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A Case Study of Differentiated Instruction in Upper Elementary Mathematics and Reading Classrooms

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COLLEGE OF EDUCATION

This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Elementary students in one school have shown a decline in proficient and advanced performance on statewide assessments. This decline increased for reading and mathematics achievement from 2003-2008, especially for disabled and minority students in grades 3-5. The purpose of this qualitative case study was to determine the extent to which differentiated instruction was implemented in instructional practices to increase student academic performance. Vygotsky's theory of constructivism, Bruner's theory of problem solving, and Gardner's theory of multiple intelligences provided the conceptual frameworks for this study. The research questions focused on the instructional strategies and resources used by teachers. Data included interviews, observations, and lesson plans from 2 third-grade, 2 fourth-grade, and 2 fifth-grade teachers. Data were coded using categorical aggregation through the use of inductive analysis to identify patterns. Results included the processes used to determine ability levels, methods used to differentiate instruction, and resources used to supplement instruction. Findings revealed that teachers differentiated instruction using a variety of strategies. It is recommended that a program that features differentiated math instruction could be offered, more time could be allocated for collaborative planning, and support could be offered for classroom management. This research has the potential to effect positive social change by equipping teachers, through professional development opportunities, to implement strategies relative to their students' learning needs.

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Dedication

To my family, who continuously encouraged me through all of my endeavors. Your hard work and support is appreciated more than you know.

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Thank you, God, for with Him all things are possible. I would like to thank the faculty members who served on my committee. Your support and feedback was greatly appreciated.

I would like to thank my colleagues who participated in this case study. Thank you for rearranging your schedules to help me to complete my project.

Last, but certainly not least, I would like to thank my students for adjusting to our changing schedule in order for me to collect data. Thank you for always making connections and doing your best.

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Section 1: Introduction to the Study

In the United States, teachers are responsible for meeting the needs of diverse populations of learners with varying abilities. The stipulations of the No Child Left Behind (No Child Left Behind [NCLB], 2001) legislation mandated progressive improvements whereby all children must score in the proficient or advanced categories as determined by statewide assessments by 2014 (U.S. Department of Education, 2007). Each year these assessments show achievement discrepancies among ethnic, socioeconomic, and ability groups. NCLB has changed since its initiation, but accountability has remained constant (Hanson, Burton, & Guam, 2006). This legislation requires optimal academic performances from all children. To meet the requirements of NCLB, educators should implement methods of instruction that encourage student success.

Currently, an estimated 30 million diverse students, with various abilities, ways of thinking, languages, and a plethora of capabilities for understanding information, compose classrooms (National Education Association Research Department, 2006). Teachers are accountable for providing instruction to all these students. Espinosa (2005) asserted the differences in student backgrounds when she stated

> This growing cultural and linguistic discrepancy between the children enrolled and the teachers who teach them underscores the need for all educators to develop the skills, knowledge, and, most importantly, the attitudes to effectively teach in multicultural and multilingual settings. (p. 837)

Students in classrooms today represent the various cultures that comprise current communities and neighborhoods. University teacher preparation programs should prepare potential educators for working with diverse student populations (Escamillia & Nathenson-Mejía, 2003). Just as one neighborhood varies from another in regards to social and economic measures, so do children's interests and abilities vary. Schools should recognize the backgrounds of the students they serve, determine the needs of the students, and provide the necessary resources that will enable students to be successful.

Many of the research-based instructional strategies that teachers and administrators use include differentiated tactics for conveying information to students by encouraging increased student interaction, engagement, and critical thinking. Because all students are different, educational researchers interested in instructional practices focus on developing strategies that will impact all learners regardless of their differences (George, 2005). The use of various methods to engage students with different academic abilities and strengths is called differentiated instruction (Edwards, Carr, & Siegel, 2006).

Differentiated instruction is not an instructional method, but an innovative way of thinking that tailors instruction to the readiness levels of students (Hollas, 2005). Teachers who differentiate instruction understand how students learn, incorporate individual differences in ability, and provide learning experiences that take this information into consideration (Anderson, 2007). The instructional strategies related to differentiated instruction are intended to allow all students to experience success and meet the expectations of curriculum objectives based on their readiness levels. This type

of instruction encourages students to grasp information at their own pace while they are being held accountable to similar goals and objectives as their peers.

It is imperative that students are provided with instruction that supports their abilities and remedies their weaknesses (Sternberg & Zhang, 2005). Children are then able to experience success, which will promote academic growth. Learning experiences based on students' abilities to perceive information are more effective in conveying information than lessons delivered based on a general readiness level. Academic success or failure is directly related to the instructional practices utilized by teachers (Wenglinsky, 2002) It is important for teachers to determine students' readiness levels and to plan lessons that support them. Adapting instruction to students' diverse academic needs demonstrates an awareness of social change. It is difficult for students to show improvement academically if teachers continue to use instructional methods that do not provide for their students' needs (Tanner, Bottoms, Feagin, & Bearman, 2003). Educators who employ the use of differentiated tactics to encourage students' abilities to retain information recognize the need for varied instruction and are reforming their instructional habits based on the academic demands of learners.

The goal of providing learning experiences that support the abilities of all children should influence the types of instruction utilized by educators and supported by administrative personnel. This section provided the problem statement, the nature and purpose of the study, and the conceptual framework. Also provided were operational definitions of terms used, the assumptions and limitations, and the scope and delimitations.

Problem Statement

There is a problem in U.S. elementary schools. That problem, specifically, is that traditional teaching methods do not consider the differences among students, and instruction should be differentiated to ensure the success of all children. (Anderson, 2007; Edwards et al., 2006). This problem impacts third, fourth, and fifth graders at a rural, southeastern elementary school because there has been a decline in the number of students with disabilities and minority students at this school who scored in the proficient and advanced categories on the reading and mathematics portions of the yearly statewide assessment (X Department of Education, 2006). In this study, I examined strategies that emulated differentiated instructional methods. There have been multiple factors contributing to this problem, among which are the utilization of instructional methods that did not individualize instruction, a lack of professional development opportunities for teachers that supported best practices, a decrease in teachers' motivation to implement experiences that catered to all students, a deficiency in the area of collaboration among teachers, and the absence of professional reciprocal relationships among teachers in each grade level. Differentiated instruction aims to provide lessons that reflect multiple modalities of learning while supporting students' levels of knowledge apprehension (Hollas, 2005). Utilizing strategies that individualize instruction provides both challenges and support of students' unique needs. This study contributes to the body of knowledge needed to address this problem by determining the extent to which differentiated instruction was implemented into instructional practices.

Nature of the Study

This qualitative study was a 4-month examination of differentiated instruction at a single, rural elementary school in the southeastern United States. The school district that this elementary school was a part of offered continual professional development opportunities for teachers as well as purchased software and learning devices geared towards providing instruction for diverse learners. This study focused on reading and mathematics instruction, and I employed a case study design, using six Grade 3-5 teachers from the school. I actively collected data by conducting face-to-face interviews with each participant while audio recording conversations, recording observations, and gathering pertinent documents. To address the issues of quality control, I employed the strategies of (a) member checking, (b) clarification of bias, (c) peer debriefing, and (d) rich, thick descriptions (Creswell, 2003).

Determining the extent to which differentiated instruction was implemented into instructional practices was the goal of this inquiry. The following research questions were addressed in this study:

1. How are various ability levels of students addressed regarding instruction?
2. What process is used to determine students' ability levels in math and reading?
3. What resources are used to supplement and/or enrich instruction?
4. What kinds of strategies are employed by teachers to address students' learning?
5. What concerns do teachers have regarding differentiated instruction?

This elementary school served approximately 850 prekindergarten through Grade 5 students. Throughout the school day, students participated in physical education, music, art, and computer lab classes, which were available to all students. The participants in this investigation included six Grade 3-5 teachers who were responsible for teaching approximately 320 students. In this case study, I interviewed and observed teachers and analyzed pertinent documents. Interviews were transcribed and analyzed for patterns and keywords, which commenced the coding process.

Purpose of the Study

The purpose of this case study was to explore the extent to which differentiated instruction was being implemented in upper elementary math and reading classrooms. This instructional practice was an issue at this school as this innovative strategy emphasized differentiated instruction as a means to increase student achievement on statewide assessments. Differentiated instruction is defined as an instructional strategy teachers use to base instruction on students' readiness levels (Hollas, 2005). The administrators at this school provided various professional development workshop opportunities centered on differentiated instruction in which teachers participated and stressed through faculty meetings the need for tailored instruction to students' learning needs. Additionally, the school district purchased technological resources that encouraged instructional methods based on diverse learning abilities and styles. I focused on instruction in the areas of reading and mathematics.

Conceptual Framework

This study examined differentiated instruction as it related to reading and mathematics. The conceptual framework of this study was based on the theoretical foundations of differentiated instruction and specific perspectives regarding the subject areas of reading and math.

Theoretical evidence of differentiated instruction can be traced through the theory of constructivism (Yuan & Hau, 2006), Vygotsky's (1978) conception of the zone of proximal development, effective problem solving (Vygotsky, 1978) and emphases on the multiple intelligences (Gardner, 1983). The constructivist view relies on students making sense of the world around them through interactions with their surroundings (Yuen & Hau, 2006). "Constructivist teachers, acknowledging the central role of the learner, structure classroom experiences that foster the creation of personal meaning" (Brooks & Brooks, 1993, p. 2). Vygotsky's zone of proximal development plays a role in adapting instruction to students' needs. Bruner (1966) advocated active problem solving by children as a mechanism for making sense of the world. Additionally, Gardner's (1983) theory of multiple intelligences plays a vital role in maximizing the individualization of instruction.

The organizational policies of both the National Education Association (2006) and the National Council of Teachers of Mathematics (2007) recognize the varied cultural backgrounds and academic abilities of student populations and advocate instructional strategies that support students' diverse learning needs of reading and mathematics respectively. These national organizations strive to provide educators with

resources and professional development opportunities that encourage student-centered instruction. “This approach [student-centered learning] empowers students to ask questions, seek answers and attempt to understand the world’s complexities” (Tanner, Bottoms, Feagin, & Bearman, 2003, p. 8). In order to do this, effective reading and mathematics instruction that maximizes student progress in these areas should take place and consider all learners’ differences and learning capacities.

Constructivism is a pedagogical theory that is founded on the notion of student-centered instruction wherein learners create their understanding of information based on previous knowledge, questioning tactics, and individual investigation coupled with necessary teacher support (Straits & Wilke, 2007). This philosophy of thinking provides for the implementation of flexible strategies as it can be applied to learners of all backgrounds and cultures (Chan, Tan, & Khoo, 2007). In the realms of constructivism, humans construct their own meanings of the world (von Glasersfeld, 1981). The act of thinking requires that learners begin with states of doubt and is followed by acts of inquiry to satisfy the perplexity of the situation (Dewey, 1933). Constructivism has been proven to be effective in sustaining students’ attention to tasks and encouraging active learning (Wiersma, 2008), and it mirrors best practices as it spurs higher order thinking skills and academic progress (Bolinger & Warren, 2007). Effective teaching is highly interactive and involves providing students with an opportunity for constructing personal meaning from the learning situation and incorporating that data with previously known information (Marzano, 1992). Constructivist practitioners take into account individual differences and personal experiences. Through this practice, learners must create

knowledge as they perceive it while integrating it into their usual modes of thinking (Gulati, 2008). As knowledge is constructed, it must be assimilated into existing pathways of knowing (Piaget, 1951). This knowledge is created through social interactions and is based on an individual's perceptions of reality (Altun, 2007) through student-centered learning experiences that allocate peer communication (Tsai, 2007). Because constructivism encourages learners to interact with one another, information is gathered through a social approach (Dewey, 1933). When students work together, they are able to build upon existing knowledge and take others' perspectives into consideration to aid in developing concepts and ideas (Havu-Nuuinen, 2005; Oldfather, West, White, & Wilmarth, 1999). When students collaborate with others while amalgamating with materials, they assimilate their understandings with former conceived meanings related to the tasks at hand (Piaget, 1952). Knowledge cannot be handed from parents and teachers to children but can be actively built in the minds of children (von Glasersfeld, 1991). The constructivist theory is the foundation of instructional models that focus on individualism, shared communication, and active learning.

Students' construction of knowledge is the result of interactions and firsthand manipulations of materials and resources. Their abilities are directly related to rich experiences and opportunities as they share and create knowledge with others (Golod & Knox, 1993). It is imperative that children make sense of their world by manipulating objects and materials as they discover meaning, which is the foundation of constructivism (Dewey, 1964). Instructional strategies that are based on this approach to learning allow children to make important decisions regarding multiple choices toward demonstrating

the understanding of information (Saurino & Saurino, 2002). Teachers who support independence in learning provide students with supportive, authentic tasks that allow them to perceive information in ways that they are able to understand, which encourages the students to feel successful and motivated to learn (Reeve & Jang, 2006). The constructivist philosophy promotes learner autonomy (Halat, 2008; Judson, 2006) as instructors provide proper scaffolding techniques to assist in grasping information (Walker & Berthelsen, 2008). It is essential that teachers provide support to learners while facilitating the development of understanding (Tomlinson, 2003). Interactive learning experiences spur academic growth and student success (Curtin, 2005; Yeh, 2006).

Academic progress is dependent upon many factors including the instructional methodology that the teacher adopts. Constructivist teachers base their strategic assumptions on three premises, which include (a) learning is an active process, (b) teaching involves coaching and providing scaffolding measures in efforts to assist students in making meaning, and (c) teaching is viewed as a student-centered process where priority is given to the students' needs (Kim, 2005). Learning is an active process in which children must be given opportunities to explore objects in order to develop their ideas (Dewey, 1956). This approach to learning is concerned with deriving meaning from within while relating it to newly acquired ideas (Null, 2004). Making sense of the world is human nature. Children rely on experiences that involve the manipulation of objects in order to construct internal meanings relative to the given situations (Piaget, 1928). The act of synthesizing what is already known to be true to what is perceived to be accurate is

the essence of understanding as a result of constructing knowledge (Brooks & Brooks, 1999).

Providing opportunities for the process of cognitive development is modeled by constructivist educators. Teachers of heterogeneously grouped students instruct students of varying abilities. Lessons that model constructivism bridge the gap between achievement goals and learning capacities (Gabriele, 2007). Differentiated instruction offers students the opportunities to construct information on their levels of readiness. Because learning and development occur simultaneously, it is important that children are provided with experiences that challenge them intellectually while providing necessary support and encouragement to spur the growth of new information (Vygotsky, 1978). Teaching models that reflect the constructivist theory allot innovative instructional strategies the flexibility towards including a range of abilities, learning needs, and modes. These approaches towards instruction enable teachers to determine the levels of content knowledge possessed by students and what steps are necessary in order to help them achieve proposed objectives under study (Hallden, Haglund, & Stromdahl, 2007). Children's intelligence is directly influenced by their abilities to make sense of the external world (Piaget, 1930). Learning experiences that take the multiple intelligences into consideration adapt to students' modalities of understanding. Vygotsky's zone of proximal development ensures that instruction is based on students' abilities to perceive information which leads to potential success. Practicing effective reading and mathematic instructional methods spurs students' academic growth and generates progress towards meeting the demands of educational accountability. Children learn best when their

individual differences are utilized to plan for instruction (Sternberg & Zhang, 2005). The constructivist theory requires that teachers and students to share the responsibility of what is learned (Schnuit, 2006). This instructional theory is the basis of pedagogies that place students at the center of instruction from which information is derived.

Operational Definitions

The following terms are operationally defined as they were used in the study:

Constructivist learning: An ideology that involves learners determining the meaning of their world based on their conceptions of information brought about by the manipulation of materials (Lambert et. al., 2002). Students maneuver new information into their own personal ways of the thinking. When constructivist learning takes place, teachers monitor and facilitate learning as they provide support as needed.

Differentiated instruction: Innovative instructional strategies aimed towards supporting students' readiness levels while targeting their interests and learning styles (Tomlinson, 2004). Differentiated instruction requires continuous and practical implications in the classroom to meet students' developing academic progress (Hollas, 2005). When implemented in the classroom, this method of teaching addresses learning and cultural diversities of students (Tomlinson, 2005). This creative, instructional approach encourages all learners to be successful and teaches students on their levels of understanding.

Measures of Academic Progress (MAP): This assessment tool is used to inform educators of students' current instructional areas while documenting their strengths and weaknesses in various subject areas. MAP assessments are "state-aligned, computerized

adaptive assessments that provide accurate, useful information about student achievement and growth" (NWEA, 2007, p. 1).

Multiple intelligences: A set of principles developed by Gardner (1983) that describe various ways in which people understand the world and solve dilemmas (Mbuva, 2003). McKenzie (1999) described nine intelligences including the following: visual/spatial, verbal/linguistic, mathematical/logical, bodily/kinesthetic, musical/rhythmic, intrapersonal, interpersonal, naturalist, and existential. Humans exhibit various levels of intelligences in different areas.

Traditional instruction: Teacher-centered, nontactile methods of instruction that infrequently involve student input within the lesson (Lambert et al., 2002). In a classroom that adheres to the standards of traditional instruction, teachers convey information to students through worksheets, lectures, and other ways that do not espouse much effort towards constructing meaning by learners.

Assumptions and Limitations

Schools nationwide serve diverse populations of students. I assumed the following statements to be true regarding the sample, instruction, and students. Teachers are held accountable for providing instruction that incorporates their various needs. Methods of instruction should be provided that enhance students' susceptibility of understanding information and encourage their participation in learning experiences. All learning communities are responsible for proving that their students are learning and retaining information with the use of various assessments.

I took proper precautions to ensure the accuracy of the findings. Therefore, teachers' instructional methods were directly related to their responses on a survey regarding styles of instruction. I interviewed teachers and obtained documents to determine the depth of their use of differentiated instruction to teach reading and mathematical concepts and ideas. A potential weakness of the study was that I was a colleague of the participants at the school. Because of this, teachers might have been hesitant to share their authentic ideas and feelings regarding the questions asked during the interview.

Scope and Delimitations of the Study

This study included six teachers of third-, fourth-, and fifth-grade students at Riverdale Elementary School (pseudonym). These teachers were selected as they had previously received training through the district in the area of differentiated instruction and had taught at this school between 2 and 13 years. Three of the six teachers were certified to teach gifted and talented instruction, whereas one teacher had received National Board Certification. Half of the participants had received their master's degrees and one teacher was in the process of completing her master's degree program. I conducted three interviews with each participant, observed teachers' math and reading lessons, and collected documents including lesson plans and student work which were used for data analysis.

Significance of the Study

Social change happens when behavior adjusts to coincide with current societal occurrences. This study may create positive social change as educators realize the

potential success students were able to make as instruction is adapted to their diverse learning needs. In order to meet the demands of recent federal legislations, educators must adjust instructional practices to effectively serve all students. Locally, teachers in this school district could create an online database where differentiated lesson plans can be stored and shared with colleagues. Also, teachers could develop a blog where they discuss various strategies and techniques that are being used in classrooms to instruct students with various ability levels.

Increased accountability for learning encourages educators to seek strategies that provide support for all learners. Positive social change creates an awareness of possibilities that could occur when similar educational measures are implemented within learning communities. Student populations are becoming multifarious on a daily basis (Tomlinson & George, 2004). Social change that spurs optimistic results for many educational stakeholders will bring teachers closer to narrowing the achievement gap between groups of students.

