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An Evaluation of One District's Think Through Math Program and Curriculum Implementation

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AN EVALUATION OF ONE DISTRICT'S THINK THROUGH MATH PROGRAM AND CURRICULUM IMPLEMENTATION: A PROGRAM EVALUATION PROJECT

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This document was created as *one* part of the three-part dissertation requirement of the National Louis University (NLU) Educational Leadership (EDL) Doctoral Program. The National Louis Educational Leadership EdD is a professional practice degree program (Shulman et al., 2006).

For the dissertation requirement, doctoral candidates are required to plan, research, and implement three major projects, one each year, within their school or district with a focus on professional practice. The three projects are:

- Program Evaluation
- Change Leadership Plan
- Policy Advocacy Document

For the **Program Evaluation** candidates are required to identify and evaluate a program or practice within their school or district. The "program" can be a current initiative; a grant project; a common practice; or a movement. Focused on utilization, the evaluation can be formative, summative, or developmental (Patton, 2008). The candidate must demonstrate how the evaluation directly relates to student learning.

In the **Change Leadership Plan** candidates develop a plan that considers organizational possibilities for renewal. The plan for organizational change may be at the building or district level. It must be related to an area in need of improvement, and have a clear target in mind. The candidate must be able to identify noticeable and feasible differences that should exist as a result of the change plan (Wagner et al., 2006).

In the **Policy Advocacy Document** candidates develop and advocate for a policy at the local, state or national level using reflective practice and research as a means for supporting and promoting reforms in education. Policy advocacy dissertations use critical theory to address moral and ethical issues of policy formation and administrative decision making (i.e., what ought to be). The purpose is to develop reflective, humane and social critics, moral leaders, and competent professionals, guided by a critical practical rational model (Browder, 1995).

Works Cited

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ABSTRACT

Think Through Math is a research based math program. One school district implemented the program to improve student performance on the state standardized assessment. After two years of implementation, 44% of middle school students in the district did not make adequate progress in math as measured by the state assessment. The purpose of my study was to determine the effectiveness of the Think Through Math program used within middle school Intensive Math classes throughout the district. Guided by research on the critical aspects of implementation, my study examined teachers' perceptions of (a) resources used within the program, (b) the impact on student achievement and performance, and (c) instructional practices used within the classroom by the teachers to engage student learners.

From a list of 64 teachers assigned to teach Intensive Math during the 2015-2016 school year, 49 teachers agreed to participate in this qualitative case study. Additionally, 14 school administrators allowed me to conduct and use classroom observation data for my study. Triangulation of data from the teacher surveys and classroom observations revealed that teachers have some mixed perceptions about the Think Through Math program and its potential to improve student achievement. The findings of my study suggest that a more robust execution of the Think Through Math program could lead to an increase in student achievement in mathematics.

PREFACE

The purpose of my evaluation was to determine the effectiveness of the Think Through Math (TTM) program used within middle school Intensive Math classes throughout the Claitt County School District. My evaluation focused on instructional practices used by middle school math teachers assigned to teach Intensive Math classes throughout the district. As part of the evaluation, I examined obstacles to and the factors essential for the successful implementation of the program. These included the environment of the class, access to computers, available instructional practices, and needed resources.

The selection of this program evaluation was critical as it directly related to TTM's impact on student achievement and the district's efforts to raise student achievement in mathematics. Additionally, as one of the district leaders, it was my responsibility to ensure that teachers implement the program with fidelity and that all students make yearly academic learning gains within mathematics.

My role within the district is to oversee the Office of Middle School Education. This role is critical as the work within the teaching and learning department has a major impact on student achievement efforts within the district. Therefore, I selected this program evaluation to determine the effectiveness of the TTM curriculum and its impact on student achievement within middle school Intensive Math classes.

The evaluation of this program is important to all stakeholders within the district and education community at large as it directly impacts decisions regarding spending and curriculum used within the Claitt County School District. During the first year of implementation, the district spent about $450,000 dollars to purchase this resource.

Given the amount of money spent on the program, it is imperative that the district work to ensure that curriculum resources used within the district are yielding positive student achievement outcomes.

I learned several lessons from a leadership perspective during the time I spent working on this Program Evaluation Project. Most importantly, I learned how important attention to detail is while working to evaluate the implementation of a resources to support and improve student learning. Taking the time to listen to classroom teachers about the district implementation of the TTM program was an eye opening experience. For sure you cannot take people's feelings for granted, and it is imperative that you attempt to walk in their shoes. While implementing things within a school district, leaders must get buy-in, listen to stakeholders, and empower others to get involved. This can be accomplished by speaking their language and provided them with a platform to voice their thoughts as part of the development and implementation, of reform efforts. Overall, the time and effort spent on the program evaluation project has been a great and rewarding experience.

ACKNOWLEDGEMENTS

This project study would not have been possible without the guidance of my committee members, the cooperation of the local school district and teachers, and the support of my family, friends, and mentors. Without the daily, consistent, positive encouragement from a host of supporters including my wife and son, I would have given up. Lastly, I would like to personally thanks Scott Fritz for his words of encourage and motivation. It was his words that inspired me to start this journey.

DEDICATION

As the first member of my family to graduate from college, I dedicate this doctoral study to my capable and hardworking parents and grandparents. Additionally, I dedicate this study to my wife and son who have always been supporters of my dreams to reach the highest stars. I am grateful to God for giving me the strength to make this journey.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SECTION ONE: INTRODUCTION

During the 2014-2015 academic school year, the Claitt (pseudonym) District's Middle School Math Department adopted the Think Through Math (TTM) curriculum for usage within its Middle School Intensive Math classes. The school district's name is a pseudonym. Think Through Math is a web-based solution that provides adaptive math instruction for students in grades 3 through Algebra 1. This program was designed to motivate students to have a better attitude toward math and to improve student achievement/performance in mathematics. The program was designed to build students' confidence and competence in mathematics, while providing teachers comprehensive data to ensure success (Think Through Learning Inc., 2015). Additionally, it allows for a blended learning classroom environment. A rotation model is set up to meet the unique and individual needs of all students. This approach provides teachers with the opportunity to personalize learning and ensure each student is given the proper level of support. As indicated by Think Through Learning Inc. (2015), the blended learning approach was designed to provide teachers with flexible classroom environments where they can use tools and resources to engage students in a personalized learning experience. Think Through Math offers students a personalized learning environment through the usage of various instructional approaches, such as station rotation, lab rotation, flipped classroom, and/or an individual rotation approach (Think Through Learning Inc., 2015).

Since this curriculum was designed to support students who are performing below grade level expectations, it appeared to be a great resource to use within middle school Intensive Math classes. Therefore, the Claitt School District elected to place students who received a score of Level 1 or 2 on the state standardized assessment for

mathematics into these Intensive Math classes. During the first year of implementation (2014-2015), Claitt District had more than 6,795 middle school students receiving this specific intervention and more than 109 teachers assigned to teach Intensive Math classes within 23 traditional middle schools.

During the second year (2015-2016), the district had more than 3,300 middle school students receiving this specific intervention and 64 teachers assigned to teach Intensive Math classes throughout the district. The decline in enrollment in the Intensive Math course was the result of a change in Section 3 of Florida House Bill 7069 (Section 1003.4156.F.S.). This House Bill removed the mandatory placement of middle school students who scored a Level 1 or Level 2 on the Florida Standards Assessment (formerly FCAT) into a remedial math course. Once the statute changed, Claitt District revised its placement guidelines to reflect that students at Level 1 or Level 2 may be placed into this remedial course. However, prior to the change in statute, all students who received a Level 1 or Level 2 on the state Mathematics Assessment were scheduled into an Intensive Math course. Given the number of students needing this type of intervention, I believed it was imperative that the district assess the effectiveness of this program and its impact on student achievement.

The Think Through Math program provides students with a multi-step approach to teach essential, standards-aligned math skills from grade 3 mathematics through Algebra 1 (Meador, 2017). This program was designed to deepen students' conceptual understanding in math. The deepening of conceptual understanding in math could be done through the usage of either supplemental or primary instruction. Students using this program begin by completing an adaptive placement test containing 10-25 questions

based on their current grade level. Upon completion of this adaptive placement test, the results are used as baseline data for individualized lessons designed to meet the individual needs of the students and to improve achievement.

The individualized web based lessons, on average, take about 40 minutes to complete, and they consist of six parts, beginning with a Pre-Quiz that allows students to skip ahead if they score above expectations (80% or higher). After the pre-quiz, students are directed to complete lessons. They do so by answering warm-up questions, completing guided learning sessions, answering problem-solving questions, completing practice problems, and finishing with a post quiz. During the process of completing the lessons, students are given the opportunity to access help through a live chat with a teacher. Student motivators are included in the form of customizable avatars and points for correct answers.

The instructional model, that is highly recommended for classroom teachers, is a blended learning "Rotation Model" to meet the needs of every student. This rotation model was designed to allow teachers to maximize time for personalizing learning and to reach every student with the right lesson at the right time. Think Through Math works by offering students a personalized math learning environment wherever or whenever they want. The model can take on many forms: a station rotation, lab rotation, flipped classroom, or an individual rotation approach. Despite the web based instructional approach, every student is given the opportunity to access a teacher through the one-to-one live teacher support, which is built into the software. Every student can work directly with the assigned classroom teacher, which is another level of support (Think Through Learning Inc., 2015).

Purpose of the Evaluation

The purpose of my evaluation was to determine the effectiveness of the Think Through Math program used within middle school Intensive Math classes throughout the Claitt School District. My evaluation focused on instructional practices used by middle school math teachers assigned to teach Intensive Math classes throughout the district. I aimed to have representation from a wide range of school settings. Almost all middle schools within the district have two to three teachers assigned to teach Intensive Math. The number of sections of Intensive Math each school offered varied depending on the needs of the students within each school.

As part of the evaluation, I examined obstacles to and the factors essential for the successful implementation of the program. These included the environment of the class, access to computers, available instructional practices, and needed resources. The selection of this program evaluation was critical as it directly related to TTM's impact on student achievement and the district's efforts to raise student achievement in mathematics. Additionally, as one of the district leaders for programs like the Intensive Math program, it was my responsibility to ensure that teachers implement the program with fidelity and that all students make yearly academic gain within mathematics.

Rationale

As one of the leaders within the district, my role is to oversee areas within teaching and learning. This role is critical as the work within the responsible program department has a major impact on student achievement efforts within the district. According to Think Through Learning (2015), the program was designed to allow students to be successful in mathematics and to motivate underperforming students in

unprecedented ways. Additionally, this program takes on a blended approach to teaching, using web-based, adaptive instruction and LIVE help from certificated teachers. Therefore, I selected this program evaluation to determine the effectiveness of the TTM curriculum and its impact on student achievement within middle school Intensive Math classes.

Frank and Hovey (2014) reported that a growing number of educators have expressed an interest in wanting to know the academic return-on-investment. For educators, this return-on-investment is specific to learning and achievement outcomes. Beyond the outcomes previously cited for TTM, longer term factors such as potential higher graduation rates, increased earning/wages, and more career options can be used to determine the academic return-on-investment.

The evaluation of this program is important to all stakeholders within the district and education community at large as it directly impacts decisions regarding spending and curriculum used within the Claitt District. During the first year of implementation, the district spent about $450,000 dollars to purchase this resource. Given the amount of money spent on the program, it is imperative that the district work to ensure that curriculum resources used within the district are yielding positive student achievement outcomes. Through the usage of the Think Through Math Program, leaders within the Claitt District want to see more students achieving at Level 3 or higher on the state mathematics assessment.

Description and Goals of the Program Evaluation

The primary goal of this program evaluation was to determine the effectiveness of the Think through Math program, which is being used within middle school Intensive

Math classes. I closely examined how the district provided staff development, implemented the program with fidelity, used instructional resources, and affected student achievement in the area of mathematics. Evaluating the implementation and usage of this program provided the district with specific feedback regarding the quality of the TTM program and the impact on student achievement.

The Claitt District is one of the largest districts in the state and nation with more than 104,000 students. The population by grade and student demographics is listed below:

2014-15 Schools and Enrollment

Pre-K	2,322
74 Elementary Schools	41,441
2 Elementary/Middle Schools	1,963
21 Middle Schools	19,717
17 High Schools	29,821
4 Exceptional Schools	603
22 Charter Schools	6,248
Other	1,729
Virtual School	260
Total PreK-12	104,104
Technical College	4,929
Adult general education	18,534

Student Demographics

White	57.4%
Black	18.6%
Hispanic	15.0%
Asian	4.5%
Multiracial	4.1%
Native American	0.3%

Of the total number of middle school students enrolled in the district, more than 9,191 are considered below the proficiency level in mathematics as determined by the 2014 Florida Comprehensive Assessment Test (FCAT) 2.0 Math assessment (students scoring a Level 1 or 2). The break down by grade level in terms of those students scoring a Level 1 or 2 is as follows:

Grade 6	2,738 students
Grade 7	3,206 students
Grade 8	3,247 students

Table 1 reflects the total number of students who scored a Level 1 or Level 2 on the 2014 FCAT Mathematics performance data for Middle Schools within the Claitt District.

Table 1

Middle School 2015-2016 Math Counts by achievement levels

School Names	Level 1	Level 2	Total Number of Level 1 & 2
School #1	411	302	713
School #2	296	176	472
School #3	116	201	317
School #4	37	126	163
School #5	164	58	222
School #6	277	208	485
School #7	7	40	47
School #8	281	240	521
School #9	3	26	29
School #10	318	189	507
School #11	252	230	482
School #12	207	43	250
School #13	41	140	181
School #14	333	294	627
School #15	258	255	513
School #16	258	313	571
School #17	173	303	476
School #18	304	321	625
School #19	232	281	513
School #20	212	229	441
School #21	124	194	318
School #22	77	135	212
School #23	278	228	506
Grand Total	4659	4532	9191

Source: Claitt School District FOCUS Student Management System (2015)

Exploratory Questions

The following were my exploratory program evaluation questions regarding the Think Through Math program implemented within middle schools throughout the Claitt District. There were six primary questions and three secondary questions.

Primary questions:

1. What do middle school Intensive Math teachers report as working well with the implementation of the TTM curriculum?
2. What do middle school Intensive Math teachers report as not working well with the implementation of the TTM curriculum?
3. What do middle school Intensive Math teachers report as major obstacles in the implementation of the TTM curriculum?
4. What do middle school Intensive Math teachers suggest as ways to improve the implementation of the TTM curriculum?
5. What do current test data, including teachers' perceptions of student academic growth, indicate regarding the program's impact on student achievement?
6. Are teachers delivering TTM instruction as required by the program with fidelity?

Secondary questions:

1. What math goals are best met through this program?
2. What are the best uses of technology in this program?
3. What is the math functional skill improvement after completion of the program?

Conclusion

It was my desire to determine the impact of the Think Through Math program that was implemented within middle school Intensive Math classes at the start of the 2014-2015 academic school year. The school district selected this program to replace another curriculum program that was used prior to the start of the 2014-15 school year. This change in curriculum usage was due to the lack of improvement in student achievement/performance as indicated by related testing data. Thus, the district

implemented Think Through Math after going through a curriculum adaptation process prior to the start of the 2014-2015 academic school year. Now that the program has been implemented, it was imperative that its use and impact on student achievement be evaluated to help guide the district's decisions for its future use. Therefore, I chose to do that task for the district.

SECTION TWO: REVIEW OF LITERATURE

Introduction

D'Ambrosio, Johnson, and Hobbs (1995) wrote a chapter in the book *Educating Everybody's Children* entitled "Strategies for Increasing Achievement in Mathematics." It highlighted two major events that resulted in the increased emphasis on providing students with opportunities to learn mathematics in new ways. They reported that the first event, that influenced the direction for curriculum, instruction, and assessment within schools, was the release in 2000 of the Principles and Standards for School Mathematics (PSSM) by the National Council of Teachers of Mathematics (NCTM). The second was the passage of the No Child Left Behind (NCLB) Act in 2001. NCLB focused on testing, accountability, and the quality of teachers (Cole, 1995). NCLB was the start of a continuous call from federal and state policymakers to improve student achievement in mathematics. Under No Child Left Behind and the usage of high-stakes testing measures, increased emphasis was placed on improving math scores and the performance of students on state and national assessments. The pressure to improve and prepare students for today's workplace became a top priority for professional educators (Perkins-Gough, 2007). This pressure to improve resulted in educators being challenged to seek new ways to engage students and keep them actively involved in learning mathematics.

