Fall 10-11-2017

A Case Study Investigation of Differentiation in Middle Grade English and Math Classrooms

Yvonne-Nicole Maisel de St. Croix
Concordia University - Portland, s7tella@yahoo.com

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Yvonne-Nicole Maisel de St. Croix
Concordia University - Portland

Concordia University (Portland)

College of Education

Doctorate of Education Program

WE, THE UNDERSIGNED MEMBERS OF THE DISSERTATION COMMITTEE

CERTIFY THAT WE HAVE READ AND APPROVE THE DISSERTATION OF

Yvonne-Nicole Maisel de St. Croix

CANDIDATE FOR THE DEGREE OF DOCTOR OF EDUCATION

Julie McCann, Ph.D., Faculty Chair Dissertation Committee Diane

Heacox, Ph.D., Content Specialist

Anne Grey, Ed.D., Content Reader

ACCEPTED BY

Joe Mannion, Ed.D.
Provost, Concordia University, Portland

Sheryl Reinisch, Ed.D.
Dean, College of Education, Concordia University, Portland

Marty Bullis, Ph.D.
Director of Doctoral Studies, Concordia University, Portland

A Case Study Investigation of Differentiation in Middle Grade English and Math Classrooms

Yvonne-Nicole Maisel de St. Croix

Concordia University–Portland

College of Education

Dissertation submitted to the Faculty of the College of Education in partial fulfillment of the requirements for the degree of Doctor of Education in Transformational Leadership

Julie McCann, Ph.D. Chair Dissertation Committee

Diane Heacox, Ed.D., Content Specialist

Anne Grey, Ed.D., Content Reader

Concordia University–Portland

2017

Abstract

The researcher investigates questions in the study explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. The researcher made efforts to answer these questions using existing related research and theories in the field of education using an explanatory case study methodology. The intent of the researcher is to add to the body of literature regarding the ways in which middle grade teachers use differentiated strategies and the challenges teachers face when implementing differentiated strategies. The findings of the study indicate teachers had an awareness of the terms associated with using multiple methods to address the unique learning needs of students, but in practice, they actually implement differentiated strategies on a limited basis. Participants indicate inconsistent use of differentiated strategies to reach student learning objectives and extend student learning. Multiple stakeholders, including specialists who work in the field of academically and intellectually gifted and who work in the field of special education students, are valuable in the process of planning instruction. To improve student learning using differentiate strategies, teachers must embrace a common understanding regarding differentiated strategies. Interactions between multiple educational organization stakeholders have value when investigating the experiences of teachers regarding their use of differentiated strategies and the barriers they face in implementing of those strategies.

Keywords: differentiation, middle grade Math differentiation, middle grade English differentiation student readiness, student interest, cognitive preference, learning preferences, pre-assessment, formative assessment, statewide achievement testing, flexible grouping, assessing differentiation

Dedication

I dedicate this dissertation to David Bowie, Muhammad Ali, Prince, and my grandfather, because each grappled with challenge and transformed it to improve and enrich the lives of others.

Acknowledgements

I want to thank all of those who have given me the support and encouragement I needed to complete this extensive journey. I would like to acknowledge my grandmother, Willa, my mother, Kathryn, and my sister, Sara, who like me, find ways over walls. I would like to acknowledge the support and guidance of the dynamic women of my committee, Dr. Julie McCann, Dr. Anne Grey, and Dr. Diane Heacox. I appreciate all of your time, expertise, and patience.

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Chapter 1: Introduction

Introduction to the Problem

In my first decade as a teacher, I enjoyed my sporadic professional development opportunities regarding what strategies of differentiation teachers use as a practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies. My decision to enter a doctoral program was guided in part by a 2009 conversation with Dr. Mel Levine. I chose to investigate the individual strengths and unique needs of students based on Levine's (2002) book, A Mind in Time, in which he stated, "Schools are like airport hubs; student passengers arrive from many different backgrounds from widely divergent destinations" (p. 170). Levine referenced this airport hub simile during conversation regarding how ways teachers use different instructional methods to reach learners who vary in readiness, interest, and learning profile. As a professional educator, I coached and mentored teachers in designing curriculum plans specific to the individual strengths and unique needs of students, emphasizing the importance of diversity and equity. These considerations of the individual strengths and unique needs of students, emphasizing the importance of diversity and equity gave time to reflect upon the complexities of contemporary education in America.

Background, Context, History, and Conceptual Framework for the Problem

Background. The strategies use when differentiating for students informed the central concepts of the study. Research suggests that differentiation involves highly effective teaching strategies conducted to meet the learning needs of each student fairly and equitably.
Such strategies encourage educational variation as teachers work with students to use strategies to facilitate the unique learning needs of students. To describe the term further, it is "an approach in which teachers proactively modify curriculum, teaching methods, resources, learning activities,

and student products to address the needs of individual students and small groups of students to maximize the learning opportunity for each student in the classroom" (Tomlinson, C., Brighton, C., Hertzberg, H., Callahan, C., Moon, T., Brimijoin, K., & Reynolds, T. 2003, p. 121). Differentiated strategies informed the study concerning the successes and challenges teachers face when the modification of content, product, or processes.

Context. The researcher examines questions in the study to explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. The researcher defines differentiation strategies in this study and reviews relevant research literature. The researcher involves in the study a collection of teacher strategies and challenges to differentiated strategies within middle grade English and Math classes. The standard terms accompanying differentiated strategies concepts are noted throughout examination of the relevant literature, including: ongoing assessment; flexible learning opportunities; tiered questions; lesson modification by content, process, and/or product; and grouping practices.

History of differentiation. After understanding differentiation as a strategy for teaching and learning, it is important to consider the history of differentiation. Early documented research about differentiated strategies may have evolved alongside academic testing, curriculum standardization, instructional sequencing, and the professional development of teachers (Washbourne, 1953). In Washbourne's 1953 article for Educational Leadership entitled "Adjusting the Program to the Child," the author recognized the need for differentiating student instruction because a range of student maturity exists in any given classroom.

The perceived abilities of students drove the type of instruction they received. At one time, students were thought to have a genetic disposition for learning which was measured by their

intelligence quotient (Witzel & Little, 2016). Witzel and Little (2016) shared that the concept of students having a genetic disposition for learning measured by their intelligence quotient placed an upper limit on their possible achievement and spoke to perceptions about the capability of students and the nature of learning which were disproven in multiple additional later educational research studies. From an historical foundation in the field of special education and the field of gifted education, differentiated strategies shifted into being applied to the general education classroom (Witzel et al., 2016).

More recent changes to incorporate differentiated strategies have transpired through the implementation of the Individuals with Disabilities Education Act (Individuals with Disabilities Education Act, 2004). Congress enacted IDEA in 1975 to safeguard equal access to a free and appropriate public education for students identified with special needs. (Individuals with Disabilities Education Act, 2004). Congress made modifications in December 2004, with additional guidelines added in August 2006. The IDEA act offers procedures for schools to provide an Individual Educational Program (IEP) for students who have been identified as requiring special education services. These plans help guide educational stakeholders as they differentiate strategies for students both in the general education classroom and in the special education classroom.

Contemporary views regarding differentiated strategies incorporate the interests, readiness, and learning preferences of students into the instruction and inform the curriculum, processes, and skill development (Callahan, Moon, Brimijoin, Conover, & Reynolds, 2003). The substantive research on differentiated strategies may measure by its linking of learning objectives to the content, product, and process through which a student acquires knowledge and understanding (Callahan et al., 2003).

Conceptual framework. Because a lack of research about differentiation practices specific to middle grade English and Math exists, there was a need to study what strategies of differentiation teachers use as a practice of teaching and learning and what challenges teachers face when implementing differentiated strategies. The research study develops a unique conceptual framework of using social constructivism to view the needs of teachers to learn and be supported while exploring what strategies of differentiation teachers use in their practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies.

My interest in differentiated strategies stems from the belief that multiple pedagogical backgrounds, multiple views and multiple realities inform one's perspective and a constructivist view of information may enrich a learning environment. Yet, it is also contends that challenges to the modification of instruction existed, even when a teacher was equipped with knowledge about research-based instructional practices which supported the unique learning needs of each student.

Statement of the Problem

In recent years, there has been an increased call resulting in federally mandated education measures to provide purposeful curriculum and instruction for students. For middle grade English and Math, federal measures to increase student learning including No Child Left Behind (No Child Left Behind, 2001) and Race to the Top (United States Department of Education, 2009) influenced and place pressured on educational stakeholders. In addition to these federal measures, a number of methods of instructional delivery and initiatives were thrust upon teachers by local and state regulations. Many states have recently adopted the Common Core State Standards (2009), which require teachers to modify the objectives and content of English and Math instruction. Although the intention of standards-based education and these federal measures focus on the needs of individual learners, the modification of the learning processes, product, or content for learners was

not occurring within all English and Math middle grade classrooms. Such methods of instructional delivery and initiative barriers may include class size, diverse student learning needs, implementation of new curriculum(s), and measures of testing achievement. With multiple outside influences affecting classroom instruction, a shift might move away from direct impact on meeting the needs of individual student learners.

Teachers must still, however, know how to address the needs of student learners. Therefore, the study addresses the strategies of differentiation teachers use in their practice of teaching and learning and the challenges teachers face when implementing differentiated strategies.

Purpose of the Study

The researcher intends this study to be a contribution to the body of literature addressing the ways in which teachers use strategies to facilitate the unique learning needs of students. The study also addresses what challenges teachers face when implementing differentiated strategies. The researcher answers these questions using existing related research and theories in the field of education using an explanatory case study methodology.

Research Questions

The researcher investigates questions in the study explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies.

Rationale, Relevance, and Significance of the Study

The study's significance was its ability to add to the body of literature regarding the ways in which teachers demonstrate inconsistent understanding regarding differentiating instructional strategies to facilitate the unique learning needs of students and the challenges face in differentiating strategies. Teachers through the modification of content, product, and processes

could improve addressing differentiated strategies. Moreover, meeting challenges to differentiated strategies within the classroom is possible. While the goal of standards-based education and these identified federal measures emphasized the needs of distinct learners, the modification of the learning processes, product, or content for learners was not occurring within all English and Math middle grade teaching spaces. When considering the application of pedagogy by teachers and interviewing teachers regarding teaching behaviors, patterns and themes emerged from qualitative research regarding the ways in which students' learning needs are addressed or are not addressed. The knowledge extended from the study will aid as a source for teachers and educational stakeholders regarding the role differentiated strategies holds in middle school English and Math.

Definition of Terms

Key terms searched in regard to middle grade (grades 6, 7, and 8) instruction included differentiation, differentiated strategies (195 results), differentiated instruction (206 results), student readiness (6 results), student interest (22 results), learning preferences (11 results), learning profiles (4 results), and flexible grouping (3 results). A glossary of terms use follows.

Differentiation: Highly effective teaching conducted to meet the learning needs of each student fairly and equitably through which teachers can work with students at varying levels of readiness and learning.

Differentiated instruction: Differentiated instruction is a teaching practice through which teachers may reach the diverse needs of the students they serve. A student's individual interest, learning style, readiness, or ability are considered when differentiating instruction. Students benefit from differentiated instruction because teachers who employ it address the learner's intelligence preferences and proclivities toward content learning (Gardner, 1993; Sternberg, 1997).

When differentiating instruction, teachers must modify content, processes, and product (Heacox, 2012).

Flexible grouping: The key to grouping for differentiation is flexibility. For the purpose of the study, flexible grouping is based on student pre-assessment or formative assessment to create small groups can change depending on student knowledge, skills, and understandings (Tomlinson, 1999). Groups may vary with topic (based on pre-assessment), interest, learning style, readiness, or ability. Groups can differ from pairs, triads, groups of four, or larger depending on instructional purposes.

Learning profile: Learning profile refers to the ways in which individuals learn best (Tomlinson, 2001). A learning profile refers to the preferred modes of learning through which a student will best understand the learning objectives sought in curriculum and instruction. A learning profile may include learning preference, learning modality, gender, and cultural group.

Learning preference: A learning preference refers to a person's characteristic patterns of strengths, weaknesses, and preferences in taking in, processing, and retrieving information.

Pre-Assessment: Pre-assessment refers to testing content area knowledge before offering content instruction. Pre-assessment may also assess skills and process.

Student interest: Engaging students in content-relevant choices regarding their interest in a given topic of study enhances the learner's capability to cultivate the ability to acquire knowledge. When teachers add engaging, content-relevant instruction choices, intrinsic student motivation increases.

Assumptions, Delimitations, and Limitations

The initial assumption was that to be responsive to student needs, teachers must modify content, processes, and product (Heacox, 2012). Another assumption of the study was that

teachers could implement differentiated strategies to address the unique learning needs of students. As well, the study assumed that different levels of content material must be adapted into instruction for the purpose of modifying tasks to meet student readiness, interests, and modes of learning, and working with small groups to re-teach content, processes, or skills (Tomlinson, 2003). Relevant to the study, it might be assumed that teachers do not necessarily use or understand differentiated strategies because the limited professional development, training, and practice in differentiated strategies. Lastly, it was assumed that all participants would respond honestly to the interview questions.

Participant exclusion criteria were the delimitation of the research study. Participants for the study were selected based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience, and whether participants had a Bachelors or Master's degree. Teachers were selected based on their educational backgrounds, training, and years of teaching experience. With a background in English instruction and work experience as a peer colleague with middle grade teachers in the district, the researcher focuses on questions for English and Math curricular areas. Math was also included because the focus educational stakeholders place on Math. Considering two subject areas allows for an expanded understanding of teacher knowledge of differentiated strategies and to consider the use of differentiated strategies by teachers.

Yin (2014) explains that the rationale for learning about a small group and then using that understanding as an explanatory case is, "the lessons learned from these cases are assumed to be informative about the experience of the average person or institution" (p. 47). However, there are limitations associated with the case study method of research. Creswell (2008) defines limitations as potential weaknesses or problems with the study identified by the research (p. 207). Limitations

existed in the study which affected the interpretations of the research findings. The limitations included the following:

- Generalization of the results to the wider population;
- Difficulty in replicating the study and its findings;
- Time constraints regarding the data collection and analysis procedure, and
- The researcher's own subjective feelings, which may influence the case study

The first limitation considered the range of teaching grades and subjects was limited to middle grades English and Math. As the study was investigating two subject areas—English and Math—as opposed to more subject areas, the scope of the study and its data were reduced. The study interviewed 12 participants total: six who taught middle grade English and six who taught middle grade Math. Additionally, the study incorporated findings from participant interviews from only one school district. Participants were selected for the study based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience. Based on the responses received, the participant selection was to be as representative as possible of the whole district while considering whether participants had a Bachelors or Master's degree. All respondents held either a Bachelor's or Master's degree in education as a prerequisite for employment within the district. The researcher purposefully selected a sample of 12 participants from the 24 responses. The sample size was established because 12 selected participants would be a more manageable purposeful sample size for the interviews, which would be conducted as part of the explanatory case study interview. These considerations and designed procedures and processes to produce a worthwhile study responded adeptly to the researcher's questions, yet protected participant anonymity (Stake, 1995). Because the criterion is small, the transferability of the study's findings in limited due to the grade levels taught by the selected participants.

A second limitation in the study pertained to the difficulty in replicating the study and its findings. One of the intentions of qualitative research is to describe the different perspectives of participants to readers (Creswell, 1998). Data from the study would be different from another explanatory case study as the responses regarding the in-depth discussion of the phenomena of differentiated strategies would differ based on participants' interview data. However, considering two subject areas in this study allows the researcher to expand the understanding of teacher knowledge of strategies and the use of differentiated strategies.

Although all qualitative research is vulnerable to personal interpretation and selection bias (Stake, 2010; Williams, 1987), the explanatory case study method was the most appropriate method for the study because it allows the study to be conducted through personal interviews of participants in two subject areas present within one school district. The research design allows for flexibility within the study's model and did not detract from the study outcomes. The risks to the study subjects inherent in the study were no greater than those normally encountered during regular classroom participation or present during a professional collaborative planning meeting. Data or other documentation collected as part of the interview process was not shared among teachers. No negative feedback resulted from the data collected in subject interviews.

A third limitation in the study would be the time constraints regarding the data collection and analysis procedures. As Creswell (1998) explains, "Qualitative research is complex, involving fieldwork for prolonged periods of time, collecting words and pictures, analyzing the information inductively while focusing on participant's views, and writing about the process using expressive and persuasive language" (p. 15). Interviews are time consuming, and the time constraints of getting the research completed in a timely manner did not allow for an extensive quantity of participants to be interviewed in depth. The research required time for the interviews to be

conducted, the coding to be designed and categorized, and the member checking process to be conducted with fidelity. These considerations and designed procedures and processes to produce a worthwhile study responded adeptly to the researcher's questions while protecting participant anonymity (Stake, 1995). While participants agreed to participation during the interview session, once the length of the interview session was completed and the interview questions were answered, participants could reasonably be expected to feel the interview was completed. A participant might have a longer response to one interview question and not as much to offer regarding a response to a different interview question.

Researcher bias may have affected the themes, patterns, and suggestions in the evaluation of the study interviews. The ability to express and reflect on researcher bias was critical to the research process. Therefore, introspection and analysis occur throughout the study in an attempt to limit such bias. Introspection and analysis occur by keeping a record of reflective notes to track researcher thoughts during the study. The ability to express and reflect on researcher bias was critical to the research process (Norris, 1997). Because the background in middle grade English, the main study question narrows to address middle grade English and Math. The professional background presents the possibility of researcher bias in the interpretation of the study.

Summary

The research in the study exists to be a contribution to the body of literature by addressing the ways in which teachers use strategies to facilitate the unique learning needs of students. The study also addresses what challenges teachers face when implementing differentiated strategies. The researcher made efforts to answer these questions using existing related research and theories in the field of education using an explanatory case study methodology. The literature surrounding differentiated strategies is in Chapter 2. The methodology and plan for data collection is in Chapter

3. The process of data gathering, analysis, and synthesis is in Chapter 4. Lastly, the recommendations and suggestions for future research are in Chapter 5. Education practitioners and stakeholders benefit from the recommendations of the study, which add to the existing literature in the field on instructional practices and instructional pedagogy.

Chapter 2: Literature Review

Introduction to the Literature Review

In America, each child is required to attend school. Although students are grouped into grades, each student learns in different ways. The teacher is required to address the learning needs of each student in the classroom. In recent years, there has been an increased call to provide purposeful curriculum and instruction for students. For middle grade English and Math, federal measures to increase student learning, including No Child Left Behind (No Child Left Behind, 2001), Race to the Top (United States Department of Education, 2009), and the Common Core State Standards (CCSS) established in 2009 continued to influence and place pressure on all educational stakeholders. However, there is not much extant research regarding how teachers differentiated strategies in middle grade English and Math classrooms. Furthermore, a review of published research reveals a gap between how teachers are making instructional design decisions and how they are using differentiated strategies.

The purpose of the literature review was to consider what has and has not been done prior in the body of research literature, create a framework regarding the researcher's questions for the study, and evaluate and synthesize the body of literature based on the researcher's questions for the study to guide where future research should lead. The researcher's questions for this study to explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies.

The chapter divides into three sections. The first section provides a brief overview of differentiated strategies, including: (a) defining differentiation; (b) offering a brief history of differentiation; (c) providing a brief overview of strategies; and, (d) outlining challenges to meeting learner's needs. The second section provides elements of the study's conceptual

framework and considers what research literature presented regarding: (a) what strategies of differentiation teachers use in their practice of teaching and learning; and, (b) what challenges teachers face when implementing differentiated strategies. The third section presents an extensive review and analysis of relevant research articles.