Social change takes place when members of common environments realize the positive impact of innovative ideas. As educators become conscious of the benefits that differentiated instruction provides, revised instructional habits will begin to emerge. Students will then be encouraged to achieve all that is possible as lessons pertain to their styles and abilities to learn. Social change requires a focused, collaborative effort from all colleagues involved in order to evoke optimistic results.

Summary

In this section, the purpose of the study was explained along with its relevance to positive social change. The achievement gap in reading and mathematics between students at one rural, southeastern school was cited as the focal point of this study. Reasons for differentiating instruction were mentioned.

The constructivist view of learning was discussed in regards to differentiated instruction. Theoretical perspectives from theorists including Bruner, Dewey, Piaget, von Glasersfeld, and Vygotsky were shared. Gardner's theory of multiple intelligences was mentioned as it supported the idea of the individualization of instruction. Pertinent definitions of terms necessary to the study were included.

Section 2 presents the review of scholarly literature that supports this study. In section 3, the methodology is discussed. The presentation and analysis of data is shown in section 4. Finally, I summarize and conclude the research study while providing recommendations in section 5.

Section 2: Literature Review

Introduction

This section reviews literature related to differentiated instruction. The first section describes recent studies focused on differentiated instruction. Subsequent sections examine the need for instructional modifications, detail traditional and differentiated instructional approaches, and investigate innovative strategies as they are used in reading and mathematics classrooms. To find relevant literature to support this study, the databases of Education Resources Information Center (ERIC), ProQuest, and SAGE Journals Online were utilized. The key terms that were used included *differentiated instruction, traditional instruction, reading instruction*, and *math instruction*. Relevant, professional articles available through *Educational Leadership* were reviewed, and texts at the local university library and Walden Library were consulted as well.

Recent Studies

The effectiveness of utilizing differentiated instructional strategies in elementary mathematics classrooms as compared to practices that reflected traditional whole-class methodologies was studied by Luster (2008) through the use of a quantitative ex-post facto study . Luster collected data using a state-specific, criterion-referenced test; participants in the study involved students in six Grade 4 classrooms who were divided into two groups. Group A contained 67 students and practiced traditional whole-class instruction, and Group B contained 68 students and received differentiated instruction. Students in both groups were given an initial pretest and a posttest at the conclusion of the 56-day study. Analyses of *t* tests before and after data collection showed that students

in Group A made an average 0.5% gain in the mean score, whereas Group B made a 6% gain in the mean score. There was a loss of 2.8 points on the mean test score for Group A, and a 17.58 increase in points for Group B.

The collaborative instructional habits of veteran general and special education teachers in inclusion classrooms were examined by Kanellis (2008). This mixed methods study involved the use of surveys, questionnaire protocols, demographic questionnaires, and observations. Kanellis used the surveys and questionnaires to gauge teachers' interest and feelings towards differentiated instruction. Observations were conducted to record the actual instructional practices being used in the classrooms. Data were coded and amalgamated between both methods. Participants in the study were 154 veteran teachers who had taught 3 or more years in general and special education settings. Grade levels from 1 to 12 were represented. Teachers were randomly selected from three urban and one rural school districts. Of the 243 questionnaires and surveys that were distributed, 154 items were returned.

Quantitative data provided by the questionnaires and surveys were analyzed using a two-way ANOVA administration (Kanellis, 2008). There were four observations per pair of general and special education teachers conducted during the duration of this study. The researcher recorded instructional practices used by teachers in the classroom, and data were organized into four categories, which included the following: (a) demographic information; (b) context of inclusion including technical assistance required, resources provided by teachers to students, and the amount of planning time between teachers and

school personnel; (c) students' educational information; and (d) instructional practices utilized by teachers.

At the conclusion of the study, Kanellis (2008) found that there was no relationship between teacher placement and collaborative practices. The study also revealed that special education teachers utilized differentiated instruction strategies while general educators used traditional methods.

The instruction provided by teachers to gifted and talented children in regular elementary school classrooms was investigated by Palladino (2008). The purpose of this 3 month qualitative study was to determine how teachers provided for students whose abilities modeled an advanced curriculum. This case study involved 22 teachers from one elementary school who had been trained to administer differentiated instruction and to teach students with gifted abilities. These teachers represented Grades 1 through 5. Palladino conducted interviews and observations and collected artifacts, which included students' artwork, transcripts, Individualized Education Plans, the school's gifted criteria, and all written work.

Results from the analysis of data showed that teachers perceived gifted students to be different from their peers in regards to ability, and they all used resources to assist in differentiating instruction for students (Palladino, 2008). Common themes that emerged from the data included teachers' quests to find resources that allowed them to provide for all ability and interest levels. In each class, students participated in math stations and reading and writing workshops where activities were differentiated depending on students' levels of understanding.

Determining the ways in which effective differentiation of instruction in reading related to classroom management and how these concepts worked harmoniously to aid students in learning reading skills in inclusive classrooms was the purpose in a study conducted by Miller (2007). The participants in the study included 32 second-grade teachers from nine schools who represented two school districts. These teachers were chosen by the researcher because their schools implemented Reading First Initiatives which required the use of differentiated reading instruction. The students in these teachers' classrooms participated in differentiated learning tasks in reading through small group instruction and literacy center activities.

During the 5-month span of the study, data were collected using observations and pre and post test scores of students' Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments. Miller (2007) observed each teacher's reading instruction 3 times throughout the study. To analyze the information, the researcher used correlational and multiple regression analysis. It was found that there was a relationship between differentiated reading instruction and classroom averages on the fall and winter assessments of students' DIBELS scores. On the fall assessment, students read an average of 54 words per minute, and on the winter assessment, students read an average of 77 words per minute. The researcher also generalized that teachers' uses of differentiated reading instruction in cooperation with classroom management strategies allowed students to become more fluent readers.

The leadership strategies that were being used to implement and sustain differentiated instruction were also investigated. This qualitative study involved 20

elementary and middle school principals and took place over the course of six months. These participants were intentionally selected by the researcher because they had been trained to implement differentiated instruction. Data were collected through telephone interviews with each participant. The researcher used grounded theory to analyze the information which required it to undergo coding three times in efforts to answer the research question.

After data had been analyzed, the researcher found that all of the participants shared common beliefs regarding instruction. The principals all supported the implementation of differentiated instruction in their schools as an initiative to meet the needs of their student populations. At each school, teacher leadership teams were put in place to support teachers' collaboration of instructional methods. The participants also provided staff development for teachers to learn differentiated instructional strategies. Additionally, all of the principals mentioned that the largest factor that deterred the implementation of differentiated instruction in their schools was teachers' belief systems. They believed that some teachers were conservative with their methodological practices, whereas others were willing to try differentiated instructional methods.

Reading teachers' reflections on the actual differentiated instructional strategies practiced in their classrooms were compared to how they perceived this innovation should take place under ideal circumstances was examined. A group of two hundred forty-two elementary school teachers from 12 schools participated in this quantitative study. Their expertise ranged from two to twelve years of teaching experience. Data were collected using a survey over the course of two months. The survey was created by

Bundoc (2007) and included four parts; the first three portions involved teachers' planning and instructional methods and the last portion pertained to demographic information.

The researcher used an exploratory factor analysis to determine similar instances on participants' survey responses. The four factors that were analyzed included the following: ideal practices in differentiated reading instruction, ought practices in differentiated reading instruction, differentiated reading instruction for special populations, and actual practices in differentiated reading instruction. Teachers rated the following factors as necessary components for the successful implementation of differentiated strategies that they actually use and should be included for reading instruction: guided reading groups, small group instruction, leveled readers and individualized materials, considerations of students' accommodations and modifications, and centers and work stations. From the data, the researcher generalized that teachers implemented these instructional practices in their classrooms even though it was a requirement of their school district.

The problem in the current study centered on the decline in the number of students with disabilities and minority students who scored in the proficient and advanced categories on the reading and mathematics portions of the yearly statewide assessment at a rural, southeastern elementary school. There were multiple factors that had a role in this occurrence. It was pertinent to the academic well-being of these students to explore differentiated instruction as this approach to instruction supported the readiness levels of all students. The strategies that encompassed this way of thinking allowed for the diverse

academic needs of students to be met. Participating in learning experiences tailored to students' needs allowed them to experience success while being challenged to meet objectives. Utilizing a one-size-fits-all curriculum served a minimum number of children. Implementing strategies that took into consideration the learning disabilities that students may have as well as possible language barriers increased these children's opportunities to understand and retain information. In this investigation, the depth of the utilization of differentiated instruction was explored.

Through this literature review, I have examined popular approaches to instruction, namely differentiated and traditional instruction. There were comparisons and contrasts of different points of view and various research outcomes were discussed. Ways in which traditional and differentiated instruction were used in the classroom were discussed in this review. Differing points of view by various authors created the cases for the opposing sides. Significant claims made by the researchers enabled the reader to understand the underlying importance of this research study and its significance in the educational field.

This study explored a central question: What was the depth of implementation of differentiated instruction that existed in upper-elementary mathematics and reading classrooms? The literature review began with a discussion of the need for social change in regards to instructional modifications in order to reach increasingly diverse school populations. Next, background was given explaining traditional and differentiated teaching methods. Afterwards, constructivism and best practices were discussed followed by classroom applications.

The Need for Instructional Modifications

Teachers and school districts across this nation are looking for ways that will positively influence student success due to the increasing demands of accountability as deemed necessary by the No Child Left Behind, (NCLB,2001) legislation (United States Department of Education, 2007). NCLB demands an increased accountability of student assessment (VanSciver, 2005). Utilizing differentiated instructional techniques supports students' varying abilities and enables them to internalize meaning from learning experiences.

In the United States, teachers are responsible for meeting the needs of diverse populations of learners with varying abilities. The stipulations of the NCLB legislation mandate progressive improvements, whereas all children must score in the Proficient or Advanced categories as determined using statewide assessments by 2014 (U.S. Department of Education, 2007). However, each year these assessments show achievement gaps between students' learning and academic progress as they are compared among ethnic groups. In 2007, a 4.3% gap existed between African American and European American fourth grade students whose scores ranked in the proficient category in reading as measured by the Palmetto Achievement Challenge Test (X Department of Education, 2008). On the same reading assessment, in 2008, a 15.4% gap was evidenced between African American and European American students' scores (X Department of Education, 2008). The increased accountability measures of NCLB places mandatory requirements on educators to ensure that all students are successful learners.

The importance of providing instruction that meets the needs of all learners in reading is even more apparent based on the achievement gap between ethnic groups during the 2007 and 2008 school year. Recent legislations encouraged these stakeholders to seek innovative methods to enable students to grasp and retain information (U.S. Department of Education, 2007).

Research-based instructional strategies that many teachers and administrators use include differentiated tactics for delivering information to students (Edwards et al. 2006). The hope is that the instructional strategies are consistent with differentiated instruction, allowing all students to experience success and meet the expectations of curriculum objectives. Rief (2005) maintained that "to address the learning differences in all of our students and maximize their levels of performance and achievement, teachers need to 'differentiate instruction' in the classroom" (p. 165). Therefore, the goal of differentiated strategies is to encourage academic progress by supporting each student's learning abilities.

By 2035 the majority of students in the United States will consist of ethnic and racial minorities, immigrants, and non-English speaking families (Tomlinson et al., 2003). Moreover, 82% of public school teachers' classrooms include students with disabilities (National Center for Education Statistics, 2004). Because of the rigorous accountability measures of the NCLB legislation, teachers are less likely to vary their instructional habits to encompass creative means to deliver information which leaves students to receive narrowly focused lessons (Cawelti, 2006). Accountability measures

relinquish teachers' freedoms of implementing a variety of instructional strategies because their abilities as educators are measured by scores on statewide assessments.

Currently, students in today's classrooms exemplify diverse learners from various backgrounds with different abilities (Young, Wright, & Laster, 2005). Not all children arrive at school with the same prior knowledge bases, backgrounds, beliefs, experiences, and may not speak the same language as their peers. However, school systems place all students in the same classrooms, expect them to demonstrate comparable mastery of each standard and show success through formative and summative assessments. As a teacher, this requirement can be a daunting task to reach all students in the classroom and hold them accountable for all objectives and goals while ensuring their personal effectiveness will be sufficient in enabling students to accomplish the expectations of statewide assessments (Tieso, 2004).

School populations are devised of many students who represent various backgrounds, cultures, socioeconomic statuses, and languages (Young et al., 2005) who are required to master identical grade-specific objects regardless of the cities and towns they represent even though a national curriculum is nonexistent (Kilpatrick, 2006). Diverse populations of students require leaders who are aware of the vast needs of the members of the learning community (Dearman & Alber, 2005; Bezzina & Testa, 2005; Quinn et al., 2006). Culturally proficient leaders implement rules, policies, and reform structures that are inclusive of the populations that they serve (Lindsey et al., 2005). Students differ in regards to backgrounds, and they also have a myriad of abilities that teachers are challenged to instruct (George, 2005). However, teachers tend to teach in the

ways that they were instructed and rarely receive training in innovative pedagogical approaches during preparatory courses (Edwards et al., 2006). Because of this type of training, teachers are inclined to deliver information towards one ability level (William & Bartholamew, 2004). This instructional practice leaves students who have abilities above or below the targeted level to sort through the information on their own, become easily distracted, or give up. Children enter schools with a vast array of abilities (Renzulli & Reis, 1998) presenting teachers with opportunities to teach in manners that represent students' aptitudes for understanding information (Winebrenner, 2003). Because differentiated instruction is geared towards educating all students, this approach should be shown some consideration.

Many ideologies exist in education and are based on various theories and perceptions of how to best teach children. In the following sections, traditional and differentiated instruction will be discussed. Both concepts seek to enhance learning and promote student growth. However, differences exist in the process through which each idea is implemented in the classroom.

What Is Traditional Instruction?

Traditional instruction is a method many educators use to convey information and has been practiced for many years. According to Ryder, Burton and Silberg (2006), teachers modeled the targeted behaviors and provided feedback while students practiced each step of the learning process. Walker, Shippen, Alberto, Houchins, and Cihak (2005) described traditional instructional approaches that were useful for students to regurgitate information distributed by teachers. This information received by students depended

solely on the teacher's point of view and interpretation of the subject matter. Students were not encouraged to interact with the information to determine its relevancy to them and how it connected to previously learned information. Shippen, Houchins, Steventon, and Sartor (2005) asserted that this instructional pedagogy embraced small group instruction and choral responses. Through this method, students were not viewed as individual learners as they provided identical responses to questions posed by the teacher (Kilpatrick, 2006). Traditional classrooms were also characterized by modeling and learning experiences that reflected what was previously shown by recalling facts (Zakaria & Iksan, 2007). In this type of classroom, information was exchanged back and forth based on one person's understanding.

According to Zakaria and Iksan (2007), classrooms that modeled traditional instruction was teacher-centered and students view teachers as sole decision makers. Traditional instruction was founded on modeling and reinforcement by the teacher as an approach to convey information to learners (Magliaro et al., 2005). The teacher's role was an integral part of the success of this type of instruction as students must gather information based on the teacher's deliverance of ideas. Students' perceptions of the content was not viewed as important as long as they were able to dispense the knowledge perceived as important by the teacher. "The defining characteristic of direct instruction is that the instructing agent—person or machine—communicates the target knowledge in explicit form, usually via discourse" (Nokes & Ohlsson, 2005, p. 770). The teacher was viewed as the center of instruction from which students ideas or abilities were taken into consideration.

Using the traditionalist method of instruction required that teachers use curriculum ideas already put in place by those in charge. There was no personalization of instruction as teachers often used prescribed dialogue that did not account for students' abilities. Ross et. al. (2004) maintained that this method was founded on prescribed curricula with formatted dialogue that teachers were required to read during lectures. This strategy provided lessons with predetermined discourses between teachers and students.

Traditional instruction aimed to close the achievement gap through using teacher-directed strategies (Grossen, 2004). The framework of traditional instruction provided minimal student interaction where collaboration and development of consensual ideas could take place. Therefore, students relied on teachers for the disbursement of knowledge without utilizing coherent reasoning skills and strategies to gather supporting evidence.

Teachers used their didactic knowledge as a means to instruct students (Brown, 2004; Margolinas, Coulange, & Bessot, 2005; Rittle-Johnson, 2006). Presenting information in this manner did not allow for student interaction with the teacher and placed an emphasis on the teacher as the center of attention. Resnick (2006) mentioned that "traditional educators need to be aware of the gap between that vision and the visions that are a part of the students' (and teachers') contemporary cultural baggage. Negotiating that gap is a fundamental challenge for the traditional educator" (p. 330). This gap between teachers and students was created by the teacher's emphasis on his or her own learning style and way of thinking without including the students' needs as a basis for instruction. Students' thinking patterns and abilities were portrayed as irrelevant

entities in the implementation of direct instruction since their capacities to understand information was not considered.

Due to teachers dispensing knowledge to students rather than allowing them to seek and gather information, students were not held accountable for their learning (Messier, 2005). This meant that students did not hold the responsibility of determining the truthfulness or significance of the content that they received. In a study conducted by Canpolat, Pinarbasi, Bayrakceken, and Geban (2006), the traditional instruction method was analyzed in regards to students' abilities to understand information. The report showed that students who were instructed using the traditional approach received lectures and a myriad of worksheets. Detailed notes relating to the topic being studied were written on the board by the teacher while students copied them. Students taught in this manner were not given the opportunity to experiment with materials which may have aided in clearing up any misconceptions that they may have encountered (Yenilmez & Tekkaya, 2006). In these classrooms, students only received the information that was given to them by their instructors without seeking the answers to questions that they may have about the content. Students who were taught reading skills for example did not comprehend and retain the subject matter as compared to their student-centered learner counterparts (Williams, Hall, Lauer, Stafford, DeSisto, & de Cani, 2005; Lutz, Guthrie, & Davis, 2006). These students depended on the teacher for the information rather than interacting with it themselves which accounted for this discrepancy in results. Additionally, these students lacked the ability to use their higher order thinking skills to solve problems which could have had a profound effect on their perceptions with real-

world situations (Ives & Obenchain, 2006). Because these students became accustomed to information being given to them, they had difficulty thinking independently.

As teachers used direct, traditional instruction approaches, they haphazardly involved preconceived notions regarding subject matter when lesson planning took place. Akkus, Kadayifci, Atasoy, and Omer (2003) mentioned the importance of interrelationships between teachers and students to spur understanding of material. In order to impact students' learning and understanding of information, they must be given a chance to construct meaning based on their perception of the data.

This type of instruction offerred a quick introduction of information because teachers merely passed on the information. Students were minimally held accountable for their learning and mimicked the actions of their teachers (Dale, Jenkins, Mills, & Cole, 2005; Ezarik, 2004). The teacher was in control of dialogue exchanged within the classroom as students were expected to only give answers that had been previously rehearsed and deemed as acceptable. Students who demonstrated initiative towards learning tasks achieved their goals rather than passive learners (Sunger & Tekkaya, 2006). Traditional instruction has rarely been viewed by some educational researchers as a method that supports students' independence and autonomy towards seeking information.

What Is Differentiated Instruction?

In opposition to traditional instruction is differentiated instruction. In order to fully implement differentiated instruction within a learning community, teachers should be properly trained so that they understand the scope of this phenomenon and its

propositions (Polk, 2006). Being knowledgeable of ways to differentiate instruction in regards to mixed ability and culturally diverse learning environments is important for all teachers to master for the sake of their students' academic well-being. This encompasses the ability to activate a student's zone of proximal development which is "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Teachers who understand these techniques inherently motivate and encourage student participation towards learning tasks. Teaching quality, which includes the things that teachers do to improve student learning, and content coverage experience, has more bearing upon student achievement than any other factor such as teaching experience and class size (Park, 2005). Teachers who take the time to plan learning experiences that take students' learning abilities into consideration prevent disruptions and disturbances that may occur in the classroom such as behavioral problems and academic boredom with subject matter (Abebe, 2007). Therefore, maximum instructional time is preserved and optimal learning can take place while "students learn by doing" (Bruner, 2006, p. 12).