Results from standardized state assessments became the major indicator of mathematics achievement among students. Additionally, the quality and knowledge of teachers hired to provide math instruction increased and became more rigid. Wong (2001) reported that resources spent on hiring certified and highly competent teachers and

providing highly effective staff development opportunities are a sound investment for schools/districts. He further indicated that programs do not produce student achievement, teachers do.

Teacher Effectiveness

When reflecting on teacher effectiveness, Ball, Hill, and Bass (2005) reported that it is no surprise that the quality of mathematics teaching depends on the teachers' knowledge. They found that the teacher's knowledge and skills were essential to their capacity to unpack standards, to use instructional materials or programs wisely, and to assess effectively student progress towards the mastery of learning. Pasley (2011) stated that many U.S. teachers lack sound mathematical understanding and skill. He concluded that teachers must be equipped with the necessary knowledge and skills to help today's students develop the skills to become the innovative thinkers of tomorrow. Also, he reported that, when it comes to mathematics, many teachers lack enough conceptual understanding to teach effectively (Pasley, 2011). Ultimately, his study revealed the following key points on the importance of teacher content knowledge:

1. Teachers who understand the content are better able to identify the conceptual "story line" in math instructional materials.
2. Teachers who don't understand math well tend to focus on algorithms rather than underlying concepts. In contrast, teachers who understand key math concepts are more likely to use multiple representations to help students understand the concepts.
3. Teachers who understand math concepts often present problems in familiar contexts and link problems to students' prior learning. They are also more likely

to solve problems collaboratively with students, in contrast to less knowledgeable teachers who tend to look up correct answers in response to students' questions.

4. When teachers with limited understanding of math or science concepts stray from their instructional materials, they sometimes misrepresent the concepts students are expected to learn (Pasley, 2011, p. 12).

The studies on teacher effectiveness are very revealing and may have a huge impact on student achievement and instructional practices taking place within schools. As a professional educator and district administrator, I have personally witnessed poor quality of instruction rooted in the teacher's inability to understand the math and science concepts beyond the surface level. Therefore, efforts to improve the quality of teachers is a critical component that must be addressed within the educational profession.

The implementation of the Common Core State Standards was one of the efforts designed to improve the quality of teacher practices. Specific to practices within math, the Common Core called for a greater focus on mathematical standards. Rather than covering many topics a mile-wide and an inch-deep, the new standards force math teachers to focus deeply on the standards. This deep focus on the mathematical standards was determined necessary to help students gain strong foundations, a solid understanding of concepts, a high degree of procedural skill and fluency, and the ability to apply the math they know to solve real world problems both in and out of the classroom (Alberti, 2012). Additionally, it forced teachers to have a deeper understanding of the math standards and instructional shifts associated with the standards.

Attitudes, Beliefs and Behaviors

In addition to the effectiveness of teachers, the attitudes, beliefs, and behaviors of the classroom teacher and their impact on student achievement also affect learning. A review of the research by D'Ambrosio, Johnson, and Hobbs (1995) revealed that the instructional behaviors of teachers have a major impact on student achievement in mathematics, and students benefit from teachers who have high learning expectations for all students despite their racial, ethnic, and cultural backgrounds.

The failure to examine the core values of our teachers can hinder our ability to ensure the success of students in mathematics. Therefore, it is imperative that educational leaders provide ongoing professional development opportunities to help teachers develop the foundational skills needed to teach math at high levels. In addition to providing ongoing professional development opportunities for teachers, educators must examine the curriculum or program being used to provide standards-based math instruction. Teachers must be proficient in unpacking standards, aligning student work to ensure that it meets the standards, and setting a clear purpose for learning.

Goldman & Knudsen (2004) examined math curriculum that raised students' participation in math education and their achievement. The authors identified three principles in providing equitable math learning experiences for all students. They saw these demonstrated by teachers when teaching mathematics standards effectively. They are: 1) making math relevant to the world, 2) providing students with hands-on experiences, and 3) ensuring that math curriculum is responsive to meet the needs of students.

The first principle of making math relevant to the world is rooted in the activities that help all students see the content as relevant and necessary in life. In other words, teachers need to help students relate their academic work to real-life needs by connecting mathematics to real life problems. It also allows educators to develop math curriculum resources that provide access and encourage the engagement of all students.

The second principle of providing students with hands-on experiences is related to making learning come to life for all the students. The goal is to design math problems in a way to get students engaged. This can be done by using manipulatives to connect their everyday reasoning to mathematical thinking.

The final principle the authors discovered is making math the curriculum responsive to the needs of students. This can be done by teachers selecting and using various resources designed to instruct individual students. The key is teachers should strongly consider using and adapting materials on an as need basis. The authors found that these principles allowed educators to provide access and opportunity for all students to achieve in mathematics. They lead to a more equitable learning experience.

Upon further review of the literature, I discovered that the National Council of Teachers of Mathematics (NCTM, 2000) suggested the following six principles for improving student performance in mathematics:

1. Having high expectations for all students
2. Providing students with a coherent curriculum of important mathematics, articulated across grade levels
3. Ensuring that teachers understand what students need to learn and them challenge and support them (requires professional development)

4. Providing instruction that builds new knowledge from experience and prior knowledge
5. Assessing students to support the learning process and provide useful feedback to both teachers and students
6. Using technology that influences mathematics and enhances students' learning (National Council of Teachers of Mathematics, 2000)

When reflecting on the six principles for improving student performance in mathematics and the design of the Think Through Math program, it appears that the design of the TMM program aligns closely to the principle framework supported by the National Council of Teachers of Mathematics. As stated in section one of this study, the Think Through Math program provides students with a multi-step approach to learn essential standards. Additionally, it allows students to deepen conceptual understanding in math. This is a major component of the program. The key challenge is to apply the principles to practice that are revealed in both the framework from the National Council of Teachers of Mathematics and in the design of the TTM program. This will help to maximize their positive impact on student achievement.

D'Ambrosio, Johnson & Hobb (1995) indicated the classroom environment should provide students with the opportunity to communicate mathematically. It also should enhance problem-solving initiatives. They also suggest that students ought to be allowed to take risks as they explore mathematics.

Instructional Changes: The Implementation of Common Core Standards

Throughout the nation, a total of 46 states adopted the Common Core State Standards in an effort to bring consistency and uniformity to what standards should be

taught. The implementation of these standards has forced schools to change the way standards are addressed and taught in classrooms. These changes have placed more emphasis on the need to prepare students for college and/or careers. The typical instructional approaches that were used in the past are no longer considered effective.

Beyond the changes in the curriculum used to teach the standards, there are philosophical changes that teachers must make in order to prepare students to master the common core standards. In mathematics, the focus is on depth of knowledge—depth not width—and digging deep into standards to make them clearer and more robust. The standards require teachers to cover fewer topics in a school year, but with greater detail. Additionally, with the new standards students are asked to provide evidence to support their thinking. It is paramount that students logically and dispassionately prove their claims.

Lastly, an increase in rigor and accountability is now more evident with the implementation of the Common Core State Standards. These standards were designed so one can see the transfer of knowledge, evidence of learning, student as risk-taker, authenticity of lessons, vertical planning, learning with increasingly less scaffolding and prompting, and differentiated instruction so all students learn (Achieve, 2012). The instructional changes associated with the implementation of the Math Common Core State Standards are summarized in Table 2, which reports strategies for increasing achievement in mathematics from both a curriculum and instructional point of view.

Table 2

Summary of new standards for mathematics curriculum and instruction

Curriculum	
Traditional Emphasis	New Emphasis
Spiral curriculum	Core curriculum, topic integration, students' home/community, culture and experiences
Teaching mathematics as a discrete subject area	Integration of process and content
Rigid sequencing of content	Development
Getting the right answer	Broad range of topics, earlier exposure
	In-depth development of concepts
	Application: novel problems, real-life problems
Instruction	
Traditional Emphasis	New Emphasis
Remediating weakness	Building on students' knowledge base and experiences
Textbook	Challenging activities and opportunities
Skills teaching; computation	Wide variety of material: calculators, computers, graphical representations, manipulatives
Uniform instruction	Strategy teaching: problem solving, focus on patterns
Tracking	Identifying individual student's learning style
Independent seatwork	Heterogeneous grouping
Teacher delivering information	Cooperative/team learning activities
Students absorbing information	Teacher as facilitator
	Student constructing meaning and knowledge.

Source: Hodges 1989

Instructional Models

When focusing on student achievement, many factors make it difficult to develop a "one size fits all" model of instruction to support the needs of students within

classrooms. The characteristics and dynamics of the student population, classroom environments, and school culture all could have an impact on student achievement and instructional practices used in classrooms. Despite these factors, administrators and educators must seek to find and use the best types of instructional models to support students in their classrooms. They must adjust the type of program (and other strategies, models, or instructional tools used in the classroom) to meet the specific needs of diverse learners in particular schools.

It is highly recommended that the Think Through Math program be a blended learning "rotational model" if you are to meet the needs of every student. This rotation model was designed to provide teachers with the ability to maximize time for personalized learning and to reach every student with the right lesson at the right time. Think Through Math works by offering students a personalized math-learning environment wherever or whenever they want. The instructional model can take on many forms: a station rotation, lab rotation, flipped classroom, or an individual rotation approach. Despite the instructional approach, every student can have the opportunity to access a personal teacher through the one-to-one live teacher support, which is built into the software. In addition to this support, every student has the opportunity to work directly with a classroom teacher (Thinks Through Learning Inc., 2015).

Another aspect of this instructional model involves opportunities for teachers to provide students with direct instruction. This approach is skills-oriented, and the teaching practices are teacher-directed. This level of instruction is delivered in face-to-face, small group instruction by teachers using carefully articulated lessons in which cognitive skills are broken down into small units, sequenced deliberately, and taught

explicitly. Based on the recommendation from the Think Through Math program and the district's implementation plan, it placed a major emphasis on the see-all aspects of the blending learning "rotation model" of instruction—especially the usage of direct instruction within small groups.

Given the growing body of knowledge about the impact of effective teachers on student learning, it is evident that educational policies have been developed to acknowledge the importance of the role that classroom teachers play in student achievement. The implementation of the federal No Child Left Behind (NLCB) Act of 2001 supports the important role of classroom teachers and their level of impact on student learning. NCLB introduced the concepts of "adequate yearly progress," based on annual testing, and "highly qualified teacher," based on teacher credentials, as strategies to improve the quality of education.

Technology in the Classroom

Several researchers supported the use of technology in the classroom to enhance student learning and improve the quality of education. As stated earlier, Think Through Math is a computer-based software that is used to enhance student learning within math classrooms. Despite the many researchers who supported the use of this type of technology, there are some schools of thought that prefer a more traditional approach to teaching. This is specifically important to the effective teaching of mathematics in the classroom. A study by Klarreich (2006), however, indicated that computers play a critical role in learning mathematics and that mathematical computer programs enable users to make astronomical gains. Additionally, Klarreich supported the notion that computer-based programs can be very useful in helping remedial students advance in

mathematical skills. Leigh (2004) reported that the usage of technology promoted cognitive and problem-solving skills. Children love to sit at a computer for hours playing computer games. Since children love to play games, Leigh suggested that computers should be used to teach students mathematical computations and other math problem-solving skills.

Koblitz (1996) argued that much attention has been placed on the use of technology within the math classroom and stated that this technology should be a major component in educational reform within math classrooms. Despite his support of the usage of technology within the classroom, Koblitz reported the following four downsides of using technology in the math classroom: 1) a big drain on resources (money, time, energy), 2) bad pedagogy, 3) anti-intellectual appeal, and 4) corruption of educators.

Regarding the drain on resources, Koblitz argued that finances should be utilized for productive classroom resources. He also urged administrators to take an in-depth look at a program and ask what would happen in a typical classroom setting with a typical teacher, because computer programs with an enthusiastic instructor will not necessarily work under less than ideal conditions. Regarding bad pedagogy, Koblitz argued that the use of computers in the classroom strips students of much-needed sensory experience. He argued that students needed a learning environment rich in sensory experience that includes color, sound, smell, movement, texture, and nature, and that this cannot be too strongly emphasized. This author raised a great question within his research: At what points and in what ways will the computer in education only further impoverish and stunt the sensory experience so necessary to the health and full rationality of the human individual and society?

Despite the anti-intellectual outcry, Koblitz argued that technological solutions are enticing when educational problems arise and promise to make education easier and more enjoyable to students. The Think Through Math (TTM) website described their computer based program as a tool to accelerate and enhance student learning. This is particularly important if students are to meet the rigor of the Common Core State Standards.

Definition of Terms

Although many of the terms used throughout the education profession are easily understood, I would like to ensure that readers of this study clearly understand the terms that will be used. The following key terms are used throughout this study. Each term is defined according to the way it is used in my study.

Achievement. Something that has been done or achieved through effort; a result of hard work; the act of achieving something; the state or condition of having achieved or accomplished something (In *American Heritage Dictionary of the English Language*, 5th Edition).

Education. The act or process of educating or being educated; the knowledge or skill obtained or developed by a learning process (In *American Heritage Dictionary of the English Language*, 5th Edition).

Educators. All education professionals and paraprofessionals working in participating schools (as defined in this document), including principals or other heads of a school and teachers and other professional instructional staff (In *American Heritage Dictionary of the English Language*, 5th Edition).

Student achievement. When a student does well academically, obtaining life skills and giving back to their community (In *American Heritage Dictionary of the English Language*, 5th Edition).

Professional development. The advancement of skills or expertise to succeed in a particular profession through continued education (In *American Heritage Dictionary of the English Language*, 5th Edition).

Conclusion

My review of literature covers periods from as early as the mid-nineteenth century through the present. It indicated that increased efforts must be made by school districts and their educational staff members throughout the United Stated to improve the overall quality of math instruction. Based on my review of the literature and my experiences as a professional educator, it is my belief that specific emphasis must be placed on the role of the teachers in the math classroom.

This belief is supported by Harry K. Wong (2001) who reported that the role of a classroom teacher is to produce student achievement results, and that role is the single most important investment for schools to make. Wong further reported that successful schools focus on instructional practices used by classroom teachers. Leaders in these schools invest in their workforce and provide ongoing professional development opportunities to support them. Teachers do not teach programs; they teach academic content, and they work to improve their instructional practices. Finally, these teachers realize the importance of ensuring that all students learn to value mathematics, become confident in their ability to do math, become mathematical problem solvers, and learn to communicate mathematical reasoning.

SECTION THREE: METHODOLOGY

Research Design Overview

The method used to conduct this program evaluation included a combination of both quantitative and qualitative measures. This program evaluation involved 1) surveys from teachers who use the product and 2) classroom observations. In addition, my program evaluation involved middle school Intensive Math teachers throughout the district. Based on the 2015-2016 course master file for the 23 schools, a total of 64 middle school math teachers were assigned to teach Intensive Math. On average, each teacher was scheduled to teach between 2 to 6 sections of Intensive Math.

Despite the fact that more than 9,191 students in grades 6-8 scored a Level 1 or 2 on the statewide mathematic assessment, a total of 3,399 students were scheduled to take Intensive Math. The number of students scheduled into the Intensive Math course consisted of only those who scored a Level 1 as measured by the 2015 statewide mathematics assessment. The other students received such math interventions within the grade level math class instruction.

The specific break down by grade level for students scheduled into Intensive Math classes is: 1,150 students in grade 6, 1,354 students in grade 7, and 1,344 students in grade 8. The demographic makeup of this group of students is: 1,511 Black, 1,416 White, 660 Hispanic, 155 Multiracial, 100 Asian American, and 6 American Indian. Additionally, more than half of these students scored at a Level 1 on the prior year's statewide mathematics assessment during the 2014 test administration.