A Brief Overview of Differentiated Strategies

Defining differentiation. For the study, understanding the definition of differentiation and the use of differentiation as a strategy for teaching was essential. The strategies use when using differentiated strategies for students informed the central concepts of the study. Research defines differentiation as highly effective teaching strategies conducted to meet the learning needs of each student fairly and equitably. Such strategies encouraged educational variation in content, process, and product as teachers work with students to use strategies to facilitate the unique learning needs of students.

Based on research gathered from Callahan et al. (2015), Heacox (2012), and Tomlinson et al. (2003), differentiation is highly effective teaching conducted to meet the learning needs of each student fairly and equitably. Differentiation was widely described as a means of meeting the diverse learning needs of students (Callahan et al., 2015; Heacox, 2012; Tomlinson et al., 2003). To describe the term further, it is "an approach in which teachers proactively modify curriculum, teaching methods, resources, learning activities, and student products to address the needs of individual students and small groups of students to maximize the learning opportunity for each student in the classroom" (Tomlinson et al., 2003, p. 121). For Wormeli (2007), differentiation involved using different instructional strategies for individual students to allow students to acquire content area learning using diverse strategies within the same classroom environment. The teacher within the learning environment could narrow these types of strategies specifically into the

modification of content, product, or processes. The next section of the study explores the historical development of differentiated strategies in the context of considering how teachers use strategies to address the learning needs of all students and the challenges that arose.

Brief history of differentiation. Differentiated strategies may have evolved alongside academic testing, curriculum standardization, instructional sequencing, and the educational enhancement of teachers (Callahan et al., 2015; Tomlinson et al., 2003; Washbourne, 1953) to address the contemporary view of differentiated strategies. Initially, differentiated strategies were based in the field of special education and in the field of gifted education (Voltz, Sims, & Nelson, 2010). However, in the early stages of differentiation, strategies related to the approach were opposed by school districts because school leaders felt differentiated strategies "divorced the mechanics of learning from motivating social experience." (Washbourne, 1953, p. 140). Differentiated strategies, nevertheless, were adhered to as a way to accommodate each child's learning needs and preferences to achieve maximum growth as a learner. Differentiated strategies emerged from these sectors of education as teachers sought ways to proactively adjusting teaching and learning methods.

The perceived abilities of students drove the type of instruction they received. At one time, students were thought to have a genetic disposition for learning which was measured by their intelligence quotient (Witzel et al., 2016). The concept of students having a genetic disposition for learning measured by their intelligence quotient placed an upper limit on their possible achievement and spoke to perceptions about the capability of students and the nature of learning which were disproven in multiple additional later educational research studies.

From an historical foundation in the field of special education and the field of gifted education, differentiated strategies shifted into to the general education classroom (Witzel et al.,

2016). Contemporary views regarding differentiated strategies incorporated the interests, readiness, and learning preferences of students into the instruction and these differentiated strategies then informed the curriculum, processes, and skill development (Callahan et al. 2003). The substantive research on differentiated strategies may measure by its linking of learning objectives to the content, product, and process through which a student acquires knowledge and understanding (Callahan et al., 2003).

Brief overview of strategies. Inside the classroom, teachers sought modifications of differentiated strategies to enhance the rigor and relevance of curriculum and instruction for diverse students (Frey, 2009). A cyclical relationship exists among teaching, learning, and assessment (Heacox, 2009). The cyclical relationship unites the teacher's instructional methods and the student's learning. Topics, themes, and concepts presented to students as part of the curriculum are referred to as content (Heacox, 2012). Process modification is the way in which the teacher supports the learning profiles and preferences of the students to increase the creative and critical ways in which students learn about a topic (Heacox, 2012). Product expresses new ideas or thoughts resulting from student learning and demonstrates the use of learning (Heacox, 2012).

While theoretical literature exists regarding how teachers should modify curriculum and instruction to differentiate content, product, or processes for students across grade levels, the existing empirical literature rarely included middle grade English and Math settings which describe what the theory looks like in practice.

The modification of content, processes, and product is the basis of differentiated strategies. Tomlinson (1999) identified various differentiated strategies which could be use by teachers, including multiple intelligences, varied text materials, tiered centers, and learning contracts. Educational stakeholders' concerns regarding student learning validated the necessity to promote

and support differentiated strategies: first, the perception that children were able to make it successfully on their own; and secondly, the perception of student boredom or frustration related to the absence of academic challenges (Galbraith & Delisle, 2015). The intent of using differentiated strategies is to incorporate the interests, readiness, learning preferences, and cognitive preferences of students into the pedagogy use by teachers. However, according to Westberg and Daoust (2003), "teachers' differentiation practices in third and fourth grade classrooms have not changed in the last 10 years" (p. 6). These researchers found that when they recreated their 1992 Classroom Practices Survey Study, administered to more than seven thousand teachers across the county, and compared 1992 results with the results of their 2002 Classroom Practices Survey Study, there was no significant difference between results of the 1992 study and of the 2002 study. Researchers recognized the lack of change in differentiation practices. Participants in the 2002 study taught in third and fourth grade classrooms but were not the same participants as in the original 1992 study. The findings here support assertions made by Westerberg et al.

As the study inquires: (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies, the literature reviewed was an analysis of the research about differentiated strategies by Beecher and Sweeny (2008), Block, Parris, Reed, Whiteley and Cleveland (2009), Edwards, Carr and Siegel (2006), and Tieso (2004). Selections of the literature review investigate the strategies of differentiation teachers use in practice, as well as the learning and the challenges teachers face when working with students at varying levels of readiness and learning. The keywords use in the search of the literature were differentiation, middle grade Math differentiation, middle grade English differentiation, student readiness, student interest, cognitive preference, learning preferences, pre-assessment, formative assessment, statewide achievement testing, flexible

grouping, and assessing differentiation, and 548 articles were retrieved. The literature review included a search of multiple databases, including ERIC (EBSCO), ProQuest, and Sage Journal Online.

Challenges to meeting learner's needs. When striving to address the unique needs of all students, teachers face challenges in working to improve student performance with multiple instructional strategies. Foundational challenges to differentiated strategies included teaching students for understanding versus teaching students relevant skills, using universal design versus differentiated design, and assessing for growth versus for assessing for comparison (Tobin, 2008). According to Tobin, teaching for skills is more fundamental; a student needs to learn a skill to gain an understanding of a particular part of instruction content. To solve the foundational challenge, teachers observed the needs of the student at the student's skill level and then modified instruction to support student understanding of the content (Tobin, 2008). Research gathered from Tobin conveyed that teachers who taught for understanding considered the big ideas or concepts a student need to know.

Teachers face a challenge to student performance when students compared themselves with one another, especially in the context of an increased emphasis on standardized instruction objectives and testing. Callahan et al. (2015) noted that school accountability, engendered by the politicization of linking school funding to bridging achievement gaps, focus on student achievement on standardized testing rather than on the cultivation of creative, unique, diverse student thinkers and learners.

Within the classroom, teachers had the ability to differentiate evaluation of students by considering their initial starting points and by recognizing growth. Tomlinson (2003) pointed out that although students shared the same classroom, they differed in terms of their readiness to learn,

their interests, and their preferences regarding learning. Tobin (2008) suggested using rubric-based evaluations to assess growth and advised that to mitigate foundational challenges, teachers should "clarify the essential learning objectives first and then provide opportunities to engage in activities that cultivate those essential learning objectives" (p. 164). A cyclical relationship exists among teaching, learning, and assessment (Heacox, 2009). The cyclical relationship unites the teacher's instructional methods and the student's learning. Wormeli (2007) reported that, in general, differentiated strategies are a popular term in school improvement plans; however, some teachers who claimed to be modifying assessment and curriculum were not doing so. Westberg et al. (2003), who found that when they recreated their 1992 Classroom Practices Survey Study, administered to more than seven thousand teachers across the county, and compared 1992 results with the results of their 2002 Classroom Practices Survey Study, "teachers' differentiation practices in third and fourth grade classrooms have not changed in, supported the statement the last 10 years" (p. 6). If teachers are to strive for student success through differentiated strategies, teacher instruction must include a supportive learning environment, continuous assessment, high-quality curriculum, respectful student tasks, and flexible grouping (Tomlinson, 2003). Yet, based on the information presented by these researchers, a rationale for teachers not using differentiated strategies could be that differentiating for multiple learning preferences may be limited based on teacher understanding and usage of differentiated strategies.

The following section considers the elements of the study's conceptual framework, including: (a) its conceptual framework; (b) social constructivism; (c) the needs of teachers to learn and be supported while differentiating strategies; and, (d) the impact on student learning. The section organizes according to the significance of the research to the study.

The Conceptual Framework

The study's conceptual framework provides the structure for the examination or clarification of an argument's chosen concepts (Eisenhart, 1991). McGaghie, Bordage, and Shea (2001) stated that a conceptual framework contributed in two significant ways to the research report: first by identifying research variables, and second, by clarifying the relationship between the variables in the research. When conducting research, beliefs about inquiry shape how researchers formulate research questions, and philosophical assumptions guide how researchers seek out information to answer these questions (Lester, 2005).

Knowledge of how beliefs about inquiry shape how researchers formulate research questions, and philosophical assumptions that guide how researchers seek out information to answer these questions, was significant to understand given that the beliefs and philosophical assumptions educational researchers bring to their research inform and determine the conceptual framework of a study (Creswell, 2013).

Determining what needs to be studied provides a framework for the researcher to design an inquiry process which supports the research. Because a lack of research about differentiation practices specific to middle grade English and Math exists, there was a need to study what strategies of differentiation teachers use as a practice of teaching and learning and what challenges teachers face when implementing differentiated strategies. The review of relevant literature developed a unique conceptual framework of using social constructivism to view the needs of teachers to learn and be supported while differentiating instruction and the impact on student learning of understanding, and the challenges of implementing differentiated strategies in middle grade English and Math.

The research commenced with the belief that multiple pedagogical backgrounds enrich a learning environment and that if teachers were to influence student learning in a positive way, they support professional growth. Yet, challenges to the modification of instruction existed even when a teacher was equipped with knowledge about research-based instructional practices that supported the unique learning needs of each student.

For the study, the conceptual framework drew from Vygotsky's (1978) social constructivism. Additionally, the need of teachers to learn and be supported and teacher impact on student learning was part of the evaluative case study. The focus for the study was to learn about the ways in which teachers use differentiated strategies and the challenges of implementing them. A central assumption of the study was that teachers could implement differentiated strategies to address the unique learning needs of students. Additionally, a second assumption was that the personal perspective teachers brought to a diverse group of students was most effective in its impact on student learning when multiple methods and strategies were use.

Social constructivism. Vygotsky's (1978) social constructivism theory informed the study. Vygotsky believed the needs of teachers to learn and be supported should be based on an assessment of a person's learning readiness. When Vygotsky emphasized the collaborative nature of learning, he asserted that social context, multiple realities, and multiple personal perspectives guided the learning. Social constructivists assert that individuals could learn material or perform tasks which were more complex when they had guidance or worked in collaboration with peers (Vygotsky, 1978). Teachers face challenges in acquiring knowledge about their instructional practice. Because the study investigated the methods teachers use to differentiate and the challenges teachers face when doing so, the use of social constructivism as a theoretical framework was appropriate for the study. Social constructivism as a conceptual framework for the study

supported collaborative approaches, guided learning of the group, and multiple perspectives of teachers to potentially address the unique learning needs of students as they determined what strategies could be used as a practice of teaching and learning and what challenges teachers face when implementing differentiated strategies.

Vygotsky (1978) saw the two channels of the social constructivist continuum as indistinguishable. The first channel was the brain, which constructed meaning from experiences using reflective practices. The second channel being the social situation in which one gained experience. Consequently, one individual's advancement impacts the other; one individual's improvement relies upon the other (Kozulin, 1986; Liu & Mathews, 2005; Tudge & Winterhoff, 1993). In entirety, a person's social improvement is thought to start first through social association, and afterward inside, with advancement falling behind learning (Kozulin, 1986; Liu et al., 2005). Liu and Matthews (2005) allude to Vygotsky's hypothesis as authentic in that one's advancement of dialect and mental working are a result of their social advancement.

Another key commitment to the point of view of social constructivism was Vygotsky's (1978) zone of proximal development (ZPD) (p. 86), which is the contrast between where the learner is formatively and where the learner could be formatively with guidance. What the learner cannot manage without help today ought to be what they can do all alone tomorrow. The suggestion of ZPD for instruction was to provide learning opportunities for the advance the learner and to participate in learning opportunities which urge the learner to seek after exercises which go just past their capacities (Vygotsky, 1978).

Needs of teachers to learn and be supported while differentiating strategies. A central concept of the study assumed that teachers might implement strategies of differentiation in their practice of teaching. However, a second consideration questioned the challenges teachers would

face when implementing differentiated strategies. Additionally, the personal perspective teachers brought to a diverse group of students could be most effective in its impact on student learning when multiple methods and strategies were use. Sondegeld and Shultz (2008) suggested teachers should ask for assistance and guidance from colleagues to ascertain their ideas and suggestions when implementing new strategies.

Learning from other colleagues' knowledge and gaining experience with differentiated learning strategies might support attempts by teachers to integrate new instructional strategies within their classroom (Tobin, 2004). According to Sundered and Shultz (2008), the use of differentiated strategies might be a learning process for most teachers and teachers would benefit from the constructive feedback from their colleagues about ways to implement and improve diverse instructional strategies. When teachers had opportunities to collaborate, they also increased the quantity of instructional strategies they learned which could be used as strategies to differentiate in efforts to increase student learning (Sundered & Shultz, 2008).

Social interaction among teachers can be a catalyst for reflection (Vygotsky, 1978). When teachers reflected upon collaborative professional discourses, they are more capable of determining ways in which they might use diverse strategies to complement their teaching styles and the classroom environment. Teacher knowledge and experience informs and enriches student learning. Teachers could meet challenges regarding the use of differentiated strategies within the classroom, according to Tomlinson (2015), through educational enhancement, professional collaboration, and professional support. To provide optimal student learning and to benefit the professional growth of teachers, it was important that teachers have a practical understanding and knowledge base prior to implementing differentiated strategies (Tomlinson, 2015).

Impact on student learning. The personal perspective teachers bring to a diverse group of students might be most effective in its impact on student learning when teachers in their practice of teaching and learning use strategies of differentiation, and when challenges can be addresses which teachers face when implementing differentiated strategies. Brooks and Brooks (1999) describe the social constructivist teacher as a weaver, an explorer, and an analyst (p. 98), and one who helps search rather than follow (p. 102).

Hudson and Hudson (1998) supported the concept and shared that social constructivist theory gives teachers a central role: leading children and students to new levels of conceptual understanding by interacting and talking with them (p.37). Through interacting and talking with students, teachers might show responsiveness to student learning needs by using modifications, by incorporating varying levels of reading content material into instruction, and by working with small groups to re-teach content (Tomlinson, 2003). A major drawback of traditional instruction is that many teachers "teach to the middle" (Haager & Klingner, 2005, p. 19), which means a growing number of student needs will go unmet. Research shows that teachers need to modify their conventional instructional strategies for addressing student learning needs, encouraging student discourse, and limiting requests for the need to memorize materials. Teaching to the intermediate level is a challenge teachers' face when implementing differentiated strategies. Research shares that teachers inconsistently have attempted to actualize differentiated strategies in their classroom however experiencing difficulty when ending their past instructional inclinations in the classroom. According to Tomlinson and McTighe (2006), teachers attempt to differentiate instruction by giving struggling learners less to do than other learners do and giving more advanced learners more to do than other learners. It is not helpful to struggling learners to do less of what they do not grasp. As well, it is not helpful for advanced students to do more of what they

already understand. It is likely that the *more* or *less* approach to differentiation occurs when uniformed teachers lack clarity about essential outcomes and meaningful basis from which to differentiate (Tomlinson et al., 2006 p. 41).

The primary goal of teachers has historically been to provide effective instruction in the most informed way possible with the purpose of improving student achievement and understanding. Differentiated strategies provide students, who have diverse learning needs, the opportunities to access the curriculum, which may result in greater learning outcomes (Tobin, 2004). Tobin (2008) advised, "Teachers should provide instruction that allows for student choice within product, processes, or content" (p. 167). The structure of student grouping, instruction, and feedback should respect and honor the uniqueness and learning potential of each student. It is possible to design tasks that respect the needs, interests, learning preferences, and cognitive preferences of every student based on student interest, appeal, understanding, and skill (Tomlinson, 2000). The research articles reviewed as part of the study supported the abilities of the teachers to increase student independence, incorporate student choice, and more effectively monitor and modify instruction to enhance student learning when differentiated strategies are incorporated. The third section presents a research article review and analysis, including the research article methodologies.

Review of Research Literature and Methodological Literature

The literature reviewed in the section focus on how the implementation of differentiated strategies affected student performance and engagement in the classroom. The literature was also reviewed to determine other relevant quantitative, qualitative, or longitudinal studies to investigate the experiences of teachers using differentiated strategies and the barriers they face.

Beecher et al. (2008) considered in a longitudinal study the instructional and enrichment approaches use by teachers to decrease the achievement gap among students at a linguistically and culturally diverse, high-performing suburban elementary school. Beecher and Sweeney explored what strategies of differentiation teachers use in their practice of teaching and learning. The research study considered how teachers flexibly to respond to data collected regarding student achievement (Watts-Taffe et al. 2012) use instructional strategies. Beecher et al. Beecher et al. set out to determine whether student achievement would result from the modification of instructional practices. The researchers gathered information from staff meetings, observations of site-based educational development sessions, the school-wide enrichment plan, and test score data. Beecher et al. (2008) found that the teachers involved in the study changed student competency by shifting from traditional instructional methods to instructional methods of teaching and learning focus on enriching students' strengths. By creating learning and enrichment opportunities focus on student strengths, needs, and personal responsibility for their learning, teachers produced active learning environments in their classrooms (Beecher & Sweeny, 2008). Using a quantitative methodology, Beecher et al. found at the end of their eight-year research period that the achievement gap at the school narrowed from 62% to 10%, with a reduction in 9% for writing, 7% for valid Math, and 30% in Reading across differing ethnic groups. The researchers concluded, based on collected data, that the achievement gap for students narrowed as teachers enriched learning experiences by using differentiated approaches to instruction (Beecher & Sweeny, 2008). The use of varying instructional methods by teachers to achieve higher learning for students was a theme of the study.

Another study conducted by Block et al. in 2009 considered methods of improving reading instruction. The comparison study involved a total sample population of 660 students ranging

from seven to 12 years of age. The study, conducted over the course of one year, focus on improving reading comprehension using tiered instruction, small-group instruction, and whole-group discussion. Participants were divided into a control group, which received no modifications, and an experimental group, in which participants were taught using one of the multiple differentiated reading approaches. The study considered strategies of differentiation teachers use in their practice of teaching and learning of reading instruction. Data were collected from Scholastic Aptitude Test reading subtests, the Texas Assessment of Essential Learning and Skills Test, and publisher workbook texts. The researchers found that struggling readers who received 20 minutes of instruction using one of the three approaches made gains in their reading comprehension equal to or above those of their peers who received only lecture-based, traditional instruction (Block et al., 2009). By differentiating, the teacher met the student readiness level and of understanding and offered options by which students achieved success. The research by Block et al. supported the findings of Beecher and Sweeney (2008) in determining that the use of varying instructional methods by teachers led to higher learning achievement in reading for students.