Subsequently, a student's readiness level is dependent upon information regarding a certain topic that has been previously understood, practiced, and conceptualized (Tomlinson, 2005). Due to the varying degrees of background experiences held by students, this level differs greatly depending upon the topics focused on in the classroom. Teachers who structure the learning experiences in their classrooms through the use of varied instructional techniques stand a better chance of producing learners who are

motivated to learn and take responsibility for their learning (Yuen & Hau, 2006). This method allows information to be internalized and is tailored to students' ability levels.

Differentiated instruction is an innovative approach to teaching which emphasizes teachers' considerations of all children's learning styles and abilities. This notion is held constant while lessons are planned. These learning experiences hold students accountable for reaching the same goals. As defined by Hollas (2005), "differentiated instruction means that you are consistently and proactively creating different pathways to help all your students to be successful" (p. 2). This process of instruction takes into account learners' differences, needs, and interests (Kelly, 2007). Students are viewed as individual knowledge seekers rather than possessing the identical abilities of their peers.

When teachers differentiate instruction, they provide various avenues in which to present information and determine whether or not students understand concepts that are taught to them. Strategies that teachers may employ include the following: portfolio assessments, journals, grouping arrangements (including flexible learning, knowledge-based ability, peer-to-peer tutoring, and cooperative groups) choice boards, and learning environments that foster student success (Chapman & King, 2005). Portfolio assessments are a collection of student work samples. This formative assessment tool allows teachers to view an array of children's work in order to make informed decisions regarding grades which are usually determined by rubrics. Journal writing activities allow students to reflect on what was learned as well as record further questions that they may have. Flexible learning groups may be applied in a variety of ways dependent on the tasks at hand. These groups are comprised of students whose abilities are homogeneous as

determined by assessment devices. Knowledge-based groups can be composed of students who have similar interests in a topic. In contrast, ability groups are arranged by teachers and are based on students' comparable abilities. Peer-to-peer tutoring groups are composed of high-ability students and those with lower aptitudes. In cooperative learning groups, students complete a mutual project assignment where each learner contributes to the completion of it.

Choice boards give students a plethora of options to display their understanding of information. Children are able to choose assignments that best suit their learning styles and accommodate their readiness levels. These boards are focused on one general topic and are composed of nine project options in which each is based on various learning styles. Students choose and complete the activity that he or she is most comfortable. This encourages student success for all learners (Tomlinson, 2005).

Providing nurturing learning environments is also important to differentiated learning classrooms. Resources and materials that lend themselves to hands-on approaches are desirable because they allow students to construct knowledge on their own coupled with teacher facilitation. Proactive management strategies eliminate negative student behavior while providing positive reinforcement that influences enviable outcomes.

Differentiated instruction offers varied pathways to the perception of information in ways that meet the needs of students (Edwards, Carr, & Siegel). Implementing strategies that accommodate all learners in the classroom potentially equalizes the achievements of these students (Hood & Gerlovich, 2007; Sterberg & Zhang, 2005;

Tomlinson, 2005; Tomlinson & George, 2004). When implementing differentiated instructional strategies, there is the potential that the disparity in today's achievement scores among students gradually diminishes (Tomlinson & George, 2004). Considering students' needs requires that the teacher takes an active role in building relationships among students while finding out their likes, dislikes, strengths, and weaknesses (Reis, Kaplan, Tomlinson, Westberg, Callahan, & Cooper, 1998). To accomplish this task, teachers can use pre-assessment devices to gauge student interest, activate prior knowledge, and to find out children's likes and dislikes regarding certain topics (Chapman & King, 2005). "Diverse classrooms pose many challenges and require teachers to develop a variety of activities to help students understand key concepts and make connections to their learning" (Keck & Kinney, 2005, p. 15). In learning environments where instruction is differentiated for each learner, teachers take students' prior experiences, or lack thereof, into consideration for planning lessons (Tomlinson & George, 2004). This approach proposes multiple avenues for children's vast array of aptitudes.

Hands-on learning and inquiry-based teaching reflect the constructivist theory and are also forms of differentiated instruction. Inquiry-based teaching encourages hands-on learning; objects are manipulated by children and frequent demonstrations are conducted in efforts to seek information (DeKeyser, 2004). This instructional approach requires active learning in which students pose questions of interest and utilize available resources to find answers to those questions (Educational Broadcasting Corporation, 2004). Inquiry-based teaching inevitably creates a connection between content and application

as students must use previously conceived knowledge and apply it to the new situation (Regassa & Morrison-Shetlar, 2007). Hands-on learning allows students who perform at different ability levels to attain knowledge at their levels of understanding and through various modalities of accomplishment (Britsch & Heise, 2006).

Differentiated Instruction and Multiple Intelligences

The fundamental notion of differentiated instruction encompasses the support of multiple intelligences. Both ideologies were founded on the belief that all students have the abilities to learn yet information delivered to them in ways that increase the perception of ideas. Implementing instructional strategies centered on students' propensities to learn increased students' chances for academic success (Voltz, Sims, Nelson, & Bivens, 2008). "Differentiated instruction and multiple intelligences can help foster content literacy among struggling and reluctant learners" (Harushimana, 2008, p. 275). Educators who employed the use of differentiated instruction replicated the work of Gardner (1993) as they allowed for students' various learning styles and encompassed a myriad of abilities (Rule & Lord, 2003).

Gardner's (1983) study of multiple intelligences explained seven strengths that learners have the susceptibility to exhibit in order to apprehend information. These abilities included the following: verbal-linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial, interpersonal, and intrapersonal (Smith, 2002, 2008). In 1999, the naturalistic intelligence was added to Gardner's theory of multiple intelligences.

Verbal-linguistic intelligence involved the impeccable usage of words coupled with dynamic written and oral communication skills (Gardner, 1993). Students who

possessed this type of intelligence were able to write stories and cohesive compositions, listen effectively and respond with profound oral competencies (Voltz, Sims, Nelson, & Bivens, 2008). Verbal-linguistic learners had highly developed capabilities for utilizing words and are able to adapt them to rhythmic patterns as well.

Logical-mathematical intelligence related to learners who had exceptional skills when dealing with the quantification of observations. These students were "number smart" as they were able to compute calculations with ease (Diaz-Lefebvre, 2006). Students who exhibited logical-mathematical intelligence were interested in dealing with abstract, numerical ideas that followed certain steps or formulas that were relative to commonly accepted reasoning strategies (Gardner, 1983).

Musical intelligence pertained to non-verbal sounds in the environment. Learners who utilized musical intelligence were sensitive to pitch, tone, rhythmic patterns, and melodic cadence (Barrington, 2004). These students were sensitive to sounds, could play musical instruments, and were able to sing. Musically inclined learners used this skill to assist them in memorizing information (Hatt, 2007).

Bodily-kinesthetic learners showed exemplary efforts towards using tools and hand-eye coordination (Hatt, 2007). These students also exhibited the use of movement in order to assist in understanding information (McCoog, 2007). The ability to use the body to relate to topics understudy allowed learners to display creativity and ingenuity through dramatic plays and theatrical performances.

Spatial intelligence embodied the necessity of visual competency and a focus on interpretation and design (McCoog, 2007). Learners who possessed spatial intelligence

exemplified their creativity skills with pictures and illustrations to express their understanding of information. Students also displayed their spatial intelligence through the creation of graphs, diagrams, computer slide shows, multimedia projects, mind mapping, and graphic organizers (Haley, 2004).

Interpersonal intelligence referred to the ability to relate to others' feelings while using appropriate socialization competencies (Haley, 2004). Students who had interpersonal intelligence showed unique aptitudes when working with groups of peers. They were especially gifted in regards to teaching and relaying information to others in ways that theya were able to understand (Noble, 2004).

Intrapersonal intelligence took into consideration learners' abilities to be aware of their own feelings, values, beliefs, and thought processes (Kaya, 2008). Students who were interpersonally intelligent enjoyed working in isolation and judged their accomplishments on preconceived stipulations (Noble, 2004). These learners were self-aware and were self-motivated to achieve their goals and met objectives.

Naturalistic intelligence referred to the ability to care for living things and interacted with nature (Waterhouse, 2006). These learners had a profound interest in relating information to elements within the environment. Students with naturalistic intelligence enjoyed activities such as working outdoors and climbing trees (Rettig, 2005). These pupils flourished when they were growing things and collected and analyzed data.

Activities within the classroom that took into account individual learning styles as well as varying degrees of intellectual intensity allowed students with differing abilities

to experience success (Lutz & Huitt, 2004; McGhie-Richmond, Underwood, & Jordan, 2007; Bruce, 2007; Kaufeldt, 2005). Lawrence-Brown (2004) stated that "differentiated instructional strategies [are] a must, especially given the simultaneous push for all students to achieve high standards" (p. 38). Students retained the information when it was delivered through practices that embraced their levels of understanding (Betterton & Ensworth, 2006; Danzi, Reul, & Smith, 2008). With this strategy, each learner had a means for grasping information and applied personal implications.

Effectively differentiated classrooms responded to the individual needs of its learners (Hamm & Adams, 2008; Hoover & Patton, 2005). The kinds of instruction used by teachers who differentiated instruction reflected students' degrees of aptitudes and learning styles (Heacox, 2002; Tomlinson & Kalbfleish, 1998; Levy, 2008; Salmonowicz, 2007; Kapysnick & Hauslein, 2001; Chapman & King, 2003; Anderson, 2007). Implementing both multiple intelligences and differentiated instruction was shown to be beneficial in assisting students with the retention of information (Harushimana, 2008; Hallam, Ireson, & Davies, 2004). Practical implications of multiple intelligences that incorporated differentiated instruction included student-centered experiences that utilized active engagement by providing multimedia presentations; project-based assessments including songs, skits, poetry, and illustrations that depicted concepts, and working within cooperative learning groups exemplified the amalgamation of these strategic approaches (Delaney & Shafer, 2007; Schrand, 2008).

Multimedia presentations involved a myriad of modalities such as interpersonal, logical-mathematical, linguistic, visual-spatial, and bodily-kinesthetic intelligence

(Gardner, 1983; Schrand, 2008). As learners worked collaboratively to prepare a presentation, they were working with one another which required them to use acceptable socialization skills. Logical-mathematical skills were dependent upon when incorporating a sense of order and placement of objects and information, whereas linguistic capabilities were called upon to verbalize and share ideas. Finally, bodily-kinesthetic intelligence emerged when learners reacted in response to the presentation using their bodies to move around.

Project-based learning allowed students to work in small groups while demonstrating their knowledge regarding concepts in a plethora of ways. Through this approach, learners constructed new objects such as collages, songs, skits, poetry, and posters which included illustrations (Cheng, Lam, & Cham, 2008; ChanLin, 2008). Project-based learning offerred opportunities for students to seek answers by applying real-world problem-solving techniques (Lightner, Bober, & Willie, 2007; Murray, Shea, & Shea, 2004).

Creating cooperative learning groups also provided an avenue for the implementation of differentiation of instruction while emphasizing students' multiple intelligences. As students were arranged in these groups, they applied their oral and written communication skills, interpersonal skills, and critical thinking skills while displaying their abilities to work with diverse team members (Lightner, Bober, & Willie, 2007). These learning arrangements were configured according to students' abilities, learning styles, interests in topics, or by random selection (Schnuit, 2006).

Elements of Differentiated Instruction

Tomlinson (1999, 2000) described four necessary components in order for classrooms to be considered differentiated learning communities. These four elements took into account students' levels of understanding, interests, learning profiles, and consisted of the following ideas: (a) *conten*t, or the information that students needed to know and how it would be delivered; (b) *process*, or learning experiences provided to the student to convey the intended message; (c) *product*, or performance assessments that required students to demonstrate mastery in regards to what was learned; and (d) *learning environment*, or the aesthetic qualities of the classroom and its comforting appeal. Content included the prescribed curriculum taking the forms of small-groups, student choice regarding reading activities, and utilizing peers for the completion of chosen project assignments. Process choices for diverse learners consisted of learning stations, tiered assignments, flexible grouping, learning contracts, lesson compacting, student choice in assignments, and learning inventories that encompassed academic abilities, interests, culture, or learning styles. Products included authentic assessments such as interviews, portfolios, written reports, illustrations, or oral presentations. Learning environments provided a sense of security where students were encouraged to take risks as their teachers provide scaffolding as needed and served as facilitators (Tomlinson, 2001).

In the following scenarios, Tomlinson (1999a) contrasted three classrooms as each teacher provided instruction on a unit about ancient Rome. The purpose was to illustrate the kinds of strategies that reflected differentiated instruction. Mr. Appleton

required that his students read the textbook in class and finish reading at home if this task was not completed in the classroom. He reminded them to take sufficient notes and to answer the questions upon completion of the chapter. Mr. Appleton's instruction consisted of well-planned lectures and study sheets that detailed the information that was assessed on one standard test. In Mrs. Baker's class, students received graphic organizers, viewed illustrations that depicted ancient Rome, participated in a Roman banquet which includes eating food from the time period, dressed in togas, and read relative myths. She allowed students to choose from 10 project options to demonstrate what had been learned. In the third classroom, Ms. Cassell had predetermined vocabulary lists, facts, skills, and objectives she used to plan various learning experiences. She ensured that each activity was focused upon students' readiness levels, interests, and learning profiles while requiring students to meet identical goals. She gave students the opportunity to choose tasks that were appropriate for them and asks essential questions that informed her of their levels of understanding. According to Tomlinson, the only classroom that modeled differentiated instruction was the third one due to Ms. Cassell's careful planning of activities which all were centered on the same objective. Learning communities truly differentiated instruction when experiences targeted "student engage plus student understanding" (Tomlinson, 1999a).

As previously mentioned, differentiated instruction included four essential factors which comprise the following: the content or information that is delivered to students, the process by which this information is presented, the product that is created from the culmination of these occurrences, and the learning environment in which instruction takes

place. In Mr. Appleton's class, instruction was carefully planned but did not allow for various learning styles and abilities. When students did not complete assignments in class, they finished them at home without guidance from the teacher. In the classroom, interaction between the students and the teacher was non-existent. On the other hand, Mrs. Baker provided different activities to support student learning, but she did not consider students' readiness levels in regards to students' assignments.

In Ms. Cassell's class, the content included the vocabulary lists, facts, skills, and objects related to ancient Rome. The process in which information was delivered to students involved giving children opportunities to exemplify their understandings of information. In the example, students chose activities based on their instructional levels and interests yet met the identical goals set forth by the teacher. Because Ms. Cassell implemented the crucial elements which formulated individualized learning, Tomlinson argued that her instructional strategies reflected a differentiated learning environment.

Differentiated instruction required that teachers took the time and effort to implement lessons that correlated to students' competencies of understanding. Teachers and administrators of learning communities should consider the impact this strategy has to offer. Due to the diverse nature of the students entering today's schools in regards to culture, prior experiences, and beliefs, it is evident this approach to instruction is applicable to today's classroom communities.

Differentiated Instruction in a Reading Classroom

In a reading classroom, students' abilities, interests, and learning preferences reflect a multitude of levels. There may be some students in the classroom who read

below grade level, on grade level, above grade level, and somewhere in between. Reading material provided for students should embrace their levels of understanding while challenging their current literacy skills (Van Tassel-Baska, 2003).

Tobin (2005) suggested five ways in which reading instruction could be differentiated in a classroom. These strategies included (a) *choices in reading material*, which allowed students to choose books that they were interested in reading which differred from student to student; (b) *reading workshop*, inclusive of the following six strategies: teacher sharing time, focus lessons, conferencing, self-selected reading, responding time, and student sharing time; (c) *tiered activities*, which requires students to respond at different levels of complexity; (d) *creative responses to text*, which includes a broad range of responses such as illustrations, dramatic play, and dance skits, and (e) *taped interviews and books on tape*, which allowed limited English-speaking students to hear and interact with spoken language in small groups or individually. Flexible grouping allocated varying arrangements of students based on their interests, readiness levels, or learning styles (Cox, 2008; Cusumano & Mueller, 2007; Jones, 2007).

Allowing students to respond to literacy in various ways is another characteristic of differentiating reading instruction (Barone, Mallette, & Xu, 2005; Weigel & Gardner, 2009). Learners should be given opportunities to demonstrate their apprehension of information by being involved in activities such as writing in journals, creating multimedia presentations, and illustrations that depict what was read. By employing these kinds of assignments, teachers arrange a variety of ways in which students can respond to

text so that multiple learning styles and abilities are taken into account in the learning process.

According to Allington (2005), former president of the International Reading Association, effective reading instruction requires that the classroom organization is adaptable to the kinds of groups of children it serves, matching pupils to texts by ensuring that they are capable of understanding the books that they read, and accessibility to interesting texts, choice, coupled with an allowance of time for collaboration among peers.

In an example of research conducted on the effectiveness of differentiated forms of instruction at increasing reading comprehension, Boulware-Gooden, Carreker, Thornhill, and Joshi (2007) conducted a 5-week, quantitative study of the effects of students' abilities to use multiple metacognitive strategies for reading comprehension and vocabulary. The researchers used a quasi-experimental, non-equivalent pretest/posttest control-group design. A direct instruction strategy was used in the intervention group (Group 1) at one school as compared to instruction that incorporated hands-on, constructivist methods (Group 2) at the other school. The participants included 119 third-grade students from six classrooms in two urban, southwestern elementary schools. All students were given a pretest at the beginning of the study to determine the levels of reading comprehension and vocabulary knowledge students possessed. Likewise, a posttest was administered at the end of the study.

During the investigation, students in both groups received 30 minutes of reading comprehension and vocabulary instruction daily for a total of 25 days. Lessons for

students in Group 1 began with an introductory component where teachers stated the purpose and activated students' prior knowledge followed by students copying the definitions of two vocabulary words from the board and then creating illustrations for each. Students were responsible for independently reading stories which were followed by responding orally to teachers' prescribed questions and writing answers to questions in the book that followed the stories. Students were not encouraged to think aloud as they were reading.

Students in Group 2 received an identical introductory lesson and vocabulary words for each study. The vocabulary words were placed on semantic webs to relate to words that were already known. Teachers' asked questions that activated prior knowledge in which students used these inquiries as guides as they read. Students were reminded to think aloud as they read the stories. The teacher modeled this process, reading the story and thinking aloud, during the first week of the study though students were responsible for reading on their own beginning the fourth week of the project. When students finished reading, they answered teachers' simple questions along with those regarding story structure and required higher-order thinking skills. A pyramid was drawn on the overhead projector and was used to display students' responses.

At the conclusion of the study, researchers found that students who received differentiated instruction, based on the constructivist theory (Group 2) made significant gains in reading comprehension and vocabulary skills. The control group (Group 1) scored means of 105.98 and 27.87 in reading comprehension and vocabulary respectively. In comparison, the means of Group 2 were 111.07 in reading

comprehension and 30.59 in math. There was a 20% gain in reading comprehension and 40% increase in vocabulary with Group 2 as compared to students who received direct instruction (Group 1). The researchers noted that the visual representation of the pyramid and being able to think aloud as the stories were read allowed preferential learning styles to be used. Providing activities that delved into students' learning styles enhanced student progress (Moorefield, 2004).