It was my belief that teacher surveys and classroom observations were the best approach to obtaining the information needed to determine if the district's

implementation and usage of the Think Through Math program was beneficial. The data sources used to obtain this information provided me with multiple ways to access the quality of the program and its impact on student achievement.

The literature that surrounds the usage of the Think Through Math program is limited because this program is a new product. This product was created in 2012 to prepare students for the Common Core State Standards and the new assessments associated with the implementation of these standards. Additionally, this interactive web-based math resource program was designed for students in grade 3 mathematics through Algebra 1. Research that focused on this product is almost non-existent Therefore, I focused my research on the following questions:

Primary questions:

1. What do middle school Intensive Math teachers report as working well with the implementation of the TTM curriculum?
2. What do middle school Intensive Math teachers report as not working well with the implementation of the TTM curriculum?
3. What do middle school Intensive Math teachers report as major obstacles in the implementation of the TTM curriculum?
4. What do middle school Intensive Math teachers suggest as ways to improve the implementation of the TTM curriculum?
5. What do current test data, including teachers' perceptions of student academic growth, indicate regarding the program's impact on student achievement?
6. Are teachers delivering TTM instruction as required by the program with fidelity?

Secondary questions:

1. What math goals are best met through this program?
2. What are the best uses of technology in this program?
3. What is the functional skill improvement after completion of the program?

I designed the research questions to help me determine the effectiveness of a school district's usage of the Think Through Math Program for students who are performing below grade level expectations as measured by the statewide mathematics assessment. As indicated in Chapter 1 of this study, the purpose of this evaluation was to determine the effectiveness of the TTM program strategies used within middle school Intensive Math classrooms and any related obstacles. I did this in order to lead to an understanding of the strengths and weaknesses of the program and to determine what impact it has had on student performance, positive or negative. I thought the findings also have the potential to help the school district in my study as well as other districts (a) better meet the needs of students who are struggling in math by developing the mathematical skills necessary to be successful, (b) increase the percentage of students meeting graduation requirements and thus increasing the graduation rate, and (c) prepare students for continuing education and careers.

Teachers using the Think Through Math program in their classrooms may benefit from this study by having their perceptions of the program addressed and articulated to district leadership. This would include addressing obstacles to the success of the program. School and district leaders will be able to use the results of the study to address the needs and concerns of teachers who are tasked with implementing the TTM program.

Finally, this study has the potential to contribute to the scholarly literature on implementing evidence-based math intervention programs.

Participants

The participants for this study included middle school Intensive Math teachers within the Claitt District. Currently, there are a total of 23 traditional middle schools and a total of 64 middle school math teachers assigned to teach anywhere from 2 to 6 sections of Intensive Math. These teachers have been assigned by the schools to teach students who struggle in mathematics using the Think Through Math Program as an intervention. Given the limited number of teachers assigned to teach intensive math within the 23 middle schools, I targeted each of them to (64 Intensive Math teachers) take part in this program evaluation. According to Krejcie and Morgan (1970), when determining an appropriate sample size for my program evaluation, it is important to obtain data from at least 55-of the middle school Intensive Math teachers. Of the 64 targeted to participate in this study, a total of 49 teachers agreed to participate. Of the 49 teachers who participated in this program evaluation survey, 53% were in their first year of teaching Intensive math, 37% taught this course between 3 to 5 years, 2% taught this course between 6 to 9 years and 8% taught this course for 10 or more years. Lastly of the participates who took part in this study, 48% of the teachers taught in a school using a traditional bell schedule, while 52% of the teachers taught in a school using a block schedule. It is important to note that schools using the block scheduling method within the district are Title 1 Schools. These schools receive additional funds to support academic initiatives.

Teachers in the Intensive Math classroom are required to hold a State of Florida certification in Mathematics. The method of assigning teachers to classrooms varied from school to school. In some cases, teachers were included in the decision-making process. At other schools, teachers were involuntarily assigned to teach classes. Despite the method used to assign teachers, all teachers were required to take part in district wide training on the usage of the Think Through Math Program.

Data Gathering Techniques

I obtained the Institutional Review Board (IRB) approvals prior to the collection of data so that all participants in this research were protected from potential harm. This included approval from both National Louis University and the Claitt District. Beyond obtaining IRB approvals, I collaborated with the Think Through Math representative assigned to work with the district to obtain information to support this study. I gave consent forms to teachers who chose to participate in this program evaluation (Appendix A). I also obtained approval for site-based administrators as needed prior to the beginning of this program evaluation (Appendix B). The data I gathered during this program evaluation consisted of information obtained from surveys and classroom observations.

Surveys

I used the district's data files to determine the number of teachers assigned to the Intensive Math courses. This data files was provided by the district's Assessment, Accountability and Research Department. This files contained the following information; names of all teachers assigned to teach intensive math, their school name, work email address and number of years within the district. I used surveymonkey.com to

create the survey and included a link to the survey in the personal emails sent to teachers asking them to participate in the survey (Appendix C). The survey included questions on demographics, teacher experience, professional development, and ended with three open-ended questions (Appendix D). During this program evaluation, I made every effort to protect participant anonymity.

Classroom Observations

During this study, I conducted 70 classroom observations in various middle school Intensive Math classes. Each observation ranged in time from 15 to 20 minutes. Additionally, the observations took place over a 12-week research period in middle schools that agreed to take part in my study. The purpose of the observations was to understand the specific teaching strategies that affected the achievement of students using the Think Through Math program. As the observer, I remained isolated from the teaching environment to reduce reflexivity, which diminishes accurate observations. I designed the observation forms used for this study (Appendix E) to focus on the following: teacher behaviors, student behaviors, the classroom setting, the phrase of instruction, the usage of clear learning goals and scales, and the tracking of student progress.

Data Analysis Techniques

During this program, I used SurveyMonkey.com to collect data from adult participants. Using this platform to collect data from teachers gave me the ability to access the data at any time and to create and export dynamic charts, use filters, compare data, and show rules to analyze specific data views and segments. The software allowed me to view and categorize open-ended responses and easily download results in multiple formats. I analyzed the survey results by using a statistical analysis with descriptive statistics.

Ethical Considerations

I designed this study to determine the effectiveness of the Think Through Math Program, which was used in Intensive Math classrooms for students who struggled in mathematics. I also used the results of this study to determine the impact on the future usage of the Think Through Math program for middle school students who are performing below a Level 3 proficiency in math. During this study, I gave careful consideration to the participants, as outlined in the Florida Department of Education Code of Ethics (Florida Department of Education, 2012), the Claitt's District Research and Accountability standards, and the National Louis University Institutional Research Board's IRRB Criteria for Ethical Research (National Louis University, 2012). Additionally, I strove to adhere to the American Educational Research Association's professional standards of competence, integrity, scholarly responsibility, respect for privacy, and social responsibility during the course of this study (American Educational Research Association, 2011). Upon obtaining permission to complete this program evaluation and prior to collecting data, I directed the teacher participants to read and complete an informed consent form (Appendix A). Each middle school Intensive Math teacher received information about this study and was informed that their participation was totally voluntary and their personal identity would not be revealed to anyone outside of this program evaluation.

In the survey portion, I did not ask participants to provide any information that would link them to the survey. And their survey responses were totally anonymous. Additionally, I insured the data collected from the survey was completely confidential. Again, I informed the participants that the survey was voluntary and I would not reveal

their identity. Teachers who elected to take part in this survey signed a letter of consent (Appendix A). The risk from participating in this study is minimal, whereas the benefit, if any, will be that Claitt District may be able to determine the impact of the Think Through Math program on student achievement efforts. Finally, I structured the survey questions to insure their integrity, and I also created the observation form with proper terminology and diction so that any potential biases or persuasiveness was avoided for the purpose of insuring truthful responses and data collection by all participants.

Conclusion

In Chapter 3, I outlined the research questions I pursued during this research. I identified the population of the teachers I targeted to participate in the evaluation of the district's implementation and usage of the Think Through Math program within Intensive Math classes throughout the district's 23 middle schools. My goal was to determine the overall effectiveness of this program and use the results to drive school improvement efforts related to math education throughout the school district in my study.

SECTION FOUR: FINDINGS & INTERPRETATION

Findings

In this chapter, I will report the findings of my study that examined the implementation of the Think Through Math Curriculum. The data I collected from participants are presented in accordance with each of the six primary research questions and three secondary questions. Additionally, I presented the relationship to the core teaching components of the Think Through Math Program. As the researcher, I conducted a complete analysis of the data collected. My goal was to minimize bias, therefore, I provided several explanations of the data when applicable.

Background Information

The primary focus of my study was to investigate what effect, if any, the Think Through Math program had on students enrolled in Intensive Math because of their below grade level performance as measured by the statewide standards assessment. I derived the findings associated with the question of the effectiveness of this program from an evaluation of the Think Through Math curriculum, classroom observations, and teacher surveys. Several factors impacted the perceived effectiveness of Think Through Math program, including teacher fidelity with implementation of the program, student placement into the program, student participation and attendance, and access to Think Through Math curriculum.

Teacher Survey Results

The participants for this study included middle school Intensive Math teachers within the Claitt District. During the 2015-2016 school year, the district contained a total of 23 traditional middle schools and a total of 64 middle school math teachers assigned to teach

anywhere from 2 to 6 sections of Intensive Math. During this program, I used an evaluation SurveyMonkey.com to collect data from the teachers assigned to teach Intensive Math (Appendix D). Of the 64 teachers assigned to teach Intensive Math, a total of 49 teachers, or 76.56% of the teachers, volunteered to participate in this survey. Using SurveyMonkey.com to collect data from teachers, I was able to access the data in real time and create and export dynamic charts, use filters, compare data, and show rules to analyze specific data views and segments. The survey consisted of several critical questions, which were derived from my primary and secondary questions contained within Chapter 1 of this study.

Demographic Information Survey Results

I designed Questions 1-5 on the survey to obtain demographic information from individual teachers. Based on the data received from the 49 teachers who completed the program evaluation survey, 53% of the teachers assigned to teach Intensive Math were in their first year of teaching this course, 37% between 3 to 5 years, 2% between 6 to 9 years and 8% with 10 or more years. This data is significant as it provides a prospective of the number of years teachers within this study have taught Intensive Math. As noted from the data collected the majority of the teachers within this study were within the first year of teaching this specific course. Table 3 show data for the number of years' teachers taught Intensive Math.

Table 3

Survey question #1, "How many years have you taught Intensive Math?"

Answer Choices	Responses	
	Percentage	Number
0-1 year	53.06%	26
3-5 years	36.73%	18
6-9 years	2.04%	1
10 or more	8.16%	4
Total		**49**

When asking this same group of teachers about their experience using the Think Through Math Program, the majority of the teachers (67% or 33 teachers) indicated that they taught using the TTM program for one full school year. On the other hand, 22% (11) of teachers reported that they used the program between 0-3 months, 8% (4) for 2 or more years, and 2% (1) between 6-9 months. When implementing and using any curriculum resources, it is necessary to ensure that we build teacher capacity and teacher expertise. Generally speaking, when teachers have the opportunity to teach the same class over time, they get to learn what works and what does work. Ultimately they learn have to navigate their way through the course to better meet the needs of students. As indicated above the majority of the teachers within this study reported having experience using the TTM program. Table 4 provide data for the number of years teachers used the Think Through Math Program.

Table 4

Survey question #2: How many years have you used the Think Through Math (TTM) Program?

Answer Choices	Responses	
	Percentage	Number
0-3 months	22.45%	11
3-6 months	0.00%	0
6-9 months	2.04%	1
1 full year	67.35%	33
2 or more years	8.16%	4
Total		**49**

Additionally, of the 49 teachers who completed the survey, 38.78% (19) teachers reported that they taught 1 to 2 sections of this course, 34.69% (17) taught 3-4 sections, 26.53% (13) taught 5-6 sections, and none of the 49 teachers were assigned to 7 or more sections. During my years as a professional educator, I have found that teachers struggle to teach multiple courses and when they have less than 2 class sections of a course they

tend to devote little to no time properly preparing for instruction. Therefore, the above data is significant to this study as it provides a prospective of the number of class sections teacher were assigned to teach throughout the school day. Table 5 show data for the number of sections taught by teachers in the study.

Table 5

Survey question #3: How many sections of TTM math classes do you teach?

Answer Choices	Responses	
	Percentage	Number
1-2 sections	38.78%	19
3-4 sections	34.69%	17
5-6 sections	26.53%	13
7 or more sections	0.00%	0
Total		**49**

Based on the data collected, it appeared that all classes complied with the class size rules as dictated by the State Department of Education. This rule prohibits a school/district from assigning more than 22 students to core academic classes within middle schools. Table 6 provide data for the average number of students in each class

Table 6

Survey question #4: What is the average number of students in your TTM classes?

Answer Choices	Responses	
	Percentage	Number
5-10 students	2.08%	1
11-15 students	14.58%	7
16-20 students	56.25%	27
21 or more students	27.08%	13
Total		**49**

Of the 49 teachers who completed the survey, 56% (27) of the teachers reported having an average of 16-20 students per class, 27% (13) reported having classes with 21 or more students in them, 15% (7) with 11-15 students, and 2% (1) with 5-10 students.

When it comes to the discussion of class size, many would argue for smaller class sizes when working with struggling and/or low performing students. Researchers generally agree that smaller class sizes, can be linked to positive educational benefits such as better test scores, increased levels of engagement within classes, increased opportunities for individualized instruction, fewer dropouts and higher graduation rates. Specific to the district within my program evaluation, the generally practice was to have schools schedule no more than 18 students into Intensive Math classrooms.

In response to survey question #5, which asked about the number of computers assigned to the classroom, 32 (65%) teachers reported that they had 16 or more computers assigned to their Intensive Math class for daily usage, 10 (20%) teachers indicated that they had 11-15 computers, 5 (10%) teachers reported that they had 6-10 computers, and 2 (4%) teachers reported that they had 0-5 computers. Table 7 shows the number of computers assigned to each TTM classroom.

Table 7

Survey question #5: How many computers are assigned to your TTM classroom for daily usage?

Answer Choices	Responses	
	Percentage	Number
0-5 computers	4.08%	2
6-10 computers	10.20%	5
11-15 computers	20.41%	10
16 or more computers	65.31%	32
Total		**49**

As reported in Chapter 1 of this study, the usage of computers is a critical component of the Think Through Math program. In fact, prior to our implementation of the Think Through Math program, the Content Specialists for Middle School Math worked with the district's Technology Department to confirm that all schools had

enough computers to ensure that students would have access to computers for daily usage within the Intensive Math classes. The final recommendation made by the district indicated that all Intensive Math classes would be setup with an average of 11 to 15 computers. It was disappointing to learn that 7 (14%) of the teachers that took part in the study indicated that they did not have the recommended number of computers for daily usage.

Instructional Focus Survey Results

I designed Questions 6-9 of the survey to obtain information specific to the instructional practices used within the classrooms. When asked, what is the average number of instructional minutes students spend using the Think Through Math program per week, 42 (85%) of the teachers who completed the survey reported weekly usage of 76 or more minutes per week. Table 8 show data for weekly computer use.

Table 8

Survey question #6: What is the average number of minutes' students spend on the classroom computer per week completing TTM lessons?

Answer Choices	Responses	
	Percentage	Number
31-50 minutes weekly	4.08%	2
51-75 minutes weekly	10.20%	5
76-100 minutes weekly	61.22%	30
101 or more minutes weekly	24.49%	12
Total		**49**

Based on information from the Think Through Math program, students should be engaged in the online component of TTM for more than 75 minutes per week. Teachers within the district were encouraged to provide students with at least 90 minutes of online instructional time using the TTM program.

It is not only imperative for students to spend time during the week on the program, but this should be a daily activity. The instructional model recommended consisted of instructional rotations within the classroom. One of the three rotations provided students time to be actively engaged in the online component of the TTM program. Table 9 show data for how often the TTM software is used by students.

Table 9

Survey question #7: How many days do most of your students use the TTM software within a class period?