Because the study considered the use of varying instructional methods by teachers to meet the learning needs of students was a consideration in a case study conducted by Edwards et al. (2006). The researchers examined teacher training and appropriate support for designing instruction based on the diverse learning needs of students. The researchers administered an initial survey to pre-service elementary teachers who would be graduating from college and seeking employment as teachers. The survey asked participants about teacher preparation classes, district trainings, and workshops centered on instructional strategies and management.

Survey results indicate 40% of candidates received differentiated instruction. The following year, the researchers conducted a post-survey with the same participants, who were now

employed as elementary teachers. Post-survey results indicate less than 15% received district training in differentiated strategies once they had become elementary teachers. The post-survey data demonstrates a challenge faced by teachers who implement differentiated strategies. Edwards et al. (2006) determined that although differentiated strategies are viewed as important in university instruction, teachers in practice are not receiving the appropriate amount of training in professional development to use, prepare, and plan for the use of differentiated instruction strategies or techniques.

Prior to the work of Edwards et al. in 2006, a 2004 case study by Tieso considered how the schools in which teachers taught were providing professional development to prepare for the use of differentiated instruction strategies. Tieso (2004) researched a school's approach to implementing technical and peer coaching models. The school's approach was to help teachers modify, differentiate, and enrich curriculum. In the study, Tieso followed teachers through a year of instruction to explore what strategies of differentiation teachers use in their practice of teaching and learning. Tieso interviewed participants to understand how differentiated strategies were used in their practice and how differentiated strategies were enhanced. Tieso observed teachers frequently instruct to the middle of the students' zone of proximal development in many public education settings. In doing so, Tieso discovered data showing teachers face challenges when implementing differentiated strategies. Tieso found that if students' diverse educational needs were to be addressed, teachers need to make decisions regarding curriculum implementation based on knowledge of the student's background.

As indicated by Carolan and Guinn (2007), a portion of the barriers teachers were confronted with when attempting to use differentiated strategies were related to not having enough time to effectively plan and not being able to support instructors enough to develop their skills and

practices with differentiated strategies. The use of differentiated strategies required more planning time, more student assessment time, and more re-instructing time (Carolan & Guinn, 2007). Teachers were compelled by the need to cover the substance, benchmarks, and the material required by the school district in a short measure of time (Lim, Pek, & Chai, 2005) while also exploring what strategies of differentiation could be use in their practice.

Not many resources were found, which consistently encouraged the use of differentiated strategies in middle grade classrooms (Marzano, R. J., Norford, J. S., Paynter, D. E., Pickering, D. J., & Gaddy, B. B. 2001; Tomlinson et al., 2006; Wiggins & McTighe, 1998). The barrier connects to the need of teachers to have appropriate, effective, and sustained professional development to effectively implement (Bain & Parkes, 2006; Simpkins, Masteropieri, & Scruggs, 2009). Often, administrative expectations for teachers' performance exceed prior training, practice, and expertise in differentiated strategies. Teachers are asked: (a) to assess student strengths and diagnose needs, (b) to deliver high-quality differentiated strategies for diverse needs, (c) to monitor progress and adjust instruction, re-teaching as needed, and (d) to manage classrooms of active students (Everson, Emmer, & Worsham, 2003; Tomlinson et al., 2006). The expectations previously listed highlight some additional challenges teachers face when implementing differentiated strategies.

Acknowledgement that these barriers to differentiated strategies many exist were reflected the researcher's questions posed in the study. While Wormeli (2007) detailed that a few instructors and principals make cases to advance differentiate strategies, there is a lack in the way to execute differentiate strategies effectively. A lack in the way to execute differentiated strategies brings about erroneous judgments and carelessness as found in the study's findings. Lastly, as Tomlinson (1995) noted, these barriers to differentiated strategies can also cause teachers to have something

else added to educational learning without the support or the capacity to deal with a classroom with various types of student learners. To deal with a classroom of diverse student learners, the research study explored what strategies of differentiation teachers have use in their practice of teaching and learning and barriers to differentiating strategies.

Review of Methodological Issues

The literature review of scholarly research by Beecher et al. (2008), Block et al. (2009), Edwards et al. (2006), and Tieso (2004) considered various argument patterns use in their studies. Using a longitudinal study, Beecher et al. (2008) considered the instructional and enrichment approaches teachers use to decrease the achievement gap. Block et al. (2009) conducted a quantitative research study focus on improving reading comprehension using tiered instruction, small group instruction, and whole-group discussion. Edwards et al. (2006) examined teacher training and appropriate support for designing instruction based on the diverse learning needs of students in a case study. Tieso (2004) also use a case study to research a school's approach to differentiated strategies through the implementation of technical and peer coaching models to help teachers modify, differentiate, and enrich curriculum. The methodological issues found in the literature reviewed demonstrate the impact of differentiated strategies and challenges to differentiating strategies.

Synthesis of Research Findings

Some researchers felt Vygotsky's research had implications for teaching such as accentuating real experience, exploration of multiple perspectives, holistic instruction of broad concepts, and social interaction (Fosston, 1996, Schunk, 2008). From a social constructivist point of view, subject matter must be personally relevant to the learner which allows an opportunity for personal meaning making (Fosston, 1996; Schunk, 2008). Mainly, subject matter should be

present in a fragmented or isolated fashion which demands memorization and regurgitation, but should instead present the learner with an over-arching problem and its major concepts (Brooks & Brooks, 1999; Terhart, 2003).

It may be possible for teachers to implement solutions, which addresses the unique learning needs a student exhibits through the modification of instructional content, processes, or product. Additionally, the personal perspective teachers brought to a diverse group of students was most effective in its impact on student learning when teachers use multiple methods and strategies. The study inquires as to what strategies of differentiation teachers use in their practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies. The research drew upon the studies by Beecher et al. (2008) and Block et al. (2009) because both considered the extent to which modification of processes in learning resulted in higher student performance with meaningful content exposure taking place through active learning. The studies conducted by Edwards et al. (2006) and by Tieso (2004) supported the study's conceptual framework and research design. These scholarly articles focus on the extent to which teachers addresses student learning by applying differentiated strategies. Currently, little research exists regarding how teachers differentiate strategies specific to middle grade English and Math classrooms.

Unfortunately, previous research indicates that teachers in heterogeneous classrooms tended not to group students they believed most need differentiated strategies consistently. For example, Westberg, Archambault, Dobyns, and Salvin (1993) found that little differentiation in the instructional and curricular practices of teachers was provided for high-ability learners in regular classrooms. Westberg et al. (2003) findings propose, "teachers' differentiation practices in third and fourth grade classrooms have not changed in the last 10 years" (p. 6). The data measured by

the study's participant interviews might also indicate which differentiation practices are limited. Edwards et al. (2006) supported such an analysis of teachers being use for varying instructional methods to meet the learning needs of students. Edwards et al. found that the use of varying instructional methods by teachers connected not to student improvement but to the educational development of teachers in their ability to differentiate strategies. When Vygotsky (1978) emphasized the collaborative nature of learning, he asserted that, when learning in a social context, individuals could learn material or perform tasks which were more complex when they had guidance or collaboratively worked with peers.

Tieso's 2004 study considered how the schools in which teachers taught were to help teachers modify, differentiate, and enrich curriculum. Tieso's findings show that to address students' diverse educational needs, teachers need to make decisions regarding curriculum implementation. However, Beecher and Sweeny's 2008 data shows that beyond staff meetings, observations of site-based professional development sessions, the school-wide enrichment plan, and test score data, it was the individual practices of teachers and their instructional methods of teaching and learning focus on enriching students' strengths leads to improved student performance data.

Although Beecher et al. (2008) considered the instructional and enrichment approaches teachers use to decrease the achievement gap over the course of a longitudinal study, most recent literature published centers on the differentiation strategies teachers use or the challenges teachers face when implementing differentiated strategies. Professional development learning was site-specific. For teachers, challenges existed regarding how to use strategies to differentiate for student learning and how to receive support and professional development. However, challenges to differentiated strategies existed in the classroom and outside the classroom. Tobin (2008)

reported that when a teacher feels unprepared to accommodate for individual characteristics and needs, the teacher was likely to have fewer student interactions which lacked instructional content.

When Westberg et al. (2003) recreated their 1992 Classroom Practices Survey Study, and compared the 1992 results with the results of their 2002 Classroom Practices Survey Study, the research shows a recreation of the data and not a longitudinal approach to data collection. The findings contradicted expectations that the study would find an increased use of differentiated strategies.

Critique of Previous Research

When critiquing the previous research, it was surprising to find few research studies on differentiated strategies in middle grade English or middle grade Math. Wormeli (2007) reported that differentiated strategies were a popular term in school improvement plans; however, some teachers who claimed to be modifying assessment and curriculum are not doing so. A search of recent peer-reviewed studies found on ProQuest yielded 17 studies. The methodologies of all 17 studies were based either on quantitative student achievement data or on qualitative research reliant on case studies. The literature on studies conducted by Edwards et al. (2006) and by Tieso (2004) provided qualitative research based on case studies, similar to the research discovered. The research reviewed by Block et al. (2009) provided quantitative student achievement data.

Research shared that several things can occur for students who complete their assignments while modifying for process, product, or content. Students could do their work individually, in small groups, or in a whole group environment. Research about a differentiated classroom suggested numerous methods for learners to process and make sense of the theories and abilities which demonstrate their learning (Tomlinson, 2001). Tomlinson (2001) shared that differentiated strategies allows teachers to adjust teaching to meet the requirements of individual learners by

giving all students with the applicable level and provisions to support each child's learning goals.

The critique of the literature demonstrates that the application of multiple instructional strategies differed by the support and professional development teachers received and by the use of multiple instructional strategies which varied based on experience, support, and subject area. Westberg et al. (2003) observed that the lack of change between the results of the 1992 study and of the 2002 study were recognized by researchers, who expressed concern for students of all learning ability levels, "high stakes testing appears to have a negative impact on the classroom practices provided to capable students" (p. 6). Yet, addressing differentiated strategies could be improved by teachers through the modification of content, product, and processes. Meeting challenges to differentiate strategies within the classroom is possible by reflecting on instructional practices and targeting teacher learning opportunities. Tobin (2008) suggested that when teachers incorporate differentiated strategies, they should have "an orientation to planning, decision-making, curriculum selection and instructional flow" which "is flexible and opportunistic" (p. 160). Differentiated strategies required teachers to design a well- balanced process which requires careful planning because not all students learn the same way; their needs are diverse.

Teachers should likewise have time for reflection (Confrey, 1990; Fosston, 1996) and time to pay consideration regarding their own reasoning and learning processes (Terhart, 2003). The procedure requires an investment in additional time than conventional instructive strategies (Brooks & Brooks, 1999); something the social constructivist instructor must consider. Teachers must oppose covering a wide scope of material and instead respect the human procedure important to achieve a profound of understanding fundamental for learning to be effective. (Confrey, 1990; Fosston, 1996). Effectiveness might be recovered in the long haul, as an instructor who permits students time to investigate and imagine on the front end may gather more proficient methods for

going about exercises accordingly.

Another limitation of the research was the difficulty in viewing the findings beyond their cultural, social, and historical context given the duration of the studies and the length of the interventions addressed in each study. The literature provided by Beecher et al. (2008) was the only longitudinal research study found. The study by Beecher et al. also blended differentiated strategies with a schoolwide enrichment teaching plan.

Social constructivism might be used to inform the needs of teachers to learn and acquire knowledge. Vygotsky's (1978) social constructivism theory informed the research study. When Vygotsky emphasized the collaborative nature of learning, he asserted social context, multiple realities, and multiple personal perspectives guided learning. Social constructivists believed individuals could learn material or perform tasks which were more complex when they had guidance or worked in collaboration with peers (Vygotsky, 1978).

Social interaction among teachers could also be a catalyst for personal reflection after receiving professional development. Tomlinson (2015) observed that in efforts to provide optimal student learning and to benefit the professional growth of teachers, it is important for teachers to have a practical understanding and knowledge base prior to implementing differentiated strategies. Teachers observed the connections students made to learning through informal and formal assessments and through reflecting upon their teaching experiences. Because the connection, students invested more time learning the content and making connections with the new information based on prior knowledge. Because teacher knowledge and experience informed and enriched student learning, critical conversations between teachers and other educational stakeholders have value.

The review of published research reveals a gap between how teachers are making instructional design decisions and how they are using differentiated strategies. Therefore, the researcher investigates in this study: (a) what strategies of differentiation teachers use in their practice of teaching and learning; and, (b) what challenges teachers face when implementing differentiated strategies.

Summary

A review of the literature develop a unique conceptual framework whereby social constructivism viewed the needs of teachers to learn and feel supported while differentiating instruction, as well as understand the impact and challenges of implementing differentiated strategies in middle grade English and Math. Additionally, the review offered sufficient reason to believe that an investigation examining the effect of differentiated strategies in middle grade English and Math would yield socially significant findings. The literature review provided strong support for pursuing a research project to address the following multipart research on: (a) what strategies of differentiation teachers use in their practice of teaching and learning; and, (b) what challenges teachers face when implementing differentiated strategies. Although theoretical literature existed in regard to how teachers should modify curriculum and instruction to differentiate content, product, or processes, the existing empirical literature rarely included middle grade English and Math settings. Although there is research to be found regarding middle grade English and Math, its quantity was limited and its findings are inconsistent.

In this chapter, the purpose of the study and the guiding questions to shape the study's focus were presented. A review of the relevant literature outlined challenges teachers face when searching for differentiated strategies which appropriately meet the learning needs of their students. Subsequently, the conceptual framework and influence of social constructivism, the needs of

teachers to learn and be supported while differentiating, and the impact of differentiation on student learning provided additional context. A review of research literature followed, and the chapter concluded with a description of methodologies use in research literature. The next chapter explicitly addresses the rationale, methods, and procedures of data collection, analysis, and presentation for the study.

Chapter 3: Methods

Introduction

The objective of Chapter 3 is to describe the methods and procedures use to conduct the study. Chapter 3 reviews the purpose of the study and the guiding questions to shape the study's focus. In addition, the reader will discover a rationale for using qualitative research and the target population, sampling methods, instruments, and data analysis procedures. Lastly, limitations of the study, trustworthiness, expected findings, ethical issues, conflicts of interest, assessment, the researcher position, and ethical issues in the study are addresses, before an overall summary of the chapter is offered.

Research Questions

The research considers questions in the study exploring (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies.

Purpose and Design of the Study

The purpose and design of the study intend to fulfill the aims of the researcher's questions investigated in the study.

Purpose. The study's significance lies in its ability to add to the body of literature regarding ways in which teachers demonstrate an inconsistent understanding of how to use differentiated strategies effectively to facilitate the unique learning needs of students and understand the challenges face when differentiating strategies. The researcher made efforts to answer these questions using existing related research and theories in the field of education using an explanatory case study methodology. When researchers involve themselves in qualitative research, they are interpreters and gatherers of the knowledge gained in their research investigation

(Stake, 2010). As Creswell (1998) explained, "qualitative research is complex, involving fieldwork for prolonged periods of time, collecting words and pictures, analyzing the information inductively while focusing on participant's views, and writing about the process using expressive and persuasive language" (p. 15). Qualitative research should use a constructivist paradigm to frame, analyze, and create new understanding based on subjective, insightful research to make sense of information.

Creswell (2013) asserted that education researchers bring particular beliefs and philosophical assumptions to research studies. Because these beliefs are shared, researchers incorporate what needs to be studied in their inquiry process into a framework which supports the research. Beliefs about inquiry shape how researchers formulate research questions, while philosophical assumptions guide how information answers these questions (Lester, 2005). In the study, multiple perspectives offered by participants are described through interpretation in a defined and measurable way (Creswell, 2013).

Analyzing the semi-structured interviews allows for the emergence of patterns of strategies teachers use to address the unique learning needs of all students in their classrooms and of themes regarding the educational challenges to addressing student needs. Shulman (2004) defines educational content knowledge as teachers' interpretations and transformations of subject-matter knowledge in the context of facilitating student learning. Shulman (2004) further several key elements of educational content knowledge:

- Knowledge of representations of subject matter (content knowledge);
- Understanding of students' conceptions of the subject and the learning and teaching implications associated with the specific subject matter; and
- General educational knowledge (or teaching strategies). (p. 8).

Design. The research employed an explanatory case study methodology using semi-structured interviews. Yin (2008) that a case study "has a distinct advantage…when a 'how' or 'why' question is being asked about a contemporary set of events over which the investigator has little or no control" (p. 8). The value of using a case study of this nature was that the explanatory case study answers the researcher's questions to describe the underlying links in real-life interventions which are too difficult for the survey or experimental strategies. In the explanatory case study, there was an opportunity to evaluate the in-depth understanding into the phenomena of differentiated strategies within the context of English and Math middle grades instruction by teachers (Yin, 2003).

Case studies are a form of qualitative research use to promote rational disaggregation of data, variance in research methodology, and flexible design in efforts to measure posited objectives (Wenkert, 1981). Explanatory case study answers the researcher's questions and explain the underlying links in real-life interventions which are too difficult for the survey or experimental strategies because the in-depth nature of the phenomena (Yin, 2014). The intent for the research was to inquire about the multiple perspectives teachers could share regarding differentiated strategies and the challenges to using differentiating strategies. An explanatory case study research design examines the phenomenon of the use of differentiated strategies in middle grades English and Math instruction and explain how and why the phenomenon occurred (Yin, 2014). Participants were encouraged to express their feelings, thoughts, and perceptions during semi-structured interviews. Case studies inquire about how procedures are impacted by the setting in which it is happens (Creswell, 2013). Creswell shared that a case study starts with the distinguishing proof of a particular case or cases in which the researcher displays an inside and out comprehension of the case(s) by gathering many types of qualitative data.

In the explanatory case study, 12 participants shared their perspectives on differentiated strategies and challenges to those strategies in semi-structured interviews. Kuntz and Hessler (1998) asserted that since case studies ask the reader to question assumptions underlying the theories, they can explore and promote common issues. The common issue was the misuse of strategies and the challenges teachers face regarding differentiated strategies in the study.

Through the case study, the intent was to improve the services provided to middle grade English and Math students by encouraging teachers to reflect on their beliefs or practices. Study participants were teachers who met the targeted criteria. The 12 participants for the study were teachers. These teachers educated students at the middle grade level in either English or Math and varied in educational background and training. Participants were selected to participate in individual semi-structured interviews.

Because the interview method offered in-depth and objective data from study participants (Borg & Gall, 1979), it was appropriate for the study. According to Borg and Gall (1979), interviews are valuable for acquiring information about attitudes, perceptions, beliefs, feelings, past experiences, and future intentions. By interviewing teachers and then synthesizing the content to discover patterns and teachers identified themes, barriers to differentiated strategies through the modification of content, product, or processes addresses. Using interviews increased the credibility of the process because it provided data for patterns or themes which emerged. Data collection included transcribing interview transcripts for analysis. The initial coding and margin notions were conducted by hand on a hard copy of interview transcripts. Data were drawn from the process based on reading and analyzing the interview transcripts for ideas, concepts, relations, and meanings.

Binding the case. To identify common experiences among participants, a single case study was conducted involving teachers from multiple sites. Yin (2003) and Stake (1995) suggested placing boundaries or binding a case, can prevent a study's topic from being too broad or having too many objectives. Within the study, the case was bound by identifying teachers from one district who taught middle grade English or Math across four middle schools. The study interviewed 12 participants total: six who taught middle grade English and six who taught middle grade Math. Teachers were selected based on their educational backgrounds, training, and years of teaching experience. Participants of the case study were interviewed for one hour off-campus using a set of eight semi-structured interview questions (Appendix D). By binding the study specifically to English or Math teachers, the intent was to more fully discover differentiated strategies and challenges face by teachers who taught these subjects. Additionally, by binding the case, it was hoped to promote understanding of the challenges teachers face when trying to use ways to differentiate strategies. Binding the study ensured that the scope of the study remained reasonable.