Differentiated Instruction in a Mathematics Classroom

Mathematics classrooms contain students who differ in the same regards as they do in a reading classroom which includes learning styles, readiness levels, and interest. Under the NCLB legislation, the National Assessment of Educational Progress, NAEP, is administered nationally at least every 2 years in the areas of reading and mathematics to students in Grades 4 and 8. According to the 2007 NAEP mathematics report card, fourth and eighth graders show upward trends and White, Black, and Hispanic students scored higher during test administration in 2007 than previous years (Lee, Grigg, & Dion, 2007). The mathematical strands (number and operations, geometry, data analysis and probability, measurement, and algebra) contain skills with subsets that must be mastered in order to fully understand concepts. Because a firm understanding of mathematics instruction is pertinent to grasping more abstract concepts, an approach to instruction that lends itself to many learning styles is necessary.

According to Butler and Gerkin (2006), a successful mathematics classroom is led by teachers who maintain (a) deep understandings of process learning, by understanding which skills are needed to enhance understanding of the targeted material; (b) accurate

content knowledge; (c) educators that stay abreast of current trends related to subject matter; (d) an engaging pedagogy which necessitates active student engagement; (e) organic, responsive assessment that informs instruction, or authentic evaluation methods that calls attention to students' strengths and weaknesses; (f) a continuous cycle of formative assessment, utilizing measurement tools to guide lessons; (g) evaluation of assessment data to understand implications for the learner and permitting teachers to analyze students' results, and (h) planning of differentiated instruction to meet individual student needs and teaching that results in learning, allowing teachers to address students' weaknesses through various instructional strategies. Students should be exposed to mathematical problem-solving experiences during the early years that encourage multiple responses so that mathematical thinking is developed (Rivera, 2006). Provisions within the NCLB (2001) and the Individuals with Disabilities Education (IDEA) Act (2004) require that educators implement instructional support services for struggling students (Berkas & Pattison, 2007). Therefore, it is imperative that students are provided with instruction that promotes understanding at the onset of academic difficulty.

The standards set forth by the National Council of Teachers of Mathematics, NCTM (2008) are founded on constructivist ideals and diverse instructional approaches. This organization works tirelessly to promote the success of all children in math through the use of strategic techniques that reflect learners' abilities (Franco, Sztajn, & Ortigão, 2007). Effective mathematics programs hold all students to identical objectives though the methodological procedures may differ depending on the needs of the students (Schmidt, 2004; Blanton & Kaput, 2005; Tate & D'Ambrosio, 1997). Children benefit

greatly academically when mathematics instruction is student-centered, and there is interaction between learners and teachers (Stigler & Hiebert, 2004; Weiss & Pasley, 2004; White, 2004; Rasmussen & Marrongelle, 2006).

In a mathematics classroom, differentiation can take many forms. Tomlinson (1999c) identified six differentiated instructional strategies that can be used to provide for students' readiness levels, interests, and modes of learning. These methods included the following: tiered assignments, compacting, interest centers or interest groups, flexible grouping, learning contracts, and choice boards. Tiered assignments were created in response to students' levels of comprehension. These tasks exemplified the same objective yet various activities were completed to meet the goal. Compacting addressed readiness levels and was used to assess prior knowledge, create plans for what was needed to accomplish the goal, and it created time for enriched or accelerated study based on the topic. Interest centers, term applicable to younger students, and interest groups, referred to older students, reflect students' readiness levels and interests. In these assemblages, students chose activities that they favored and were curious in studying.

Flexible grouping applied to all three areas of differentiated instruction- readiness levels, interest, and learning profile. Students were assembled in flexible groups based on either element and was assigned by teachers or by student choice. Learning contracts were developed to address students' readiness or learning modality. Teachers identified the tasks while students determined the methods for completion. This allowed students to work at their own pace, it targeted various learning styles, promoted independence and opportunities to develop planning skills, and it eliminated unnecessary time spent on

previously learned skills. Additionally, choice boards contended with all three entities of differentiated instruction, and it allowed students to choose activities. This increased student engagement and participation in learning experiences (Tomlinson, 1999c).

An example of research on the effectiveness of differentiated instruction in mathematics, Suarez (2007) designed an action research project in his mathematics eighth-grade classroom to determine the implications of differentiated strategies of instruction. The researcher implemented a quantitative, one shot case study design. He compared students' test scores on the geometry unit before the experiment to assessment results at the conclusion of the study. This study took place over the course of one complete school year. The students at this school were initially either bored or overwhelmed with mathematics at this school. Suarez decided to adopt a student centered, constructivist approach to geometry instruction.

Each day lessons began with a substantial amount of whole group instruction, which allowed the objectives to be established and background knowledge to be activated. Then, students were allowed to choose tiered practice assignments which were appropriate for their ability levels. Forty minutes were allotted for the completion of these tasks which students took home to finish if they were undone at the end of class. Students were allowed to work with their peers in homogeneous or heterogeneous groups, and they received support from the teacher as needed. Additionally, students switched levels when necessary throughout the units. During summative assessments, students chose tests that matched their levels of competency.

At the conclusion of the study, Suarez discovered that when students were presented with differentiated tasks, their overall achievement improved 90% on the test, and they began to choose more difficult assignments to complete. He found that students performed at higher levels of achievement, were more motivated to participate in learning experiences, and take more responsibility to make sure that they understood the material. Also, students increasingly chose assessments that intensified the difficulty levels when they felt that the test reflected their readiness levels.

Summary

This study was bound by the notion that students could achieve when they were involved in learning experiences that addressed their levels of understanding and took into consideration their preferred modalities of learning. It also targeted learning communities that take a student-centered approach to instruction. The foundation of this project was that academic progress in math and literacy would be positively affected thus narrowing the achievement gap among students. This notion was based on the research by Butler and Gerkin (2006). Through their study of effective classrooms, environments that were maintained by teachers who demonstrated knowledge of their pedagogy placed students' needs at the forefront of instruction.

Tomlinson (1998, 1999 a,b,c, 2000, 2001, 2003, 2004, 2005), Gardner (1993), Bruner (2006), and Vygotsky (1978) have conducted and written research that shows that students can be successful when given appropriate opportunities. When the information gained through their studies was put together, students understood that they (a) learned by doing (Bruner, 2006), (b) chose assignments that reflected their learning styles and

modalities of apprehending information (Gardner, 1993; Tomlinson, 1998, 1999, 2000, 2001, 2003, 2004, 2005), and (c) were able to narrow the gap between what was known and unknown (Vygotsky, 1978).

Determining student's readiness levels, interests, and learning profiles offers teachers the abilities to provide meaningful, authentic learning experiences for students. Replacing traditional lessons that model direct instructional approaches with ones that provide personalized emphases on students' dynamic levels of learning could achieve cohesive academic communities that take into account the diverse learners it serves.

In section 3, the methodology and approach for the current study are discussed. The research design, the researcher's role, and research questions are investigated are described. The context of the study is given, as well as ethical considerations. Additionally, the partipants, data collection and analysis methods are presented.

Section 3: Methodology

Introduction

This section presents the research design, role of the researcher, the research questions, context of the study, and ethical considerations. The participants, data collection methods, data analysis, and an exploratory study are also shared.

The purpose of this inquiry was to establish to what extent principles of differentiated instruction were used when lessons were planned, implemented, and assessed in mathematics and reading. Two teachers each from Grades 3, 4, and 5 participated in this qualitative case study. A case study approach was the method chosen to conduct this study because of its flexibility towards allowing participants to share their experiences, and because it gave me the ability to explore the instructional strategies used by teachers at this particular location. Furthermore, this method enabled me to explore differentiated instruction as it was being implemented by six professional educators and develop a detailed perception of its impact while utilizing data collection methods that involved a wide scope of resources. Utilizing open-ended questioning techniques during interviews allowed me to gather a myriad of perspectives while determining patterns within the data from the in-depth analysis of this learning community's academic program.

Research Design

A case study allows researchers to explore topics in-depth while collecting information from more than one source complete with rich, thick descriptions (Creswell, 1998). Case studies illuminate the components of the events under study (Browne, 2005).

Utilizing a case study approach allowed me to gather data from a variety of sources that provided different perspectives held by the participants and perceptions at various points regarding differentiated instruction. This methodological design enables researchers to make generalizations through the use of contemporary events (Yin, 1994), and it allows programs and settings to be explored and described comprehensively from which information can be derived (Cousin, 2005). It is possible for case studies to be conducted by practitioners who are a part of the environment being investigated as they can inevitably improve the practice and view it as a self-study with holistic implications (Corcoran, Walker, & Wals, 2004). This methodology offered many opportunities for me to collect information through interviews, observations, and document analysis which included lesson plans and student work samples. The district in which this study was conducted was involved in the process of encouraging teachers to use differentiated strategies within the classroom. Merriam and Associates (2002) stated that case studies "might be unique or typical, representative of a common practice, or never before encountered. The selection depends upon what you want to learn and the significance that knowledge might have for extending theory or improving practice" (p.179). Therefore, this methodological tradition allowed me to interpret and analyze the information and then share it with the participants. This information was relevant to the participants in the study and administrators within the school district.

Conducting a case study allowed information to be taken directly from the field of inquiry and analyzed: meaning was then derived from it. Qualitative studies allow participants' points of view to be used as foundations for their actions (Hatch, 2002).

Because perspectives can be used exactly as they happen in social settings, this element allows for the collection of authentic research. Additionally, case studies involve investigations of specific happenings within larger contexts (Hatch, 2002).

To ensure the validity of the data and increase the accuracy of findings, data were triangulated. Triangulation involved the use of "a combination of different methods [such as interviews, observations, and examples of student work that] gives us a much more rounded picture of someone's life and behavior" (Livesey, n.d., p. 5). Validity is strengthened in qualitative research as data are triangulated by the use of member-checking, rich, thick descriptions, and clarification of bias is given by the researcher (Creswell, 2003). Member-checking took place throughout the study. Brief, theoretical memos (Strauss & Corbin, 1998) of the transcriptions were shared with participants to check for accuracy of interpretations. Rich, thick descriptions were embedded within the narrative portion of the study to give readers an idea of the setting and surroundings in which data was gathered. As potential biases were incurred within the study, these issues were explained and expounded upon.

Role of the Researcher

During the duration of this study, I was a fourth-grade math and science teacher at the elementary school in which the study took place. As a teacher leader of the fourth grade level, I served on the School Leadership Team, which involved leading and recording the minutes of weekly grade level meetings. I was also involved with the school's Math and Science Committee, which was responsible for working with district office personnel to develop standardized math and science curriculums for the elementary

schools within the district. As a member of The Teacher Forum, I met monthly to problem solve and discuss current educational trends and initiatives with the Superintendent and other school representatives within the district. I was also a member of the Technology Committee at the school which provided technological assistance for colleagues. Additionally, I was selected as the school's Promethean Board Trainer where duties included teaching supplemental classes for teacher colleagues of kindergarten through fifth grades on how to utilize and implement this technology in the classroom.

Research Questions

This research study was guided by the question: What is the depth of the implementation of differentiated instruction in upper elementary mathematics and reading classrooms? It was my intention to determine the levels at which teachers plan for and utilize this strategic method of instruction. Questions utilized in qualitative studies are open-ended yet narrow in scope (Hatch, 2002). The subquestions that supplement the overarching question included the following:

1. How are various ability levels of students addressed regarding instruction?
2. What process is used to determine students' ability levels in math and reading?
3. What resources are used to supplement and or enrich instruction?
4. What kinds of strategies are employed by teachers to address students' learning?
5. What concerns do teachers have regarding differentiated instruction?

These questions formed the basis of the interview which allowed teachers to share their thoughts regarding these inquiries.

Context of Study

This study was directly related to the instructional methods encouraged by school district officials. At the school in which this study took place, all grade levels were involved in flexible groups at the beginning of each day. During this 45-minute period, students took part in literacy activities that are centered on their individual reading abilities. Students' groups were determined by their scores on their reading MAP tests. Literacy coaches collaborated with teachers as they provided resources and ideas regarding ways in which to positively influence students' reading abilities.

The teachers who participated in this study were expected to engage in professional development concerning differentiated instruction. Professional development opportunities for the teachers at this school centered on differentiated instruction in all subject areas and were regularly offered to educators throughout the year. A district-wide instructional fair focused on various instructional habits that could improve student achievement included mandated teacher attendance. Teachers were required to exemplify the learned skills through their instructional methods. Principals shared with teachers a list of instructional elements which should be present during unscheduled observations, and among the items on the list was a reference to the teacher's instructional aptitude to provide lessons that involved all students in the class in the learning experiences. Recently, each school in the district was provided with a number of Promethean boards which encouraged interactive, student-centered instruction. Teachers who had these technological tools in their classrooms were trained on how to operate the software and how to create lessons that encouraged student participation.

Because I was a teacher within this district, I was able to gain firsthand experiences within the field of inquiry. The participants were a part of a purposive sample as they were teachers within the same school environment as myself. The results from this study were used to inform the instructional strategies of those involved, as well as other teachers of mathematics and reading.

Ethical Considerations

Ethical concerns are faced by qualitative researchers during the collection, analysis, and distribution of information (Creswell, 1998). In this qualitative study, I safeguarded participants' identities and information. It was important to allow for ethical considerations to ensure genuine thoughts were shared and positive relationships between the participants and I was fostered. Prior to the study, participants were informed of the topic and areas encompassed by this project. Data were stored on the hard drive of my computer and protected by a password. Therefore, only I was able to access the data. Documents, field notes from observations, and student work samples were kept in a locked file cabinet. Hatch (2002) mentioned that ethics can be maintained by researchers in qualitative studies by collecting and reporting genuine information that emphasizes authentic viewpoints of the participating individuals.

Criteria for Selecting Participants

In this study, it was important to access participants who were able to provide firsthand experiences of differentiated instruction and opinions regarding statewide assessment of mathematics and reading as those subjects were under investigation. I utilized careful consideration when choosing the participants so that the collected data

reflected those most knowledgeable of the topic and who had experience executing lessons related to differentiated instruction. Therefore, a purposive, non-random sample was used. Hatch (2002) stated that "identifying participants and inviting their involvement are important steps in designing an effective research project. Selecting the right participants and building working relationships with them can make or break a qualitative study" (p. 52). Teachers who had direct familiarity with differentiated instruction were given the option to participate.

The participants of this study included 2 third-grade teachers, 2 fourth-grade teachers, and 2 fifth-grade teachers at a rural, southeastern elementary school. These teachers taught mathematics, reading, or both subjects as some fifth grade teachers specialized in team teaching situations. The average years of teaching experience ranged from 2 to 13 years. I informed participants of the nature of this study, and they were issued a written contract describing the methods of data collection that would be gathered throughout the fall semester. These teachers previously participated in inservices and professional development workshops held by the district where the topic was differentiated instruction. Additionally, all participants were assigned pseudonyms to protect their identities.

Data Collection

In this case study, data collection took place using various methods. Participants were contacted in early August through electronic messages informing them of the nature of this study and their potential involvement in the study. Teachers also received written notifications of this study and invitations for participations in their mailboxes which were

located in the main office at the school. The Consent Form (Appendix A) explained the reasons for the study and detailed information regarding data collection was shared.

I conducted formal, structured interviews with the participants that were tape recorded and then transcribed in the middle of October. These interviews took place in mutual settings which included either my classroom or the school's Conference Room. Using interviews as one option to collect data allowed me to gain the perspectives of the participants who had firsthand experiences with instruction. Questions that were asked during the interview were given to the participants prior to the meeting so that they would be prepared and informed of what was expected (Appendix B). Although a list of predetermined questions was shared, this compilation of inquiries did not include follow-up questions asked as the interviews took place. These questions were inserted as clarifications of specific instances were needed. Hatch (2002) stated that "they [formal interviews] are semistructured because, although researchers come to the interview with guiding questions, they are open to following the leads of informants and probing into areas that arise during interview interactions" (p. 94). Follow-up interviews took place after preliminary data were collected and theoretical memos were constructed. There were a total of three interviews in which each participant partook. I conducted initial interviews with the six teachers and two successive consultations with each one to clarify ideas and provide additional information as needed. The subsequent interviews developed from my ongoing analysis of interviews and observations.

I audio recorded responses to interview questions. Participants were informed prior to the initial interview that all discussions would be taped. Coleman and Briggs

(2005) suggested that taped interviews allow researchers the flexibility to review interview sessions especially as they are being analyzed. The ability to examine the recording alleviated any discrepancies in the information thus increasing the validity of results (Creswell, 1998; Janesick, 2004; Merriam & Associates, 2002; Farber, 2006). Tape-recorded interviews lend researchers the option to review information and accurately record data (Burton & Bartlett, 2004; Taylor, Wilkie, & Baser, 2006; Verma, 1998;). Taylor et al. (2006) stated that "[interviews] give researchers the opportunity to follow up ideas and probe responses, thus potentially giving more detailed information than other forms of data collection" (p. 37). As each interview took place, I wrote any supplementary notes into a journal which was kept confidential.

Observations were also conducted of each participant's classroom in mid-September and concluded by early November using the Study Note Template in Janesick Format (Appendix C). Spradley (1980) described three phases of participant observation which included the following: (a) *descriptive observation*, occurred as researchers become acquainted with the environments that were to be focused upon; (b) *focused observation,* developed when researchers began to focus on occurrences that were directly related to research questions, and (c) *selective observation*, where the researcher sought to uncover further details regarding the occurrences in the second segment of the process. Follow-up interviews were developed from these ongoing analyses as ideas and events were clarified and explained by participants.

Notes were taken during the time spent in each classroom of the actual happenings that took place. Each classroom was visited three times. The content that

students were required to learn, the process in which it was delivered to them, performance assessments given to students that demanded demonstrations of their understandings of each lesson, and the learning environments were focused upon during each observation. Taking note of the content allowed me to gain an idea of the lessons' objectives and what students were expected to learn. As I observed the process in which instruction was delivered and assessment devices, she was able to determine whether or not these strategies used by the teacher related to differentiated instruction. The organization of the learning environments also provided pertinent information in determining whether differentiated learning experiences were implemented in the classrooms. Other examples that were observed included choices in reading material, tiered activities, flexible grouping, and the use of learning contracts and choice boards. The length of each observation was an entire lesson. Student work and teachers' lesson plans were also part of the data collection process. Lesson plans of the observed lessons were requested from each teacher.

Data Analysis

Creswell (1998) discussed four forms of data analysis. They included (a) categorical aggregation, (b) direct interpretation, (c) naturalistic generalizations, and (d) establishing patterns. Categorical aggregation involved the researcher gathering data from multiple sources and synthesizing similar meanings thus developing codes from this information. Direct interpretation required that a researcher determine meaning from an individual source by taking it apart and putting it back together. Naturalistic generalizations allowed for the applicability of instances being applied to various

situations. The establishment of patterns required the researcher to determine commonalities between data sources. In this case study, categorical aggregation was used as information from various sources was gathered and coded as similar themes emerged.