Answer Choices	Responses	
	Percentage	Number
0-2 days per week	12.50%	6
3-4 days per week	70.83%	34
5 days per week	16.67%	8
Total		**48**

Based on the 48 responses to this question, 6 teachers provided their students with 0-2 days of computer time per week, 34 teachers 3-4 days per week, and 8 teachers 5 days per week. When reviewing these data, it is imperative to examine closely the type of bell schedule used within each school as the type of bell schedule allows one to determine the amount of instructional time teachers and students have within each class throughout the school day.

A second critical component of the instructional model within Intensive Math classrooms is the classroom teacher should meet with students in a small group setting. The intent of small group work is to provide direct instruction to students specific to their academic needs, to facilitate learning using grade level standards, to conduct data chats, and to plan instructional pathways to address gaps in learning. Teachers are expected to conduct small group instruction daily. Table 10 presents the percentages and numbers of hours spent each week in small group instruction.

Table 10

Survey question #8: How many days do most of your students participate in a small group instructional segment?

Answer Choices	Responses	
	Percentage	Number
0-2 days per week	48.98%	24
3-4 days per week	40.82%	20
5 days per week	10.20%	5
Total		**49**

Based on the data collected from the 49 teachers who completed the survey, 5 teachers indicated that they engaged in small group instruction 5 days a week; 20 teachers used small group instruction 3 to 4 days per week; and 24 teachers engaged in small group instruction 0 to 2 days per week. Given the fact that the district's implementation model requires and promotes daily small group instruction, it was necessary to collect data from teachers regarding the number of days small group instruction was taking place within TTM classrooms. During small group instruction, teachers were to provide direct instruction to students using on grade level resources to develop and strengthen student mathematically practices.

Additionally, based on the data from survey questions 7-8, 48% of the teachers taught in a school with a traditional bell schedule, while 52% of the teachers taught in a school with a block schedule. Table 11 include data for school schedules.

Table 11

Survey question #9: What type of bell schedule does your school use?

Answer Choices	Responses	
	Percentage	Number
Traditional bell schedule (7-period day)	47.92%	23
Block schedule (A/B days)	52.08%	25
Total		**48**

In traditional settings, students have seven classes per day for an average of 47 to 50 minutes. In a school on a block schedule, students have four classes per day using a rotation schedule, which consists of an A and B day rotation schedule. The average number of instructional minutes in a block schedule range from 85 to 90 minutes per class. Although the total amount of annual instructional minutes were the same for all schools and students, generally speaking schools that used a block schedule were able to provide their students with more time to complete required rotations within a given school day.

The final critical component of the intensive math program involves the ongoing monitoring of student progress. The student academic performance must be measured on a regular basis by the classroom teacher. Progress toward meeting the student's goals is measured by comparing expected and actual rates of learning based on performance indicators within the TTM program. Based on performance outcomes, teachers are to make instructional adjustments to support students in meeting their academic needs. As stated by districts using this TTM program, when progress monitoring is implemented correctly, the benefits are greatest for everyone involved. These include:

- accelerated learning opportunities
- more informed instructional decisions;
- tracking of student progress for accountability purposes;
- more efficient communication with families and other professionals about students' progress.

The use of progress monitoring results in more efficient and appropriately targeted instructional techniques may move students towards the mastery of curriculum standards. Table 12 shows how often teachers monitored student performance.

Table 12

Survey question #10: How often do you monitor student performance data within the Think Through Math program?

Answer Choices	Responses	
	Percentage	Number
Daily	26.53%	13
Twice a week	14.29%	7
Weekly	42.86%	21
Bi-weekly	4.08%	2
Monthly	0.00%	0
Other (please specify)	12.24%	6
Total		**49**

When I reviewed the data specific to the question regarding progress monitoring, 43% (21) of teachers indicated that they monitor student progress weekly, 26% (13 teachers) progress monitor students daily, 14% (7) progress monitor twice a week, and 12% (6) selected other, but did not indicate specific information to clearly communicate the frequency of their usage of progress monitoring to support student learning. Given the level of accountability, it was imperative that teachers know where students were during the progress of learning. Therefore, student progress monitoring was a practice designed to allow teachers to use student performance data to continually evaluate the effectiveness of their teaching and make more informed instructional decisions. Based on the survey data collected during my program evaluation many teachers missed the mark as daily progress monitoring was evident within classrooms.

Professional Development Survey Results

The importance of ongoing professional development should not be underestimated. This must be a career-long obligation for improving professional practices. Thus, questions 11-13 specifically focus on the professional development training that the Intensive Math teachers received after being assigned to teach this course within the district's middle schools. Table 13 shows the number of teachers who participated in the Think Through

Math professional development in 2014-2015. Table 14 shows the number of teachers who participated in TTM professional development in 2015-2016.

Table 13

Survey question #11: During the 2014-2015 school year, did you participate in Think Through Math professional development?

Answer Choices	Responses	
	Percentage	Number
Yes	75.51%	37
No	6.12%	3
N/A (I did not use TTM during the 14-15 school year)	18.37%	9
Total		**49**

Table 14

Survey question #12: During the 2015-2016 school year, did you participate in Think Through Math professional development?

Answer Choices	Responses	
	Percentage	Number
Yes	55.32%	26
No	44.68%	21
Total		**47**

Based on data collected during the first year of implementation (2014-2015), 75% of teachers who completed this survey participated in the required training. Only 55% of the teachers assigned to the class during the 2015-2016 school year received the required training. And 45% of teachers reported that they did not participate in professional development training specific to the Think Through Math program. As reported by several researchers, professional development opportunities should allow one to strengthen their knowledge and skills. Collecting data specific to professional development opportunities provides a prospective of the teachers' participation in the required training. Therefore, the data report in tables 4.11. and 4.12 is associated the need for the district to ensure that teachers assigned to teach Intensive Math using the TTM program received the training to successfully implement and use the TTM program. Based on the data within tables 4.11 and

41.2 it appears that more teachers took part in the required training during the 2014-2015 school year than the 2015-2016.

When reviewing the data regarding the quality of professional development specific to TTM, several teachers selected a rating of undecided to all questions regarding the quality of professional development, and many teachers communicated a rating of N/A. It is important to note that teachers who selected N/A did not take part in TTM training during the 2015-2016 school year as they were not assigned to teach within Intensive Math classrooms. Beyond this finding, on average most teachers indicated that they either agreed or strongly agreed with each statement. Below please find the summary of data specific to the overall quality of professional development offered to teachers teaching Intensive Math since the start of the 2015-2016 school year. After reviewing the data table below you will find a summary of each statement within question 13. Keep in mind that participants who marked N/A to the statements were not included in the summaries as these participants were not associated with the usage of this program during the 2015-2016 school year.

Question 13a which asked teachers to provide feedback regarding the learning goals of the training sessions. 14% (7) teachers strongly agreed, 35% (17) of teachers agreed that the training sessions had clear goals for what teachers should have learned. Other the hand 8% (4) of teacher were undecided and 2% (1) of teachers disagreed. Based on my experience and knowledge training is a process used to enhance the skills, capabilities and knowledge of others. Therefore, the data obtained from question 13a is significant as it provides feedback regarding the learning goals associated with the training sessions and it helps to determine if teachers had an understanding of the learning outcomes associated with the training sessions.

Question 13b addressed the organization of the training session. 16% (8) of teachers strongly agreed that the training sessions were well organized, 33% (16) teachers agreed, 12% (6) of teachers were undecided and 2% (1) teacher disagreed. The purpose of this question was to obtain feedback from participants on how well the training sessions were organized. Similar to the data from question 13a, this data was used to help determine the effectiveness of the training sessions. Having a clearly planned training session helps one avoid detours and keep session moving in the right direction. Additionally, having an organized training helps one effectively manage their time.

Question 13c was designed to obtain feedback regarding the trainer's ability to motivate teachers to use the program in the prescribed manner. 16% (8) of teachers strongly agreed that the trainer motivated them to use the program in the prescribed manner, 33% (16) of teachers agreed, 8% (4) of teachers were undecided and 4% (2) of teachers strongly disagreed. The data collected was used to help determine the effectiveness of the trainer's ability to motivate the participants to use the program with fidelity as it was designed. Research tells us that the way a program is implemented determines the impact of the program. Implementing a program in a prescribed manner improves the likelihood for positive outcome measures.

Question 13d was designed to collect data regarding the feedback given to teachers who attended the training sessions to help them better implement the program. 10% (5) of teachers strongly agreed that the professional developers provided feedback to help them better implement the program, 31% (15) of teachers agreed, 12% (6) of teachers were undecided, 2% (1) of teachers disagreed and 6% (3) of teachers strongly disagreed. It is no secret that feedback both positive and negative can be used to develop and strengthen

practices. Therefore the significance of this data is valuable information that will be used to make decisions about future training sessions.

Question 13e was geared to help the program evaluator determine if the TTM training sessions prepared teachers to implement the program within their classroom. Based on the feedback obtained, 12% (6) of teachers strongly agreed, 33% (16) of teachers agreed, 10% (5) of teachers were undecided, 4% (2) of teachers disagreed and 4% (2) of teachers strongly disagreed that the training prepared them to implement the TTM program within their classroom. As indicated earlier within this study training program should be continually monitored to determine the effectiveness of the training. The data collected associated with this questions will allow the organization to identify any weaknesses in the training program. Upon determining areas of concern, the training program can be revised to ensure objectives are being met.

Question 13f asked participants to provide feedback regarding the sufficient of trainings provided to them within the 2015-2016 school year. 12% (6) of teachers strongly agreed that the amount of professional development received was sufficient, 24% (12) of teachers agreed, 12% (6) of teachers were undecided, 8% (4) of teachers disagreed and 8% (4) of teachers strongly disagreed. Although the majority of the participants indicated that the training was sufficient, it is interesting to note that 14 teachers walked away feeling that the amount of training provided was not sufficient. Excluding the 17 participants that did not respond to this question due to the fact that they did not teach the Intensive Math course during the 2015-2016 this means that 44% (14) of the remaining participants did not receive a sufficient amount of training to be successful. Without a doubt this will have a significant impact on quality of implementation associated with the TTM program.

Table 15

Survey question #13: Please consider the professional development you received since the start of the 15-16 school year. Rate the extent to which you agree with each statement.

	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		N/A		Total	Weighted average
	%	#	%	#	%	#	%	#	%	#	%	#		
13a The training sessions had clear goals for what you should have learn.	14.29	7	34.69	17	8.16	4	2.04	1	2.04	1	38.78	19	49	3.59
13b. The training sessions were well organized.	16.33	8	32.65	16	12.24	6	0.00	0	2.04	1	36.73	18	49	3.49
13c. The trainers motivated me to use the program in the prescribed manner.	16.33	8	32.65	16	8.16	4	0.00	0	4.08	2	38.78	19	49	3.59
13d. The TTM professional developers provided feedback to me that helped me better implement the program	10.20	5	30.61	15	12.24	6	2.04	1	6.12	3	38.78	19	49	3.80
13e. The training sessions in TTM prepared me to implement TTM in my classroom.	12.24	6	32.65	16	10.20	5	4.08	2	4.08	2	36.73	18	49	3.65
13f. The amount of TTM professional development I received this year was sufficient.	12.24	6	24.49	12	12.24	6	8.16	4	8.16	4	34.69	17	49	3.80

Student Impact Survey Results

As noted in Chapter 1 of my study, it was my goal to determine the impact that the TTM program had on student achievement in mathematics. Therefore, when asked about the impact on student learning, the following feedback was obtained from statement 14a on the survey: 15 teachers indicated that their students enjoy using the TTM program, while 23 teachers disagreed or strongly disagreed with that statement. Eleven teachers reported they were undecided about student enjoyment or did not indicate a response to this question. This data represents the perspective of teachers based on their observations of students within their classroom. As communicated earlier within this study, stakeholder buy-in is critical to the success of the program. Statement 14b focused on the overall student improvement in mathematics, 20 teachers agreed or strongly agreed that their students were improving, 9 teachers disagreed or strongly disagreed, and 20 teachers reported either undecided or did not indicate a response to this question. Although this data indicated that teachers agreed that math skills were improving for students, it was puzzling to see the number of participant's undecided about this program specific to the improvement of math skills for students. As a program evaluator additional information would be needed to determine why these teachers were undecided. Table 16 shows the percentages and numbers of teachers for each category of impact.

Table 16

Survey question #14: Please consider the impact on student learning.

	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		N/A		Total	Weighted avg.
	%	#	%	#	%	#	%	#	%	#	%	#		
Most of my students enjoy the TTM program.	6.12	3	24.49	12	18.27	9	36.73	18	10.20	5	4.08	2	49	3.33
Most of my students are improving their overall math skills.	8.16	4	32.65	16	34.69	17	8.16	4	10.20	5	6.12	3	49	2.98

Survey questions 15, 16, and 17 were opened ended questions. I designed them to obtain additional feedback from the teachers regarding the Think Through Math program. There were several common themes that surfaced from the data for each question. Of the 49 participants who responded to survey question 15, a total of 41 respondents provided comments regarding the barriers associated with the implementation of TTM curriculum. Table 17 is a summary of the data collected for question 15.

Table 17

Survey question #15. In your experience, what are major barriers in the implementation of the Think Through Math (TTM) curriculum?

Category	Percentage	Frequency
Classroom Management	9.76	4
Master Scheduling	4.88	2
Progress Monitoring	14.63	6
Academic Rigor	19.51	8
Student Motivation	48.78	20
Usage of Technology	17.07	7
Uncategorized	4.88	2

According to the respondents, the top barriers associated with the district's implementation of the Think Through Math curriculum were: lack of student motivation,

too much academic rigor, and overuse of technology. The teachers who provided comments specific to student motivation all expressed language which indicated that their students were disinterested, disengaged, and not motivated to learn. Teachers made comments like: Intensive Math is not a course that students need to pass - so many students do not care about the work, students do not stay actively engaged, students feel frustrated, defeated because they cannot pass lessons and students resent this class because they have to give up an elective course option. When reflecting on the above information, it is my belief that the role of the classroom teacher is to make students excited about learning. This involves creating a classroom culture where students have multiple opportunities to experience success. Specific to my study, teachers must work to build positive relationships with students, to communicate clear expectations to students and to motivate students to take ownership of their learning.

Regarding academic rigor, teachers shared differing comments. These could all be summarized as frustration with the students due to their lack of basic math skills. Therefore, the course was too difficult and rigorous for them. Additionally, teachers expressed concerns associated with the lack of academic alignment of the TTM class to the district-pacing guides for grade level math courses. Thus, they were concerned about whether or not they were addressing district expectations adequately. Knowing that teachers often struggle to ensure students engage in the higher-order and cognitively complex tasks, the feedback obtained is critical as it could be used to drive professional development opportunities for teachers.

The third highest barrier reported was related to the usage of technology. Overall, the comments indicated that teachers did not have enough computers and bandwidth. In

addition, the comments indicated that many teachers had issues with wireless access, which had a direct impact on the student's ability to access the TTM curriculum resources. As indicated in Chapter 1 of this study, students must have daily access to computers in order to gain maximum benefit from the Think Through Math curriculum. Without sufficient access to computers and/or the internet it is impossible for students to extend their learning using the TTM program. Therefore, the district must take action to ensure that all schools have the necessary technology resources to TTM classrooms can operate as designed.

I obtained a total of 37 responses from question #16. Even though 12 of the 49 teachers did not provide comments to this question, the following three topics were among the most common issues cited: technology (poor access & usage), inadequate curriculum design, and buy-in. Based on my review of the data, I was not surprised to see these categories at the top of the list. Table 18 is a summary of the data collected for question 16.

Table 18

Survey question #16. In your experience, what would you suggest to improve the district's usage of the TTM curriculum?

Category	Percentage	Frequency
Assessment	2.70	1
Buy-In	16.22	6
Curriculum Design	21.62	8
Expanded Program Usage	13.51	5
Resources	8.11	3
Student Placement	5.41	2
Technology (Access)	24.31	9
Time	8.11	3
Training	10.81	4
Uncategorized	8.11	3

Regarding the access and usage of technology, 24% of teachers made comments. They were: provide more computers; provide better bandwidth; improve the network as it runs slow; set restricts on the computers to block students from going to other websites;

provide teachers and students with additional training; and provide a platform, which works without all the glitches that was experienced. Within today's society, the integration of technology into the classroom is an effective way to connect with students of all learning styles. Additionally the usage of technology helps students stay engaged. Therefore, it only seems logical to align today's classrooms with the way that make learning engaging and exciting for students. Thus, the data obtained from question #16 will be used to help determine which schools need additional technology support.