Research Population and Sampling Method

The total target population of the study included 48 middle grade English and Math teachers. A typical case study includes five to 12 participants (Yin, 2005). A data set of 12 teachers, including six middle grade English teachers and six middle grade Math teachers, was selected based on middle school location, being a teacher of English or Math, educational backgrounds, professional training, and the number of years of teaching practice.

Participant selection. The purposeful sampling of the teachers allows the selection of individuals best suited to the study. Teachers from four middle schools in one school district were invited to participate in the study via an e-mail. The e-mail introduced the purpose of the study,

the requirements of the study, and the method by which potential participants could indicate interest in the study. Interested teachers were encouraged to reply via e-mail.

In order to participate in the study, the participants needed to meet multiple criteria. The first criterion was middle school location. The researcher investigates the middle teachers who were employed by those middle schools which were part of the school district. The second criterion was being a teacher of English or Math. Each participant had to be a current teacher of English or Math and the number of years of teaching practice was considered as well.

Within the district, teachers were recruited who taught middle grade (sixth, seventh, or eighth grade) English and Math with different educational backgrounds, professional training, and number of years of teaching practice. The pool included 24 middle grade English teachers and 24 middle grade Math teachers. A wide net of potential participants was cast as the sample would be derived from a single district. Unexpectedly, 24 responses were received from interested participants. A data set of 12 teachers, including six middle grade English teachers and six middle grade Math teachers, was selected from the 24 participant responses received.

Participants for the study were selected based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience, and whether participants had a Bachelor's or Master's degree. To gain a balanced perspective on the in the classroom on strategies of differentiation teachers use in their practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies, the research study was bound by interviewing a data set of 12 teachers, including six middle-grade English teachers and six middle-grade Math teachers, collected from four suburban middle schools in a public-school district along the Southeast coast of the United States. All respondents held either a Bachelor's or Master's degree in education as a pre-requisite for employment within the district. The researcher

purposefully selected a sample of 12 participants from the 24 responses. This sample size was established because 12 participants would be a more manageable purposeful sample size for the interviews, which would be conducted as part of the explanatory case study interview. Initiating the case study required compliance with the local school board policies governing teacher-participants. A consent letter (see Appendix B) was provided to teachers interested in participating in the study. In selecting participants, guidelines were also established for possible study participants.

Before the interview process began, participants received detailed explanations on the interview process, how confidentiality would be maintained, how documentation would be stored, and the fact that interviews would be audiotaped and transcribed. To maximize confidentiality and to ensure information would be protected, any personal information provided was coded and not linked to the participant. Any name or identifying information was kept secure via electronic encryption. During the interview process, none of the data included the participant's name or identifying information. Teachers were not identified in any publication or report. Information was kept private at all times, and study documentation will be destroyed five years after the conclusion of the study.

The data drawn from these interviews describes and defines the meaning of central themes presented by the subjects in response to the interview questions asked. Interview questions drew participant data to evaluate, dialogue, exchange, and apply material gained to the researcher's questions (Kvale, 1996).

Instrumentation

Creswell (2013) served as the model for the process for gathering data employed in the explanatory case study. The activities include: locating individuals; gaining access and

establishing rapport; purposefully sampling; collecting data; recording information; resolving field issues; and, storing data (Creswell, 2013). The method of data analysis for the study was to filter or narrow down the data from semi-structured interviews. Borg et al.(1979) expressed that the personal interview method offered in-depth and objective access to data. Semi-structured interviews were valuable for the study to acquire information about attitudes, perceptions, beliefs, feelings, past experiences, and future intentions. Participants of the case study were interviewed for one hour off-campus using a set of eight semi-structured interview questions (Appendix D). The interview questions asked how students were grouped in classes, how teachers support student learning, what it is like to teach English or math, how teachers assess student needs, what strategies teachers use to meet students' learning needs, what barriers teachers face, and advice teachers would share with other teachers.

Data Collection

Creswell (2013) offered that qualitative research exists to question methodologies and to explore social or human issues. Using an explanatory case study approach for the study made it possible to consider (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. A process for gathering data for the explanatory case study was designed by Creswell (2013). One goal associated with Creswell's process was to help a researcher to visualize the activities in the process of collecting data for a qualitative case study.

First, participants were interviewed. The qualitative explanatory case study methodology involved anonymous interviews and were conducted at a time which best fit the research participants' schedules. Participant interviews were required to be conducted off school grounds—neither in the administration office nor in the teacher's classroom. After participants for the study

were selected, interviews with the teachers were arranged off the school campus at a time which best fit the needs of the research participant.

During the interview process, none of the data included the participant's name or identifying information. A record of reflective notes was kept to track thoughts during the interviews. Kawulich (2005) promoted the method of recording reflective notes for observation to contribute to the study's process because it was a key means of collecting data about people, processes, and cultures. Descriptive reflective notes were also recorded during interviews and analyzed, allowing informed inferences and capture key words of phrases. Data from the interviews provides insight for the research regarding what differentiated strategies teachers use and what challenges teachers face when working with students at varying levels of readiness and learning. All relevant reflective notes were reviewed, coded, and analyzed for similarities.

When the interviews were concluded, each interview was sent for transcription. The interviews were transcribed by a professional third-party service, GMR Transcription. The initial coding and margin notions were noted by hand on a hard copy of interview transcripts. Audio recordings of the interviews were played while simultaneously reading the transcripts in order to ensure accuracy of the transcribed information. Participant interviews were read several times in efforts to use the data to comprehend the perceptions of the participants and recognize emerging pattern and themes.

Once the interviews were heard and transcribed, the process of member checking began. Member checking takes place when data, analytic categories, interpretations, and conclusions were tested with participants of those groups from whom the data were gained (Creswell, 2013). Member checking is viewed as a technique for establishing credibility and can be accomplished formally or informally during the normal course of conversation (Creswell, 2013). Through

member checking, teachers had access to what they said during interviews by reviewing the transcription and the recorded notes from the interview process.

The method of follow-up allows the participant to correct errors and challenge interpretations they believed to be wrong, or volunteer additional information. The review by the participants occurred prior to adding data findings to the study and no necessary additions were requested. After member checking, the information was coded to classify the data.

Data Analysis Procedures

Upon receiving a confirmation of accuracy of transcript from each participant, the process of coding began, which is the foundation of data analysis (Creswell, 2007). In coding, data collection and interpretation of data were linked to form the basis of the research analysis. The quality of the research is based on the quality of the coding, according to Strauss (1987). Descriptive coding is use for the sorting of known data information into categories based on a researcher's expertise and is often use for asking questions of the data (Richards & Morse, 2013). Although descriptive coding is ubiquitous in sorting data, as teacher interviews were conducted and reviewed, the information was manually coded to classify the data.

Forty themes emerged from the transcribed interview data responses collected from 12 study participants who had answered eight questions as part of the interview process. Themes were pulled out of the data after each transcript was read multiple times in an effort to find consistent key words and phrases in the interview data. The distinguishing situation of interviews gathered deep, rich, and descriptive comments of interest rather than just data points or survey analysis. Crucially, the research method values each descriptive word that is shared by a participant. These descriptive words represent a model of the participant's consciousness (Vygotsky, 1987). For each participant transcript, comparisons between each of the transcripts

were made to see the emerging themes. After the codes in each transcript were documented, checked through for accuracy, and re-documented as necessary, the next level of coding began.

The 40 codes were then sorted into categories. Keywords and phrases were noted in a separate document to look for emerging categories. As Yin (2003) advocated, the data analysis examined and categorized evidence to address the questions posed by the research study. While reviewing the codes, categories were noted in each of the twelve transcripts which emerged.

Table 2 lists categories regarding study participants' responses to initial student assessment practices. Categories listing study participants' responses to address student learning needs can be found in Table 3. The final table, Table 4, provides categories the study participants' barriers for differentiating strategies. An interesting observation during the second level coding was the repeated emergence of four dominant categories: grouping practices, differentiated strategies, professional development, and teacher evaluations.

In the third level of coding, categories were synthesized into themes. The data analyzed determined the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies. The categories were synthesized into the following themes:

- Study participants' responses to initial student assessment practices;
- Study participants' responses to meeting student learning needs; and
- Study participants' barriers to differentiated strategies.

As teacher interviews were filtered for like themes leading to categorizes, specific themes emerged regarding the application of pedagogy by teachers. The data analysis of the findings obtained through the interviews discovers themes regarding the application of pedagogy based on the data set of the participating teachers.

Patterns developed as data were parsed into themes. These patterns were synthesized to determine the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies in those three themes. A last reading of each transcript, while comparing against identified patterns, allows for specific quotes from participants to support the credibility of the data. Eight patterns emerged regarding the theme of study participants' responses to initial student assessment practices. Implications of the patterns found in relation to the theme of the study participants' responses to initial student assessment practices are discussed in Chapter 5. Nineteen patterns emerged regarding responses to meet student learning needs implications of the patterns found in relation to the theme of study participants' responses to meet student learning needs are discussed in Chapter 5. Five patterns emerged regarding the theme of study participants' barriers to differentiated strategies. Those five patterns are: time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning, different levels of achievement in a classroom setting, and a lack of administrative support. By interviewing teachers and then synthesizing the content to discover patterns and themes, barriers to modification of differentiated strategies were identified by content, product, or processes addresses by teachers. These patterns and themes were discussed in the findings addresses in the study's final chapter.

Limitations of the Research Design

Yin (2014) explained that the rationale for learning about a small group and then using the understanding as an explanatory case is, "the lessons learned from these cases are assumed to be informative about the experience of the average person or institution" (p. 47). However, there are limitations associated with the case study method of research. Creswell (2008) defines limitations as potential weaknesses or problems with the study identified by the research (p. 207). Limitations

existed in the study, which affected the interpretations of findings in the research. The limitations in the research study are the following:

- Generalization of the results to the wider population;
- Difficulty in replicating the study and its findings;
- Time constraints regarding the data collection and analysis procedures; and
- The researcher's own subjective feelings that may influence the case study.

The first limitation considered the range of teaching grades and subjects which are limited to middle grades English and Math. As the study was investigating two subject areas—English and Math—as opposed to more subject areas, the scope of the study and its data were reduced. The study interviewed 12 participants total: six who taught middle grade English and six who taught middle grade Math. Additionally, the study incorporated findings from participant interviews from only one school district. Participants for the study were selected based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience. Based on the responses received, participant selection was as representative as possible of the whole district and included consideration of whether participants had a Bachelor's or Master's degree. All respondents held either a Bachelor's or Master's degree in education as a pre-requisite for employment within the district. The researcher purposefully selected a sample of 12 participants from the 24 responses. This sample size was established because 12 participants selected would be a more manageable purposeful sample size for the interviews, which would be conducted as part of the explanatory case study interview. These considerations and designed procedures and processes produced a worthwhile study which responded adeptly to the researcher's questions, yet protected participant anonymity (Stake, 1995). Because the criterion is small, the transferability of the study's findings in limited due to the grade levels taught by the

selected participants.

A second limitation in the study pertained to the difficulty in replicating the study and its findings. One of the intentions of qualitative research is to describe the different perspectives of participants to readers (Creswell, 1998). The data from the study would be different from another explanatory case study because the responses regarding the discussion of the phenomena differ based on participant interview data. However, considering two subject areas allows the researcher to expand the understanding of teacher knowledge of strategies and the use of differentiated strategies.

Although all qualitative research is vulnerable to personal interpretation and selective data collection (Stake, 2010; Williams, 1987), the explanatory case study method was the most appropriate method for the study because it allows the study to be conducted through personal interviews of participants in two subject areas present within one school district. The research design allows for flexibility within the study's model and did not detract from the study outcomes. The risks to the study subjects inherent in the study were no greater than those normally encountered during regular classroom participation or present during a professional collaborative planning meeting. Data or other documentation collected as part of the interview process was not shared among teachers. No negative feedback resulted as part of the study from the data collected in subject interviews.

A third limitation in the study would be the time constraints regarding the data collection and analysis procedures. As Creswell (1998) explains, "Qualitative research is complex, involving fieldwork for prolonged periods of time, collecting words and pictures, analyzing the information inductively while focusing on participant's views, and writing about the process using expressive and persuasive language" (p. 15). Interviews are time consuming, and the time constraints of

getting the research completed in a timely manner did not allow for an extensive amount of interviews to be conducted. The research required time for the interviews to be conducted, the coding to be designed and categorized, and the member checking process to be conducted with fidelity. The considerations and designed procedures and processes to produce a worthwhile study that responded adeptly to the researcher's questions while protecting participant anonymity (Stake, 1995). While participants agreed to participation during the interview session, once the length of the interview session was completed and the interview questions were answered, participants could reasonably be expected to feel the interview was completed. A participant might have a longer response to one interview question and not as much to offer regarding a different interview question. Researcher bias may have affected the themes, patterns, and suggestions in the evaluation of the study interviews.

The ability to express and reflect on researcher bias was critical to the research process. Therefore, introspection and analysis occur throughout the study in an attempt to limit such bias by keeping a record of reflective notes to track thoughts during the study. The ability to express and reflect on researcher bias was critical to the research process (Norris, 1997). Because the background in middle grade English, the main study question narrows to address middle grade English and Math. The professional background presents the possibility of researcher bias in the interpretation of the educational background.

Validation

Credibility. Considerations when interviewing teachers for the study included: (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. Analysis of questions asked during interviews with the teachers factored into the study's credibility. Teachers were expected to

respond to the semi-structured interview questions honestly and to the best of their ability based on the grade taught, the subject taught, and their level of experience with differentiated strategies. Open questions were asked that provided insight to answering the researcher's questions toward the study. Participant responses were recorded as accurately as possible. Follow up questions were determined based on inferences made from the teacher's responses. Data were used to acquire an in-depth understanding of the issue being studied through the voices of the teachers interviewed being expressed as part of the interview process.

Member checking is viewed as a technique for establishing credibility and can be accomplished formally or informally during the normal course of conversation (Creswell, 2013). Through member checking, teachers had access to what they said during interviews by reviewing the transcription and the recorded notes from the interview process. To complete the member checking process, audio transcripts of the participant interviews were sent to be transcribed by a professional third-party service. Next, the transcripts were read and reviewed prior to member checking. Then, participants met with to provide an additional opportunity after the interview to review their given responses. The consistency of the interviews was verified through transcription of the interviews. The use of these data sources in the study allows for the modification of suggestions posited by the expected findings of the study.

Dependability. The research analyzed participant interviews to find credible results based on the trustworthiness of patterns and themes which emerged (Johnson, 1997). The credibility of the data speaks to the study's trustworthiness. Trustworthiness in qualitative research included setting up the believability of the human instrument use to gather information, the steadfastness of the discoveries, and the researchers' capacity to affirm the outcomes (Lincoln & Guba, 1985). Measuring qualitative research exhibited legitimacy, transferability of the discoveries to different

settings, and gave the setting in which the examination was directed. The precision of transcripts and reviewed meeting transcripts were checked to gauge and substantiate the findings for the examination. The utilization of rich, thick portrayals enables the reader to comprehend the complexities of the site and the participants, and use of results from the examination to different settings (Creswell, 2013). The trustworthiness further connected to the ability to apply patterns and themes which were found to be credible in a study beyond the sample teachers. As such, the common explanations and associations existing between middle grade English and Math teachers in the study could be found in similar research study circumstances.

Expected Findings

Using the data, expected discoveries relate to: (a) what strategies of differentiation teachers use in their practice of teaching and learning; and (b) what challenges teachers face when implementing differentiated strategies. Responses to the interview questions also indicate how well teachers knew terminology associated with differentiated strategies and how understanding was demonstrated in their methodology and pedagogy. Synthesizing the data gathered in the investigation discerns how teachers incorporated differentiated strategies in their classrooms. In addition, it was anticipated that discerning how differentiated strategies connect to the classroom environment, methodologies, classroom organization, and student engagement, could offer information and inform differentiated strategies. The hope was that, through the patterns and themes drawn from data generated, recommendations could be found that would support researchers in future studies.

Ethical Issues

Conflict of interest assessment. For the study, the role of a researcher was assumed by an education specialist, which did not conflict with the researcher's occupation as an education

specialist within the district. During the time the study was conducted, the researcher was not in a supervisory role over the teachers, nor was the researcher serving as a classroom English or Math teacher. Although working for the school district where the study took place, no additional obligations, financial relationships, affiliations with organizations, clubs, or groups existed. A thorough account of the data provided the greatest transparency in assessing whether goals had been met or had to be modified.

Researcher's position. Multiple perspectives, multiple views, and multiple realities inform one's perspective and a constructivist view of information may enrich a learning environment. The researcher inquiries into what strategies of differentiation teachers use as a practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies. The curricular areas of English and Math were included because the importance educational stakeholders place on statewide achievement testing. Considering two subject areas allows in-depth exploration to understand teacher knowledge of differentiated strategies and to consider the use of differentiated strategies by middle grade English and Math teachers.

By interviewing teachers and then synthesizing the content to discover patterns and themes, barriers are identified to modification of content, product, or processes addresses by teachers. Yet, researcher bias may have affected the themes, patterns, and suggestions in the evaluation of the study interviews. Understanding implicit bias, great effort was taken to eliminate researcher bias in the study. Introspection and analysis occur throughout the research by keeping a record of reflective notes to track thoughts during the study. A method of recording reflective notes for observation contributed to the credibility of the study.

Ethical Issues in the Study

The risks to the study subjects inherent in the study were no greater than those normally encountered during regular classroom participation or present during professional collaborative planning meetings. The small data set size was intentional because the study was conducted in one small school district and the anonymity of the English and Math participants was important to uphold. Data or other documentation collected as part of the interview process was not shared among teachers. No negative feedback resulted as part of the study from the data collected in subject interviews. Due to a background in English instruction and work with middle grade teachers, the main study question narrows to address English and Math. The background presented the possibility of researcher bias. Researcher bias may have affected the themes, patterns, and suggestions in evaluation of the study interviews. The ability to express and reflect on researcher bias was critical to the research process. Therefore, reflective notes during the interview process and introspection are used throughout the study research.

Summary

In summary, patterns and themes emerged from the study as the application of pedagogy by teachers and interviews regarding teaching behaviors were conducted. In the study, patterns and themes were based on variants including subject taught, experience with differentiated strategies, and the extent of application of differentiated strategies. Within the study, the case was bound by identifying teachers who taught middle grade English or Math through the incorporating of differentiated strategies and the challenges face by teachers. Guidelines were also established for possible study participants. In order to participate in the study, the participants needed to meet multiple criteria. The first criterion was middle school location. The researcher investigates the middle teachers who were employed by those middle schools which were part of the school

district. The second criterion was being a teacher of English or Math. Each participant had to be a current teacher of English or Math. Using purposeful sampling, the study included teachers with different educational backgrounds, training, and years of teaching experience with differentiated strategies. After participants for the study were selected, interviews with the teachers were arranged off-campus at a time which best fit the needs of the research participant. Participants of the case study were interviewed for one hour off-campus using a set of eight semi-structured interview questions (Appendix D). The research focus on data derived from semi-structured interviews with teachers. The researcher's questions explored in the study to explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies.

Data collection included interview transcripts for researcher analysis. Consistency of the interviews was checked through transcription of the interviews and member checking. To complete the member checking process, and audio transcripts of the participant interviews were sent to be transcribed by a professional third-party service. Next, transcripts were read and reviewed prior to member checking. Then, participants were provided an additional opportunity, after the interview was conducted, to review their given responses.