The form of data analysis that I conducted was categorical aggregation through the use of inductive analysis. Donalson (2009) suggested that qualitative research that involves open-ended questions requires inductive analysis. As categorical aggregation took place, inductive analysis assisted me with the development of categories and inherent relationships within the data. Inductive analysis involved thinking from specific to general. According to Hatch (2002), arguing inductively required that patterns of understanding throughout the data were sought so that common accounts of information were made. The steps that were utilized to analyze data included the following based on recommendations made by Hatch (2002):

1. Read the data and identify frames of analysis.
2. Create domains based on semantic relationships discovered within frames of analysis.
3. Identify salient domains, assign them a code, and put others aside.
4. Reread data, refining salient domains and keeping a record of where relationships are found in the data.
5. Decide if your domains are supported by the data and search data for examples that do not fit with or run counter to the relationships in your domains.
6. Complete an analysis within domains.
7. Search for themes across domains.

8. Create a master outline expressing relationships within and among domains.
9. Select data excerpts to support the elements of your outline. (p. 162)

The data collection included interviews, observations, and document analysis. Interviews were transcribed soon after they took place so that the information was accurately recorded. “Interviews should be processed as soon as possible following the interview” (Hatch, 2002, p.112). I printed and read each transcription in its entirety several times to obtain a general view of the participant’s thoughts relating to differentiated instruction. Key words and phrases were highlighted as they appeared within the conversations. Afterwards, each interview was coded individually. Then, each observation was coded. Rubin and Rubin (2005) maintained that

> coding allows you later on to quickly locate excerpts from all the interviews (as well as from observations and documents if you have coded them) that refer to the same concept, theme, event, or topical marker and then examine them together. (p. 219)

Lesson plans and student work were copied and originals were returned to respective teachers. Student work such as projects that could be photocopied were photographed with the permission of the students’ parents.

Analyzing data from multiple sources allowed the process of triangulation to take place. Triangulation ensured that information was accurate and reliable (Mills, 2003). Transcripts from interviews, observation notes, and lesson plans were systematically reviewed to determine the similarities within the information. Codes were assigned to collections of analogous ideas. This evaluation process was used to address discrepant or

nonconforming data. Discrepant cases were evaluated to classify unidentified themes. "Implementing the triangulation of data permitted the cross-checking of information between sources to information by examining evidence from the sources and using it to build a coherent justification for themes" (Creswell, 2003, p.196).

Data were analyzed after all interviews, observations, documents, and student work was coded. Common themes and categories were corroborated between sources. All information was kept in files on my computer.

Exploratory Study

Exploratory studies give researchers the opportunity to conduct the planned investigation on a smaller scale. Researchers are able to resolve any difficulties that arise before the actual study takes place. If he or she is unfamiliar with conducting interviews and observations, conducting a pilot study allows him to test new equipment and have experiences with coding collected data (Janesick, 2004).

A pilot study was conducted in early 2010 where the research question was, What are the implications of early literacy instruction? In this initial study, the participant was the reading recovery teacher at the rural, southeastern elementary school where the study later took place. Data were collected through a tape recorded semistructured interview. Then, I transcribed, coded, and analyzed the interview.

Through the study, I was able to gauge the level of differentiated instruction implemented by an early literacy instructor and her perception of the factors that warrant the early literacy program and the necessity of its existence. The themes that emerged from the data included the following ideas: the purpose of Reading Recovery,

qualifications of students for participation in Reading Recovery, classroom assessments, teacher input, ranking systems, instructional format, student involvement, and student progress.

Conducting this study prior to the proposed study allowed me to practice the steps necessary in carrying out a qualitative study. I learned how to formulate questions relevant to this type of methodology as well as proper transcription process. This preliminary study was related to the current study in that they both involved literacy instruction, followed the qualitative tradition, and sought to find out the level of differentiated instruction strategies used to involve all learners.

In the next section, data collected for the present study is presented and analyzed. The results of each research question are included. To ensure the merit of this study, evidence of quality is explained. Discrepant and nonconforming data are shared as well. Emerging themes are discussed, which provide a holistic view of the purpose of this study.

Section 4: Results

Introduction

This section explains the qualitative process through which data were gathered, recorded, and analyzed. Teachers who participated in this study represented Grades 3 through 5. Emerging patterns, relationships, themes, and a discussion on quality are discussed as well. The results of this study revealed how teachers' instructional styles encompassed differentiated learning strategies. This research is an additional resource for educators and administrators as it details the methods and instructional approaches regarding reading and mathematics implemented by teachers to spur meaningful learning for students with varied abilities.

The research examined the answer to the guiding question: What was the depth of the implementation of differentiated instruction in upper elementary mathematics and reading classrooms? In order to answer this question, responses to the following subquestions were sought:

1. How are various ability levels of students addressed regarding instruction?
2. What process is used to determine students' ability levels in math and reading?
3. What resources are used to supplement and or enrich instruction?
4. What kinds of strategies are employed by teachers to address students' learning levels?
5. What concerns do teachers have regarding differentiated instruction?

Data Collection

Following IRB approval of this study (approval #08-31-09-0321653), data collection began. Data were collected between September and November 2009 through the use of open ended interviews, classroom observations, and artifacts. The participants were informed of the study and their invitations to contribute. Each of the six participants was interviewed three times, for approximately 30 minutes. An initial interview was conducted with each participant prior to beginning each observation. Participants were given a copy of the Interview Guide (Appendix B) as their Consent Forms (Appendix A) were signed. However, I asked additional questions that stemmed from the participants' responses and assisted in clarifying their ideas. All interviews were scheduled at each participant's convenience and took place in the school's Conference Room. Each interview was audio recorded and later transcribed. All participants were asked to member check and examine transcripts.

Observations and artifacts that were collected were used as a part of the data collection process. Each observation took place in each participant's classroom during times that were agreeable to each party's schedule. Detailed notes of the instructional practices utilized by teachers and student interactions within activities were recorded at the time of each observation which lasted approximately 30 minutes or one class period. I also recorded notes and questions about observations that were used to guide subsequent interviews. I observed each participant a total of three times. Documents used during observations were collected. This included lesson plans used to guide differentiated

lessons and activity pages used by students which required the utilization of various ability levels to accomplish similar tasks.

Systems for Keeping Track of Data

Interviews, observations, and collections of artifacts supplied the data that were analyzed. “Interviews should be processed as soon as possible following the interview” (Hatch, 2002, p.112). This allowed me to record information accurately to alleviate any discrepancies. All paperwork was kept in a binder with dividers to separate the hand-written notes from each participant’s observation. This binder, along with the digital audio recorder, was kept in a locked file cabinet when not in use. The audio recorded interviews were downloaded to my computer and stored in a password protected file on the computer.

Categorical aggregation involved the gathering of data from multiple sources and synthesizing similar meanings thus developing codes from this information (Creswell, 1998). While analyzing the data, I assigned color-coded codes using highlighters that represented common themes among teachers’ responses from interviews, actions that occurred during observations, and instructional notations made on lesson plans. Specific words and phrases were highlighted that made the patterns more visually apparent.

Findings

The data were explained through the organization of the five subquestions that assisted in guiding the resource question. The findings for Questions 1 and 2 were similar and were merged to create a much stronger and more detailed analysis. Results of Questions 3 and 4 were combined for the same reason.

Research Questions 1 and 2

How are various ability levels of students addressed regarding instruction, and what process is used to determine students' ability levels in math and reading? In this study, teachers utilized two assessments in order to assess students' knowledge and then determine how to provide meaningful instruction. These two formal methods were useful for verifying specific strengths and weaknesses of students. The formal assessments used were Measures of Academic Progress (MAP) tests and Developmental Readiness Assessments (DRA). MAP examinations were computerized tests mandated by the school district for both reading and math. Students took these tests in both subjects at the beginning, middle, and end of the school year. Teachers assessed students' literacy abilities through DRA which measured students' students' progress over time. The results from these tests were used by teachers to put students into appropriate groups for targeted instruction.

Formal Methods of Assessing Students' Ability Levels

Formal methods of assessment are those in which students are presented with standard questions that are sufficed with predetermined responses and have been tested over time. Therefore, bias is minimized which increases the validity of results (Henderson, 2009). These formal, standardized measures are comparative to other students who took the same test at the same age or grade level. The analyses of formal assessments are provided with data to substantiate any claims.

Teachers' perceptions of these formal assessments were nonjudgmental as they recognized the usefulness provided by the results. Fourth-grade teacher, Chloe Gordelski

(pseudonym), recognized the importance of the tests as they informed her instruction. "This [students' test scores] helps me to better address each group's needs, their weaknesses, [and] their strengths." Sheena Collier (pseudonym), a fifth-grade teacher, commented on the flexibility supplied by the assessments as they allow her to "target the different levels of learning." Fifth-grade teacher, Janene Foster (pseudonym), shared that these assessments gave her more information about the range of her students' abilities and allowed her to place students in groups with comparable levels. "I'll have more information to better place them where they need to be [instructionally]."

Measures of Academic Progress (MAP)

At the beginning of the school year, students completed MAP tests in the areas of reading, mathematics, and science. These benchmark tests were required by the school district. Teachers were only allowed to read generalized directions to students as each one-hour test was completed using the computers in the school's lab over the course of three weeks. After the administration of the assessments, teachers analyzed students' MAP scores to determine which specific mathematical skills posed difficulties. Students were then placed into Groups of 3 or 4.

The formal methods of assessment used in this district were Measures of Academic Progress (MAP) and Developmental Readiness Assessment (DRA). Students completed MAP assessments in three academic areas which included reading, mathematics, and science; DRA was used to determine their instructional reading levels. The results of students' scores were analyzed by teachers to establish instructional plans.

The results of students' MAP scores were available to teachers immediately after the tests were completed because of the test's online accessibility. Students' reports included the numerical ranges or Rasch UnIT (RIT) bands of students' skills within each content area examined as well as information regarding the specific areas in which more practice was needed. The quantitative results allowed teachers to divide students into groups with similar scores and focus on the skills in which required more support. Teachers recorded students' results and wrote them in order from least to greatest. Then, they divided students into Groups of 3 or 4 based on their location within the list. Third grade teacher, Patricia Martinson (pseudonym) stated that "After recording a list of my students' scores and writing them down in order, I've used their MAP scores to divide them [students] into groups." Sheena Collier, a fifth-grade teacher, mentioned "I use my MAP data. I go into the RIT bands and see where they are struggling." Fifth-grade teacher, Janene Foster, taught a class with students whose scores showed that they had "high MAP scores [which enabled them] to be taught at the same level." Chloe Gordelski, a fourth-grade teacher, determined her students' needs based on their MAP scores as well. "I use MAP scores to put my students in [groups based on their] reading levels." Beverly Watkins (pseudonym), a fourth-grade teacher, indicated that she relied on students' "MAP scores [to] make sure they're reading on the right levels."

The instructional plans that teachers created for each group were dependent upon the needs of the students in that particular group. Because students were placed in groups based on the numerical outcomes of their assessments, each group was composed of homogenous ability levels. Marsha Langford (pseudonym), who taught third grade,

shared that she assessed students' abilities as determined by their MAP scores and used that information to determine her instructional plans for each of her groups. "I look at the MAP testing scores and how they scored; I look at that [the scores] and determine how they are [which skills posed problems] and where they are [compared to the peers in their groups]."

Developmental Readiness Assessment (DRA)

Students' reading levels were determined from their DRA, Developmental Readiness Assessment, scores that were administered at the beginning and the end of the year. The scores that students received allowed teachers to address strengths and weaknesses in regards to literacy.

The school district in which this study took place enforced the administration of a Developmental Readiness Assessment by all teachers of reading. This examination assessed students' literacy abilities in three major areas which included accuracy, fluency, and comprehension. The embedded goal of this program was to measure students' progress over time while developing independent readers. From this assessment, teachers were able to determine a student's instructional reading level and then group him for differentiated guided reading tasks.

Teachers determined their students' reading levels using their DRA scores. After obtaining these results, students were strategically placed in groups with peers who had comparable ability levels. These groups either participated in guided reading instruction or were assigned research projects where information was appropriately differentiated according to their learning levels.

The school district implemented a balanced literacy approach to instruction during the time this study took place. Based on this idea, students received whole-group, small, guided reading groups, and independent reading practice (Bitter, O'Day, Gubbins, & Socias, 2009). This standard reading differentiation model was used district wide. Participants addressed their students' various literacy needs through the use of guided reading instruction. This assessment was a tactic that allowed teachers to work with 4 to 5 students per group as they read and responded to a text on their reading instructional level.

Students' abilities were formally assessed in this district using MAP and DRA results. Teachers did not exhibit any bias towards the use of these examinations as they provided educators with valuable information necessary to deliver differentiated instruction. Students' scores allowed teachers to assemble them into small, homogeneous groups with similar abilities. Instruction was focused on the needs of all students within each particular group.

Various Methods of Differentiating Instruction in Reading

The formal assessment devices provided teachers with detailed information about students' strengths and weaknesses. By analyzing students' results, teachers were then able to determine which differentiated strategies would best meet students' needs. The strategies that were chosen by the teachers in this study were guided reading, projects, and small group instruction.

Guided Reading

Guided reading groups employ the use of differentiated instruction. In this study, all teachers implemented guided reading as this was a requirement by the district of all teachers who taught reading. These small groups usually contained 4 or 5 students who had similar reading abilities as determined by their DRA tests in this school district. During the two to three times that the groups met each week for 15–20 minutes, the teacher deliberately selected texts that were written on the students' reading levels in order to focus on certain literacy skills. Before reading lessons began, the teacher shared the purpose for reading and introduced any pertinent vocabulary to activate prior and build background knowledge. Next, the teacher observed students as they read aloud simultaneously or silently while necessary support was provided. Lastly, teachers asked planned questions to determine students' comprehension abilities of the text and whether or not they were able to apply learned strategies. These small groups afforded teachers the options to work closely with clusters of students who had comparable reading levels.

Teachers used leveled readers, short texts geared towards various reading levels, and focused on specific weaknesses that particular groups of students may have had. "As far as my small groups' reading instruction, we use leveled books that are on their instructional levels" (Chloe Gordelski, a fourth-grade teacher). Similarly, third-grade teacher, Marsha Langford, made use of guided reading groups in her classroom created from students' DRA results. "In reading, the big thing would be the guided reading group and that's where we work on their levels and they're working on books on their level." Utilizing books that were written on students' comprehension levels as determined by

DRA was representative of differentiated instruction as learners worked on skills that were specific to their ability levels.

Teachers determined their students' reading levels using their DRA scores. After obtaining these results, students were strategically placed in groups with peers who had comparable ability levels. These groups either participated in guided reading instruction or were assigned research projects where information was appropriately differentiated according to their learning levels.

Projects

Instruction was differentiated by teachers with the integration of research projects within the curriculum. Fifth-grade teacher, Janene Foster, gave her students choices in the ways in which they chose to demonstrate their understandings of information. She provided opportunities for the diverse abilities presented by her students while emphasizing students' learning styles. When activities rely on students' learning styles, this increases their abilities to understand information (Gardner, 1983). Foster explained her reasoning when she stated

> For example, on one that I just gave on the Reconstruction, they could use their study guide to make flashcards or you could do a Powerpoint presentation on the Amendments for Reconstruction and the 3 plans for Reconstruction, or you could draw pictures with captions explaining the Amendments and explaining the plans, and then I had one that was a writing assignment. I try to reach all of the different abilities in my project choices.

Janene Foster taught only language arts and social studies as she was a part of a team teaching cohort where she and a colleague shared two classes of students; her colleague was responsible for science and mathematics instruction. Both of Mrs. Foster's classes were configured with vast ranges of abilities; whereas, the abilities of the students in her first class were of a higher caliber than her second class. She assigned independent projects for students in the first class. "They [first class] can do more on their own through projects, and I can give them things to do where they can research and find out extra information on their own."

Due to the diverse learning needs of students in the second class, Foster provided guided reading experiences, which offered substantial teacher support and guidance. "My second group since there is so many different levels in there; there's a lot of guided reading. I have some who can work on their own and others who need me to be right there with them and lead them through." Although each class was comprised of members with numerous abilities, the teacher differentiated instruction to provide distinct tasks to accomplish analogous objectives.

Small-groups

The foundation of differentiated instruction requires that students are taught concepts relative to their abilities. For teachers to be able to teach concepts at the ability levels of their students, they are challenged to find ways to determine students' ability levels so they can provide instruction that suits their needs. Fifth-grade teacher, Sheena Collier, suggested that one way she could assess a student's individual understanding or ability was through individual and small group work such as centers. Each participant in

this study used small group centers in a variety of ways. “I also do . . . centers where it allows me to work individually or in small groups with students.” Sheena also acknowledged that, because students worked one on one with the teacher, their weaknesses could be addressed and practiced. Once the teachers used this more informal method to determine where the students are in their learning, they could change tests and homework to meet their needs. “Their [students who perform below grade level] homework is different, and I go over their assignments; they don’t even realize that their assignments are different” (Marsha Langford, third-grade teacher). Modifying tests and homework assignments ensured that students receive additional tasks that target the specific skills unique to their abilities.

The differentiated reading strategies that teachers utilized in this district were guided reading, projects, and small group instruction. Teachers were able to tailor reading instruction to students’ needs based on their analyses of assessment results. The implementation of these methods allowed teachers to pinpoint the specific skills in which students needed assistance and focus instruction in these areas.

Assessing students in mathematics

Because there was not one strategy that the teachers were required to use to assess students in math, teachers shared their satisfaction regarding the differentiation of reading rather than mathematics. Third-grade teacher, Patricia Martinson, stated that “Well, I believe it’s much easier for me to differentiate instruction in reading.” Because there was a defined program for reading instruction, this made the planning of lessons more user-friendly for teachers as well as encouraged more positive implementation of the concepts.

Chloe Gordelskid, fourth-grade teacher, mirrored her sentiments when she mentioned that "I use small group reading instruction every day." Reading instruction was executed on a daily basis whereas students received tailored math instruction only when they exhibited weaknesses with their assignments.

Teachers assessed students' mathematical abilities using observations, discussions, judgment, and implementing pretests to determine whether or not students understood the information. Evaluating students' knowledge in this manner enabled teachers to plan instruction based on their needs.

Observations and discussions were used by teachers to assess students' mathematical abilities. Chloe Gordelski used observations and discussions to pinpoint exactly where students exhibited strengths and weaknesses in math. "I walk around the classroom and really see if they're having problems. I learn a lot . . . about my students' abilities- not only about their weaknesses but their strengths as well." She mentioned that the discussions about various math concepts with her students allowed her to understand how students perceived the information and determine whether or not it was retained. "[Through discussions,] you hear the questions that they ask and you see the problems that they have." Sheena Collier, fifth-grade teacher, assessed her students' abilities as they worked within groups and discussed information with their peers. "They [students] can work together and share information and turn and share with their partner. That way, I can target the different levels . . . in my classroom."

Third-grade teacher, Patricia Martinson, used teacher judgment to appraise students' knowledge. "When I give an assessment and notice that certain kids had a

problem with a particular idea, I'll pull them separately for [enriched] instruction." Chloe Gordelski, fourth-grade teacher, used teacher judgment to figure out whether or not students needed additional help with particular math skills before they are formally assessed. "If I see a student [having difficulty] rounding [numbers], we'll have a small group time with them and maybe two other students to see what the problem is before we have an assessment on that skill." Teacher judgment was used to assess students' capabilities of understanding mathematical concepts.

Pretests allowed teachers to assess students' mathematical knowledge before instruction. To determine the areas in which students needed instruction, Beverly Watkins, a fourth-grade teacher, gave her students a math pretest at the beginning of the year which included the skills that they were to learn during the year. "I also do pretests at the beginning of the year to where they are with multiplication and place value, and I keep track of it." This allowed her to see where students' strengths and weaknesses were and to tailor instruction based on these data. Having this information about her students upfront, allowed Watkins to "do things [different activities] for each of the different learners."