On the other hand, 22% of respondents provided feedback regarding the curriculum design of the TTM program. Overall, teachers expressed dissatisfaction with the structure of the curriculum and how they were directed to use it to support student learners. Teachers shared the following comments: allow more time for small group instruction within the classroom; provide more direction on what students should be recording in their journal while using the TTM software; provide more resources to help support students as most students are performing well below grade level expectations; and give teachers the autonomy to build learning pathways for student's verses allowing the software to dictate instructional pathways. The above data speaks to the need for the district to provide teachers with additional support and autonomy within the classroom.

Finally, the concept of buy-in appeared as the third highest category for question 16. The topic of buy-in appeared to be closely connected to "motivation and attitudes" of stakeholders (students and teachers) using the TTM program. There were comments such as: my students are off task often; the district needs to consider another problem that aligns with the primary math class (this was stated multiple times); allow teachers to have the autonomy to use the program as they desire to support students; and give choice and

voice to teachers as it relates to approved programs and other items that might concern them. Based on the above comments, it would appear that the district needs to work with teachers to build buy-in to truly support the usage of this curriculum resources within classrooms. Specific to my study, involving teachers in the decision-making process is essential however the district must work to build a consistent work force of teachers who are truly commitment to working with struggle and/or low performing students using the TTM program. As indicated in the data throughout in this chapter, many of the teachers assigned to this course are new to teaching and many of them are assigned to teach multiple courses. It is apparent to me that staffing issues within schools have a significant impact on the implementation of the TTM program.

For question 17, a total of 34 teachers (69%) provided general comments about the Think Through Math program. When analyzing the comments for this question, common themes from questions 16 and 17 surfaced to the top of the list, which were buy-in and curriculum design. Table 19 is a summary of the data collected for question 17.

Table 19

Survey question #17. What general comments would you like to share regarding Intensive Math and/or the TTM curriculum?

Category	Percentage	Frequency
Buy in	47.05	16
Classroom Management	5.88	2
Curriculum Design	14.71	5
Expanded Program Usage	2.94	1
Like the Program	14.71	5
Master Scheduling	5.88	2
Progress Monitoring	2.95	1
Technology Access	2.94	1
Training	2.94	1
Uncategorized	11.76	4

Despite the common theme regarding buy-in, it is important to note that the majority of the comments associated with this theme were mostly negative. Teachers expressed the following comments: please make changes to this ASAP; I am very disappointed; I think that other programs would be better suited for our students; if the program is doing all the work—what is my role as the teacher?; the program deletes the classroom teacher's role within the classroom; why are we expecting all students to take the same treatment—this should not be a one size fit all approach; it is difficult and emotionally draining to assign teachers to classrooms with all below level students; get a new curriculum; I like voyager better; and, finally according to teachers the TTM program is a waste of time. Based on my review of the collective survey data, the above comments result in the need for the district to involve teachers in the decision-making process and the need to refrain professional development opportunities. This action must extend beyond the curriculum resources used within the Intensive Math classrooms to the structures provided to ensure the success of teachers and students within classrooms. Additionally, a close analysis of staffing practices used within school must be conducted. As the most inexperience teachers are being assigned to teach students needing the most academic support in math.

The comments associated with the category labeled curriculum design could be considered both a strength and weakness of the Think Through Math program. The following are major comments shared by teachers: the lesson structure that the program used to address gaps in learning works fairly well, but some grade level lessons are too difficult. Additionally, the practice lesson should have a function to prevent students from moving forward without demonstrating mastery of content.

Despite the fact that the lessons were aligned to state standards, teachers reported that the content was very challenging for the students. As a result, this created situations where students were disengaged and off track. Finally, the teachers reported that because their informational dashboard was set up to mirror the student's dashboard, it easier to target students needed additional support and to monitor the progress of students.

As previously mentioned within this section of my study the comments specific to the design of this curriculum resource could be perceive as a strength and weakness of the TTM program. For example, the format for each lesson targeted skills in various ways, but they were written at levels above what most students could comprehend. Additionally, teachers appeared to like the on-line drill practice activities but they felt like combining the on-line drill and teacher-led instruction using word problems would be a more effective method to enhance the learning experience. Based on my review of the above the comments, it is my belief that it might take time to get teachers and students familiar with the curriculum designed used within TTM program. This is significant as the district within this study is still in the early stages of using the TTM program.

While there were many complaints, a new theme captured comments from teachers that expressed their satisfaction with the TTM program. Here are some examples: I "like the program" and "this is a good program." This program is aligned to the state standards. The program is great, but I would recommend more variety of activities. I really like the fact that the program forces the students to think through math content. I am overjoyed when the program assigns additional lessons based on

individual student needs to address gaps in learning and the final comment from teachers was, I think more students can benefit from using the TTM. Upon review of the above comments it appears that teachers did have several positive things to share about the TTM program. The most significant comments to me as the researcher has to doing with knowing that this curriculum resource is aligned to the standards and knowing that teachers see value in this resources. Lastly, although this data is not quantified with a total number of teachers it does provides a sense of hope for the usage of this curriculum resource within schools.

Analysis of TTM Student Performance Mid-Year Achievement Data

The district has kept data that show how many lessons students completed within the program from August 24, 2015 to December 15, 2015. When the program was implemented, the yearly goal was to get students to complete a total of 30 lessons. At the mid-year point, students were expected to have completed at least 15 lessons in order to be considered on track. Based on the data from the TTM summary of performance from August to December, 80% of the students completed at least 10 lessons and 57% completed at least 20 lessons. Additional data from the mid-year student performance review indicated that a total of 102,000 TTM lessons were completed. Based on the data, 89% of students completed more than 5 lessons and 37% completed more than 30 lessons. Of the 102,000 lessons completed, the lesson pass rate was 49%.

Overall the above data indicate that 57% of the students using the TTM program were making sufficient progress based on mid-year progression requirements. Additionally, according to the research that supports TTM, the more lessons students

complete the better chance they have to make gains on high stakes assessments. Therefore, the district must continue to work with schools to ensure that teachers and students are using this curriculum resource with fidelity.

Classroom Observations

During this study, I conducted a total of 70 classroom observations within Intensive Math classrooms. The data collected are reflective of instructional practices observed during these observations. In order to collect and manage classroom observation data, I created the observation protocol form using SurveyMonkey.com (Appendix E). To protect the identity of teachers and schools, I did not collect demographic information during these observations. Again, the observations focused on the instructional practices used by the classroom teachers and the impact on student learning and the classroom environment.

Of the 70 observations conducted, 24 (34.78%) were completed in grade 6 classrooms, 23 (33.33%) in grade 7 classrooms, and 22 (31.88%) in grade 8 classrooms. One of the observations did not indicate the grade level (skipped response). It is important to note that I did not intentionally plan the breakdown of observations conducted by grade level, but it appears that all grade levels were equally represented within the data collected. In many ways this added value to this study as observations were conducted within each grade level and it is reflective of common issues within Intensive Math classrooms. Figure 1 and Table 20 show data for classroom observations.

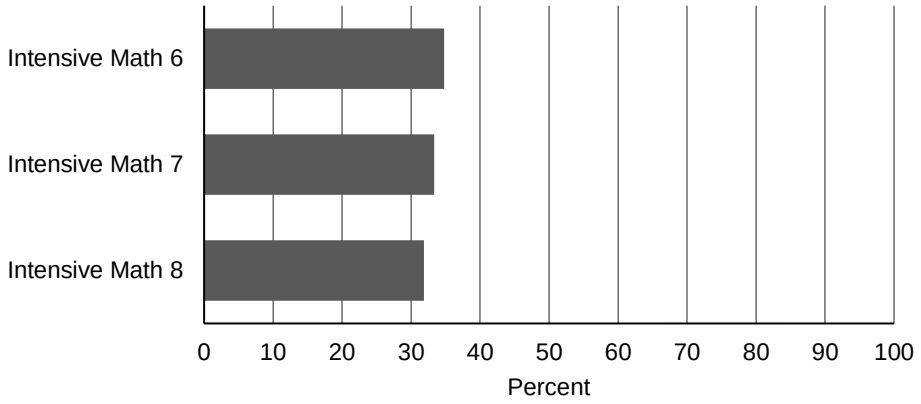

Figure 1. Classroom observation protocol question #1. Grade / course level There were 69 responses and 1 skipped response.

Table 20

Classroom observation protocol question #1, grade / course level.

Answer choices	Responses	
	Percent	Number
Intensive Math 6	34.78	24
Intensive Math 7	33.33	23
Intensive Math 8	31.88	22
Total		**69**

Note: There were 69 responses and 1 skipped response.

I designed Question 2 of the classroom observation protocol to contain several statements which captured information specific to the behavior (instructional practice) of teachers within Intensive Math classrooms. Additionally, the statements within this section highlights the critical components that must be evident within Intensive Math classrooms. Below please find a summary of the data associated with this section of the classroom observation protocol.

Statement 2a, revealed that 70% (49) of teachers showed control of the classroom. On the other hand 30% (21) of teachers had classroom management issues. Although the data revealed that classroom management was not a minor issue in the majority of classroom, it did reveal that several teachers were struggle to maintain

order within their classrooms. Based on my review of the data, the teachers with classroom management issues did not have clear expectation for students. This lack of clear expectations resulted in disorder within the classrooms.

Statement 2b, indicated that only 31% (22) of teachers were assisting students individually or in groups during the conducted observations. 69% (48) of teachers were not assisting students individually or in groups. The data associated with statement 2b was very distributing to me as the evaluator as one of the essential components of the TTM require the classroom teachers to be working with students. During observations it was notes that several teachers were not engaged with students when I entered classrooms. They were often checking emails, grading papers and a few teachers were caught on their personal cell phone, etc. For sure it was dishearten to walk into these classroom to see teacher disengaged from the work.

Statement 2c, was intended to collect data specific to the teacher's monitoring of student progression within the classroom. 40% (28) of teachers were noted monitoring the progress of students. While 60% (42) of teachers were not monitoring the progress of students. Given the level of accountability to ensure the success of students within schools, it is imperative that professional educators determine ways to identify students who are at risk academically and adjust instructional strategies to better meet the needs of their students. Therefore, the TTM program place emphasis on the need for classroom teachers to monitor the daily progress. The goal is to help teachers use student performance data to continually evaluate the effectiveness of their teaching and make more informed instructional decisions.

Statement 2d, focused on the teacher's ability to show a strong understanding of the math content. Based on the data 60% (42) of teachers demonstrated a strong understanding of the math content. While 40% (28) of teachers did not demonstrate a strong understanding of the math content. Upon closer examination of the above data it appears that of the 28 teachers that did not demonstrate a strong understanding of the math content were new to the teaching profession. Many of them struggled to understand the depth of the standards associated with what they were teaching during the time of the observations.

Statement 2e, was used to collect data specific to the usage of various methods of instruction and remediation during off-line time (meaning times when students were not using the TTM online platform). 33% (23) of teachers were using a variety of methods to enhance learning opportunities for students. While 67% (47) of teachers were not using a variety of methods to meet the needs of the students. Determining the level of conceptual knowledge a teacher has is a complex issue that involves understanding underlying phenomena such as the process of teaching and learning as well as the way teachers' knowledge is put into action. It was not surprising to discover that classrooms where teachers lacked the content knowledge in mathematic did not have the structures needed to manage the classroom. As a result students within these classrooms were disruptive and disengaged during the instructional time.

Overall the data collected from the statements within question 2 of the classroom observation protocol is significant to this study as it specifically addresses observed instructional practices of teachers within this study. As notes by several researchers, it is the classroom teachers that has the greatest impact on student

achievement. Effective teachers refuse to take their role within the classroom for grant. These teachers are open to change and they are constantly trying to determine the impact of their instructional practices on student learning. The data from statements 2a and 2d revealed that the teachers within this study were displaying instructional practices that are considered highly effective and that aligns to the TTM instructional format. On the other hand, the data from statements 2b, 2c and 2e was alarming in nature as this data suggested that the majority of the teachers were not using the most effective instructional practices. Additionally, this data indicated that teachers were not implementing the TTM program with fidelity. Figure 2 and Table 21 show data for teacher behaviors.

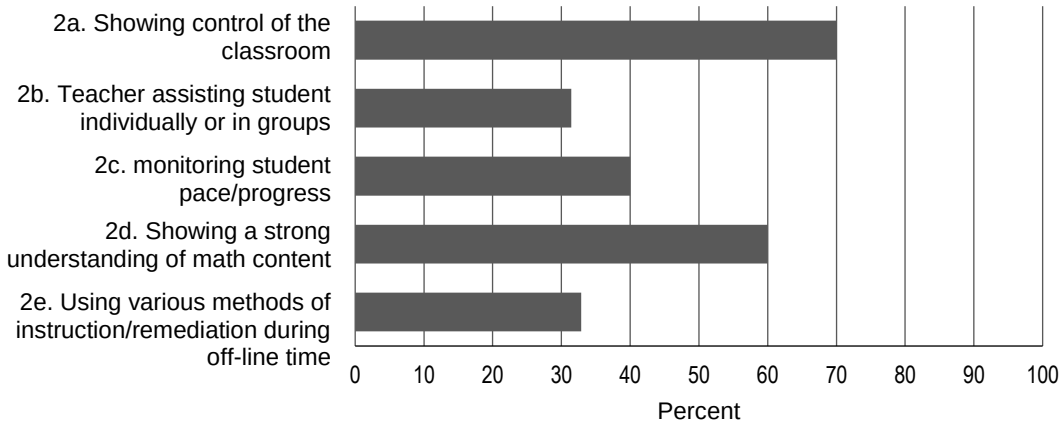

Figure 2. Classroom observation protocol question #2. Teacher behaviors. There were 70 responses and 0 skipped responses.

Table 21

Classroom observation protocol question #2. Teacher behaviors

	Yes		No		Total	Weighted average
	%	#	%	#		
2a. Showing control of the classroom	70.00	49	30.00	21	70	1.30
2b. Teacher assisting student individually or in groups	31.43	22	68.57	48	70	1.69
2c. Monitoring student pace/progress	40.00	28	60.00	42	70	1.60
2d. Showing a strong understanding of the math content	60.00	42	40.00	28	70	1.40
2e. Using various methods of instruction/remediation during off-line time	32.86	23	67.14	47	70	1.67

Question 3 of the classroom observation protocol to contained several statements which captured information specific to the behavior of the students within the observed classrooms. For statement 3a, the observations revealed that 69% (48) of students were focused and engaged on their computer work while 31% (22) of students were not focused and engaged. Statement 3b, indicated that 61% (43) of students were completing practice problems in their student notebooks while 39% (27) of students were not using their notebooks to complete the practice problems. In fact many of these students were off task and disruptive. Statement 3c, indicated that 71% (50) of students were using headphones to listen to the lesson presentations within the program while 29% (20) of students were not.

One mighty wonder why this is significant to this study, but this could have an impact on the learning environment within the classroom as the noise levels could contribute to student distractions. In fact, upon entry into some of the classrooms, students were listening to music videos via YouTube. For sure this was not in the scope of work for this type of classroom. Statement 3d, revealed the 63% (44) of

students were following classroom procedures while 37% (26) of students were not following classroom procedures. Lastly, statement 3e, revealed that during the observations, 41% (29) of students were engaged during small group instruction or peer tutoring for remediation purposes while a whopping 59% (41) of students were not engaged during small group instruction or peer tutoring for remediation purposes. This was a very interesting finding as the small group instruction was designed to be teacher directed, which means the classroom teacher is providing and facilitating the learning. Instead of working with students in small groups, students were directed to work independently or with a peer. In many cases, this resulted in the occasional off task behaviors noted during observations.