To keep data confidential, any personal information was coded provided to ensure it could not be linked to the participant. Any name or identifying information was kept secure via electronic encryption to provide confidentiality. To ensure ethical standards were preserved, teachers had the option of withdrawing from the study even after returning the signed consent letter. When reviewing data or reporting findings, neither the participant's name nor any identifying information was use. Information was kept private at all times, and all study documentation will be destroyed five years after the conclusion of the study. Responses to the

interview questions indicate how well teachers know terminology associated with differentiated strategies and how understanding was demonstrated in their methodology and pedagogy. The data analysis and discussion shared in Chapter 4 will provide the data provided by the interview process of 12 participants in the explanatory case study.

Chapter 4: Data Analysis and Results

Introduction

The objective of Chapter 4 is to report the findings of the research field experience, describe the sample, review the methodology and data analysis procedures, and present the data along with a synthesized summary of the findings. The researcher investigates questions in the study to explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. In earlier chapters of the study, differentiated strategies were defined and research literature relevant to the factors, concepts, and variables were reviewed. The concepts in the researcher's questions for the study considered strategies of differentiation teachers use in their practice of teaching and learning and the challenges teachers face when implementing differentiated strategies.

Description of the Sample

The objective for the explanatory case study was to learn about the real-life experiences of teachers in the school's setting regarding their evaluation system and then transfer those understandings and experiences to other teachers experiencing changes in the way they are evaluated (Yin, 2014). Therefore, a purposeful sample of participants was selected in the study. The population from which the participant sample was drawn came from six through eighth grade teachers from four middle schools of within the participating school district. The target population of the study included a total of 48 teachers—24 middle grade English teachers and 24 middle grade Math teachers. The sample in the study consisted of 12 teachers from grades six through eight who varied in educational backgrounds, training, and years of teaching experience.

A wide net of potential participants was cast as the sample would be derived from a single district. Unexpectedly, 24 responses were received from interested participants. When responses

were received from interested teachers, participants were selected for the study based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience, and whether participants had a Bachelor's or Master's degree. All respondents held either a Bachelor's or Master's degree in education as a pre-requisite for employment within the district. The researcher purposefully selected a sample of 12 participants from the 24 responses. This sample size was established because 12 participants would be a more manageable purposeful sample size for the interviews, which would be conducted as part of the explanatory case study interview. Procedures and processes were designed to produce a worthwhile study which responded adeptly to the researcher's questions, yet protected participant anonymity (Stake, 1995). The study was bound by interviewing a data set of 12 teachers, including six middle-grade English teachers and six middle-grade Math teachers, collected from four suburban middle schools in a public-school district along the Southeast coast of the United States.

To examine middle grade teachers' perspectives and experiences, data were collected via individual interviews and member checking of the interview transcript. Data gathering for case study research should focus on an individual's perceptions. Teachers in the sample group were provided the opportunity during the interview process to explore, discuss, and openly share lived experiences and perceptions related to experiences with differentiated strategies. Teachers were given a questionnaire via email in which they provided demographic information to ensure selecting a diverse sample for the study. To gain a balanced perspective on the in-classroom strategies of differentiation teachers use in their practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies, the research was bound by interviewing a data set of 12 teachers, including six middle-grade English teachers and six middle-grade Math teachers, collected from four suburban middle schools in a public-school district along

the Southeast coast of the United States. Participants of the case study were interviewed for one hour off-campus using a set of eight semi-structured interview questions (Appendix D).

Research Methodology and Analysis

The data collection process started with the interview of the study participants. The qualitative explanatory case study methodology applied was focus and involved interviews which protected participant anonymity and occurred at a time that best fit the needs of the research participant selected from four middle schools within a single district. As a result, participants' interviews were conducted off school grounds—neither in the administration office nor in the teacher's classroom. After participants for the study were selected, interviews with the teachers were arranged off the school campus at a time that best fit the needs of the research participant.

During the interview process, none of the data included the participant's name or identifying information. A record of reflective notes kept track of thoughts during the interviews. Kawulich (2005) promoted the method of recording reflective notes for observation to contribute to the study's process because it was a key means of collecting data about people, processes, and cultures. Descriptive reflective notes were also recorded during interviews and analyzed, allowing informed inferences and capture key words of phrases. Data from the interviews provides insight for the research regarding what differentiated strategies teachers use and what challenges teachers face when working with students at varying levels of readiness and learning. All relevant reflective notes were reviewed, coded, and analyzed for similarities. Data gained acquires an in-depth understanding of the issue being studied through the voices of the teachers interviewed being expressed as part of the interview process.

When the interviews were concluded, each interview was sent for transcription. The interviews were transcribed by a professional third-party service, GMR Transcription. The initial

coding and margin notions were noted by hand on a hard copy of interview transcripts.

Interviews were listened to while simultaneously reading the transcripts to ensure accuracy of the transcribed information. Participants' interviews were read several times in efforts to use the data to comprehend the perceptions of the participants and recognize emerging pattern and themes.

Once the interviews were transcribed, the process of member checking began. Researchers view member checking as a technique for establishing the credibility of an account (Lincoln et al. 1985). Member checking takes place when data, analytic categories, interpretations, and conclusions were tested with participants of those groups from whom the data were gained (Creswell, 2013). Member checking is viewed as a technique for establishing credibility and can be accomplished formally or informally during the normal course of conversation (Creswell, 2013). Through member checking, teachers had access to what they said during interviews by reviewing the transcription and the recorded notes from the interview process.

The method of follow-up allows the participant to correct errors and challenge interpretations they believed to be wrong, or volunteer additional information. The review by the participants occurred prior to adding data findings to the study and no necessary additions were requested. After member checking occurred, the information was coded to classify the data.
For the research, semi-structured interviews were determined to be most appropriate and convenient for data collection. According to Borg at al. (1979), the interview was appropriate for the study in education in efforts to probe for information about attitudes, perceptions, beliefs, feelings, past experiences, and future intentions. Additionally, member checking was use in the study to verify the effectiveness of communication by offering opportunities to clarify questions and answers. Ary, Jacobs, and Razavieh (1979) promoted the use of semi-structured interviews because the rapport and cooperative atmosphere established through such interviews can often

increase the truthfulness of the information obtained and encourage greater response rates, which makes them more advantageous than questionnaires.

These interviews enhanced the research for the study and allows investigation of strategies teachers use to address the unique learning needs of all students in their classrooms and themes regarding the challenges to addressing those needs. After teachers were selected, the teachers were interviewed individually for approximately one hour off campus. The following questions were asked during the interview:

- How are students grouped within your classes?
- What do you think are some important ways to support student learning in your teaching?
- Talk to me about what it is like to teach English/Math with the students you have.
- How do you initially assess the unique learning needs of the students you teach?
- Talk to me about the strategies you use to meet the learning needs of all students in your classroom.
- What are the barriers you face in trying to meet students' learning needs in the classroom?
- After having taught heterogeneous classes for years, what advice would you give to someone who is just starting to teach heterogeneous classes?
- Is there anything else you think I should know to understand a teacher's use of differentiation?

To ensure data collected is represented correctly, all interviews were recorded and transcribed. To seek a rich understanding of the issues being studied, semi-structured questions were posed to study participants which allows for the expression of more in-depth responses by

teachers and for follow-up questions to the responses to be asked by me. The qualitative explanatory case study methodology applied in the study was focus and involved interviews which protected participant anonymity and occurred at a time that best fit the needs of the research participants selected from four middle schools within a single district. As a result, participants were required to be interviewed off school grounds—neither in the administration office nor in the teacher's classroom. A semi-structured interview procedure collects data. The data from the interviews provides insight regarding what differentiated strategies teachers use and what challenges teachers face when working with students at varying levels of readiness and learning.

A consent letter (see Appendix B) was provided to teachers interested in participating in the study. Before the interview process began, participants understood the interview process, how confidentiality would be maintained, how documentation would be stored, and that participants' interviews would be audiotaped and transcribed. To maximize confidentiality and to make sure information would be protected, any personal information provided was coded and was not linked to the participant. Any name or identifying information was kept secure via electronic encryption. During the interview process, none of the data included the participant's name or identifying information.

The data were organized to share the responses of each interview question by listing the interview question followed by the overall participant group response, separate English and Math participant groups, and individual participant response. Responses were grouped by patterns and themes which emerged from the overall group response and the participant group response for each subject area before listing individual participant responses.

Coding procedure. The overall group responses included all participants in the study. Participants were divided into groups based on the subject areas of English and Math. For the

study, each teacher was referred to by subject area taught, with English abbreviated as "E" and Math abbreviated as "M," and a study number was assigned to each participant, beginning with 1 and ending at 6. A brief masked profile about each participant was provided in the following descriptions.

E1 taught middle-grade English for more than 15 years, teaching four classes of seventh grade annually for most of the career.

E2 taught for 15 years in English and had taught courses for academically gifted students in elementary school in the past.

E3 taught four classes of seventh-grade English annually for 12 years.

E4 taught English for 10 years in middle school. E4 taught for seven years at the high school level prior to teaching middle school and, while teaching middle school, had taught only eighth grade.

E5 was a second year teacher of seventh-grade English. Previously, E5 served as the talented and gifted teacher for three years.

E6 was a third year middle grade English teacher and was pursuing advanced education toward a master's degree in English.

M1 taught for 11 years total, teaching Math for four of those years, and was certified to teach science.

M2 taught high school and middle school Math. At the time the interviews were conducted, M2 had taught middle school Math for the previous 20 years and taught high school Math for nine years.

M3 taught for 15 years in both high school and middle school Math courses across a span of grades. M3 was also certified in science and taught science for three years.

M4 taught for 18 years and was teaching higher-performing eighth-grade Math when the study was conducted.

M5 taught eighth grade for the first four years as a teacher and had taught sixth grade for three years.

M6 began a teaching career as an academically gifted teacher in another school district and taught gifted populations at the elementary level for eight years.

Table 1 displays study participants by years of teaching experience, subject area taught, professional degree level, and gender.

Table 1

Years of Teaching Experience, Subject Area, Degree Level, and Gender of Study Participants

Variable	*N*	%
Years of Teaching Experience		
1–5	2	16.6
6–10	2	16.6
11–15	2	16.6
>15	6	50.0
Degree Level		
B.A. /B.S.	9	75.0
M.A. /M.S.	3	25.0
Ph.D.	0	0.0
Subject Area		
English	6	50.0
Math	6	50.0
Gender		
Male	1	8.3
Female	11	91.6

The method of data analysis use for the study was to filter or narrow down the data from semi-structured interviews. A process for gathering data use for the explanatory case study was designed by Creswell (2013). The activities include locating individuals, gain access and establishing rapport, purposefully sampling, collecting data, recording information, resolving field issues, and storing data (Creswell, 2013). The data analysis of the findings obtained through the interviews discovers patterns and themes regarding the application of pedagogy based on the data

set of the participating teachers. To organize data throughout the study research, a record of reflective notes tracked thoughts during the study. All relevant reflective notes were reviewed, coded, and analyzed for similarities.

The analysis process started by member checking transcriptions of the participants' interviews. Member checking provided the opportunity to confirm aspects of the data with study participants and provided access to participants regarding what participants said during interviews through review of the transcription and the recorded notes from the interview process (Lincoln et al.1985). To complete the member checking process, audio transcripts of the participant interviews were sent to be transcribed by a professional third-party service. Next, the transcripts were read and reviewed prior to member checking. Then, participants were provided an opportunity, after the interview was conducted, to review their given responses. The method of follow-up allows the participant to correct errors and challenge interpretations they believed to be wrong, or volunteer additional information.

After receiving a confirmation of accuracy of transcript from each participant, the process of coding began, which is the foundation of data analysis (Creswell, 2007). In coding, data collection and interpretation of data were linked to form the basis of the research analysis. The quality of the research is based on the quality of the coding, according to Strauss (1987). Descriptive coding is use for the sorting of known data information into categories based on a researcher's expertise and is often use for asking questions of the data (Richards et al., 2013). Although descriptive coding is ubiquitous in sorting data, as interviews were conducted and reviewed, the information was manually coded to classify the data.

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Descriptive coding is use for the sorting of known data information into categories based on a researcher's expertise and is often use for asking questions of the data (Richards et al., 2013). Although descriptive coding is ubiquitous in sorting data, the information was manually coded as interviews were conducted and reviewed, to classify the data.

Forty themes emerged from the transcribed interview data responses collected from 12 study participants who had answered eight questions as part of the interview process. The coding happened after each transcript was read multiple times to find consistent key words and phrases in the interview data. Deep, rich, and descriptive comments of interest were gathered, rather than just data points or survey analysis. The use of the explanatory case study method was essential because the research method values each descriptive word shared by a participant. These descriptive words represent a model of the participant's consciousness (Vygotsky, 1987). For each participant transcript, a comparison between each of the 12 transcripts was made to see which themes emerged. After the codes in each transcript were documented, checked through for accuracy, and re-documented as necessary, the next level of coding began.

The 40 codes were then sorted into categories. Keywords and phrases were noted in a separate document to look for emerging categories. As Yin (2003) advocated, the data analysis examined and categorized evidence to address the questions posed by the research study. While reviewing the codes, categories in each of the twelve transcripts were noted. Table 2 lists categories regarding study participants' responses to initial student assessment practices. Categories listing study participants' responses to address student learning needs can be found in Table 3. The final table, Table 4, provides categories the study participants' barriers for

differentiating strategies. Some dominant categories that repeated occurred were grouping practices, differentiated strategies, professional development, and teacher evaluations. Because the topics were multifaceted, the data gathered in the study ascertains themes for greater versatility in the use of the information in reporting findings.

In the third level of coding, categories were synthesized into themes. The data analyzed determined the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies. The categories were synthesized into the following themes:

- Study participants' responses to initial student assessment practices;
- Study participants' responses to meeting student learning needs; and
- Study participants' barriers to differentiated strategies.

As teacher interviews were filtered for like codes leading to data categorization, themes emerged regarding the application of pedagogy by teachers. The data analysis of the findings obtained through the interviews discovers themes regarding the application of pedagogy based on the data set of the participating teachers.

Patterns developed as data were parsed into themes. These patterns were synthesized to determine the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies in those three themes. A last reading of each transcript while comparing against identified patterns allows for specific quotes from participants to support the credibility of the data. Eight patterns emerged regarding the theme of study participants' responses to initial student assessment practices. Implications of the patterns found in relation to the theme of study participants' responses to initial student assessment practices are discussed in Chapter 5. Nineteen patterns emerged regarding responses to meeting

student learning needs implications of the patterns found in relation to the theme of study participants' responses to meeting student learning needs are discussed in Chapter 5. Five patterns emerged regarding the theme of study participants' barriers to differentiated strategies. Those five patterns are: time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning, different levels of achievement in a classroom setting, and a lack of administrative support. By interviewing teachers and then synthesizing the content to discover patterns and themes, barriers were identified to modification of differentiated strategies by content, product, or processes addresses by teachers. These patterns and themes were discussed in the findings addresses in the study's final chapter.

Summary of the Findings

Individual participant responses were identified by their assigned subject area and by their assigned number of 1–6. All participants indicate in their interviews that initial student grouping within their classes, referred to as balancing the classroom, and were organized by each school's administrative team and special education teachers. In balancing the classroom, a practice new to the district as of the time of the interviews, objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements to place students of mixed ability levels in the same classroom. But the grouping the participants referenced was not the differentiated strategy of flexible grouping; rather, participants were describing the steps taken by the school's administrative team and special education teachers to balance the classroom. As a differentiated strategy, flexible grouping is understood to be based on student pre-assessment or formative assessment to create small groups which can change depending on student knowledge, skills, and understandings. Pre-assessment refers to testing content area knowledge before offering content instruction. Pre-assessment may

also assess skills and process.

It was reported by the participants that students were assigned to classes based on a combination of the following factors: (a) objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements; and, (b) subjective data which included student behavior records; special education identification plan requirements federally mandated from an individualized education plan; and the talented and gifted identification of students, depending on state regulations. In balancing the classroom, a practice new to the district at the time of the interviews, objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements were the criteria use to inform the design of student's class schedules. No English or Math teacher in the district was involved in the process of balancing the classroom. The balancing of the classroom began the same year that teacher evaluations, a formative or summative procedure administrators employ to collect and use information to judge teachers, began being linked to statewide achievement testing undergone by students (Darling-Hammond, 1983). Student proficiency on statewide achievement testing was linked to teacher evaluations which influenced teacher pay and teacher retention. Teacher evaluations were conducted directly after results of students' quarterly statewide achievement testing data were reviewed and recorded by the administration.

Interview Question 1

How are students grouped within your classes?

Overall participant group findings. The study occurred during the first year the district decided to begin the practice of balancing the classroom. No participants interviewed took part in initial student grouping, or balancing, within English and Math classes. As well, no participant

was aware of any English or Math teacher participating in student grouping for balancing the classroom. Rather, all participants indicate that students within English and Math classes were initially placed by each school's administrative team and special education teachers. Once students were balanced within each teacher's classroom, participants indicate they had the ability to group students in the classroom setting.

Participant group findings by subject area. Participants who taught English indicate that students in their classes were placed strictly for scheduling purposes. Scheduling was not based on student ability level but instead was based on special education teacher availability to co-teach if the quantity of students in a classroom, formally identified as requiring special education services, exceeded the school district's maximum of six students per class.

Participants indicate that the balancing of the classroom was conducted in part to make teacher evaluations, which were linked to statewide achievement testing undergone by students, more likely to demonstrate student proficiency on tests. When reviewing the participant data collected, the researcher found every participant who taught English indicate that students were flexibly grouped based on the content, product, or process being studied. However, further probing indicates what the participants identified as flexible grouping was not in fact the differentiated strategy of flexible grouping. As a differentiated strategy, flexible grouping is based on student pre- assessment or formative assessment to create small groups which could change depending on student knowledge, skills, and understandings (Tomlinson, 1999). The participants understanding of flexible grouping presented in the interviews did not represent the differentiated strategy of flexible grouping.

Participants who taught Math indicate that students in their classes were initially balanced based on objective data derived from statewide achievement testing results acquired from the

students' prior years of instruction. In the Math classroom, talented and gifted identification of students was also considered initially to balance the grouping of students. However, in the Math classroom, students identified as talented and gifted in English were included in the balancing process with students identified as talented and gifted in Math, regardless of their statewide achievement testing performance in Math. Regardless of talented and gifted identification in Math for advanced performance, when compared with their peers, students were placed in classrooms with the intention of balancing the classroom. Balancing the classroom was a practice new to the district as of the time of the interviews.

No participant who taught Math indicates a special education teacher's availability to co-teach. However, participants teaching Math indicate no support was provided for classrooms with more than six special education students in their classrooms. Every participant who taught Math reported that students were grouped based on formative pre-assessments of content area readiness and achievement data acquired from quarterly district-designed benchmark testing. The limitations placed on the Math participants by the technology-based software Math program and the subsequent reports to the school's administration hampered any authentic use of differentiated strategies. Math participants were required to instruct student solely based on the technology-based software Math program.

Individual participant findings. Within the group of participants who taught English, a theme emerged of using flexible grouping for students. As a differentiated strategy, flexible grouping is based on student pre-assessment or formative assessment to create small groups which could change depending on student knowledge, skills, and understandings (Tomlinson, 1999). However, data from the participant groups shows a discrepancy between what flexible groups were and how flexible grouping was being use. Five of the six participants who taught English indicate

they use flexible grouping in their classroom to support student learning. E1 reported grouping students in class in both cooperative learning groups and homogeneous groups so that "students are exposed to a variety of learning styles or levels." Expanding on the response, E1 noted in cooperative learning groups that the intent was to group students by different areas of strength in English. E4 grouped according to the learning level of the student to have students focus their "work on the task, like making inferences, with a text on their level," or grouped students "who need a different approach to the material."