Students' mathematical abilities were assessed by teachers using observations, discussions, personal judgments, and pretests. These ways in which teachers evaluated students' knowledge allowed them to target the weaker areas using various differentiated instruction strategies.

During instruction within small groups and math centers, teachers focused on skills in which students were struggling with in class. Chloe Gordelski, fourth-grade

teacher, mentioned that small group instruction provided a more relaxed atmosphere where students were better able to focus on tasks they struggled with during regular instruction. “In the whole classroom, they’re [students] a little bit more timid to ask questions about math concepts, but in small groups, I think they feel more comfortable.” Beverly Watkins, who taught fourth graders, shared that her math centers provided enrichment for students who did not grasp concepts during whole group instruction. “Throughout my centers, I provide extra practice with lessons that are taught to the whole class.” Weaknesses were determined either by participation in class discussions or class work assignments. Marsha Langford, third-grade teacher, pointed out that she verified her students’ weaknesses on the responses gathered from assignments that students completed in class. “I look at the different data like how they scored on class work.” Sheena Collier, fifth-grade teacher, used class discussions where she required students to think independently, pair up with a peer, and verbally share their information. “I also allow students to pair up, and I try sometimes to pair up a high and a low student, but I also do a high and high and a low and a low student so that I can work with them in smaller groups.” The students in these groups worked with hands on materials such as dry erase boards, Unifix cubes, base-ten blocks, and other tactile resources that enabled concepts to be conveyed through concrete, pictorial, and then abstract measures.

The basis of differentiated instruction is grounded on the belief that teachers inherently make the informed decisions to alter their instructional habits based on their students’ abilities. In this study, it was found that the school district provided a single model for the differentiation of reading instruction that teachers were expected to

practice. This lone model was used to determine students' literacy levels which inevitably influenced instruction. It impacted instruction due to the fact that certain instructional protocols had to be carried out based on each literacy group's level of ability. Because only one standard model of reading differentiation is required by the school district, this obligation interferes with the basic notion of differentiation. Augmenting instruction to increase student achievement should develop naturally within the process of educating children. "I reexamine my assignments when a student expresses confusion, and I've made changes to my [personal instructional] approach because of students' remarks" (Cotugno, 2009, p. 172). Teachers felt frustrated when they differentiated math instruction and confident when they prepared their reading lessons.

Teachers did not exhibit self-assurance when they organized math instruction, and because of this, some students did not receive comparable amounts of differentiated instruction in this subject as compared to reading. Third-grade teacher, Patricia Martinson, found it difficult to increase her students' math performances on assessments. "In math, for me, I think it's harder to boost them up." Chloe Gordelski, fourth-grade teacher, provided differentiated instruction in math when she observed students who struggled in particular areas. "Math instruction is more like on a needed basis." Third-grade teacher, Marsha Langford, had to develop multiple math lessons for her students due to the vast ranges of abilities represented in her classroom. "In math, they may struggle in one area but they may also be stronger in another one." The mathematics abilities of fifth graders taught by Sheena Collier were diverse, and she was challenged to

set aside time to work individually with her students. “I also do math centers where it allows me to work individually or in small groups with students.”

Differentiated math instruction was not practiced on a daily basis by all participants due to some teachers’ interpretations of differentiated instruction and the feasibility of preparing varied lessons based on the ranges of students’ needs. Fourth-grade teacher, Chloe Gordelski, provided differentiated instruction for math only when she saw that students were having difficulty. “[Differentiated] math instruction is more like on a needed basis.” On the other hand, Marsha Langford provided ongoing diverse instruction for her third graders. “I pull different groups each day based on their levels look at every skill that we do in math. Of course, I don’t have the same groups. I use flexible groups in math just because they may struggle in one area, but they may also be stronger in another one.” Sheena Collier rearranged her fifth-grade students’ homework assignments each day based on their abilities. “I modify tests and homework for students daily.” Beverly Watkins, fourth-grade teacher, shared that creating different math lessons for her students was problematic because of the vast array of her students’ abilities. “I have a huge spectrum [of abilities]. That would be my concern about math instruction.”

On the other hand, Particia Martinson, third-grade teacher, felt content when she prepared reading lessons. “I believe it’s much easier for me to differentiate instruction in reading; I have guided reading groups each day.” Chloe Gordelski echoed similar sentiments. “I use small group reading instruction every day.” Sheena Collier made an effort to meet with her reading groups each day. “I try to do my guided reading with my small groups daily.”

Mandatory regulations regarding instructional practices can be implemented in schools while simultaneously encouraging teacher autonomy and collaborative, decision-making procedures (Brown & Abernethy, 2009; Gasoi, 2009; Goldstein, 2008; Marchel & Keenan, 2005). In this district, teachers differentiate reading instruction based on the guidelines set forth by the district while math instruction is tailored to students' needs at teachers' discretions. As previously mentioned, MAP and DRA were utilized by teachers as they were implemented by the district to determine students' reading instructional levels. Chloe Gordelski, fourth-grade teacher, used the results of her students' assessments to assist her in placing students into proper reading instruction groups. "I use MAP scores to put my students in reading levels, and I use DRA levels to put them in their reading levels in their reading groups for reading instruction." Third-grade teacher, Marsha Langford, too, used her students' MAP scores to place them into groups. She commented, "I look at the MAP testing scores to group my students." Sheena Collier, fifth-grade teacher, added that "I use my MAP data for reading group placement." In math, there was no standard requirement in place that teacher were required to use to assist them in differentiating instruction. Marsha Langford used teacher-made tests to gauge students' math abilities. "I do little mini-assessments." Beverly Watkins, fourth-grade teacher, stated that she used her teacher judgment to determine the levels of her students' abilities. "For math, I use my personal teacher observation." Patricia Martinson found it difficult to provide differentiated learning tasks for her third graders in math due to the absence of a required tool specified by the district to determine mathematical ability. She mentioned, "In math, it's kind of hard- you've gotta figure out where they

are." Because the district's instructional expectations regarding math differed from those in reading, teachers experienced frustration while trying to decipher how math instruction should be carried out. Patricia Martinson, third-grade teacher, shared that "Sometimes you get a child that's good in math and then they struggle with certain things in math and it's kind of hard- you've got to figure out where they are." Chloe Gordelski, fourth-grade teacher, echoed similar sentiments though she recognizes the advantage of differentiated instruction when she mentioned "Inside the classroom, I think it's very hard to differentiate your instruction. It takes a lot of work, but it truly is beneficial for the students." Teachers' input on the strategies that they use to implement differentiated instruction displays their professional knowledge of innovative practices and supports the conceptual framework on which differentiated instruction is built upon (Gibson, 2006).

The formal assessment device that teachers used to determine students' literacy abilities was the Developmental Readiness Assessment or DRA which was implemented by the school district whereas, there was not an informal assessment device in place for mathematics' instruction. Because there was no standard instructional requirement for mathematics, teachers used differentiated strategies to meet students' academic needs. Teachers created smaller groups within both subject areas in order to focus on the different levels of the learners in which they served.

Various Methods for Differentiating Instruction in Math

Even though there was a standard model for the differentiation of reading instruction put into place by the teachers' school district, there were no set strategies for math differentiation. Therefore, teachers used various mathematical strategies during

instruction that they decided their students needed. This decision was based on teachers' personal, informal judgments or formal MAP assessments. Based on their analyses, teachers delivered differentiated math tasks through small groups and centers and hands-on approaches with the use of manipulatives.

Small groups and Centers

Fourth-grade teacher, Chloe Gordelski, asserted, "As far as math instruction, I do small group math instruction." Patricia Martinson shared that she also used small group instruction when she noticed that her third-grade students were having trouble. She ". . . pulls them [students] separately for a small group instruction." During instruction within small groups and math centers, teachers focused on skills in which students were struggling within class. Weaknesses were determined either by participation in class discussions or class work assignments. The students in these groups worked with hands on materials such as dry erase boards, Unifix cubes, base-ten blocks, and other tactile resources that enabled concepts to be conveyed through concrete, pictorial, and then abstract measures.

Teachers used small groups and centers in math in order to provide differentiated instruction. "In math, [I] pull groups that are on the same level and try to teach the same, you know work on whatever skill we're doing, just whatever level they're on" (Marsha Langford, third-grade teacher). "I also do math centers where it allows me to work individually or in small groups with students" (Sheena Collier, fifth-grade teacher). A math center was a small area within the classroom devoted to math instruction sufficient for 2 to 3 students. This area contained a small table with task cards centered on math,

various hands-on manipulatives such as dice, blocks, rulers, counters, and any other tools that would assist students in understanding the tasks. When students visited this center, they were allowed to work collaboratively and at their own paces. The teacher provided support as needed and reviewed the information with students to ensure their success. Working with small groups of students and during center time where instruction was centered on a specific skill through games allowed teachers to differentiate instruction based on students' competency levels. "I do a lot of group work where they can work together and share information and turn and share with their partner. It gives them more confidence when answering questions" (Sheena Collier, fifth-grade teacher). Students appeared to have more self-confidence when they worked with peers who had similar abilities as they actively participated and were engaged in the instruction that was provided. Beverly Watkins, fourth-grade teacher, mentioned, "I do a lot of centers." Sheena Collier concurred when she stated, "I also do math centers."

Hands-on Instruction

In order to make concepts relevant and concrete, teachers relied on the use of hands-on materials to differentiate instruction during small group practice. "In math, small groups we use the whiteboards for them. We use manipulatives like base-ten blocks and things like that" (Chloe Gordelski, fourth-grade teacher). Whiteboards were small, hand-held dry erase boards that allowed students to record their thinking strategies as they completed mathematical tasks and were used in conjunction with base-ten blocks; students were able to use dry erase markers to illustrate and solve problems. On these boards, teachers quickly and easily saw students' thinking processes and addressed them

if needed. “You can really see if they’re having problems rounding or difficulty with this kind of word problem.” Base ten blocks allowed students to create numerals using small, manipulative blocks that represented our place value system of counting where each numerical value was represented by various-sized blocks. Marsha Langford, third-grade teacher, also used hands on approaches to instruction. She said that “I try to do hands on for my kinesthetic and tactile learners.” This demonstrated that Langford differentiated math instruction based on students’ learning styles rather than performance. This allowed her to tailor students’ instruction not only to the specific skills in which they demonstrated weaknesses but to their precise styles of learning. The hands on approaches that teachers employed during instruction allowed them to make concepts relevant and easier to understand.

Summary of Findings for Questions 1 and 2

The results of this study indicated that teachers used the same methods to indicate students’ reading levels of learning in order to guide their instruction as they were compelled by the school district to use a computerized assessment program, MAP, as a data collection resource to determine students’ academic strengths and weaknesses. Each participant also utilized DRA to verify the reading levels in which their students were able to read. As shown in Table 1, all teachers used both MAP and DRA in their classrooms to establish the reading abilities of their students as both of these assessments were required by the school district. According to Table 2, participants used guided reading, projects, and small groups to differentiate reading instruction. All grade levels utilized both guided reading and small groups in their classrooms. Of the grade levels

represented, fifth-grade teachers were the only grade level to implement projects in their classrooms. Fifth-grade teachers practiced all three methods to differentiate reading instruction, and third and fourth grade teachers both used guided reading and small groups to meet the needs of their learners.

On the other hand, the methods in which teachers used to determine ability levels in math differed. Teachers relied on their observations, professional judgments, and pretests to verify the skills that students understood with ease and those that provided challenges (see Table 3). Professional judgments and observations were utilized by third and fourth grade teachers. Only fourth grade teachers used pretests to determine students' mathematical abilities. In this study, there was only one fifth grade teacher represented. This teacher did not implement a process to determine her students' mathematical abilities though it was apparent that she used various methods to meet students' academic needs.

As shown in Table 4, fourth and fifth grade teachers both used math centers in their classrooms. All grade levels in this study participated in small group, math instruction. Third-grade teachers were the only participants to create teacher-made tests to differentiate instruction though their students did not participate in math centers. Hands on, mathematics activities were utilized by third- and fourth-grade teachers. Of the four methods participants used to differentiate math instruction, fifth grade was represented by half of these. Small group instruction was implemented in both reading and mathematics to differentiate instruction (see Table 2 and Table 4).

Table 1

Processes Used to Determine Ability Levels in Reading

Grade	MAP	DRA
3	Yes	Yes
4	Yes	Yes
5	Yes	Yes

Table 2

Various Methods of Differentiating Instruction in Reading

Grade	Guided reading	Projects	Small groups
3	Yes	No	Yes
4	Yes	No	Yes
5	Yes	Yes	Yes

Table 3

Processes Used to Determine Ability Levels in Math

Grade	Observations	Pretests
3	Yes	No
4	Yes	Yes
5	No	No

Table 4

Various Methods of Differentiating Instruction in Mathematics

Grade	Math centers	Small groups	Teacher-Made Tests	Hands-on Activities
3	No	Yes	Yes	Yes
4	Yes	Yes	No	Yes
5	Yes	Yes	No	No

Note. Tables 1 – 4 show the results of research questions 1 and 2.

Because the school district required teachers to use students' reading scores resulting from their MAP assessments, this aspect of academic assessment and understanding was removed from teachers. This testing program determined students' strengths and weaknesses based on their numerical outcomes. However, teachers used the results from the reading portion of the test and their personal judgments to gauge students' abilities and provide meaningful instruction in which each student was able to benefit.

In this district, a standardized mathematics program for differentiated instruction was not implemented. However, teachers used the results of students' formal and informal assessments to decide which skills should be focused upon. Based on these results, teachers employed the uses of small groups, centers, and hands on approaches which incorporated manipulatives. This dialogue with teachers showed that they used students' MAP scores as a basis for determining small groups in which to place students. As students' abilities improved, teachers relied on their observations to reconstruct small groups so that they contained homogeneous ability levels.

Research Questions 3 and 4

What resources are used to supplement and or enrich instruction, and what kinds of strategies are employed by teachers to address students' learning levels? This study showed that teachers used many different resources to supplement instruction. Teachers used trade books to enrich literacy instruction, incorporated book clubs, listening centers with books on tapes, and they included the use of technology to assist reading and math curriculums.

To complement literacy instruction, teachers used fiction and nonfiction trade books written on students' reading levels to expose them to different genres. "We do [read] a lot of fiction and nonfiction texts because I think it's important for them to learn the difference in how to read fiction and how to read nonfiction" (Chloe Gordelski, fourth-grade teacher). Instruction was differentiated because each group of students participated in lessons geared towards their unique literacy needs. All books were leveled and representative of the students' abilities who interacted with them.

Literacy instruction was also enriched by the use of book clubs. These clubs were an extension of the small groups that were used, but students' focuses were on reading an appropriately leveled text in which members were assigned certain duties; one student may have been the leader who led the discussion of the reading assignment, whereas another student was the task monitor who was in charge of making sure that the group's discussion did not wander. "I'm having to do some things to make it [reading] fun even though one day we're going to do it during recess time, and I'm going to try to make it like a book club" (Marsha Langford, third-grade teacher). Students received teacher support as they read and discussed trade books that were differentiated among each group. Langford discussed her students' reading progress with them. I go over their assignments with them each time that we meet." Fourth-grade teacher, Beverly Watkins, recorded notes concerning students' reading abilities that she referred to when she met regularly with each learner. "I have a clipboard that has each kid's name on it with my anecdotal notes that I use when I conference with my kids."

Listening centers were incorporated to enhance instruction. In this center, students were able to listen to recordings of various books as they followed along with the actual texts. Beverly Watkins shared that this learning experience was used with students in her class who were on a lower reading level in efforts to encourage them to become better readers. “I have listening centers especially for my lower kids and I can incorporate that for my lower kids and that usually some sort of book on tape.” This allowed students to see the written words while they heard the words being spoken.

Teachers also commented on the use of technology to inform instruction. They used a software program, Classworks, that contained both reading and math instruction on the computer. This program provided tasks and games that challenged students at the levels particular to their needs. “I use Classworks and try to cater it to [their needs]” (Sheena Collier, fifth-grade teacher). Teachers used additional websites that contained games that were aimed at specific skills in which students needed to practice. “There are also games on the computer, websites that we can use. They [students] do have a computer day and they can do those type of things on the computer” (Patricia Martinson, third-grade teacher). Students were allotted days during the week in which they were allowed to work on the computers where they visited websites that pertained to their instructional levels.

In order to supplement instruction, teachers used trade books, book clubs, listening centers, and technology. These resources used by these teachers were intended to be used in conjunction with their specific instructional practice for students that

correlated to their abilities. Because various resources were used by teachers, students participated in differentiated tasks that coincided with their learning needs.

As shown in Table 5, only fourth-grade teachers used trade books and listening centers in their classrooms to enrich instruction. Both third- and fourth-grade teachers used book clubs, whereas third and fifth grade teachers implemented the use of technology. However, technology was the only resource used to supplement the instruction of fifth grade teachers. Similarly, third-grade teachers did not use (listening) centers in reading or math as a method to differentiate instruction (see Tables 4 and 5).

Table 5

Resources Used to Supplement and Enrich Instruction

Grade	Trade books	Book clubs	Listening centers	Technology
3	No	Yes	No	Yes
4	Yes	Yes	Yes	No
5	No	No	No	Yes

Note. Table 5 shows the resources used by teachers to supplement and enrich instruction.

The results of this research have shown that teachers were aware of their students' learning levels in both reading and math as they rigorously provided tasks that were responsive to their students' abilities. Teachers used focused, small group assistance to inform instruction, adapted the composition of their groups to include students with various learning needs based on their scores in certain areas, involved students' predilections in the planning of various learning tasks, and adjusted the requirements of assessment devices based on students' learning styles and abilities.

As mentioned earlier, small group instruction allowed teachers to assist clusters of three or four students with comparable abilities. Various skills were taught in areas of the learning environment that students felt comfortable. This differentiated instructional tactic permitted focused practice on concepts that students within each group needed with teacher support. Beverly Watkins, fourth-grade teacher, mentioned that she provided assistance for each of her small groups. She constantly observed learners who performed on levels lower than the others in her class. “I’m moving around checking on the kids that I know that struggle.” “I’m able to do that [address learning needs] in my guided reading groups” (Patricia Martinson, third-grade teacher). Teachers were able to provide instruction that students needed, and students actively participated in tasks required of them. “In their small groups, they’re [students] less afraid to ask questions because they’re around their peers who have similar ability levels as them” (Chloe Gordelski, fourth-grade teacher). During small group instruction, teachers were able to work with smaller groups which allowed them to provide focused attention towards each student’s needs while offering viable environments for learning to take place.

The compositions of students’ groups were adapted based on students’ assessment scores in certain areas. Before students were tested to determine their strengths and weaknesses, teachers relied on their personal judgments to configure the groups that were created to address students’ learning levels. Patricia Martinson commented that she regularly configured her small groups depending on the skills that they needed help with. “I’ve actually moved a couple because of their MAP scores.” Third-grade teacher, Marsha Langford, adjusted her students’ groups based on their abilities in different areas

and subjects. “I use flexible groups in math just because they may struggle in one area but they may also be stronger in another one.” Fourth-grade teacher, Beverly Watkins, regularly organized her groups depending on their needs as well. To positively influence her students’ reading abilities, she “[made] sure they‘re reading on the right level and introduce books to them that they might need or want to read.” Sheena Collier, fifth-grade teacher, reiterated that working with her small groups that were regularly constructed allowed her to focus on each student’s learning needs. “I try to do my guided reading with my small groups. That way, I can target the different levels of readers in my classroom.”