The data collected from the statements within question 3 of the classroom observation protocol is significant to this study as it provides feedback about the behavior of students within the Intensive Math classrooms. As noted within the data above many classrooms did not have structures in place to motivate students to be actively engaged during instructional time. This data would suggest that teachers need additional support and training on how to properly create learning environments where students are inclined to take ownership of their learning and are held accountable for misconduct. Figure 3 and Table 22 show data for student behavior.

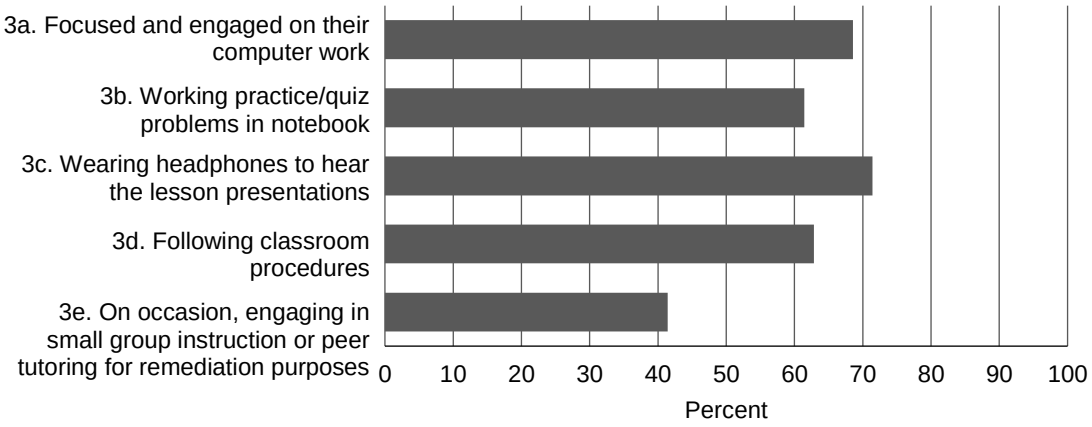

Figure 3. Classroom observation protocol question #3. Student behaviors. There were 70 responses and 0 skipped responses.

Table 22

Classroom observation protocol question #3. Student behaviors

	Yes		No		Total	Weighted average
	%	#	%	#		
3a. Focused and engaged on their computer work	68.57	48	31.43	22	70	1.31
3b. Working practice/quiz problems in notebook	61.43	43	38.57	27	70	1.39
3c. Wearing headphones to hear the lesson presentations	71.43	50	28.57	20	70	1.29
3d. Following classroom procedures	62.86	44	37.14	26	70	1.37
3e. On occasion, engaging in small group instruction or peer tutoring for remediation purposes	41.43	29	58.57	41	70	1.59

Question 4 of the classroom observation protocol to contained several statements which captured information specific to the classroom setting within the observed classrooms. Based on the data collected the majority of classrooms observed had learning environments that promoted student learning. These environments appeared to be conducive to the development of student learners. In observing the classrooms, statement 4a, indicated that 80% (56) of the classrooms were neat and organized,

statement 4b indicated the 66% (46) of classrooms had evidence of classroom rules and student expectations, and statement 4c, revealed that 57% (40) of classrooms had motivational and/or incentive charts posted within the classroom. Additionally, statement 4d, indicated that 47% (33) of classrooms had evident of the usage of progress charts and lesson charts to help students track and monitor their progression of learning. Statement 4e, revealed that 57% (40) of classrooms posted weekly learning goals. Finally, statement 4f, indicated that 70% (49) had textbooks and/or other curriculum resources readily available for student usage.

Based on the data from question 4 of the classroom observation protocol, it was interesting to see that almost half of the classrooms observed did not consistently have classroom settings which consisted of the following critical elements for an Intensive Math classroom: charts posted to motivate student-learning, charts posted that report the lesson progress, and posted targeted goals. Additionally, it is disappointing to see that several teachers had worked to create the conditions for success within the classroom but took no action to ensure successful implementation.

Based on my observations and experience as a professional educator, this appeared to be teachers feeling overwhelmed by the behavior of students within the classroom and giving up. Ultimately, this speaks to the need for school administrators to 1) provide support to teachers within classrooms, 2) hold students accountability for their behavior and 3) carefully consider who they assigned to work with the most struggling students. The common practice of assigning new and/or inexperience teachers to these classrooms most be discontinued. Additionally, the district must examine the level of support provided to the

teachers and the need for additional training. For the training I would highly recommend a shift to job embedded coaching opportunities to support teachers within classrooms.

Figure 4 and Table 23 show data for classroom setting.

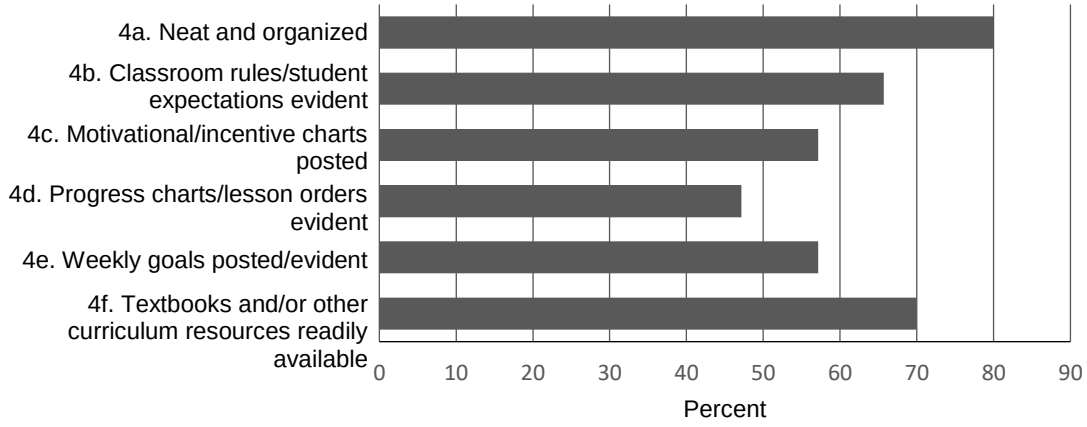

Figure 4. Classroom observation protocol question #4. Classroom setting

Table 23

Classroom observation protocol question #4. Classroom setting

	Yes		No		Total	Weighted average
	%	#	%	#		
4a. Neat and organized	80.00	56	20.00	14	70	1.20
4b. Classroom rules/student expectations evident	65.71	46	34.29	24	70	1.34
4c. Motivational/incentive charts posted	57.14	40	42.86	30	70	1.43
4d. Progress charts/lesson orders evident	47.14	33	52.86	37	70	1.53
4e. Weekly goals posted/evident	57.14	40	42.86	30	70	1.43
4f. Textbooks and/or other curriculum resources readily available	70.00	49	30.00	21	70	1.30

Question 5 of the classroom observation protocol focused on the phrase of instruction specific to the usage of the gradual release model of instructional delivery. The gradual release model of instruction has been documented as an effective approach for improving student achievement and meeting the needs of individual and groups of

students. The four interactive or interrelated components of the gradual release model of instruction that I observed are: explicit teaching, modeling, guided practices and independent practice.

Briefly, explicit teaching is a component that allows the classroom teacher to model his or her thinking and understanding of the lesson and/or concept. Modeling provided both students and teachers with the opportunity to problem solve, discuss, negotiate, and think together. Guided practice is used to guide the learning by questioning, facilitating, or leading students through the task to increase understanding and learning. Independent practice provides students with the opportunity to practice applying information learning in new ways. Independent practice also allows students to synthesize information, transform ideas, and solidify their understanding of information (Fisher & Frey, 2013). Table 24 and Figure 5 represents the number of times teachers were using these teaching components.

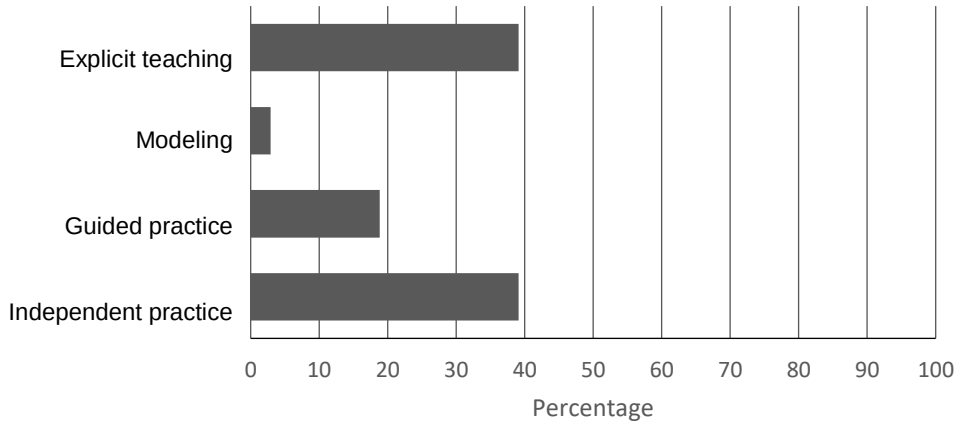

Figure 5. Classroom observation protocol question #5. Phase of instruction: How do I effectively use a gradual release model for instructional delivery?

Table 24

Classroom observation protocol question #5. Phase of instruction: How do I effectively use a gradual release model for instructional delivery?

Answer Choices	Responses	
	Percentage	Number
Explicit teaching	39.13	27
Modeling	2.90	2
Guided practice	18.84	13
Independent practice	39.13	27
Total		**69**

When reviewing the data points for all 70 observations, I noted that teachers were using explicit teaching methods in 27 (39%) classrooms, independent practice in 27 (39%) classrooms, guided practice in 13 (19%) classrooms, and modeling in 2 (3%) of the classrooms. This data is significant as it provides a perspective of what taking place within classrooms. Within an ideal classroom, teachers should be strategically shifting the responsibility within the learning process to the students. This strategic shift of responsibility is designed to have the students gradually assume increased responsibility for their learning. Although, I would have liked to have seen additional evidence of guided practice and modeling within the observed classrooms, the data above indicated that teachers were using a variety of teaching methods within the classroom.

Question 6 of the classroom observation protocol was designed to collect data on the usage of clear learning goals and scales within classrooms. By definition, a learning goal identifies what students will learn or be able to do as a result of teacher instruction and a scale is a continuum that articulates distinct levels of knowledge and skill relative to the topic of instruction. Since the school district in this study used a new teacher appraisal system, which focused heavily on the usage of clear learning goals and scales within classrooms, it was not surprising to see that 64% (45) of the classrooms were

using clear learning goals and scales. Figure 6 and Table 25 show data for providing clear learning goals and scales.

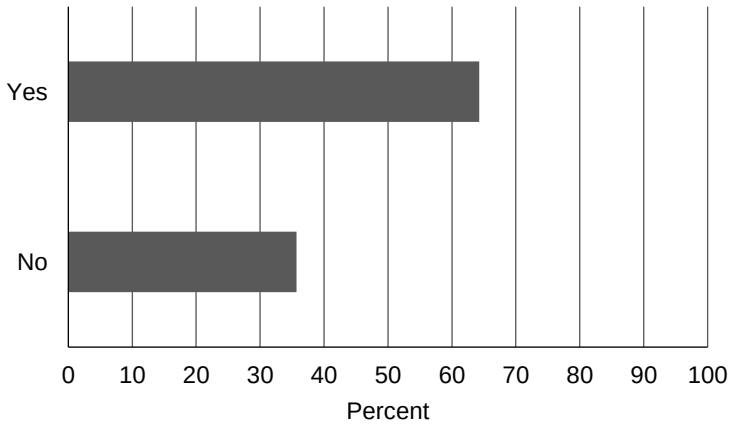

Figure 6. Classroom observation protocol question #6: Providing clear learning goals and scales

Table 25

Classroom observation protocol question #6: Providing clear learning goals and scales

Answer Choices	Responses	
	Percentage	Number
Yes	64.29	45
No	35.71	25
Total		**70**

On the other hand, it was somewhat disheartening to see that 25 (36%) of the classrooms I observed had no evidence of the usage of clear learning goals and scales. To make matters worse students within the observed classrooms could not articulate the purpose of the lesson nor activity. Although, my study did not focus on this component, the teachers within the district has had extensive training on the Marzano Instructional Framework. This framework emphasized the importance of teachers within all classroom using clear learning goals and scales. Additionally, students should be able to articulate the learning goal and to track where they are during the progression of learning using the

scales associated with the lesson. Thus, I created the classroom observation protocol to contain data specific to this critical component. Based on the data collected it appears that additional support is needed to ensure that teachers are setting the purpose of learning and they students can track this progress.

Question 7 focused on the tracking of student progress within the learning process. The concept of tracking student learning is as equally important as the concept specific to the usage of clear learning goals and scales within classrooms. As stated earlier, the school district in this study implemented a teacher appraisal system that focused heavily on the usage of learning goals and scales and the tracking of student progress. Figure 7 and Table 26 show data for tracking student progress.

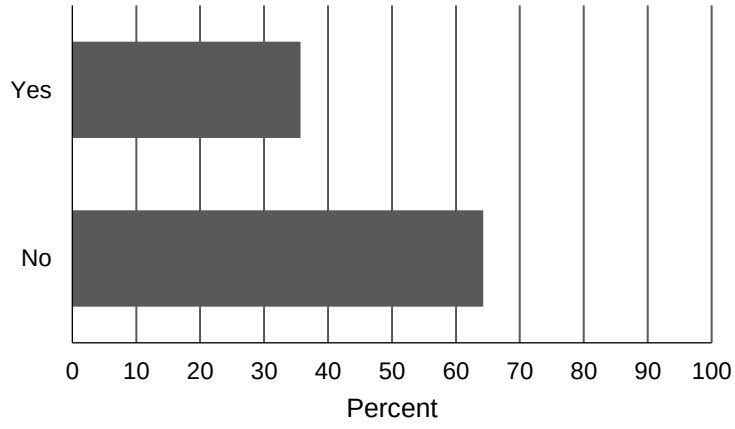

Figure 7. Classroom observation protocol question #7: Tracking student progress

Table 26

Classroom observation protocol question #7: Tracking student progress

Answer Choices	Responses	
	Percentage	Number
Yes	35.71	25
No	64.29	45
Total		**70**

The data collected within the 70 classrooms indicated that 64% of the classrooms had no evidence of tracking student progress, while only 36% of the classrooms had evidence of it happening. The data would clearly suggest that teachers have not embraced the critical nature of having students track their progress towards the mastery of standards. Therefore additional training and support must be implemented to help teachers see the value of this work. The strategy of tracking student progress on specific learning goals is well supported and many would say that this strategy helps students set goals and perform other related functions. Unfortunately, this strategy has was not evident within the observed classrooms. Similar to the discussion on the usage of learning goals within classrooms this strategy is supported by Marzano Instructional Framework which is used to evaluate teachers within the district.

Conclusion

The findings in this case study provided important information regarding the impact of the Think Through Math program used to support students who struggle to perform at a proficiency rate of Level 3 as measured by the Mathematics Florida Standards Assessment. As stated earlier, the Think Through Math program was implemented within the school district during the 2014-2015 school year, and it was designed to support students in grades 6 through 8 who were identified as being at Level 1 or Level 2 in mathematics as measured by the statewide-standardized assessment. The four research questions I used to guide my exploration of this topic required the gathering of multiple forms of data, which included the teacher surveys, classroom observations, and student performance data. In Chapter 5, I presented an overview of the problem and summary of the findings. As indicated within this section, it is my belief that the district

must analyze the staffing practices used within schools. Many of the teachers who used the TTM program during the first year (2014-2015) were no longer assigned to classroom using the program during the second year (2015-2016). In fact, 33 (67%) of the 49 were within their first full year of using the TTM program during the second year of implementation. This is significant as the turnover of staff creates majority challenges to the successful implementation of any initiative.

This also impacts the ability for the district to truly obtain input from teachers regarding curriculum resources. For example, priority to the implementing the TTM program within Intensive Math classrooms in 2014-2015 teachers were involved in the decision making process. However, many of the teachers involved during that time period did not continue to use the program beyond the first year. The biggest reason was associated with the fact that the teachers did not want to be negatively impacted as measured by their Valued Added Model (VAM) scores. As determined by the Florida Department of Education, VAM is used to help determine the teacher's impact on student achievement. Although, many might not understand the long term impact of VAM, most seasoned teachers within the district elected to teach higher performing students. Unfortunately this becomes a vicious cycle that requires school based administrators to confront and break.