Three of the six participants who taught Math use flexible grouping, and all participants reported pre-assessing student learning. The term compacting, which means "to adjust curriculum for students who have already mastered the material to be learned, replacing content students know with new content, enrichment options, or other activities" (National Association for Gifted and Talented, 2015), was use in response to the interview question. M1 and M2 expressed that they use flexible grouping to compact students out of the level of classroom Math instruction; however, only M1 compacted students to "develop more critical analytical skills in a Math topic by going deeper into the material or increasing the difficulty of the material based on learner needs." The three participants who use flexible grouping for Math noted they referred to these flexible groups as being synonymous with cooperative groups, or groups of students which are combined based on difference in skills or Mathematical strengths. When reviewing the participant data collected, the researcher found findings indicating that teachers acknowledged the existence of flexible grouping.

Interview Question 2

What do you think are some important ways to support student learning in your teaching?

Overall participant group. All teachers indicate that having students working collaboratively was an important way to support student learning in their teaching. Use of

technology applications, such as computer-based vocabulary programs or web-based Math pre-assessments, was also mentioned by the participants; however, individual participant responses regarding the extent to which technology was use as part of student instruction varied because English participants use technology as part of student assessment practice and Math participants use technology as part of student instruction.

Participant group by subject area. Within the participant group who taught English, a theme emerged of using grouping in their classroom to support student learning. Groups could include flexible groups, cooperative learning groups, and thematic groups based on a given topic. When reviewing the participant data collected, the researcher found grouping of students in English classrooms centered on the teacher's delivery methods such as whole group, teacher-led lesson, cooperative learning, or small group instruction.

All six Math participants indicate they retaught content material to students to support student instruction. The re-teaching of content material took place in all the Math participants' classrooms in the form of regular classroom instructional time at the start of each lesson. Math participants indicate that re-teaching occurred in a whole class format. The whole group of students in the classrooms of the Math participants received re-teaching of course material at the start of each instructional class period.

Individual participant responses. As each participant who taught English was interviewed, the responses offered no consistent themes or patterns regarding how teachers support student learning. English participants' responses varied in terms of how to support student learning. Only one of the six participants, E1, mentioned involving parents as partners in education to support student learning by making "sure the student, parent, and teacher are working together." E2's response to supporting student learning also included student involvement; E2

recommended teachers "listen to them . . . find out if they are bored, and create pre-assessments to see what they know." E2 was the only English participant to refer to pre- assessment as an instructional practice in English. In further discussion, E2 indicates the use of these pre-assessments to group students by area of expertise in each English curriculum topic.

E4 supported student learning by using grouping practices. Three participants referenced incorporating technology into instruction by finding; as E3 put it, "technology applications geared to English for effective vocabulary instruction." E5 use tiered assignments, or tasks with different levels of difficulty, to advance student learning. E6 use methods of delivery, instructional pacing, methods of questioning, and alternate assignments to differentiate activities. Participant reactions offered no constant topics or pattern regarding how teachers encourage student learning.

All six Math participants mentioned they supported student learning beyond the initial grouping of students by using statewide achievement data, re-teaching material at the start of each class using a class warm-up activity or homework review, and integrating technology into their Math classrooms. Math participants in the school district were required to use the purchased online course materials and to deliver instruction in tandem with the online course material. M1 said that "students could be assigned targeted goals by the program then grouped into small groups to do practice activities." When asked to elaborate, M1 gave the specific example of grouping students who might not be competent in decimals with students slightly more proficient in decimals, so they could learn collaboratively. However, when asked how this would help assess learning objectives, M1 explained that the small groups serve "to break up the strictly web-based program." Among the six Math participants, a theme of viewing the technology integration as both a barrier to student learning and a method to support student learning was expressed. M2 said it was a barrier because it was difficult to pace teacher-led instruction of any kind since students were

at various levels of skill proficiency. The technology integration also leads to most of the direct instruction by participants who taught Math being in the form of reviewing material assigned for homework. M4 expressed similar views, noting, "I can review the homework the students all do, but I can't review materials as diversely as the computer-based program can." Because the computer-based program did assign different skill lessons to different students, M5 indicates that the system was supporting student learning. M6 would have preferred to see students working more on Math projects, but observed, "[t]he curriculum's pace and the academic testing don't leave room for much beyond the computer-based program."

Interview Question 3

Talk to me about what it is like to teach English/Math with the students you have.

Overall participant group. All participants in the study indicate the teaching of their English or Math students was influenced by the way in which students were initially placed in classes. Students were balanced into their classroom by administrators, who use objective data from statewide achievement testing results from the students' prior years of instruction and formal special education identification plan requirements to allocate students to classrooms. These summative data were combined with subjective data, including student behavior records, informal special education identification plan requirements, and the talented and gifted identification of students.

Participant group by subject area. Both participant groups responded to the question, reporting that student performance on statewide achievement testing was included as part of the teacher evaluation in the school district. Specific examples of statewide achievement testing mentioned by participants included the following: E3 listed EVAAS (testing that examines the impact of teachers, schools, and districts on the learning of their students in specific courses,

grades, and subjects) data and pre-assessments; E5 added benchmarks; and E6 cited End-of- Grade testing. When the participant group was probed further, statewide achievement testing was indicated as the driver of English and Math instruction.

Individual participant responses. The response to the question represents the teaching of English or Math was overwhelmingly influenced by the presence of statewide achievement testing. Student performance on statewide achievement testing in English and Math was a factor in teacher evaluation in the school district. Specific examples of statewide achievement testing participants mentioned included EVAAS, pre-assessments, benchmarks, and End-of-Grade testing. However, the English participants use no centralized testing assessment taken by students to inform their instruction as a curriculum area according to the interview data.

Participants who taught English reported using technology applications as part of their instruction to formatively assess their students but did not report using technology to develop their students' individual learning objectives. Examples of technology for assessment purposes included Scholastic Reading Inventory and TeenBiz, mentioned by E3, and USA Test Prep, mentioned by E5. Each English participant indicates that he or she uses a different technology-based program for student assessment. All the participants were required to place their students' formative scores from each of these assessments on a spreadsheet shared with their school's administration regardless of the type of technology they use or for what instructional purpose the technology was use.

Although students participated in multiple statewide achievement tests recorded throughout the year, Math participants were not required to place their formative student scores on a spreadsheet shared with their school's administration. Since the curriculum was based on an online Math curriculum platform, student performance data could be easily retrieved from the online

platform's spreadsheet, including data characterizing the relationship between teacher, instruction, and student. M1 commented, "Student who are already behind their appraised age-level readiness with numeracy and literacy continually struggle to achieve." While, Math participants did not indicate a comprehensive understanding of differentiated strategies, the limitations placed on the Math participants by the technology-based software Math program and the subsequent reports to the school's administration hampered any authentic use of differentiated strategies.

Interview Question 4

How do you initially assess the unique learning needs of the students you teach?

Overall participant group. All teachers indicate they did initially annually assess the unique learning needs of the students they taught. Table 2 shows the varied methods by which they initially assessed the unique learning needs of students.

Participant group by subject area. The initial assessment of the unique learning needs of the students by teachers of English or Math who participated in the study contrasted. Those in the English participant group use informal assessment practices, such as book surveys, reading level data, and online reading vocabulary data; and those in the Math participant group use formal assessment practices, such as beginning-of-year pre-assessment tests. Although all participants in English indicate they initially assessed the unique learning needs of the students they taught, no consistent method for doing so was mentioned. Participants who taught Math initially assessed the unique learning needs of the students they taught through a beginning-of- year pre-assessment based on Math content from the prior year. To examine the specific strategies each group of participants reported using, Table 2 provides data from the study regarding the initial assessment practices of English and Math participants.

Table 2

Study Participants' Responses to Initial Student Assessment Practices by Subject Area

Initial Student Assessment Practice	*N*	%
English		
Book Surveys	1	16.6
Reading Level Data	1	16.6
Online Reading Vocabulary Data	1	16.6
Multiple Intelligence Surveys	1	16.6
Post-assessment Data	1	16.6
Demographic Data	1	16.6
Math		
Beginning of Year Pre-Assessment Data	6	100.0
Prior Statewide Achievement Testing Student Performance Data	6	100.0

Individual participant responses. All participants who taught English indicate they initially assessed the unique learning needs of the students they teach. However, participants varied in the methods they use to initially assess student learning needs. E2 use both book surveys and reading level data to initially assess students, E4 use pre-attempts on curriculum vocabulary practices online, and E5 use multiple intelligence surveys. E1 did not directly state the technique use to initially assess the learning needs of the students. E1 responses indicate that the initial assessment of students and the final assessment of students, whether formal or informal, were not as significant as the yearlong developmental process of learning English. In contrast to E1, E3 use formative post-assessment data to acquire "insight as to where students were regarding their reading abilities" as part of the initial assessment. E3 reported initially using demographic data to assess the students' learning needs, although when probed further, E3 did not indicate which

components of demographic data were considered when making the initial assessment.

Participants who taught Math initially assessed students' unique learning needs using a beginning-of-year pre-assessment based on Math content from the prior year. When probed with more questions regarding how they initially assessed the unique learning needs of the students they taught, the participants mentioned only statewide achievement testing data from the prior year, given that pre-assessments were frequently conducted in the Math classroom due to the online curriculum instruction. The frequent pre-assessment was the method use to serve students differently in the Math classroom, and evidence of varied Math instruction by content, product, or process was not offered by any Math participant in response to the question.

Interview Question 5

Talk to me about the strategies you use to meet the learning needs of all students in your classroom.

Overall participant group. Study participants use strategies to meet the learning needs of all students in their classrooms. These strategies involved varied instructional methods, flexible grouping, formative and statewide achievement tests, and technology applications. Table 3 presents the participants' responses to Interview Question 5.

Participant group by subject area. To meet their students' learning needs, English participants use strategies centered on varying instructional methods, flexible grouping, and technology integration. Varying instructional methods and flexible grouping were patterns which emerged among participants teaching English as examples of classroom-driven instructional methods, while technology applications were used by teachers of English in part because their ability to formatively assess students but also because a school mandate to use certain technology applications.

Table 3

Study Participants' Responses to Address Student Learning Needs

Strategy	*N*	%
English		
Class Debates	2	33.2
Class Discussions	1	16.6
Hands-on Learning Opportunities	1	16.6
Individualized Projects	1	16.6
Individualized Presentations	1	16.6
Writing Prompts	1	16.6
Statewide Achievement Testing	1	16.6
Flexible Grouping	6	100.0
Technology Integration	4	66.7
One-on-one Instruction	1	16.6
Read Aloud	1	16.6
Tiered Questions	1	16.6
Modify Level of Challenge	2	33.2
Unspecified Learning Strategies	2	33.2
Math		
Pre-Assessments	6	100.0
Cooperative Learning Groups	6	100.0
Collaborative Group Assignments	6	100.0
Technology Integration	6	100.0
Hands-on Learning Opportunities	2	33.2

Math participants in the study all use methods beyond their online Math curriculum to refine instruction. In addition to the use of formative assessments, which are used to show student progress towards an objective as teaching and learning moved forward, Math participants use pre-assessments. The use of cooperative learning groups and collaborative group assignments was another pattern which emerged among Math participants.

Individual participant responses. Study participants who taught English based their strategies for meeting the learning needs of all students in their classrooms on the unique learning needs of their students. E1 observed that a personal teaching objective was "finding ways to meet all the needs of every student and leading them to success in learning." E2 modified strategies by learning to trust instincts. A pattern that emerged in the group of participants was the use of differentiated strategies. E3 reported differentiated instruction by offering debates, discussions, and hands-on learning opportunities, and by incorporating technology into instruction. E4 also mentioned differentiating to teach "skills though different media or methods that fits each student's skill level or intelligence." Elaborating upon the response, E4 offered "alternative ways to assess students through projects, presentations, essays, tests, or oral explanations." E5 provided more examples than other participants regarding ways to differentiate instruction to modify content; E5 would "chunk information, offer one-to-one instruction, provide reading aloud of English materials, use tiered questioning strategies, and change learning styles or challenge levels." E6 adapted instruction for process by changing the pacing of curriculum objectives and assignments.

Two of the six participants who taught Math indicate they use hands-on applications in their classrooms as strategies to meet the learning needs of all students in their classrooms. These same two participants indicate they were guided by their online Math curriculum to refine instruction to conduct formative assessments like pre-assessments and adding cooperative learning groups and collaborative group assignments. In the past, math participants shared they had done hands-on mathematical applications with students. These hands-on applications included foldable displays and three-dimensional models. When asked further about how these hands-on applications were useful, M1 said they allows students to "kinesthetically and visually understand

and apply the concepts they are progressing toward to try and attain Mathematical mastery." No indications of the frequency of these hands-on applications were mentioned by M1.

Interview Question 6

What are the barriers you face in trying to meet students' learning needs in the classroom?

Overall participant group. All study participants spoke of encountering barriers in trying to address student learning needs in the classroom. However, many of the barriers referenced were not necessarily able to be modified within the classroom environment. Classes were grouped through the process of balancing by each school's administrative team and special education teachers. The overall participant group considered the balancing of the class by administrators and special education teachers to be a barrier because as teachers, they had no role in evaluating student placement in their class. Because participants lacked a role in balancing the classroom, they felt the needs of higher-performing students in classrooms were superseded by the federally mandated individualized education plans of students who qualified for special education and related services. To examine the specific strategies each group of participants reported using, the study participants' barriers for differentiating strategies were entered into Table 4.

Participant group by subject area. Five patterns, mentioned by both study participant groups, emerged in response to the question. These patterns were recognized as barriers by the study's two participant groups, and participants felt these barriers in the classroom could not be corrected within the classroom environment alone. Those five barriers are: (a) time constraints; (b) prescribed curriculum pacing and assessments; (c) lack of knowledge regarding differentiation as a strategy for teaching and learning: (d) different levels of achievement in a classroom setting; and, (e) a lack of administrative support.

Table 4

Study Participants' Barriers to Differentiated Strategies

Barriers	*N*	%
English		
Prescribed Curriculum Pacing and Assessments	6	100.0
Lack of Knowledge Regarding Differentiated Strategies	6	100.0
Different Levels of Student Achievement Per Class	5	83.3
Lack of Administrative Support	4	66.7
Time Constraints	6	100.0
Math		
Prescribed Curriculum Pacing and Assessments	6	100.0
Lack of Knowledge Regarding Differentiated Strategies	2	33.3
Different Levels of Student Achievement Per Class	5	83.3
Lack of Administrative Support	4	66.7
Time Constraints	6	100.0

Individual participant responses. Among study participants in both English and Math, patterns emerged regarding barriers to differentiated strategies. These patterns, observable in Table 4, demonstrate a consistency of barriers among participants. However, participants felt many of the barriers referenced were not necessarily fixable within the classroom environment. Participants in both groups expressed that time for planning high-quality instruction, time for reflection with other professionals, and time spent directly with students was infringed upon by the time lost when participants were pulled from their classrooms for subject area meetings, departmental meetings, cross-curricular team meetings, administrative meetings, data meetings, and professional development meetings. Participants also most of the meeting time was allocated to discussing

technology and special education and focus on the implementation of technology applications or on special education programming of students.

A second challenge reported by both participant groups' data is the assertion that the prescribed curriculum pacing, and assessments do not align in a way which promotes individualized student learning. As E4 describes, the challenge makes it, "difficult to continuously assess each individual student's needs and mastery and then respond with cohesive lessons." Specifically, participants referenced 21st-century learning skills connected to newly adopted CCSS as the rapidly changing student needs they were attempting to address. E4 referenced "creativity and accountability" as 21st-century learning skills. M3 referred to "problem-solving, analytic thinking, and collaboration" as changing student needs. The challenge was accompanied by participants sharing that they were an expectation of recursive data monitoring by teachers of students and reporting the data to administrators. For both groups of participants was an expectation of the reporting of assigned technology-based instructional expectations to school administration.

A third challenge was that participants indicate a lack of professional knowledge regarding differentiation as a strategy for teaching and learning. Participant data shows limited professional development regarding differentiated strategies and the intentional and purposeful use of specific strategies. While the questions designed for the explanatory case study did not ask participants about their professional development focus specifically in differentiated strategies, participants indicate in their interviews that a lack of professional development was a challenge they face when differentiating strategies. For example, one participant, M2, noted that the first training on differentiated strategies with the district was a decade ago, where the head of the department leading the meeting criticized the way M2 spelled "differentiated strategies" at the beginning of the

meeting in front of colleagues. M2 added that because the small insult offered at the start of the career, confidence in ability to differentiate decreased. A personal reflection on M2's introduction to differentiated strategies was indicative of the participant's group relationship with differentiated strategies.

Evidence did not support that teachers had an in depth enough understanding of how to modify content, product, or process for students effectively. For example, E5 use tiered assignments, or tasks with different levels of difficulty, to advance student learning. E6 reported using methods of delivery, instructional pacing, methods of questioning, and alternate assignments to differentiate activities. Data also shows participants were using varied texts and tiered centers mostly "re-teaching concepts." Participants had some ideas regarding what could be differentiated strategies, but these ideas were not in accordance with what differentiated strategies are.

To meet their students' learning needs, English participants indicate they use strategies centered on varying instructional methods such as flexible grouping and technology integrations. E3 describes these as, "technology applications geared to English for effective vocabulary instruction." These are not examples of differentiated strategies because participants did not modify the content, process, or product to meet the unique learning needs of students. The fourth challenge was different levels of achievement in a classroom setting. M1 stated there was "no variance in pedagogy due to no variance in tested objectives—the tests are not levelled [accounting for different levels of student understanding]." In terms of the participant data, findings show haphazard use of differentiated strategies.

All the Math participants indicate they re-taught content materials to students to support student learning. The re-teaching of content material took place in all the Math participants' classrooms in the form of regular classroom instructional time at the start of each lesson.

However, the participants did not indicate if the re-teaching occurred in a format other than a whole class format. All students in a classroom of the Math participants received re-teaching of course material at the start of each instructional class period as part of the technology-based software Math program.

Provision of special education services to formally identified students within the classroom emerged from the study and affected both participant groups. However, data did not show the provision of special education services increased the participants' use of differentiated strategies. No change was shown in the data that supported and increased use of differentiated strategies regardless of special education identification. E5 and M4 stated being able to meet special needs requirements would be easier if standardized wording was use to describe the necessary classroom assistance and modification. The concern was more prevalent among the English teaching participants because special education teacher availability to co-teach took precedence in student scheduling when balancing the classroom. The findings indicate that, in practice, teachers implement flexible grouping on a limited, if not wholly misunderstood, basis.

The fifth barrier participants felt challenged by was a lack of administrative support. Participants shared that most of the professional development centered on administration's focus on special education or technology applications. In balancing the classroom, a practice new to the district as of the time of the interviews, objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements were the criteria use to inform the design of student's class schedules. Participants also indicate that conversations regarding funding for special education and technology applications occurred with more frequency with administrators than did those regarding funding for concrete instructional materials for classroom use. The barrier existed because, as M3 shared,

"we have a technology-based program and Chromebook computers to use with the program, so resources like paper, glue, and scissors are not well funded because we don't use them as often." Data from participants indicate that funding for English and Math instructional materials was limited by budgetary allocations for technology and special education.

Interview Question 7

After having taught heterogeneous classes for __ years, what advice would you give to someone who is just starting to teach heterogeneous classes?