In order to increase participation in the learning experiences, teachers involved students’ preferences in the planning of the learning tasks in which they participated. This element spurred engagement in activities, and it allowed teachers to prepare meaningful instruction. Chloe Gordelski, fourth-grade teacher, mentioned that she learned a lot about her students’ needs from a teacher’s perspective as she worked with these groups. “You hear the questions that they ask and you see the problems that they have. I learn a lot from small groups about my students’ abilities not only about their weaknesses but their strengths as well.” Sheena Collier, fifth-grade teacher, suggested that she considers students’ likes and dislikes of various topics when she plans instruction. “If they [students] go to a center, and they’re not actively engaged in the center . . . I’m not going to repeat the center for them if they didn’t like it the first time.” Marsha Langford, third-grade teacher, provided tasks that were representative of her students’ multiple intelligences. “I do different ways of teaching for the different learning styles.”

Considering students' needs, interests, and abilities when planning varied tasks, enabled teachers to create experiences that encouraged more meaningful and significant improvements from each student.

The assessment strategies that teachers used modeled the differentiated instruction that they provided. Some teachers allowed students to choose the ways in which they preferred to display their knowledge. Sheena Collier suggested that she allowed students to give oral reports when they lacked necessary writing skills. "When students are struggling, I try to give them accommodations." Janene Foster, fifth-grade teacher, commented that she gave students choices in the ways in which they wanted to demonstrate their understandings of information. "They [students] always have a choice." Patricia Martinson, third-grade teacher, allowed her students flexibility in the kinds of educational websites that they chose to practice particular skills. She commented "they can choose to do those type things [skills] on the computer."

Teachers used various resources and strategies to address students' learning needs. The resources that they used were trade books, book clubs, listening centers, and technology. These resources used by teachers were intended to be used in conjunction with their specific instructional practices for students that correlated to their abilities. All teachers utilized small group instruction, adapted the composition of groups based on students' abilities, considered students' interests and preferences, and adjusted assessment strategies in order to address the myriad of needs required by their students. Because teachers were able to use various resources and a variety of strategies to

differentiate their instruction, this allowed them to readily diagnose learning issues and provide adjustments to instruction.

Research Question 5

What concerns do teachers have regarding differentiated instruction? The participants in this study provided differentiated instructional tasks for their students based on the diverse needs of their classes. Even though they employed the use of many innovative strategies, these teachers had a few concerns regarding differentiated instruction. The items that they worried about included the lack of time necessary for planning activities, the variety of ability levels in which they were challenged to provide instruction, and classroom management.

Teachers understood the need for differentiated instruction and its importance within the curriculum though they found that planning for the diverse learning needs of their students necessitated large amounts of time. Fourth-grade teacher, Chloe Gordelski, recognized the advantages differentiated instruction provided for her students, but she found that minimal allowances for time made planning a seemingly arduous task. She mentioned “Inside the classroom, I think it’s very hard to differentiate your instruction. Although a difficult and time consuming task, Chloe found that it helped the students to learn. “It takes a lot of work, but it truly is beneficial for the students.” Likewise, third-grade teacher, Patricia Martinson, found that time for planning proved to be an issue for her. “Time…and planning. Planning for it [differentiated instruction] takes a lot of time. That’s two things that go hand in hand.” Marsha Langford also found that time was an element that she had to confront in order to provide the type of instruction that her third

grade students needed. She suggested “Time to plan it [differentiated instruction] because you have so many different things [ability levels].” Time for planning the tasks needed to address students’ learning levels proved to be an issue for these teachers.

During the time in which this study was conducted, the administrators grouped students according to the scores from their MAP assessments the previous year and randomly assigned teachers to each of the classes. Even though students’ abilities were thought to be similar based on the ranges of those scores, teachers found that there were discrepancies among students’ abilities within classes that did not necessarily reflect their numerical standings. Fifth-grade teacher, Sheena Collier, explained that pairing students with a vast range of ability levels within the same classroom made it difficult for her to provide instruction. “The major concern I have is having the low, low with the medium. It’s good for the low to see the higher students learn, and that’s very important, but when it comes to teaching, it’s really, really hard.” Beverly Watkins, fourth-grade teacher, also faced difficulties in providing instruction for her students. She shared “My concern this year is I have a huge spectrum [of abilities]. I have kids reading on the 6th grade level and kids reading below grade level, so it’s a big spectrum.” Third-grade teacher, Marsha Langford, also found that the many levels represented by her students made it difficult to provide instruction. She stated “They’re on so many different levels and it’s [instruction] really hard.” The students in which these teachers were challenged to provide instruction comprised various ability levels.

The results from this study showed that teachers were uncomfortable with the management of their classes as students moved throughout differentiated learning tasks

whether it was through centers or while teachers worked with small groups. They felt while attention was given to a small number of children that it was complex to supervise others who were involved in various activities. Janene Foster, fifth-grade teacher, stated that "My biggest concern is keeping everyone on task during the time that I have to set aside work with my small groups. I'm also concerned with knowing that my classroom is under control during this time. I think that's the biggest challenge with differentiated instruction." Third-grade teacher, Patricia Martinson, also found that her classroom management was compromised as she differentiated instruction. She mentioned "You're meeting with a small amount but then you've got 20 or 18 at their seats and you have to give them something that's worthwhile and beneficial to do." While teachers worked with their small groups and provided other activities that offered differentiation, students who were not in certain groups at particular times became behavior problems.

Table 6 shows that third-grade teachers were concerned with each of the elements discussed that posed hindrances towards differentiated instruction. Classroom management did not pose a problem for fourth-grade teachers, but it was problematic for both third- and fifth-grade teachers. All grade levels shared that the variety of ability levels represented in their classrooms was a mutual concern. The issue of time to plan for various ability levels was not an issue for fifth-grade teachers though it concerned third- and fourth-grade teachers.

Table 6

Concerns Regarding Differentiated Instruction

Grade	Lack of planning time	Variety of ability levels	Classroom management
3	Yes	Yes	Yes
4	Yes	Yes	No
5	No	Yes	Yes

Note. Table 6 displays the concerns participants encountered with differentiated instruction.

Although teachers were concerned about differentiating instruction for their students and understood the relevance of meeting students' needs, there were a few concerns that they had. Among those were time constraints regarding the preparation of lesson plans, addressing a variety of ability levels, and classroom management concerns. Teachers felt as if these elements impacted their instructional aptitudes and plans for activities as they implemented differentiated tasks.

Discrepant Cases and Nonconforming Data

The participants in this case study collectively made efforts to provide instruction that benefitted all of their students. Instructional approaches by the teachers supported differentiated instruction. However, during the study, it became evident that some excerpts from interviews did not support the themes. For example, when one participant was asked about how various ability levels were addressed in the classroom, she responded "Right now, we're all reading the same book." This statement did not embrace the notion of differentiated instruction because the text that students were reading was identical and did not address their individual learning abilities. Supplemental questions were asked in order for the participant to explain exactly why all students were reading

the same book. It was later determined that students were reading the same book prior to the administration of the reading assessment which would determine the specific groups in which students would be placed.

Evidence of Quality

A qualitative case study was used to gather data and determine the existence of patterns relevant to the research question. Case studies allow researchers the ability to use multiple sources from which to collect evidence and establish themes (Yin, 1984). To ensure the validity of the results of this study, rich, thick, detailed descriptions, triangulation, member checking, and peer debriefing were included throughout this project.

Direct quotes provided rich, thick, detailed descriptions and helped to support the findings of this study. These quotes provided supporting evidence and revealed the perspective of the participants. Creswell (2003) recommends rich, thick, detailed descriptions as they provide a holistic view of the experience. These descriptions provided quality as they were authentic responses shared by the participants during the interviews.

Triangulation allowed the interpretation of the findings to be deemed accurate and trustworthy by using data from multiple sources (Creswell, 2003). The triangulation of data included one-on-one interviews, classroom observations, lesson plans, and relevant student work. Interviews provided each participant's perspective regarding the open-ended inquiries. The classroom observations substantiated the participants' lesson plans which ensured that instruction was being delivered as designed. Relevant student work

was gathered as evidence of student understanding and differentiation of tasks. The interviews, classroom observations, lesson plans, and student work were selected as accurate and trustworthy because they were unbiased materials that were directly related to this study. The process of triangulation required me to analyze the collected materials and determine the apparent patterns throughout the data.

Member checking was used to increase the legitimacy of the results and the truthfulness of the results (Merriam, 2002). Each participant was given a printed copy and an electronic copy of her transcript to ensure the accuracy of each interview. In addition, summaries of the observations were shared with participants as well. Teachers were given these documents to make sure that they were accurate reports of what had been shared. This was an important step to validity because it gave participants opportunities to reject any information that they deemed false or inaccurate. If the transcripts or summaries had been inaccurate, I would corrected these errors to ensure that I was communicating the participants' exact meaning. The participants in this study were satisfied with the transcripts and summaries and did not request any changes to be made.

Peer debriefing was also employed to increase the preciseness of the narrative (Merriam, 2002). The principal and literacy coach at this school served as peer debriefers for this study and were selected. They were chosen because their objective opinions were trusted and valued, and they both had prior classroom experiences with differentiated instruction. The principal had served five years as an elementary administrator with previous experience as an administrator in a middle school setting and 12 years as a

science teacher. The literacy coach served the faculty by assisting them in reading for three years. She also had 30 years prior experience as an elementary classroom teacher and gifted and talented educator. Both peer debriefers reviewed the findings in this study and provided feedback regarding its findings within one week of reviewing collected data and submitted their thoughts to me. They analyzed teachers' lesson plans and notes from observations to ensure that differentiated instruction was apparent. I used their feedback to determine the patterns and the themes that emerged from the data.

Summary

Teachers implemented differentiated instruction in their classrooms during reading and mathematics. They used students' MAP scores and professional judgments to determine their placements within small groups. In these groups, teachers focused on the strengths and weaknesses particular to each group. The resources that teachers used were planned to incorporate specific skills that students needed to practice. These materials and ideas included trade books, incorporated book clubs, listening centers with books on tapes, and technology. Teachers were concerned about the element of time, the various ability levels represented in their classrooms, and the management of their students as various activities took place. Differentiated instruction was interwoven throughout teachers' instruction and reflected the needs of their learners. In the remaining section of this study, the conclusions and recommendations for further research drawn from the analysis of data will be discussed.

Section 5: Summary, Conclusions, and Recommendations

Introduction

This study was conducted to determine the degree to which teachers implemented differentiated instruction in mathematics and literacy teaching practices in third, fourth, and fifth grade classrooms. This elementary school, located in the southeastern region of the United States, was chosen because of the decline in the number of minority students and students with disabilities who scored in the proficient and advanced categories on the Reading and mathematics portions of the yearly statewide assessment (X Department of Education, 2006). Teachers at this school received training in differentiated instruction through various professional development programs. This study was based on the following questions:

1. How are various ability levels of students addressed regarding instruction?
2. What process is used to determine students' ability levels in math and reading?
3. What resources are used to supplement and or enrich instruction?
4. What kinds of strategies are employed by teachers to address students' learning levels?
5. What concerns do teachers have regarding differentiated instruction?

Summary

Findings of the study revealed that teachers differentiated instruction in both reading and mathematics. However, the ways in which students were selected for various groups, as well as the kinds of strategies used in each subject area differed. Students' MAP scores and DRA results were primarily used to determine their levels of reading

ability which, in turn, regulated the instruction they received. These two formative assessment tools were required by the school district. Teachers differentiated reading instruction through guided reading, projects, and small groups.

On the other hand, teachers were not required to use a specific assessment tool for differentiation in mathematics. Instead they relied on their observations, professional judgments, and pretests to determine which of the various mathematics strategies to use. Mathematics instruction was differentiated using math centers, small groups, teacher-made tests, and hands on activities.

Interpretation of Findings

Data collected from interviews, observations, and document analysis answered the research questions. The first research question asked teachers how various ability levels of students were addressed during instruction. According to the data, they varied their instructional practices to meet their students' learning abilities. Students were divided into small, guided reading groups based on their literacy assessments as determined by their DRA scores. During these groups, students read books and received instruction on their individual levels. Each group consisted of four or five students.

Because the district did not have a mandatated standard model for math differentiating, students' scores on MAP assessments were used. Therefore, teachers used the data collected from this assessment or their personal judgments to divide students into small, instructional groups.Teachers used an assortment of math manipulatives or centers to explain concepts. Overall, teachers felt more comfortable differentiating reading than mathematics instruction because a set model for varying literacy had been implemented

by the school district. Due to teachers' confidence in teaching the subject, students may have performed at a much higher rate on reading assessments than math. Student performance is an effect of the quality of instruction that they receive (Bean, Ellish-Piper, & L'Allie, 2010). Thus, it can be concluded that future statewide assessments may result in higher reading scores than mathematics scores.

The second research question asked teachers to explain the process that was used to determine their students' ability levels in math and reading. All of the participants in the study used students' scores on MAP assessments to determine students' ability levels. Teachers also coupled the results from this resource with their personal judgments. They elaborated on the need to develop relationships with their students in order to better gauge their abilities. Students rely on teachers for instructional support (Bahar, 2009). Academic achievement is enriched and encouraged when meaningful bonds are formed between teachers and students (Chen & Gregory, 2009; Kolenda, 2007; Voltz & Collins, 2010; Wiseman, 2009). According to Denton, Swanson, and Mathes (2007), when teachers create supportive environments that embrace students' needs, students will exceed expectations. Therefore, building positive relationships is an impetus for successful academic growth (Frey, Ruchkin, Martin, & Schwab-Stone, 2009). They elaborated on the necessity of developing relationships with their students. It influenced teachers' judgments and allowed them the ability to select materials with which students were familiar.

MAP assessments were required biannual examinations of students' knowledge by the school district. Teachers actively used this information to guide their instruction

and were able to provide targeted lessons accordingly. Students participated within homogenous, small groups to practice skills that were troublesome for each member. The findings from this study showed that teachers made adequate efforts to ensure the success of each learner by placing them into groups where instruction was tailored to their academic needs. This showed that this assessment device established students' initial reading levels and assisted teachers in determining the groups in which to place students. It can be concluded that students' MAP results assisted teachers in regards to providing the instruction necessary to their learning levels.

The third research question asked teachers to discuss the resources that they used to supplement and or enrich instruction. It is important for teachers to choose resources to enrich instruction as these materials give students additional opportunities to practice skills (Helf, Cooke, & Flowers, 2009). Having various materials available for student use allows teachers to differentiate instruction according to learners' needs (Geddes, 2010). When teachers are able to infuse instruction with resources that enable students to grasp concepts and ideas, educational practices can be tailored to students' abilities and instruction is able to flourish thematically (Fibbin, 2010; Lin & Dwyer, 2010; Lowe, Lee, Schibeci, Cummings, Phillips, & Lake, 2010). Based on students' strengths and weaknesses, teachers in this study selected various resources to aid instruction. Many teachers explained that they differentiated instruction in fiction and nonfiction texts. Teachers who implemented differentiated instruction in regards to literacy allowed their students the opportunities to experience tasks on their levels and increased children's acceptability of understanding the presented information. This concept is supported by

Walker-Dalhouse and Risco (2009), who determined that teachers, who use differentiated instruction, assist student learning regardless of their ability level. In this study, students were arranged in small, homogenous groups, which allowed teachers to intervene and provide support as needed (Mercier Smith, Fien, Basaraba, & Travers, 2009). Students had access to a plethora of books written on their levels and had opportunities to discuss and reflect on what was read (Cox, 2008; Knowles, 2009). Cox and Knowles believed that students will comprehend content at a deeper level when they are provided with the appropriate texts to read and opportunities for discussion and reflection.

Findings from this study indicated that some teachers used computer programs to differentiate instruction. These computer programs positively impact students' learning as they offer visual stimuli that enhance instruction (Cooner, 2010; Lin & Dwyer, 2010). These online programs provided individualized, interactive instruction tailored to each student's ability level. It can be concluded that efforts to supplement instruction by teachers was evident. Teachers used resources that took students' learning styles and abilities into consideration.

Strategies Used to Address Student Learning

The fourth research question asked teachers to explain the kinds of strategies that they used to address students' learning levels. Teachers selected a myriad of innovative strategies depending on students' learning levels. Among these strategies used were centers, guided reading groups, infusion of artwork within the curriculum, and oral assignments were integral elements of instruction.

The centers that were designed by teachers encompassed the topics that had been introduced during whole group instructional settings but were focused on using different learning styles and were more tailored to students' abilities. Learning centers require teachers to actively monitor each small group as students work towards developing ideas (DeBaryshe & Gorecki, 2007). Implementing learning centers within the classroom allows teachers to present cross-curricular information while engaging student interest (Jarrett, 2010). Centers were small areas set up in fourth- and fifth-grade classrooms that composed of small tables, chairs, task cards involving math, and manipulatives such as dice, blocks, rulers, counters, and other tools that students would need to understand the activities. In these classes, groups of no more than two to three students who represented similar abilities participated in teacher-supported instruction as they worked at their own paces. While students visited the different centers in the classroom, teachers monitored students' responses to the questions included within each task and provided various scaffolding as needed to explain the reasoning necessary for solving certain algorithms and problems. Educators also reviewed the information with students at each center to ensure that they comprehended the concepts presented within each learning experience. In order for students to fully comprehend the skills at each center, teachers had to be aware of the ways in which students grasped information.

Guided reading groups were used by teachers to target each student's reading level. Guided reading is a research-based strategy and a form of best practice among balanced literacy instruction (Iaquinta, 2006). The purpose of guided reading is to assist students in developing meaning, language, and graphophonetic/visual information as they

read text (Gibson, 2006). These groups were utilized to assist students with the development of literacy skills that would eventually lead them to reading independence. Guided reading groups afford students the opportunities to gain specific, necessary literacy skills that can be used across content areas (Fisher 2008; Lesley, Hamman, Oliverez, Button, & Griffin, 2009; Purdy, 2008).

In this study, teachers utilized trade books that were written on students' reading levels. Students should be exposed to a plethora of literature suitable to their academic abilities (Avalos, Plasencia, Chavez, & Rascon, 2007). Teachers met with groups frequently during the week dependent upon their literacy needs. The books used with each group were regularly adjusted by teachers to take into account students' changing reading levels and interests in various topics. Students respond positively to reading texts in which they can relate (Craft Al-Hazza, 2006). Students were assigned to groups based on their strengths and weaknesses as determined by their scores on MAP assessments, and each group read various trade books that were written on their reading levels. Providing instruction that targets learners' needs required teachers to be responsive to their students' academic needs (Strahan & Hedt, 2009; Tobin & McInnes, 2008).

Teachers used artwork during instruction to allow students to demonstrate their knowledge of concepts. This technique is useful for literacy instruction with students with learning disabilities (Cooper-Duffy, Szedia, & Hyer, 2010). Students were allowed to illustrate their responses during literacy instruction. Arts education strengthens students' declarative knowledge (Exley, 2008; Mardirosian, Lewis, & Fox, 2007). The creation of drawings encourages critical thinking and the emergence of deeper thought

processes (Palumbo & Sanacore, 2009; Rozansky & Aagensen, 2010; Wilson, 2009). The incorporation of artwork exemplified teachers' efforts to differentiate instruction in core subject areas as this gave students another opportunity in which to display their understandings of what was learned. Teachers' instruction incorporated students' learning styles and was intended to allow students to demonstrate new learning.

