations of the general education classroom.

Implications for the Field

Pinar (2012) describes curriculum as “our key conveyance into the world” (p. 2). The field of Curriculum Studies aims to understand curriculum and empower students to construct their own understanding of what it means to be educated. For decades, many students with disabilities were denied access to the curriculum that their non-disabled peers were taught. However, beginning with the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 1997 and continuing with the No Child Left Behind Act in 2001, students with disabilities have been expected to take standardized tests and perform at the same level as non-disabled students. As a result of these expectations, schools have been made accountable for ensuring the success of students with disabilities on grade level standards. In order to meet this challenge, more students are being taught within the general education classroom.

The current mathematics curriculum is a deep, rigorous curriculum focused on real-world problem solving requiring mastery of basic computation. Many students with disabilities struggle with simple computational skills, which leads to an inability to solve the more rigorous, real-world problems they encounter in their math classrooms. Computer programs such as Classworks provide individualized instruction on computational skills that allow students to become more proficient in the skills needed to solve multi-step problems. By allowing students the time and practice needed to master computational skills that will be used to solve the problems found in the classroom, Classworks provides some access to the curriculum. Unfortunately, the time allowed to complete problems in Classworks is not available in the classroom. With the fast-paced curriculum, teachers are forced to move quickly through each standard and, many times, must move on to new skills before the previous ones are mastered. Students are not able to repeat assignments until they understand the skill and must move on to more complex skills before they are ready. Although teachers know that more remediation is needed, they feel pressure to move on in order to follow the district-required calendar of skills.

Implications for Further Research

With increased expectations on students with disabilities to master the general education curriculum, the practice of inclusion and the focus on providing access for all students to the curriculum will continue to be important for students with high incidence disabilities. Both special education and general education teachers will be required to meet the needs of every student through differentiated instruction to ensure curriculum mastery. It will be imperative for students with disabilities to consider themselves as genuine members of the classroom with their non-disabled peers in order for them to participate confidently and have the necessary self-efficacy to move forward in the curriculum.

With the increase of students with disabilities being served in the general education classroom, a larger study of how Classworks can impact curriculum access and classroom equity for students with disabilities is needed. Observations should be conducted in the general education classroom to determine if students are applying the skills learned in Classworks to the problems presented from the current grade level curriculum. Interviews with general education teachers regarding how the content presented in Classworks can be generalized to the classroom expectations would be useful in understanding how teachers view and use Classworks.

Participants noted that Classworks provided strategies, such as extended time and repeated trials, that helped support them in becoming more skilled at math computation. However, they also reported that these strategies were not usually present in their general education classrooms. Studies in successful differentiation of instruction and small group strategies would allow teachers to learn the benefits to both students with disabilities and non-disabled students and be more willing to implement some of these strategies in their classrooms.

Participants also noted that feedback from their teachers was important to them, both praise and reteaching when needed. Studies related to how feedback affects students with disabilities would be helpful in identifying feedback techniques, such as clarity of expectations, timeliness, and the inclusion of student self-assessments that could be effective in raising self-efficacy and confidence.

Studies that focus on the perspectives of students based on race and gender would be beneficial in identifying possible differences in the thoughts and needs of different groups of students. Data could also be collected to determine whether performance results vary based on race or gender.

Longitudinal data following a cohort of participants over time are necessary to determine if continued use of Classworks leads to increased access to the general education curriculum over several grade levels. Data should also be collected to determine increases in performance as a result of continued practice on Classworks.

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APPENDIX A
Student Interview Questions

Interview #1
Perceptions of Classworks

1. Tell me about Classworks.
2. What math skill are you currently working on in Classworks?
3. How do you feel while you are working on Classworks?
4. Do you think Classworks can help you do better in math in your classroom? If yes, tell me how it can help you. If no, why do you think it doesn't help you?
5. How do you feel when you are working on a math skill in your classroom that you have already worked on in Classworks?
6. What part of Classworks is most helpful to you?
7. How does that part of Classworks help you feel more successful in your classroom?
8. What part of Classworks is least helpful to you?
9. How could that part of Classworks be changed to be more helpful?
10. What happens in Classworks when you get problems right?
11. What happens in Classworks when you get problems wrong?
12. Does the feedback you get from Classworks help you monitor your work on your assignments? If yes, tell me what kind of feedback helps you. If no, tell me what kind of feedback would help you more.

Interview 2

General Education Experiences (all for RQ #1)

1. Tell me about what you are learning in math in your classroom.
2. How do you feel about learning this?
3. What does your teacher do to help you learn math?
4. If you could tell your teacher one thing that would help you learn math better, what would it be?
5. After using Classworks, how do you feel about the math skills you are working on in your classroom?
6. Does working in Classworks help you monitor your work better in the classroom? If yes, explain how you use it. If no, can you think of ways Classworks could help you monitor your classroom assignments?
7. Do the problems you see in Classworks look like the problems you see in your classroom? If yes, describe some examples of problems that look similar to your classroom work. If no, tell me about the differences between Classworks and your classroom.
8. How does your performance on your Classworks assignments make you feel about your performance on your classroom assignments?