Due to each participant's having unique responses to the semi-structured question, no patterns or themes emerged from the data. Individual participant responses were recorded and omitted overall participant responses and responses of participant groups by subject area.

Individual participant responses. Among the participants teaching English, E1 said that allowing plenty of time for planning and being flexible were pieces of advice offered to someone who was just starting to teach heterogeneous classes. The practice of balancing the classroom was new to the district as of the time of the interviews. E4 supported differentiating instruction based on instructional process, observing that teachers should make sure they have clear scoring criteria when differentiating for activities. E4 made no mention of modifying for instructional content or instructional product.

Among the participants teaching Math, M5 highlighted the need to "plan, plan, and plan" when teaching heterogeneous classes because the difficulties a teacher may have in working with students with different learning needs. M3 began using student stations in the class because "it allows them to not work ahead or fall behind. It allows those who work ahead to increase their collaboration with students. They are timed durations based on pre-assessed learning." M4 offered the opinion that the need to plan should be supported with the integration of diverse

teaching practices for differentiating instruction involving adding group activities, performance tasks, and station activities.

Interview Question 8

Is there anything else you think I should know to understand a teacher's use of differentiated strategies?

In response to the question, participant responses were specific to the individual. Due to each participant having unique responses to the semi-structured question, no patterns or themes emerged from the data. Individual participant responses were recorded while overall participant responses and responses of participant groups by subject area were omitted.

Individual participant responses. M1 stated, "As a young teacher, I was very nervous. I was overwhelmed about how to address everyone's needs," but added that confidence in the ability to address the unique learning needs of students increased through experience.M4 stated, "Professional development in differentiated strategies is inconsistent. I heard the term 'differentiated strategies' being use, but I didn't know I was doing it by grouping students based on their skills and abilities." M5 said:

> Teachers will do differentiated strategies whether they know they are or not because they are going to have to modify the pace and rigor based on the students or class of learners. Otherwise, students get bored with repetitive content and instruction. Also, teacher proximity to attend to student learning increases with flexible grouping. I'll change student groups at any time based on improvement of student learning.

E1 expressed teachers should "always be willing to try new ideas and lessons." E1 stressed that learning should extend beyond the classroom with "student, parent, and teacher working

together" to make certain in the classroom that "students are exposed to a variety of learning styles and levels." E2 made recommendations about the pacing of trying out new ideas and lessons, contending a teacher should not try to differentiate for a whole class at one time initially. E2's strategy for differentiated strategies was to consider which students could be intentionally grouped based on skills they were proficient in, or not as advanced in, and to "create a high and low group first and then go from there." The procedure grouped students on their ability initially, and E2 suggested using the practice as a starting point for modifying teacher practice in the classroom.

Although participants call the practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. E3 asked for an assistant to work with students since an assistant benefits both the teacher and students as the teacher has "another person to share ideas with and the students have someone else to ask questions." E5 recommended teachers find free resources. None of the participants teaching English indicate that professional development specifically in differentiated strategies would benefit them or their students. No evidence existed of district-wide professional development related to differentiated strategies having been conducted within the previous two years although data on professional development on differentiated strategies was requested. Again, while the questions designed for the explanatory case study did not ask participants about their professional development focus specifically in differentiated strategies, participants indicate in their interviews that a lack of professional development was a challenge they face when differentiating strategies.

Presentation of Data Results

The researcher investigates questions in the study to explore (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges

teachers face when implementing differentiated strategies. The researcher made efforts to answer these questions using data that indicate how well teachers knew terminology associated with differentiated strategies and how understanding was demonstrated in their methodology and pedagogy.

Findings Emerging from Interview Question 1

How are students grouped within your classes? All participants indicate that students English and Math classes were assigned to teachers by each school's administrative team and special education teachers. Participants who taught Math indicate students in their classes were initially placed based on objective data from statewide achievement testing results from the students' prior years of instruction. Once students were grouped within each teacher's classroom, participants indicate they could organize students in the classroom seating arrangement.

Within the group of participants who taught English, a theme emerged of using flexible grouping for students. For the study, flexible grouping was based on student pre-assessment or formative assessment to create small groups which can change depending on student knowledge, skills, and understandings. However, data from the participant groups show a discrepancy between what flexible groups are as a differentiated strategy and how flexible grouping was being use. Study participants who taught Math were less likely than participants who taught English to use grouping as a strategy to influence student learning. Math participants did not indicate a comprehensive understanding of differentiated strategies, the limitations placed on the Math participants by the technology-based software Math program and the subsequent reports to the school's administration hampered any authentic use of differentiated strategies.

Findings Emerging from Interview Question 2

What do you think are some important ways to support student learning in your teaching?

All teachers indicate having students work with other students to support their learning was important. Within the participant group who taught English, a theme emerged of using grouping in their classroom to support student learning. Grouping of students in English classrooms was noted by participants as being based on methods of instructional delivery by the teacher, such as whole class, small group, or individual learning. The participants grouped students based on formative assessments of content performance. All the Math participants indicate they retaught content material in a whole group format as a way of supporting student learning beyond the use of student grouping; they re-taught material at the start of each class using a whole class warm-up activity or a whole class homework review, and they integrated technology into their Math classrooms. The finding indicates a lack of understanding of differentiated strategies by the Math participants, because whole group instruction, whether use for re-teaching or not, is not a strategy for differentiating instruction.

Findings Emerging from Interview Question 3

Talk to me about what it is like to teach English/Math with the students you have. All participants in the study indicate their teaching of English or Math students was influenced by the way in which students were initially placed in classes by administrators using several factors. In balancing the classroom, a practice new to the district as of the time of the interviews, objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements were the criteria use to inform the design of student's class schedules. Participants indicate that the balancing of the classroom was conducted in part to make teacher evaluations, which were linked to statewide achievement testing undergone by students, more likely to demonstrate student proficiency on tests. The student proficiency on statewide achievement testing was linked to teacher evaluations, which influenced

teacher pay and teacher retention. Teacher evaluations were conducted directly after results of students' quarterly statewide achievement testing data were reviewed and recorded by the administration. Additionally, because the school district policy to shift from ability grouping students, where students are grouped by similar performance in each curriculum, to balancing the classroom, the teachers felt generally not at ease with their professional ability to use differentiated strategies.

Findings Emerging from Interview Question 4

How do you initially assess the unique learning needs of the students you teach? Participants who taught English initially assessed the unique learning needs of the students they taught by conducting multiple formative practices. Participants who taught Math initially assessed their students' unique learning needs using a beginning-of-year pre-assessment based on Math content from the prior year. Four participants in the English participant indicate specifically they use informal assessment practices, such as book surveys, reading level data, and online reading vocabulary data. One participant who taught English initially assessed the unique learning needs of the students using multiple practices like multiple intelligence surveys. One participant in the English group did not indicate the specific initial student assessment practices, but admitted to using an initial assessment. Although all participants in English indicate they initially assessed the unique learning needs of the students they taught, no consistent method for doing so was mentioned.

Findings Emerging from Interview Question 5

Talk to me about the strategies you use to meet the learning needs of all students in your classroom. English participants in the study use teaching strategies centered on varying instructional methods, flexible grouping, and technology integration. E1 observed that a personal

teaching objective was “finding ways to meet all the needs of every student and leading them to success in learning.” E2 modified strategies by learning to trust instincts. A pattern which emerged in the group of participants was the use of differentiated strategies. E3 differentiated instruction by offering debates, discussions, and hands-on learning opportunities, and by incorporating technology into instruction. E4 differentiated to teach “skills though different media or methods that fits each student’s skill level or intelligence.” Elaborating upon the response, E4 offered “alternative ways to assess students through projects, presentations, essays, tests, or oral explanations.” E5 provided more examples than other participants regarding ways to differentiate instruction and modify content; E5 would “chunk information, offer one-to-one instruction, provide reading aloud of English materials, use tiered questioning strategies, and change learning styles or challenge levels.” E6 adapted instruction for process by changing the pacing of curriculum objectives and assignments.

Math participants in the study all use the same methods as English participants and their online Math curriculum to refine instruction. Two of the six participants who taught Math indicate they use hands-on applications in previous years in their classrooms as strategies to meet the learning needs of all students in their classrooms. These hands-on applications included foldable displays and three-dimensional models. When asked further about how these hands-on applications were useful in previous years, M1 said they allows students to “kinesthetically and visually understand and apply the concepts they are progressing toward to try and attain Mathematical mastery.” These same two participants indicate they were guided by their online Math curriculum to refine instruction to conduct formative assessments like pre-assessments and adding cooperative learning groups and collaborative group assignments. In addition to the use of formative assessments like pre-assessments, the use of the terms cooperative learning groups and

collaborative group assignments emerged as a theme among Math participants, however data findings from the study demonstrate that participants had some awareness regarding the terms associated with differentiated strategies. Although participants call their practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. Findings are found on Table 3.

Findings Emerging from Interview Question 6

What are the barriers you face in trying to meet students learning needs in the classroom? All study participants referenced encountering barriers in trying to address student learning needs in the classroom. Five patterns, shared by both study participant groups, emerged. These patterns, listed in Table 4, are viewed by participants as barriers to addressing student learning needs in the classroom and are barriers which could not be corrected within the classroom environment alone. Those five barriers are: (a) time constraints; (b) prescribed curriculum pacing and assessments; (c) lack of knowledge regarding differentiation as a strategy for teaching and learning: (d) different levels of achievement in a classroom setting; and, (e) a lack of administrative support. Specifically, participants referenced 21st-century learning skills connected to the newly adopted state standards as the cause for the rapid change in student needs they are attempting to address.

While participants express the connection between 21st- century learning skills and the newly adopted state standards as the cause for the rapid change in student needs they are attempting to address, students' differences have historically existed in education. 2014 was the CCSS was adopted by middle grades English and Math across the state where the study occurred. Additionally, an overarching theme which emerged between both participant groups by subject area in response to the question was a concern about student performance on statewide achievement testing in English and Math. Student performance on statewide achievement tests

was a factor not only in balancing the classrooms between learners of varying levels but also in teacher evaluations in the school district. Student proficiency on statewide achievement testing was linked to teacher evaluations which influenced teacher pay and teacher retention.

Findings Emerging from Interview Question 7

After having taught heterogeneous classes for __ years, what advice would you give to someone who is just starting to teach heterogeneous classes? No consistent responses to the question were provided by the overall participant group or by the participant group categorized by subject area. Among the participants teaching English, E1 said allowing plenty of time for planning and being flexible were pieces of advice offered to someone just starting to teach heterogeneous classes. The practice of balancing the classroom was new to the district as of the time of the interviews. E4 supported differentiating instruction based on instructional process, observing that teachers should make sure they have clear scoring criteria when differentiating for activities. E4 made no mention of modifying for instructional content or instructional product.

Among the participants teaching Math, M5 highlighted the need to "plan, plan, and plan" when teaching heterogeneous classes because the difficulties a teacher may have in working with students with different learning needs. M3 began using student stations in the class because "it allows them to not work ahead or fall behind. It allows those who work ahead to increase their collaboration with students. They are timed durations based on pre-assessed learning." M4 offered the opinion that the need to plan should be supported with the integration of diverse teaching practices for differentiating instruction involving adding group activities, performance tasks, and station activities.

Findings Emerging from Interview Question 8

Is there anything else you think I should know to understand a teacher's use of differentiated strategies? In response to the question, participant responses were specific to the individual. Due to each participant's having unique responses to the semi-structured question, limited patterns or themes emerged from the data. Data collected from these interviews suggest that teachers would do well to create classroom learning communities for students to connect student interests to curriculum if possible. Engaging students in content-relevant choices regarding their interest in each topic of study enhances the learner's capability to cultivate the ability to acquire knowledge is a way to incorporate student interest. M1 stated, "[a]s a young teacher, I was very nervous. I was overwhelmed about how to address everyone's needs," but added that confidence in the ability to address the unique learning needs of students increased through experience. M4 stated, "Professional development in differentiated strategies is inconsistent. I heard the term 'differentiated strategies' being use, but I didn't know I was doing it by grouping students based on their skills and abilities." M5 said: Teachers will do differentiated strategies whether they know they are or not because they are going to have to modify the pace and rigor based on the students or class of learners. Otherwise, students get bored with repetitive content and instruction. Also, teacher proximity to attend to student learning increases with flexible grouping. I'll change student groups at any time based on improvement of student learning.

E1 expressed teachers should "always be willing to try new ideas and lessons." E1 stressed that learning should extend beyond the classroom with "student, parent, and teacher working together" to make certain that in the classroom "students are exposed to a variety of learning styles and levels." E2 made recommendations about the pacing of trying out new ideas and lessons, contending a teacher should not try to differentiate for a whole class at one time initially. The

strategy use for differentiated strategies was to consider which students could be intentionally grouped based on skills they were proficient in, or not as advanced in, and to "create a high and low group first and then go from there." The procedure grouped students on their ability initially, and E2 suggested using the practice as a starting point for modifying teacher practice in the classroom. Although participants call the practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. E3 asked for an assistant to work with students since an assistant benefits both the teacher and students as the teacher has "another person to share ideas with and the students have someone else to ask questions." E5 recommended teachers find free resources. None of the participants teaching English indicate if professional development, specifically in differentiated strategies would benefit themselves or their students. No evidence existed of district-wide professional development related to differentiated strategies having been conducted within the previous two years although data on professional development on differentiated strategies was requested. While the questions designed for the explanatory case study did not ask participants about their professional development focus specifically in differentiated strategies, participants indicate in their interviews that a lack of professional development was a challenge they face when differentiating strategies.

Summary

The study shared knowledge participants expressed concerning differentiated strategies through the evaluation and interpretation of interview data. Analyzing the interviews discerns both patterns of strategies teachers use to address the unique learning needs of all their students in their classroom and themes regarding the educational challenges to meeting their students' needs in the classroom. Five patterns, mentioned by both study participant groups, emerged in response to the

question. These patterns are recognized as barriers by the study's two participant groups who felt these barriers in the classroom could not be corrected within the classroom environment alone. Those five barriers are: (a) time constraints; (b) prescribed curriculum pacing and assessments; (c) lack of knowledge regarding differentiation as a strategy for teaching and learning; (d) different levels of achievement in a classroom setting; and, (e) a lack of administrative support. The researcher's questions support existing and related research and theories in the field of education using an explanatory case study methodology. The following chapter will address the researcher's questions and interpret the findings.

Chapter 5: Discussion and Conclusion

Introduction

In Chapter 5, the study addresses questions and interprets data findings. The purpose of the study was to inquire about (a) what strategies of differentiation teachers use in their practice of teaching and learning, and (b) what challenges teachers face when implementing differentiated strategies. The findings of the study indicate teachers had an awareness of the terms associated with using multiple methods to address the unique learning needs of students, but in practice, they implement differentiated strategies on a limited basis. Chapter 5 presents a summary of the results, a discussion of the results in relation to the literature, the limitations of the study, the implications of the results for practice, and recommendations for further research.

The study's purpose. The aims of the researcher's questions in the study explore: (a) what strategies of differentiation teachers use in their practice of teaching and learning; and, (b) what challenges teachers face when implementing differentiated strategies. The study's significance lies in its ability to add to the body of literature regarding ways in which teachers demonstrate an inconsistent understanding regarding differentiated strategies to facilitate the unique learning needs of students. The study also addresses what challenges teachers face when implementing differentiated strategies. Endeavors to answer these inquiries support existing related research and theories in the field of education using an explanatory case study methodology.

Analyzing the semi-structured interviews allows for the emergence of patterns of strategies teachers use to address the unique learning needs of all students in their classrooms and of themes regarding the educational challenges to addressing students' needs in the classroom. The coding of

the participants' interview transcripts filters data obtained from participant interviews for like terms and references, and to find out whether patterns and themes emerged. After the codes in each transcript were documented, checked through for accuracy, and re-documented as necessary, the next level of coding began.

In the second level of coding, the keywords and phrases in each transcript were sorted into categories. An interesting observation during the second level coding was the repeated emergence of four dominant categories; grouping practices, differentiated strategies, professional development, and teacher evaluations.

Interviewing teachers and then synthesizing interview data for patterns and themes determines: (a) what strategies of differentiation teachers use in their practice of teaching and learning: and, (b) what challenges teachers face when implementing differentiated strategies. The findings from the data are in the summary of the results, the discussion of the results, and the discussion of the finds sections in Chapter 5.

The study's structure. The research employed an explanatory case study methodology using semi-structured interviews. Although all qualitative research is susceptible to personal interpretation and selective data collection (Stake, 2010; Williams, 1987), the case study method was the most appropriate method because it allows for personal interviews of participants in two subject areas occurring within one school district. The type of case study answers the researcher's questions to describe the underlying links in real-life interventions which are too difficult for the survey or experimental strategies. In the explanatory case study, the explanations would connect teacher implementation with effects (Yin, 2003). For the case study, the configuration incorporated the utilization of both technique and request, in which the specialist investigated genuine cases after some time and a detailed portrayal. Studies inquire about looks at

how as a marvel, for example, separation procedures are impacted by the setting in which it happens (Creswell, 2013). Creswell (2013) shared that a case study starts with the distinguishing proof of a case or cases in which the scientist displays an inside and out comprehension of the case(s) by gathering many types of qualitative data.

Case studies encourage the analysis of multiple perspectives. Yin (2014) explained that the rationale for learning about a small group and then using that understanding as a representative case is, "the lessons learned from these cases are assumed to be informative about the experience of the average person or institution" (p. 47). In the explanatory case study, 12 participants were sharing their perspectives on differentiated strategies and challenges to those strategies in semi-structured interviews. These teachers educated students at the middle grade level in either English or Math and varied in educational background and training. When receiving responses from interested teachers, participants were selected for the study based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience, and whether participants had a Bachelor's or Master's degree. All respondents held either a Bachelor's or Master's degree in education as a pre-requisite for employment within the district. The researcher purposefully selected a sample of 12 participants from the 24 responses. This sample size was established because 12 participants would be a more manageable purposeful sample size for the interviews which were conducted as part of the explanatory case study interview. Kuntz et al. (1998) assert that since case studies ask the reader to question assumptions underlying the theories presented, the study can explore and promote common issues. In the case study, the common issue was the use of differentiated strategies and the challenges teacher face regarding differentiated strategies.

Summary of the Results

Over the course of the study, a composite and full depiction of the findings using the descriptive words of the study's participants was constructed. Twelve middle grade teachers participated in the interviews held after school hours. Interview questions (Appendix D) were used to guide the interviews, which were audio-recorded with the participants' permission. After the interviews were completed, they were transcribed and each of the participants provided with a copy to member check for accuracy, encouraging each to modify, clarify, and/or elaborate upon the responses, to make sure thoughts and perceptions had been accurately recorded (Creswell, 2007).

Upon receiving a confirmation of accuracy of transcript from each participant, the process of coding began, which is the foundation of data analysis (Creswell, 2007). In coding, data collection and interpretation of the data were linked to form the basis of the research analysis. The quality of the research is based on the quality of the coding, according to Strauss (1987). Descriptive coding is use for the sorting of known data information into categories based on a researcher's expertise and is often use for asking questions of the data (Richards et al., 2013). Although descriptive coding is ubiquitous in sorting data, as teacher interviews were conducted and reviewed, the information was manually coded to classify the data.

Forty themes emerged from the transcribed interview data responses collected from 12 study participants who had answered eight questions as part of the interview process. The coding happened after each transcript was read multiple times to find consistent key words and phrases in the interview data. The distinguishing situation of interviews gathers deep, rich, and descriptive comments of interest rather than just data points or survey analysis. The use of the explanatory case study method was important because the research method values each descriptive word which is shared by a participant. These descriptive words represent a model of the participant's

consciousness (Vygotsky, 1987). For each participant transcript, a comparison between each of the 12 transcripts was conducted. After the codes in each transcript were documented, checked through for accuracy, and re-documented as necessary, the next level of coding began.