When teachers sensed that students were more capable of demonstrating their knowledge through projects, they were given opportunities to do so. Giving students choices in the manner in which they demonstrate their understanding of information encourages autonomy, engagement, and incorporates the use of various communication skills (Langan, Shuker, Cullen, Penney, & Wheater, 2008). Students were allowed to complete projects that summarized their understanding of information. Projects enable students to exercise their lexical and linguistic competencies while it deepens their understanding of information (Bunch, Shaw, & Geaney, 2010; Joughin, 2007; Kerby & Romine, 2009). These responses also allow for self-reflection and evaluation of the information presented during instruction (Langan, Shukwe, Cullen, Penney, & Wheater, 2008).

Several project ideas were implemented within classrooms. In various units, teachers shared project ideas with students that involved the use of multiple intelligences. Implementing projects within the classroom allow teachers the ability to address diverse learning needs, styles, and modalities while taking students' learning levels into consideration (Bell, 2010; Hernandez-Ramos, 2009; Rathkey, 2009). Projects also enable teachers to teach across subject areas (Chug-Yan, & Chan, 2008; Lavy & Shriki, 2008;

Lowther, Inan, Strahl, & Ross, 2008; Wing-Yi Chen, Lam, 2008). The use of projects allowed students to display their knowledge. This study showed that teachers used innovative methods to address students' levels of learning.

The final question asked teachers to explain their concerns regarding differentiated instruction. Overall, teachers understood the need to vary instruction to meet learners' needs, and they planned and carried out lessons accordingly; however, teachers shared thoughts that they had about providing differentiated instruction in their classrooms. Results from this research question were grouped into three distinct themes: time constraints, variety of ability levels, and classroom management. The participants felt as if they did not have enough time during the day to plan differentiated lessons and time to carry out small group instruction. Because most teachers had a number of students whose learning levels were different, they were challenged to provide an array of lessons that reached all learners. Providing small group instruction where these lessons were implemented posed issues because teachers were responsible for teaching other subject areas in addition to reading and mathematics during the day. Teachers were also concerned about the numerous ability levels they had to address during instruction. Even though students were homogenously grouped by the administration, teachers found that there were different levels of abilities within each classroom. Students were divided into three groups (high, medium, and low) based on their MAP results. As teachers worked with these groups, they found that many subgroups existed within these groups. It was possible for teachers to have high level learners in the low groups as students' performances were compared with one another. This study also showed that classroom

management was another element that posed difficulty for many teachers when they tried to differentiate instruction. Many participants struggled to maintain desired behaviors of students as they worked to keep students interested and on task during differentiated activities. Most classrooms contained 20 students, and small groups contained three to four students and required the uninterrupted attention of the teacher. Therefore, 16 to 17 students were entrusted by the teacher to attend to independent assignments while small group instruction took place. Although students were given independent tasks to complete during this time, they did not always exhibit the expected behaviors that teachers considered satisfactory.

In conclusion, data gathered through interviews, observations, and document analysis showed that teachers used many different strategies to provide differentiated instruction in both reading and mathematics. Students' MAP results inherently determined which initial reading groups they were placed, whereas math instruction was based on professional judgments and pretests. Teachers recognized the need to provide instruction on their students' learning levels based on the range of MAP results. This was a significant task for teachers because students' learning levels varied in most classrooms.

Implications for Social Change

This research study has several implications for social change. The first is the establishment of a standard mathematics program for differentiated instruction in this school district. Teachers in this study were confident in their abilities to provide differentiated mathematics tasks, although they were unsure about the determination of

students' learning levels regarding this subject. Because NCLB of 2001 mandated progressive improvements on statewide assessments by 2014 (NCLB, 2002), it is imperative that this school district implement a mathematics program that verifies students' levels of learning to increase teachers' self confidence in providing effective instruction. This study adds to existing research on differentiated instruction because instruction was based on students' readiness levels (Hollas, 2005). Teachers in this study considered all students' learning levels as they implemented differentiated instruction to plan lessons (Tomlinson, 2005). This qualitative case study contributes to the field of education as it examined teachers' instructional strategies and efforts to create successful learning experiences for all of their students. The information presented by this research informs educators about the diverse abilities found in most classrooms and offers strategies that can be implemented in mathematics and reading instruction that will positively impact student performance.

An additional implication for social change is that differentiated instruction may assist educators in increasing the academic performance of their students. Most subjects are formally assessed on an annual basis, and if differentiated instruction is infused in the curriculum adequate yearly progress (AYP) ratings may increase. This study focused on the differentiation of reading and mathematics instruction, which results in improved student learning and retention of information (Kanellis, 2008; Kinshuk, Liu, & Graf, 2009; Luster, 2008; Miller, 2007; Palladino, 2008). When differentiated instruction is used in the classroom, meaningful learning takes place because students' learning styles and interests are considered in planning and execution of lessons (Hollas, 2005).

Some studies have shown that students with disabilities and minority populations benefit from small group instruction compared to their mainstream peers (Fiedler, Chiang, Van Haren, Jorgensen, Halberg, & Boreson, 2008; Macey, Decker, & Eckes 2009; Patchen & Cox-Petersen, 2008). This study targeted the differentiated instruction of all students regardless of their abilities or backgrounds. Because the focus of this study featured differentiated instruction across grade levels, ability levels, and diverse populations, student achievement may improve in reading and mathematics.

Recommendations for Action

The current research study showed that teachers in third, fourth, and fifth grades were implementing differentiated instruction in reading and mathematics in one school setting. Teachers used guided reading, projects, math centers, teacher-made tests, and hands-on activities in reading and mathematics instruction. Because homogenously-grouped students participated in each of these learning experiences, they received instruction specific to their academic needs. According to Sondergeld and Schultz (2008), "differentiation provides students with opportunities to approach curriculum from their strengths, as varied as these might be" (p. 37). Due to the viability of the strategies presented in this study, these approaches to instruction might be applied to other content areas.

In addition, this study found that there was not a standard mathematics program in place that offered differentiated instruction. Teachers were concerned whether differentiatd instruction was a viable method of instruction, because they were not sure whether this method was appropriate for mathematics instruction. Teachers did

implement differentiated instructional strategies although they were unsure whether or not these methods were acceptable by district personnel. Therefore, there is a need for dialogue amongst teachers and administrators to determine what strategies are acceptable for use. This may alleviate some of the concerns that participants shared in this study.

The results of this study should be shared with classroom teachers and administrators. Teachers should be informed of the differentiated instructional strategies that were used by participants in reading and math. Administrators should be aware that teachers are concerned with the lack of time for planning, range of ability levels in each classroom, and classroom management when providing materials and preparing lessons to meet the needs of diverse learners. I will share the findings from this study with other educators by presenting this information at the school district board meeting and at educational conferences devoted to instructional practices and practical approaches for teaching diverse learners.

The focus of this study was to determine which teachers implemented differentiated instruction in mathematics and literacy teaching practices in third, fourth, and fifth grade classrooms. Results of this study showed that teachers utilized differentiated instructional strategies in both reading and math. However, the processes for determining student participation in mathematics were not standard, research-based devices. For that reason, it is recommended that a program that determines students' developmental mathematical readiness be examined similar to the DRA program used for the differentiation of reading instruction. The suggested program would provide a diagnostic assessment that addressed each mathematical strand of knowledge including

algebra, data analysis and probability, geometry, measurement, and numbers and operations. Additionally, it would offer differentiated strategies geared to diverse learning styles while addressing the skills necessary for understanding each strand.

Recommendations for Further Study

This qualitative case study was an investigation on how teachers differentiated reading and math instruction in upper-elementary classrooms. I found that participants planned and implemented differentiated reading and mathematics tasks that accommodated students' abilities and learning styles. Teachers' perspectives and beliefs impact instructional practices; however, this research lends itself to other ideas.

This qualitative case study explored the implementation of differentiation in third, fourth, and fifth grade levels at one elementary school. For that reason, it is recommended that this study be replicated at the other three elementary schools in this district to determine if similar patterns exist. Another consideration would be to include middle and high school teachers in the study.

As noted in section 4, teachers had concerns regarding classroom management. Consequently, it is recommended that professional development be provided in this area. Following the professional development, a subsequent study could be conducted for comparison about how teachers' management abilities influence the implementation of differentiated instruction in the elementary classroom.

Reflection of the Researcher

Prior to conducting the interviews, I set aside my personal biases and opinions related to differentiated instruction. To ensure this, I refrained from commenting or

disclosing any personal experiences that would have interfered with the study. One revelation of the study was that some teachers did not differentiate math instruction on a daily basis. I was under the assumption that because teachers had been trained on how to differentiate instruction, they were applying these strategies on a daily basis. The interviews also disclosed that teachers struggled with classroom management as they differentiated instruction, whereas this was not apparent during casual conversations. Therefore, I wondered whether teachers chose not to differentiate math on a daily basis because of classroom management issues.

I found my involvement with the study both enriching and informative. The participants spoke freely about their classroom routines, strategies that were implemented, and knowledge of and concerns regarding differentiated instruction. They were welcoming of the observations and interviews and graciously supplied information as needed. The open dialogue expressed during this study allowed me to gain a deeper understanding of teachers' efforts to prompt student performance, and I learned new strategies that I can use with my own students. As a result of this study, I changed my view of the extent of differentiated instruction that was utilized in classrooms. Prior to this study, I was not aware of the different kinds of learning experiences that teachers actually implemented in their classrooms. Because there was little professional interaction among some of the participants who taught different grade levels, I had no idea what transpired in their classrooms. Through the one-on-one interviews, classroom observations, and analyses of lesson plans, I was able to understand and observe the differentiated tasks that were practiced and how students responded to them.

I concluded that teachers who utilize differentiated instruction must have strong classroom management abilities. Therefore, strong bonds must be built between teachers and students with foundations of trust and encouragement in order for this type of instruction to be practiced.

Conclusion

As schools nationwide strive to meet the accountability demands of NCLB, educators are faced with employing the use of research-based programs and ideas that will increase the performance of the student populations they serve. Standards are comprehensive and high for all students. However, each learner is different and requires that information is presented in ways that take their abilities into account. Differentiated instruction is one approach that considers student diversity while providing teachers with strategies that address their learning needs.

This study was conducted to determine which teachers implemented differentiated instruction in mathematics and literacy teaching practices in third, fourth, and fifth grade classrooms. Analysis of the data indicated that teachers employed differentiated instruction in mathematics and literacy through various techniques such as math centers, teacher-made tests, hands on activities, guided reading, and projects, respectively. Teachers utilized small groups with both content areas to differentiate instruction. In regards to the processes used to determine students' eligibility in differentiated reading experiences, teachers used standard assessment tools required by the district to determine specific skills that were addressed. However, there was not a set mathematics program that teachers had to use to differentiate instruction. Therefore, teachers used their

professional judgments and pretests to vary instruction dependent on student needs. Because of this, the methods used to differentiate mathematics instruction were more varied among grade levels compared to reading instruction. In order for student performance to increase in mathematics, there needs to be a consistent use of differentiated instruction practiced among grade levels. Because of this, student performances on yearly, statewide assessments may remain stagnant or decrease. The results of this study will help administrators, instructional coaches, and teachers understand that differentiated instruction addresses the needs of all students. Additionally, this study will inform stakeholders of the instructional approaches being implemented in classrooms to enhance academic achievement.

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Appendix A: CONSENT FORM

Consent Form

You are invited to take part in a research study of LaPonya Burris. You were chosen for the study because of your knowledge of differentiated instruction, content mastery, and your status of Highly Qualified as deemed by NCLB. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named LaPonya Burris, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to examine the degree to which teachers implement differentiated instruction in mathematics and literacy teaching practices.

Procedures:
If you agree to be in this study, you will be asked to:

- Participate in 3 interviews (approx. 35 minutes each)
- Participate in 3 observations (approx. 40 min. or 1 lesson period)
- Submit copies of the lesson plans of the observed lessons to the researcher

Voluntary Nature of the Study:
Your participation in this study is voluntary. This means that everyone will respect your decision of whether or not you want to be in the study. No one at Riverdale Elementary School (pseudonym) will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind during the study. If you feel stressed during the study you may stop at any time. You may skip any questions that you feel are too personal.

Risks and Benefits of Being in the Study:
There may be minimal risks in participating in this study as there may be mild discomfort with answering questions pertaining to your teaching practice. However, confidentiality will be maintained at all times. The benefits of this study include the analysis of instructional strategies utilized and how this enhances and assists in student learning.

Compensation:
There is no compensation for participation.

Confidentiality:
Any information you provide will be kept confidential. All interviews will be digitally recorded, downloaded to my personal computer and become a password protected

electronic file. Lesson plans and notes taken during observations will be locked in a filing cabinet with no direct identifiers on the data. Each participant will be anonymously assigned a letter which will correspond to their information. The researcher will not use your information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in any reports of the study.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via laponya.burris@waldenu.edu or (803) 684-1926. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368, extension 1210. Walden University's approval number for this study is **08-31-09-0321653** and it expires on **August 30, 2010.**

The researcher will give you a copy of this form to keep.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I am agreeing to the terms described above.

Printed Name of Participant

Date of consent

Participant's Written or Electronic* Signature

Researcher's Written or Electronic* Signature laponya.burris@waldenu.edu

Electronic signatures are regulated by the Uniform Electronic Transactions Act. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically.

APPENDIX B: INTERVIEW GUIDE

Interview Guide

Teacher: _____/Grade Level: _____
Date: _____ Time: _____

Interviewer: LaPonya Burris

Topic of Study: The Implementation of Differentiated Instruction in Upper-Elementary Mathematics and Reading Classrooms

The purpose of this interview will allow me to gather information related to my dissertation topic of differentiated instruction in math and reading. I appreciate your participation in this study and your willingness to be interviewed. This interview will last 15 – 20 minutes.

1. Please discuss your educational background.

2. How long have you been teaching at Riverdale Elementary School (pseudonym)?

3. Describe the population in your classroom relating to the number of total students, gender, and backgrounds represented.

4. What kinds of professional development experiences have you participated in regarding differentiated instruction?

5. How are various ability levels addressed during instruction?

6. Which strategies do you use to address students' learning levels in reading? math?

7. What concerns do you have regarding differentiated instruction?

APPENDIX C: OBSERVATION FORM

Study Note Template in Janesick Format

Participant: _____ Observer: LaPonya Burris

Grade Level: _____ Time: _____

Subject: _____ Date: _____

Notes to Self *Here you can include your own concurrent thoughts, reflections, biases to overcome, distractions, insights, etc.*	**Observation** *Here you should include exactly what you see and hear from the objects, people, and/or settings you are observing.*

Note. Adapted from Janesick, V. J. (2004). Figure 2.1. In *"Stretching" exercises for qualitative researchers* (2nd ed., p. 20). Thousand Oaks, CA: Sage. Reprinted with permission.

APPENDIX D: LETTER OF PERMISSION

Subject : **RE: Letter of Permission**

Date : Tue, May 10, 2011 01:53 PM CDT

From : **"Janesick, Valerie" <VJanesic@usf.edu>**

To : Laponya Burris <laponya.burris@waldenu.edu>

CC : "laburris@york.k12.sc.us" <laburris@york.k12.sc.us>

Good Afternoon Laponya,
Thanks for contacting me about this matter. Yes of course, I give you permission to use whatever you like as long as you reference the text, Stretching Exercises. Best wishes on your journey to completing the doctorate. Thanks, Best, Valerie Janesick

Valerie J. Janesick, Ph.D.
Professor
Department of Educational Leadership & Policy Studies
4202 East Fowler
Tampa. Florida 33620
813-974-1274
website: http://sites.google.com/site/valeriejjanesick

From: Laponya Burris [mailto:laponya.burris@waldenu.edu]
Sent: Monday, May 09, 2011 9:06 PM
To: Janesick, Valerie
Cc: laponya.burris@waldenu.edu
Subject: Letter of Permission

Dr. Janesick,

I am a doctoral student at Walden University majoring in teacher leadership. In my qualitative studies course, I had the opportunity to read your book, Stretching Exercises for Qualitative Researchers. When I prepare to collect data for my dissertation, I would like to use your Study Note Template in Janesick Format because it has helped me decipher the differences between observations and my personal insights. I really like the questions that you included in the chart which remind observers of the kind of information that should be recorded. In order for me to include your chart in my dissertation, I need written permission to use your chart. This letter can be attached in an email if you prefer to do so. I hope that you allow me to use this as it will help me capture data that is unbiased and authentic. Please let me know if you are able to grant my request.

Thanks for your consideration,
LaPonya Burris
laponya.burris@waldenu.edu

CURRICULUM VITAE

LaPonya A. Burris, Ed.D
1123 Education Street, Any City, USA 12345
Home: (555) 267-5231 Work: (421) 829-8726
E-mail: laburris1@aol.com

Education

- Walden University
  Minneapolis, Minnesota
  Doctor of Education, Ed D
  Teacher Leadership Candidate
  3.85 GPA

- Converse College
  Spartaburg, South Carolina
  Gifted and Talented Instruction
  Add-on Endorsement, 2011
  4.0 GPA

- Winthrop University
  Rock Hill, South Carolina
  Master of Education, M Ed
  Curriculum and Instruction, 2004
  4.0 GPA

- Winthrop University
  Rock Hill, South Carolina
  Bachelor of Science, BS
  Elementary Education, 1999
  Cum Laude

Teaching Experience

- [redacted]
  Fourth Grade Teacher
  1999- Present

- The Learning Tree
  Rock Hill, South Carolina
  Preschool Teacher
  1999

Professional Presentation

National Association of Black School Educators, NABSE
"What my experience has taught me about classroom management"
Winthrop University, 2011

Professional Leadership Experiences

- School Leadership Team Representative
- Grade Level Chairperson
- Yearbook Committee Representative
- Professional Technology Trainer
- Spanish Club Co-Sponsor
- District level Teacher Forum Representative
- NABSE Guest Speaker
- Technology Committee Representative
- District level Teacher Advisory Group Member

Professional Development Training

- Differentiated Instruction
- Explicit, Direct Instruction
- Guided Reading
- Brain Research
- Balanced Literacy
- Developmental Reading Assessment (DRA)
- Measure of Academic Progress (MAP)
- Promethean Board, ActivInspire
- Dynamic Indicators of Basic Early Literacy Skills (DIBELS)
- EdVenture: Integrating Math and Science Across the Curriculum
- Literacy Across the Curriculum
- Peer Assisted Learning Strategies (PALS)
- TestView Training
- ClassXP
- United Streaming by ETV
- Social Studies Standards

- Creating Thematic Units
- Understanding Poverty and Student Achievement
- Common Core Standards Training
- Mentor Teacher Training

Mentor

- Field Experience Student Mentor
- Internship Mentor

Computer Skills

- Microsoft Office Suite (Word, Excel, Publisher, PowerPoint, Publisher)
- ActivInspire
- Wikis
- Photostory
- Web page Design
- *Statistical Package for the Social Sciences*, SPSS
- Power Teacher
- Google Earth
- Kidspiration

Awards and Distinctions

- Teacher of the Year, 2007-2008
- Teacher of the Year, 2002 – 2003
- Who's Who Among Teachers, 2002
- Teacher of the Week, 2001

Professional Affiliations

- Association for Supervision and Curriculum Development, ASCD
- National Council for Teachers of Mathematics, NCTM
- Palmetto State Teachers Association, PSTA
- South Carolina International Reading Association, SCIRA

- Kappa Delta Pi Honor Society
- National Association of Black School Educators, NABSE
- Phi Delta Kappa International, PDK