Specific to the required trainings it appears that the district within my study took the necessary approaches to ensure that teachers were properly trained. However, it was apparent that teachers were not effectively nor consistently implementing what they had learned during trainings within classrooms. Based on my review of the data the biggest barrier was associated with the ability of the classroom teacher to truly manage the

learning environment. The inability to manage any classroom environment would impede a teacher's ability to effectively teach. Therefore, perimeters must be put in place to help teachers determine ways to better manage the learning environment.

SECTION FIVE: JUDGMENT & RECOMMENDATIONS

Judgment

Students who lack the basic foundational skills in mathematics often struggle to perform well in math classes and on standardized assessments. Therefore, effective math intervention programs must be designed to meet the multitude of needs of at-risk students. Additionally, teachers assigned to work with these students must have the knowledge and overall capacity to meet the individual needs of students. The Think Through Math program was designed to support students who lack the basic foundational skills in mathematics. Additionally, the program was designed to build students' confidence and competence in mathematics, while providing teachers comprehensive data to ensure success (Thinks Through Learning Inc., 2015). Since this curriculum was designed to support students in mathematics, the district in this study discussed how to use this resource to support students in middle school Intensive Math classes. The ultimate goal for using this resource was to improve student achievement as determined by the resulting scores on various assessments.

The primary goal of this program evaluation was to determine the effectiveness of the Think Through Math program that is being used in middle school Intensive Math classes. Evaluating the implementation and usage of this program is critical. The feedback regarding the quality of the TTM program and its impact on student achievement will help the district in my study to determine if this program is yielding a positive return on investment. And if not, why not and what can be done to enhance the program to better meet its ultimate goal of increasing student achievement? The guiding questions with a brief summary of findings follow (more specific information is located in Chapter 4).

Primary question 1:

What do middle school Intensive Math teachers report as working well with the implementation of the TTM curriculum?

When reflecting on the many data points, there were mixed comments regarding what teachers are reporting as working well with the implementation of the TTM program. When asked about the impact on student learning, the following feedback was obtained: of the 49 teachers who completed the survey, 15 teachers indicated that their students enjoy using the TTM program, while 23 teachers disagree or strongly disagreed, and 11 teachers were either undecided or did not indicate a response. When focusing on student improvement of math skills, 20 teachers agreed or strongly agreed that their students were improving, 9 teachers disagreed or strongly disagreed, and 20 teachers either were undecided or did not indicate a response. When reflecting on the data regarding technology, 90% (44) of the teachers indicated that they had enough working computers to permit students to rotate through using the program. However, many identified glitches within the software and network capacity problems that resulted in loss of instructional momentum and off task behaviors of students within the classroom.

Primary question 2:

What do middle school Intensive Math teachers report as not working well with the implementation of the TTM curriculum?

When reflecting on the data specific to this question, teachers expressed an overall dissatisfaction with the professional development associated with this program and the structure of the curriculum specific to how they were directed to use it to support student learners. Teachers shared comments like: allow more time for small group

instruction within the classroom; provide more direction on what students should be recording in their notebooks while using the TTM program; provide more resources to help support students; and give teachers the autonomy to build learning pathways for student's verses allowing the software to dictate instructional pathways for the students. Upon taking a closer look at comments specific to the teacher's dissatisfaction with professional development, it was interesting to read the individual comments and to see how the comments connected to the data from questions 14-16 on the teacher survey. A brief summary of these data follows, however, specific data for these questions can be located in Chapter 4 of this study. During the first year of implementation (2014-2015), 75% (37) of the teachers who completed the survey participated in the required training. In contrast, only 55% (26) of the teachers assigned to Intensive Math classroom during the 2015-2016 school year participated in the required training. On the other hand, 45% (21 teachers) of the 2015-2016 Intensive Math teachers reported that they did not take part in TTM training. This is very interesting data and it has the potential to have a negative impact on a school's ability to implement this program with fidelity.

Primary question 3:

> What do middle school Intensive Math teachers report as major obstacles in the implementation of the TTM curriculum?

According to the feedback from teachers, the top barriers associated with the district's implementation of the Think Through Math curriculum were: student motivation, academic rigor, and the usage of technology. The overall comments regarding the motivation of students were mostly negative. The teachers reported that their students were disinterested, disengaged, and not motivated to learn in class. Based

on my experiences as an educator, it is my belief that students who express a disinterest or lack of motivation in school lacks the capability and/or skills needed to complete a task. They often see little value in the work and they do not believe that their efforts will improve their academic performance. This can be associated with the fact that students have not experienced a level of success within schools. Therefore, it is imperative that structures are in place to support student achievement efforts. Simply stated students must perceive classroom climates as supportive learning environments.

Regarding academic rigor, teachers shared comments that could be interpreted as high frustration levels of the students. This was described as being related to the lack of basic math skills needed to benefit from the program. In addition, teachers expressed concerns associated with the lack of academic alignment of the Intensive Math class to the district's pacing guides for grade level math courses.

The final barrier reported was related to the usage of technology. Overall, the comments indicated that teachers did not have enough computers and bandwidth. Also, the comments indicated that many teachers had issues with wireless access, which had a negative impact on the student's ability to access the TTM curriculum resources (software).

Primary question 4:

What do middle school Intensive Math teachers suggest as ways to improve the implementation of the TTM curriculum?

When focusing on ways to improve the implementation of the TTM program, the following three topics were among the most common responses: technology (access & usage), curriculum design, and buy-in. Regarding the access and usage of technology,

teachers made comments like: provide more computers; provide better bandwidth as often times computers freeze up; the network runs slow; set restricts on the computers to block students from going to other websites; and provide teachers and students with additional training using the software.

Additionally, teachers expressed a dissatisfaction with the structure of the curriculum and how they were directed to use it to support student learners. Teachers shared the following comments: allow more time for small group instruction within the classroom; provide more direction on what students should be recording in their notebooks while using the TTM program; provide more resources to help teachers support students who are functioning well below grade level expectations; and give teachers the autonomy to build learning pathways from student's verses allowing the software to dictate instructional pathways for the students.

The final improvement recommendation was centered on the concept of buy-in. The topic of buy-in appeared to be closely connected to "motivation and attitudes" of stakeholders (students and teachers) using the TTM curriculum. Comments included such issues as: students are off task often; the district needs to consider another problem that aligns with the primary math class (this was stated multiple times); allow teachers to have the autonomy to use the program as they desire to support students; and allow teachers to have a say regarding the curriculum resources purchased.

Primary question 5:

> What do current test data, including teacher's perceptions of student academic growth, indicate regarding the program's impact of student achievement?

As stated in my response to the first question when asked what is working well, of the 49 teachers who completed the survey, 15 teachers indicated that their students enjoy using the TTM program. Twenty-three teachers disagreed or strongly disagreed and 11 teachers were either undecided or did not indicate a response. It is no secret that many students are not intrinsically motivated to do math. However, for the students within this study who indicated that they enjoyed using the TTM program, they credits the actual TTM platform for making learning math fun while competing with their peers.

Students are more motivated to not only complete their independent practice, but to go beyond with the incentive to use Think Through Math in class. Students are more motivated to complete homework when they know they have the availability of a live teacher to help when needed. Students are more motivated to achieve higher (and do) as they enjoy competing with their peers.

When focusing on student improvement of math skills, 20 teachers agreed or strongly agreed that their students were improving. Nine teachers disagreed or strongly disagreed, and 20 teachers either were undecided or did not indicate a response. I compared the data collected from teachers specific to their feelings about student performance to the data from the most recent administration of the Florida Standards Mathematic Assessment. It showed that about 32% of students placed in Intensive Math during the 2015-2016 school year moved from an achievement Level of 1 to a Level 2 or higher. Table 26 contains end of year performance data as measured by the Florida Standards Math Assessment for students who were placed into Intensive Math during the 2015-2016 school year.

Table 26

A summary of 2015-2016 FSA math performance data

Achievement levels	Count of students	Percent of students
Level 1	2285	68
Level 2	761	23
Level 3	244	7
Level 4	38	1
Level 5	8	0
Grand Total	3336	100

Source: Claitt School District Student Management System (2015)

It is critical to understand that these students were placed in the TTM program because they scored a Level 1 on the prior year's statewide assessment in mathematics. At the start of the 2015-2016 school year, 3,336 students were placed in Intensive Math since they scored a Level 1 on the prior year's math state assessment. Of that number, 68% of the population served remained at Level 1 and 32% of these students moved up a level as measured by the end of year state assessment. While these data revealed that some students are making progress, further analysis is needed to determine if the students who remained a Level 1 had any academic growth at all.

Primary question 6:

Are teachers delivering TTM instruction as required by the program with fidelity?

As indicated throughout this study, to establish accountability for student outcomes, it is critical to evaluate and document the fidelity level of implementation of the Think Through Math program. Fidelity of implementation is defined as the accurate and consistent application of an agreed upon procedure. Additionally, in order for an outcome to be attributed to a plan, it is necessary to know if the plan was implemented and then implemented as planned on a consistent basis. When plans, methods, or

programs are implemented as planned, outcomes and data can be determined to be reliable and valid.

Based on my review of the data collected during this study, several things suggest that the TTM program was not implemented with fidelity. As revealed in Chapter 4 regarding the participation in the required TTM training during the 2015-2016 school, of the 47 respondents who completed the survey, 21 (45%) of the teachers did not take part in the required training. Therefore, the question to ask is: how could these teachers effectively implement a program in which they were not trained to do so? Since these teachers did not take part in the required training, one could conclude that the program was not consistently implemented with fidelity. Therefore, the data collected on question 16 of the teacher survey does not truly measure the quality of the professional development provided to the teachers. The data contain a mixed level of responses; it appears that the teachers who did take part in training had a positive attitude about the training. Moving forward it is imperative that the district within my study continue to provide high quality professional development trainings for teachers. Beyond having teachers report to a one day training session, the district must provide opportunities for teachers to engage in ongoing job embedded training opportunities. These job embedded training opportunities must be in the form of side-by-side coaching within the classroom when students are present. This is many ways would add value and meaning to the training components and it will help those with classroom management issues improve.

As suggested by research, the implementation level of the fidelity of interventions is essential to establish the reliability of a student's response to intervention. We cannot

know that a student has a poor response to intervention unless we can document that the intervention was implemented appropriately and as planned. Again, the findings in this study suggest that TTM strategies in several schools were not implemented in the Think Through Math program with fidelity.

Summary of Findings

In general, research on the Think Through Math program has some shown positive results on the achievement of students in mathematics. Most of the data used to support the usage of this program and its impact comes out of the state of Texas. It has embraced the use of Think Through Math curriculum as a primary source of support for students. Additionally, the data indicate that improved math performance scores have resulted from using TTM regardless of a student's gender, ethnicity, or language background. It also indicated that student achievement is a byproduct of the ongoing usage of the TTM program.

Furthermore, TTM maintains that its curriculum and materials are of high interest and help provide and sustain student engagement and motivation and enhanced learning. Per the evaluation conducted in the state of Texas, students in Grades 3-8 who attempted 20 or more Think Through Math lessons had statistically significant higher STAAR-Mathematics (Texas state math assessment) scores than non-users. Additionally, TTM users who attempted 20 or more lessons achieved an average 90% pass rate on the STAAR-Mathematics exam versus only a 74% pass rate for non-TTM users. This confirms the notion that the more TTM lessons students passed, the more likely they would perform well on state wide standardized assessments (Think Through Learning, Inc., 2015).

When reviewing, the data collected during my study that focused on the implementation and usage of the TTM program in the Claitt District, my data indicated both positive and negative outcomes and beliefs about TTM. First, one must understand that, unlike the state of Texas where the program has been used for a number of years, the district in my study implemented the program only in the 2014-2015 school year. Also, during the time of this study, the district was moving into the second year of implementation. Additionally, one must understand that during the second year of implementation, the placement guidelines used to determine which students would be assigned to Intensive Math classrooms changed within the district.

The district went from having more than 109 Intensive Math teachers to only 64 teachers, meaning fewer students were being placed into Intensive Math classrooms. This did not mean that fewer students needed this intervention; it meant that schools were forced to focus only on the students who struggled the most in math. With the changes that took place between the two years, it would appear that the focus and emphasis on professional development was given less attention. Forty-five percent of the teachers did not take part in the required training, and no one from the district office took ownership to ensure that all teachers assigned to teach using TTM were trained. As stated previously, I believe the lack of engagement in professional development had negative impact on the teacher's ability to implement adequately implement the TTM program with fidelity.

While the Think Through Math program has proven to be an effective tool, it is the teacher who has the greatest impact on student achievement. Since curriculum mandates usually come from the top down, this type of program implementation does not

include the teacher in the decision-making process. I think it is essential that teachers have an active voice in the implementation of the TTM curriculum or any other program designed for student learners.

Based on feedback from participants in this study, the voice of the teachers can be heard. Teachers in this study expressed a desire for ongoing professional development and side-by-side coaching, and the research supported this level of need. In order to ensure the effectiveness of professional development, it should include theory, demonstration, practice, feedback, and side-by side coaching. It must be continuous. Ongoing professional development focused on student academic growth will strengthen the implementation of the Think Through Math program.

Recommendations

I believe that Think Through Math is a great program for mathematical instruction and, with the proper usage, it can help students achieve at higher levels. In my experience and interaction with the program, I have seen a few things that set TTM apart from other math programs that I have experienced in my 18 years in education. First, its foundation is based on Common Core principals both in the content and assessment. The design of the lessons consists of a few tools to motivate students to performance. Finally, it has the capacity for students to have access to a live teacher at all times while interacting with the program. This capability allows struggling students to learn difficult material before moving on to another topic.

Based on my study's findings, I have five recommendations for strengthening the implementation of the Think Through Math program in Intensive Math classrooms throughout the district. They are:

- Develop ongoing and targeted professional development and in class coaching for teachers to ensure that all aspects of Think Through Math are utilized to their maximum potential.
- Allow teachers to determine instructional pathways for students based on the needs of their students (teacher autonomy).
- Invest in all required materials including computers and headsets necessary to adhere to the program implementation model.
- Assist site administrators in limiting class size to no more than 20 students and in scheduling identified students into 90 minutes of daily math intervention using TTM.
- Ensure that classrooms have the space, hardware, and furniture required for the Think Through Math rotational model.

Implications, Applications, and Directions for Future Research

The Think Through Math program is used in this district as a tool to help students in Intensive Math classes to improve math fluency and comprehension. An analysis of related literature and data support its adoption and implementation. Some important research validates that students who are actively engaged in learning using this program are more successful academically than those who are not

Teachers within my study's district are familiar with the TTM program, but they lack a deep understanding of the program, its potential, and portions of the rotational model for instruction required in the TTM classroom. While the teachers in my study have attempted to use TTM in their classrooms, few have experienced the desired results as measured by student achievement and my classroom observations. The results from

this study provide support for future teachers within the district assigned to use the Think Through Math program and the school leaders. As indicated from this research, the need to implement on-going quality professional development for the program is imperative. Also, the need to provide teachers with autonomy within their classrooms to use the program to support student learning is critical.

Conclusion

Think Through Math is a revolutionary program used to support student learning of math standards. This technology based program was designed to combine a blend of adaptive assessment, skill building activities, student motivation strategies, and individualized live instruction. The entire program is geared to enhance classroom learning by filling gaps in learning for students.

The TTM's goal is to support students as they prepare to meet the rigor of the math standards associated with Common Core and its accompanying assessments. Effective assessment of student learning should include a variety of approaches that account for the strengths of students with different learning styles. It contains various types of measures that can be used to track and determine student progress over time. It is my belief that the Think Through Math program provides an organized and effective approach to ongoing assessment of student learning progression.