APPENDIX B

PARENTAL INFORMED CONSENT

Dear Parent or Guardian:

My name is Diane Marshall and I am currently a graduate student at Georgia Southern University, seeking my Doctorate degree in Curriculum Studies. I am conducting a research study on the perceptions of students receiving special education services regarding Classworks and whether or not it helps them in the general education classroom. I request permission for your child to participate in this study.

If you give permission, your child will participate in two interviews with the researcher. These interviews will consist of questions about the student's experiences with mathematics in the general education classroom and his/her experiences with Classworks. Each interview should last approximately 20 minutes. All interviews will be audio recorded. All recordings will be stored on the researcher's personal computer, which is password protected. Backup copies of the recordings will be stored in a locked file box in the researcher's classroom. As the researcher, I will have access to the recordings. My dissertation chair, Dr. Kymberly Drawdy, will also have access. All recordings and backup copies will be stored for three years after the research is collected and will be destroyed after that time.

Your child will also be observed while using the Classworks program. The observations will last approximately 30 minutes each. The specific skills each student is working on will be noted and as the researcher, I will look for and record specific actions from participants, including comments connecting Classworks to the general education curriculum, conversations among students about the different features of Classworks they encounter (i.e. games, quizzes, mini-lessons, etc.), and instances of sharing successes and/or failures with others.

Only myself and my dissertation chair, Dr. Drawdy will have access to the data collected. During the entirety of this study and in the resulting written report, your child's identity will remain anonymous. All information obtained will be kept in a secure, locked area in my classroom. At the conclusion of the study, all information will be presented and explained to you.

Participants for this study were selected based on their grade level and the inclusion of mathematics goals on their IEP. A possible benefit to participation is increased self-esteem regarding math. The study could also provide the school district with valuable information on the perceptions of students receiving special education services regarding Classworks and whether or not it helps them achieve equity in the general education classroom. The risks from participating in this study are no more than would be encountered in everyday life, but it is possible that your child could feel some frustration in trying to explain his or her feelings about math and Classworks. If your child feels uncomfortable answering any of the interview questions, he/she may choose not to answer. You are invited to inspect any and all materials used for this study before you give consent to participate. You and your child may ask questions at any time during the study. Participation in this study is completely voluntary and your decision will not affect the services provided to your child in any way. Even if you give your permission, your child is free to choose not to participate. If your child does agree to participate, he/she is free to withdraw from the study at any time with no negative consequences. There will be no compensation for participating in the study.

If you have questions about this study, please contact the researcher named above or the researcher's faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Office of Research Services and Sponsored Programs at 912-478-0843.

I am asking your permission for your child to participate in this study, and will provide him/her with a simplified "assent" letter/verbal description before enrollment in this study.

You will be given a copy of this consent form to keep for your records. This project has been reviewed and approved by the GSU Institutional Review Board under tracking number H13390.

Title of Project: Classworks as a Means to Gaining Equity in the General Education Classroom: Perceptions of Students Receiving Special Education Services

Principal Investigator: Diane P. Marshall, 1520 Lee Rd 281, Salem, AL 36874, 706.615.2305

Faculty Advisor: Dr. Kymberly Drawdy. P.O. Box 8134, Statesboro, GA 30460, 912.478.5041

I understand that neither the Muscogee County School District nor St. Marys Elementary is responsible for conducting or sponsoring this study.

______________________________ ____________________

Participant Signature Date

I, the undersigned, verify that the above informed consent procedure has been followed.

______________________________ ____________________

Investigator Signature Date

APPENDIX C

MINOR ASSENT FORM

Dear Student:

I want to ask you to be in a project I am doing. I am asking you because you are a student in fourth or fifth grade that comes to me for help in math.

I am doing this study to find out your feelings about *Classworks.* I want to know how you feel about math in your classroom. I will ask you some questions about how you feel when you use *Classworks* for math and how you feel about math in your classroom. I will also observe you while you are working on *Classworks* and take notes on what I see you doing and any conversations you may have about *Classworks* with other students.

Your parents will also be asked if you can be in this study. Please talk to your parents before you decide if you want to be in the study. You do not have to be in this study and it will not affect your grade in any way. If you are in the study, you can change your mind at any time and no longer be a part of the study.

If you have any questions at any time, please ask me.

If you sign this form, it means you that you understand what the study is about and have decided to participate in the study.

Thank You,
Mrs. Marshall

____
Student Signature

____
Date