It uses strategies most essential to increasing student's achievement data. It is aligned in content, process, and assessment. It encourages critical thinking and problem solving development, provides students with access to critical math formulas and key mathematics vocabulary terms, and other important math learning needs. Finally, it is my belief that once the district in my study addresses the concerns associated with the

implementation of this program and develops a method to provide on-going support to teachers and students, significant learning gains will result.

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Appendix A: Teacher Informed Consent

Teacher Classroom Observation & Survey: Individual Participant

My name is Dywayne B. Hinds, and I am a doctoral student at National Louis University, Tampa, Florida. I am asking for your consent to voluntarily participate in my dissertation project. The study is entitled: AN EVALUATION OF ONE DISTRICT'S THINK THROUGH MATH PROGRAM AND CURRICULUM IMPLEMENTATION. The purpose of the study is to understand the effectiveness of the Think Through Math (TTM) program used within middle school intensive math classes throughout the district. This evaluation will focus on instructional practices of middle school math teachers assigned to teach intensive math classes throughout the district.

My project will address the effectiveness of the Think Through Math program which is being used within middle school intensive math classes. I will take a close look at the district provided staff development, program implementation, use of instructional resources, and the impact it is having on student achievement in the area the mathematics. Additionally, I will look at the fidelity of its implementation. I will use the data I collect to understand the process and changes that may possibly need to be made regarding the usage of the TTM program within intensive math classes. I will survey voluntary participants in regards to their thoughts on the implementation and usage of the Think Through Math program throughout the district.

You may participate in this study by signing this Consent form indicating that you understand the purpose of the classroom observations and agree to participate in an online survey that I will give to you. All information collected in the survey reflects your experience and opinion as a teacher providing instruction to students using the Think Through Math program.

Your participation is voluntary and you may discontinue your participation at any time. I will keep the identity of the school and all participants confidential, as it will not be attached to the data and I will use pseudonyms for all participants. Only I will have access to all of the surveys, which I will keep in a locked cabinet at my home and on a password protected hard drive, to which only I will have access. Participation in this study does not involve any physical or emotional risk beyond that of everyday life. While you are likely to not have any direct benefit from being in this research study, your taking part in this study may contribute to our better understanding of the implementation and usage of the TTM program throughout the district and what changes, if any, need to be made.

While the results of this study may be published or otherwise reported to scientific bodies, your identity will in no way be revealed. You may request a copy of this completed study by contacting me at dhindsd@my.nl.edu.

In the event you have questions or require additional information, you may contact me at: phone: (813) 928-4233 or email dhinds@my.nl.edu. If you have any concerns of questions before or during participation that you feel I have not addressed, you may contact my dissertation chair, Dr. Jim Schott, email: jschott@nl.edu; phone (407) 251-8001; 5110 Sunforest Blvd. #102, Tampa, FL 33634; or EDL Program Chair (Dr. Norm Weston, NWeston@nl.edu; 1.233.2287; or the NLU's Institutional Research Review Board: Dr. Shaunti Knauth, NLU IRRB Chair, shaunti.knauth@nl.edu, 224.233.2328, National Louis University IRRB Board, 122 South Michigan Avenue, Chicago, IL 60603.

Thank you for your participation.

Principal Name (Please Print)

_____ _____
Principal Signature Date

Dywayne B. Hinds

_____ _____
Researcher Signature Date

Appendix B: School Site Administrator Informed Consent

My name is Dywayne B. Hinds, and I am a doctoral student at National Louis University, Tampa, Florida. I am asking for your consent for selected staff at your school to voluntarily participate in my dissertation project. The study is entitled: AN EVALUATION OF ONE DISTRICT'S THINK THROUGH MATH PROGRAM AND CURRICULUM IMPLEMENTATION.

The purpose of the study is to understand the effectiveness of the Think Through Math (TTM) program used within middle school intensive math classes throughout the district. This evaluation will focus on instructional practices of middle school math teachers assigned to teach intensive math classes throughout the district.

My project will address the effectiveness of the TTM program which is being used within middle school intensive math classes. I will take a close look at the district provided staff development, program implementation, use of instructional resources, and the impact it is having on student achievement in the area the mathematics. Additionally, I will look at the fidelity of its implementation. I will use the data I collect to understand the process and changes that may possibly need to be made regarding the usage of the TTM program within intensive math classes. I will survey voluntary participants in regards to their thoughts on the implementation and usage of the TTM program throughout the district. I will survey up to 135 intensive math teachers in regards to their thoughts on the implementation and usage of the Think Through Math program.

I will give teachers who volunteer a printed survey to be completed and returned using specific instructions as included, and an Informed Consent form indicating that they understand the purpose of the survey and agree to take the survey. The survey should take approximately 30 minutes to complete. Also, participating teachers may volunteer to allow me to conduct classroom observations. These observations are designed to collect data regarding the instruction practices. All information collected in the surveys and classroom observation reflects the experience and opinion of teachers regarding the implementation and usage of the TTM curriculum.

By signing below, you are giving your consent for me to ask for voluntary participation from selected stakeholders to participate in this research study: to complete a survey and participate in classroom observations.

All participation is voluntary and you may discontinue your participation at any time. I will keep the identity of the school and all participants confidential, as it will not be attached to the data and I will use pseudonyms for all participants. Only I will have access to all of the surveys and classroom observation notes, which I will keep in a locked cabinet at my home, and on a password protected hard drive, to which only I have access. Participation in this study does not involve any physical or emotional risk beyond that of everyday life. While you are likely to not have any direct benefit from being in this research study, your taking part in this study may contribute to our better understanding of implementation and usage of the Think Through Math program throughout the district and what changes, if any, need to be made.

While the results of this study may be published or otherwise reported to scientific bodies, your identity will in no way be revealed. You may request a copy of this completed study by contacting me at dhinds1@my.nl.edu.

In the event you have questions or require additional information, you may contact me at: phone: (813) 928-4233 or email dhinds@my.nl.edu. If you have any concerns of questions before or during participation that you feel I have not addressed, you may contact my dissertation chair, Dr. Jim Schott, email: jschott@nl.edu; phone (407) 251-8001; 5110 Sunforest Blvd. #102, Tampa, FL 33634; or EDL Program Chair (Dr. Norm Weston, NWeston@nl.edu; 1.233.2287; or the NLU's Institutional Research Review Board: Dr. Shaunti Knauth, NLU IRRB Chair, shaunti.knauth@nl.edu, 224.233.2328, National Louis University IRRB Board, 122 South Michigan Avenue, Chicago, IL 60603.

Thank you for your participation.

_____
Principal Name (Please Print)

_____ _____
Principal Signature Date

_____
Dywayne B. Hinds

_____ _____
Researcher Signature Date

Appendix C: E-mail Invitation to Potential Participants

Dear (INSERT TEACHER'S NAME),

Claitt District Intensive Math Teacher Survey

My name is Dywayne B. Hinds, and I am a doctoral student at National Louis University, Tampa, Florida. I am asking for your consent to voluntarily participate in my dissertation project. The study is entitled: AN EVALUATION OF ONE DISTRICT'S THINK THROUGH MATH PROGRAM AND CURRICULUM IMPLEMENTATION". The purpose of the study is to understand the effectiveness of the Think Through Math (TTM) program used within middle school intensive math classes throughout the district.

My project will address the effectiveness of the Think Through Math program which is being used within middle school intensive math classes. I will take a close look at the district provided staff development, program implementation, use of instructional resources, and the impact it is having on student achievement in the area the mathematics. Additionally, I will look at the fidelity of its implementation. I will use the data I collect to understand the process and changes that may possibly need to be made regarding the usage of the TTM program within intensive math classes.

You may participate in this study by providing me with feedback using the link below:

https://www.surveymonkey.com/[no longer active]

All information collected in the survey reflects your experience and opinion as a teacher providing instruction to students using the Think Through Math program.

Your participation is voluntary and you may discontinue your participation at any time. I will keep the identity of the school and all participants confidential, as it will not be attached to the data and I will use pseudonyms for all participants. Your taking part in this study may contribute to our better understanding of the implementation of this curriculum within the district.

If possible please take a few minutes to complete the survey by October 2, 2015.

Please feel free to contact me should you have questions and/or concerns (my contact information is listed below).

Thanks,

Dywayne B. Hinds, Executive Director, Middle School Education

Appendix D: Teacher Survey

Think Through Math Survey Questions for Intensive Math Teachers

About this survey...

This survey contains questions about your background, satisfaction with the Think Through Math materials and professional development, implementation of Think Through Math (i.e., instruction), as well as your perceptions of this program's impact on students. Your responses are extremely important in helping me understand how the Think Through Math program is being implemented in your school and across the district. No information from this survey will be used to evaluate you in any way. All survey results will be de-identified and reports in aggregate. The survey should take approximately 20 minutes to complete.

Thank you very much for your help!

Demographic Information:

1. How many years have you taught Intensive Mathematics?

___ (0-1) ___ (3-5) ___ (6-9) ___ (10 or more)

2. How many years have you used the Think Through Math (TTM) Program?

___ (0) ___ (1) ___ (2 or more)

3. How many sections of TTM math classes do you teach?

___ (1-2) ___ (3-4) ___ (5-6)

4. What is the average number of students in your TTM classes?

___ (5-10) ___ (11-15) ___ (16-20) ___ (21 or more)

5. How many of computers are assigned to your classroom for daily usage?

___ (0-5) ___ (5-10) ___ (11-15) ___ (16 or more)

Instructional Focus

6. What is the average number of minutes' students spending on the classroom computer per week completing TTM lessons

___ (0-30 minutes) ___ (31-50 minutes) ___ (51-75 minutes)

___ (76-100 minutes) ___ (101-150 minutes) ___ (151 or more minutes)

7. How many days do most of your students use the TTM software within a class period?

___ (0-2) ___ (3-4) ___ (5)

8. How many days do most of your students participate in a small group instructional segment?

___ (0-2) ___ (3-4) ___ (5)

9. What type of bell schedule does your school use?

___ (Traditional Bell Schedule) ____ (Block Schedule)

10. During the course of ONE MONTH, how often do you access student performance data?

___ daily ___ twice/week ___ weekly ___ biweekly ___ (once a month)

Professional Development and Support

2014-2015

11. During the 2014-2015 school year, how many days did you participate in TTM professional development? (Count a day as 6 hours or more)

___ Yes

___ No

___N/A (I did not use TTM during the 14-15 school year)

2015-2016

12. Since the start of the 2015-2016 school year, how many days did you participate in TTM professional development? (Count a day as 6 hours or more)

___ Yes

___ No

13. Please consider the professional development you received since the start of the 2015-2016 school year. Rate the extent to which you agree with each statement. Check N/A if a statement is not applicable to you.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	N/A
13a. The training sessions had clear goals for what we should learn						
13b. The training sessions were well organized						
13c. The trainers had sufficient experience with the program to answer my questions						
13d. The trainers motivated me to use the program in prescribed ways						
13e. The quality of the training MATERIALS was good						
13f. The Think Through Math professional developers provided feedback to me that helped me better implement the program.						
13g. The training sessions in Think Through Math prepared me to implement Think Through Math in my classroom.						
13h. Think Through Math professional developers are responsive to my questions and needs.						
13i. The amount of Think Through Math professional development I received this year was sufficient.						
13j. The Think Through professional development I have received this year was of high quality.						

Impact on Students

14. Please consider the impact on students. Rate the extent to which you agree with each statement. Check N/A if a statement is not applicable to you.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	N/A
14a. In my opinion most of my students enjoy the TTM program in general.						
14b. In my opinion most of my students are improving their overall math skills.						

Open Ended Questions

15. In your experience, what are major barriers in the implementation of the TTM curriculum?

_____

_____

16. In your experience, what would you suggest to improve the district's usage of the TTM curriculum?

_____

_____

17. What general comments would you like to share regarding Intensive Math and/or the TTM curriculum.

_____

_____

Appendix E: Classroom Observation Protocol

Think Through Math Observation Checklist

Teacher Name: _____ Period: _____ Date: _____

1. Course: Int. Math 6 Int. Math 7 Int. Math 8 School Name: _____

		Yes	No
TEACHER	2a. Showing control of the classroom		
	2b. Teacher assisting students individually or in groups		
	2c. Monitoring student pace/progress		
	2d. Showing a strong understanding of the math content		
	2e. Using various methods of instruction/remediation during off-line time		
STUDENTS	3a. Focused and engaged on their computer work		
	3b. Working practice/quiz problems in notebook		
	3c. Wearing headphones to hear the lesson presentations		
	3d. Following classroom procedures		
	3e. On occasion, engaging in small group instruction or peer tutoring for remediation purposes		
CLASSROOM	4a. Neat and organized		
	4b. Are the following items posted?		
	4c. Classroom Rules/Student Expectations		
	4d. Motivational/Incentive Charts		
	4e. Progress Charts/Lesson Orders		
	4f. Weekly Goals		
	4g. Textbooks and/or other resources readily available		

The above chart was created by Dywayne B. Hinds

Notes/Comments:

_____

_____

_____

Think Through Math Observation Checklist – cont.

*(The language table below is from **Marzano Art and Science of Teaching Teacher Evaluation Model Learning Map** by Dr. Robert Marzano. However, I created the table below to capture data from TTM observations)*

Instructional Layout	☐ Whole group ☐ Small group (teacher-led) ☐ Small group (students-led) ☐ Pairs One-on-one	
DQ1: COMMUNICATING LEARNING GOALS AND FEEDBACK		
Phase of Instruction **5a. How do I effectively use a gradual release model for instructional delivery?**	☐ **Explicit [Teacher]:** Initiates • Activates ☐ **Models [Teacher]** Explains • *Thinks Aloud* • *Shows* ☐ **Guided Practice [Teacher/Student]:** Demonstrates • Leads • Suggests • Explains •Responds ☐ **Independent** [Student]: Applies learning • Takes charge • Practices •Problem solves • Approximates • Self-corrects ☐ **Application** [Student]: Initiates • Self-monitors • Self-directs • Applies learning • Problem solves • Confirms • Self-evaluates	☐ **Engage:** Activate Prior Knowledge/Anticipation of Learning ☐ **Explore:** New Concept(S) w/o Explicit Teacher Intervention ☐ **Explain** Concept(s): Demonstrates • Leads • Suggests • Explains •Responds ☐ **Elaborate/Extend:** Practice and Reinforce of Concept(s) • Applies learning • Takes charge • Practices •Problem solves • Approximates • Self-corrects ☐ **Evaluate**/Assess: Key Concepts and Skill Development • Self-monitors • Self-directs • Applies learning • Problem solves • Confirms • Self-evaluates

CATEGORIES/INDICATORS	**Teacher Evidence**		**Student Evidence**	
6a. Providing Clear Learning Goals and Scales (Rubrics) (The teacher provides a clearly stated learning goal accompanied by scale or rubric that describes levels of performance relative to the learning goal). **_____ Yes** **_____ No**	☐	Teacher has a learning goal posted so that all students can see it	☐	When asked, students can explain the learning goal for the lesson
	☐	The learning goal is a clear statement of knowledge or information as opposed to an activity or assignment	☐	When asked, students can explain how their current activities relate to the learning goal
	☐	Teacher makes reference to the learning goal throughout the lesson	☐	When asked, students can explain the meaning of the levels of performance articulated in the scale or rubric
	☐	Teacher has a scale or rubric that relates to the learning goal posted so that all students can see it		
	☐	Teacher makes reference to the scale or rubric throughout the lesson		
	Teacher Evidence		**Student Evidence**	
7a. Tracking Student Progress The teacher provides a clearly stated learning goal accompanied by scale or rubric that describes levels of performance relative to the learning goal. **_____ Yes** **_____ No**	☐	Teacher helps student track their individual progress on the learning goal	☐	When asked, students can describe their status relative to the learning goal using the scale or rubric
	☐	Teacher uses formal and informal means to assign scores to students on the scale or rubric depicting student status on the learning goal	☐	Students systematically update their status on the learning goal
	☐	Teacher charts the progress of the entire class on the learning goal	☐	

*The language on page 2 is from **Marzano Art and Science of Teaching Teacher Evaluation Model Learning Map** by Dr. Robert Marzano. The format for this was created by Dywayne B. Hinds*