These 40 codes were then sorted into categories. Keywords and phrases were noted in a separate document to look for emerging categories. As Yin (2003) advocated, the data analysis examined and categorized evidence to address the questions posed by the research study. While reviewing the codes, categories were noted in each of the twelve transcripts. Table 2 lists categories regarding study participants' responses to initial student assessment practices. Categories listing study participants' responses to address student learning needs can be found in Table 3. The final table, Table 4, provides categories the study participants' barriers for differentiating strategies. An interesting observation during the second level coding was the repeated emergence of four dominant categories: (a) grouping practices; (b) differentiated strategies; (c) professional development; and, (d) teacher evaluations. Because the topics were multifaceted, the data gathered in the study ascertains themes for greater versatility in the use of the information.

In the third level of coding, categories were synthesized into themes. The data analyzed determined the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies. The categories were synthesized into the following themes:

- Study participants' responses to initial student assessment practices;
- Study participants' responses to meeting student learning needs; and
- Study participants' barriers to differentiated strategies.

As the teacher interviews were filtered for like codes leading to categorization of data, themes

emerged regarding the application of pedagogy by teachers. The data analysis of the findings obtained through the interviews discovers themes regarding the application of pedagogy based on the data set of the participating teachers.

Patterns developed as data were parsed into themes. These patterns were synthesized to determine the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing differentiated strategies in those three themes. A last reading of each transcript while comparing against identified patterns allows for specific quotes from participants to support the credibility of the data. Eight patterns emerged regarding the theme of study participants' responses to initial student assessment practices. Implications of the patterns found in relation to the theme of study participant responses to initial student assessment practices are discussed in Chapter 5. Nineteen patterns emerged regarding responses to meeting student learning needs implications of the patterns found in relation to the theme of study participants' responses to meeting student learning needs are discussed in Chapter 5.

Five patterns emerged regarding the theme of study participant barriers to differentiated strategies. Those five patterns are: time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning, different levels of achievement in a classroom setting, and a lack of administrative support. By interviewing teachers and then synthesizing the content to discover patterns and themes, the barriers to modification of differentiated strategies were identified by content, product, or processes addresses by teachers.

One reason for the approach was that methods use by teachers varied for multiple reasons, including differences in age, experience, professional development regarding differentiated strategies, and length of time teaching as presented in Table 1 and Table 3. Responses to the

interview questions indicate how well the participant teachers knew concepts associated with differentiated strategies, such as their use of "flexible grouping" and how their understanding of differentiated strategies was demonstrated in their methodology and pedagogy. The understanding of differentiated strategies on participant responses to the interview questions was incomplete at best, and minimal at worst, as the considerations of age, experience, professional development regarding differentiated strategies, and length of time teaching did not diminish a lack of understanding of differentiated strategies nor lessen barriers using differentiated strategies.

Discussion of the Results

The findings of the study indicate that teachers acknowledged they need multiple methods to address the unique learning needs of students. However, in practice, they implement differentiated strategies on a limited basis. The findings of the study also reveal that the use of multiple instructional strategies by teachers differed; the support and professional development teachers received regarding the use of multiple instructional strategies differed; and teacher reflection upon the use of multiple instructional strategies was inconsistent based on teacher experience, teacher support, and subject area as presented in Table 1 and Table 3.

Within the classroom, teachers had the ability to differentiate evaluation of students by considering their initial starting points and by recognizing growth. Tomlinson (2003) pointed out that although students shared the same classroom, they differed in terms of their readiness to learn, their interests, and their learning preferences. Although all participants in English indicate they initially assessed the unique learning needs of the students they taught, no consistent method for doing so was mentioned. Four participants in the English participant indicate specifically they use informal assessment practices, such as book surveys, reading level data, and online reading vocabulary data. One participant who taught English initially assessed the unique learning needs

of the students using multiple practices like multiple intelligence surveys. One participant in the English group did not indicate the specific initial student assessment practices, but admitted to using an initial assessment.

In Math, all the participants indicate they were required to place their student formative scores from each of these assessments on a spreadsheet shared with their school's administration. Every participant who taught Math reported that students were grouped based on formative pre-assessments of content area readiness and achievement data acquired from quarterly district-designed benchmark testing. The grouping was directed by data and determined by the district's technology-based software Math program. These formative assessment scores were frequently measured within the classroom through the technology-based software program use by the Math department throughout the district.

However, the descriptions of multiple instructional strategies shared by participants did not indicate a comprehensive understanding of differentiated strategies. What the Math participants indicate in the data was either achievement or aptitude data depending on the assessment. While, Math participants did not indicate a comprehensive understanding of differentiated strategies, the limitations placed on the Math participants by the technology-based software Math program and the subsequent reports to the school's administration hampered any authentic use of differentiated strategies.

Data also shows a comprehensive understanding of differentiated strategies and professional development necessary to support such an understanding existed on a limited and inconsistent basis. While the questions designed for the explanatory case study did not ask participants about if their professional development focuses in differentiated strategies, participants indicate in their interviews that a lack of professional development was a challenge they face when

differentiating strategies. The findings of the study indicate teachers had an awareness of the terms associated with using multiple methods to address the unique learning needs of students, but in practice, they implement differentiated strategies on a limited basis.

Evidence did not demonstrate an understanding of how differentiated strategies could be used to modify content, product, or processes to enhance student learning and engagement in their learning by responding to various types of student learners. For example, the data from Interview Questions 7 and 8 indicate that teachers acknowledged the need for flexible grouping, although in practice, they did not flexibly group students in accordance with differentiated strategies. Flexible grouping is understood to be based on student pre-assessment or formative assessment to create small groups which can change depending on student knowledge, skills, and understandings. While teachers call their practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. Perhaps due to newly adopted curriculum standards and practices, the teachers felt generally not at ease with their professional ability to use differentiated strategies, which could be a rational limit as no district training regarding differentiated strategies accompanied the district policy shift.

As well, teachers recognized that the use of diverse practices by teachers allows students to build upon student content area strengths and improve their learning. However, participants lacked a comprehensive understanding of differentiated strategies and the professional development necessary to support such an understanding existed on a limited and inconsistent basis. Because English and Math instruction was driven by a statewide achievement test, participants responded to the request to “talk to me about what it is like to teach English/Math with the students you have” in a way which reflected teacher instructional practices rather than consideration of individual student

differences. Among the participants teaching Math, M5 highlighted the need to "plan, plan, and plan" when teaching heterogeneous classes because the difficulties a teacher may have in working with students with different learning needs. M4 offered the opinion that the need to plan should be supported with the integration of diverse teaching practices for differentiating instruction involving adding group activities, performance tasks, and station activities. However, the data identified on Tables 2, 3, and 4 provided insight into the low frequency with which differentiated strategies were being used. For example, all the Math participants indicate they retaught content material in a whole group format as a way of supporting student learning beyond the use of student grouping; they re-taught material at the start of each class using a whole class warm-up activity or a whole class homework review, and they integrated technology into their Math classrooms. This finding indicates a lack of understanding of differentiated strategies by the Math participants, because whole group instruction, whether use for re-teaching or not, is not a strategy for differentiating instruction.

Teachers who thought they were using differentiated strategies face challenges to their attempts to implement differentiated strategies including time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning, different levels of achievement in a classroom setting, and a lack of administrative support.

Based on the information presented in the literature reviewed for the study, a consistent rationale for teachers' not using differentiated strategies was that modifying content, product, or process for multiple learning preferences and cognitive preferences and levels was time consuming. As indicated by Carolan et al.(2007), a portion of the barriers teachers are confronted with when attempting to use differentiated strategies was absence of time to get ready lessons, not

supporting instructors enough to develop their skills and practices with differentiated strategies and feedback regarding attempts with differentiated strategies. The data from the study acknowledged the professional development of teachers in differentiated strategies and their use of differentiated strategies were swayed by the amount of time devoted to planning and using differentiated strategies daily. Common planning time for teachers could be used to create student learning opportunities as teachers design and share differentiated lessons.

To improve student learning using differentiate strategies, teachers must embrace a common understanding regarding differentiated strategies. By planning together, teachers may determine if differentiated strategies as appropriate for the student in relation to the instructional content, process, and product being taught. It is recommended those meetings be used to determine how teachers use data (such as in pre-assessment of student readiness, student-teacher conferencing, and student data notebooks) to drive content instruction. Teachers could also consider lesson delivery with these differentiated modifications, relevant curriculum standards alignment, sequenced steps in the lesson plan, teacher-generated materials and materials list, samples of student work, and teacher's reflection of content delivery.

Participants in both groups expressed that time for planning high-quality instruction, time for reflection with other professionals, and time spent directly with students was infringed upon by the time lost when participants were pulled from their classrooms for subject area meetings, departmental meetings, cross-curricular team meetings, administrative meetings, data meetings, and professional development meetings. Participants also indicate most of the meeting time was allocated to discussing technology and special education and focus on the implementation of technology applications or on special education programming of students. Previous research has established that the need for planning is essential because the modification of content, process, or

product is time consuming (Tomlinson et al., 2006). Further examination is suggested on the extent of classroom teaching time dedicated to cooperative planning and developing differentiated strategies is suggested based on participant interview findings.

A second challenge reported by both participant groups data were the assertion that the prescribed curriculum pacing, and assessments do not align in a way which promotes individualized student learning. As E4 describes, the challenge makes it, "difficult to continuously assess each individual student's needs and mastery and then respond with cohesive lessons." Specifically, participants referenced 21st-century learning skills connected to newly adopted CCSS as the rapidly changing student needs they were attempting to address. E4 referenced "creativity and accountability" as 21st-century learning skills. M3 referred to "problem-solving, analytic thinking, and collaboration" as changing student needs. Recognition of the rapid pace at which student needs change could be attributed the participants' understanding of best practices. Alternatively, the assertion that student needs change rapidly could be linked to the student data required to be shared between the participant and the school's administration. The expectation regarding continuous assessment required participants to place their students' formative scores and statewide achievement testing scores from assessments on spreadsheets shared with their school's administration. The challenge was accompanied by participants sharing that there was an expectation of recursive data monitoring by teachers reported the data to administrators. For both groups of participants was an expectation of the reporting of assigned technology-based instructional expectations to school administration.

A third challenge indicates a lack of professional knowledge regarding differentiation as a strategy for teaching and learning. Participant data shows limited professional development regarding differentiated strategies and the intentional and purposeful use of specific strategies. For

example, one participant, M2, noted that during the first training on differentiated strategies with the district a decade ago, the head of the department leading the meeting criticized M2's spelling of the words "differentiated strategies" at the beginning of the meeting in front of colleagues. M2 added that because the small insult offered at the start of the career, personal confidence in abilities to differentiate decreased. The personal reflection on M2's introduction to differentiated strategies was indicative of the participant's relationship with differentiated strategies.

Based on research, differentiation involves highly effective teaching strategies conducted to meet the learning needs of each student fairly and equitably, thereby allowing teachers to work with students at varying levels of readiness and learning. Although the participants supported and encouraged differentiated strategies for students, participants who received training a decade or more ago conceded a need to stay updated on differentiated strategies. In the district, there was a lack of professional development opportunities for differentiated strategies for most of the participants in the study had not been conducted in the prior two school years. Professional development could be an underlying cause of teachers' lack of understanding of differentiated strategies. However, the questions designed for the explanatory case study did not ask participants about their professional development focus specifically in differentiated strategies, participants indicate in their interviews that a lack of professional development was a challenge they face when differentiating strategies. Within the participants' schools, professional development opportunities often focus on data analysis, technology integrations, or special education services.

Tomlinson (1999) identified differentiated strategies that could be use by teachers, including varied texts, tiered centers, and grouping activities. Study participants indicate in the data collected in the interviews that while participants are aware of some of the verbiage associated with differentiated strategies, evidence did not support that teachers had an in depth enough

understanding of how to modify content, product, or process for students effectively. For example, E5 use tiered assignments, or tasks with different levels of difficulty, to advance student learning. E6 reported using methods of delivery, instructional pacing, methods of questioning, and alternate assignments to differentiate activities. Data also shows that participants are using varied texts and tiered centers mostly "re-teaching concepts." Based on the study's data, these strategies the teachers indicate they use are not actually differentiated strategies which would modify content, product, or process for meeting the unique learning needs of students. Participants had some ideas regarding what could be differentiated strategies, but these ideas are not in accordance with what differentiated strategies are.

Teacher misunderstanding regarding differentiated strategies was most clear in the interview data regarding flexible grouping. Although participants call their practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. Within the group of participants who taught English, a theme emerged of using grouping in their classroom to support student learning. In Math, data on students grouping and for what purpose were inconclusive based on participant responses to interview questions. The structure of student grouping, instruction, and feedback should respect and honor the uniqueness and learning potential of each student.

The primary goal of teachers has historically been to provide effective instruction in the most informed way possible to improve student achievement and understanding (Darling-Hammond, 2000). Although it would have been reasonable to expect that teachers differentiated more frequently as they gained experience, analysis of the participants' responses found in Tables 2, 3, and 4 did not support that assumption. To meet their students' learning needs, English

participants indicate that they use strategies centered on varying instructional methods such as flexible grouping and technology integrations. E3 described these as, "technology applications geared to English for effective vocabulary instruction." These are not examples of differentiated strategies because participants did not modify the content, process, or product to meet the unique learning needs of students.

The fourth challenge was different levels of achievement in a classroom setting. Strategies implemented by a teacher to guide instruction were used rather than distinctions made by teachers to address the unique needs of learners. M1 stated that there was "no variance in pedagogy due to no variance in tested objectives—the tests are not levelled [accounting for different levels of student understanding]." In terms of the participant data, findings show haphazard use of differentiated strategies. These findings lead to the conclusion that in the two- year absence of focused professional development on differentiated strategies, it would be inappropriate to expect teachers to be able to implement differentiated strategies appropriately. Without further opportunities for professional conversations to follow up on those professional developments, it would be difficult for teachers to meet the unique learning needs of students.

All the Math participants indicate they re-taught content material to students to support student learning. Re-teaching of content material took place in all the Math participants' classrooms in the form of regular classroom instructional time at the start of each lesson.

However, the participants did not indicate if the re-teaching occurred in a format other than a whole class format. All students in a classroom of the Math participants received re-teaching of course material at the start of each instructional class period as part of the technology-based software Math program. Re-teaching of course material at the start of each class for all students is an example of what differentiated strategies are not, because the method of instruction did not

consider the variance of content, product, or process a student should have to meet individual learning objectives.

In the study, special education providers and services were viewed as a challenge to differentiated strategies. Provision of special education services to formally identified students within the classroom emerged from the study and affected both participant groups. However, data did not show that the provision of special education services increased the participants' use of differentiated strategies. No change was shown in the data that supported and increased use of differentiated strategies regardless of special education identification. Participants in both English and Math expressed having difficulty within special education documentation for individual students because special education terms varied depending on who contributed the documentation; to clarify further, participants indicate that two students who had similar identifications on their individualized education plan would have inconsistent wording if the individualized education plans were written by different members of the school's special education team. E5 and M4 stated being able to meet special needs requirements would be easier if standardized wording describes the necessary classroom assistance and modification. The concern was more prevalent among the English teaching participants because special education teacher availability to co-teach took precedence in student scheduling when balancing the classroom. The findings indicate that in practice, teachers implement flexible grouping on a limited, if not wholly misunderstood, basis.

The fifth barrier participants felt challenged by was a lack of administrative support. Participants shared that much of the professional development centered on the administration's focus on special education or technology applications. In balancing the classroom, a practice new to the district as of the time of the interviews, objective data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification

plan requirements was the criteria use to inform the design of student's class schedules. However, it could be assumed by teachers who played no role in balancing the classroom that the student scheduling was not based on student ability level but instead was based on special education teacher availability to co-teach if the quantity of students in a classroom, formally identified as requiring special education services, exceeded the school district's maximum of six students per class. Alternatively, because the school district policy to shift from ability grouping students, where students were grouped by similar performance in each curriculum, to balancing the classroom, the teachers felt generally not at ease with their professional ability to use differentiated strategies, which could be a rational limitation as no district training regarding differentiated strategies accompanied the district policy shift.

Participants also indicate that conversations regarding funding for special education and technology applications occurred with more frequency with administrators than did those regarding funding for concrete instructional materials for classroom use. Perceived as a barrier, M3 shared, "we have a technology-based program and Chromebook computers to use with the program, so resources like paper, glue, and scissors are not well funded because we don't use them as often." Data from participants indicate that funding for English and Math instructional materials was limited by budgetary allocations for technology and special education.

Discussion of the Results in Relation to the Literature

A central assumption of the study was that teachers could implement solutions which address the unique learning needs a student exhibits by modifying instructional content, processes, or product using differentiated strategies. However, teachers face barriers to differentiated strategies such as time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning on the part of the

teachers, different levels of achievement in a classroom setting, and a lack of administrative understanding regarding effective, authentic balancing the classroom practices. The study occurred during the first year the district decided to begin the practice of balancing the classroom.

There was a need to conduct the study because although there is research to be found regarding the strategies and challenges regarding differentiated strategies in middle grade English and Math, its quantity is limited, and findings are inconsistent. Although existing theoretical literature regarding how teachers should modify curriculum and instruction to differentiate content, product, or processes for students, the existing literature rarely includes middle grade English or Math settings which describe what that theory looks like in practice. Research shares that teachers inconsistently have attempted to actualize differentiated strategies in their classroom however having trouble bringing an end to past instructional inclinations in the classroom. Participants in the study indicate that they would engage in classroom activities which could be seen in part as differentiated strategies. However, study data indicates a lack of authentically implement differentiated strategies in the classroom. The study was pertinent because it reveals gaps in teacher understanding which may be of interest to those considering differentiated strategies in the context of middle grade English and Math instruction.

For teachers, challenges exist regarding how to use strategies to differentiate for student learning and how to receive professional training (Tobin, 2008). However, challenges to differentiated strategies exist in the classroom and outside the classroom. Tobin (2008) found that when a teacher feels unprepared to accommodate for individual characteristics and needs, the teacher was likely to have fewer student interactions and those interactions are likely to lack instructional content. Wormeli (2007) reported that, in general, differentiated strategies is a popular term in school improvement plans; however, some teachers who claimed to be modifying

assessment and curriculum are not doing so. The statement was supported by Westberg et al. (2003), who found that when they recreated their 1992 Classroom Practices Survey Study, administered to more than seven thousand teachers across the county, and compared 1992 results with the results of their 2002 Classroom Practices Survey Study, "teachers' differentiated practices in third and fourth grade classrooms have not changed in the last 10 years" (p. 6). Their study considered primary grades, but the study's data on the middle grades supported the same finding. Participant M1 in the study indicates professional development for teachers in the classroom was driven in part by student proficiency on statewide achievement testing. Further probing of the participant group suggested that statewide achievement testing, rather than the application of professional subject area knowledge, was the driver of English and Math instruction. Westberg et al. (2003) found that the lack of change between results of the 1992 study and the 2002 study was recognized by researchers, who expressed concern that, for students of all learning ability levels, "high stakes testing appears to have a negative impact on the classroom practices provided to capable students" (p. 6). All participants referred to encountering barriers in trying to address student learning needs in the classroom. However, many of the barriers mentioned are not necessarily fixable within the classroom environment and are beyond the locus of control for the participants.

The findings of the study also demonstrate that the application of multiple instructional strategies by teachers differed; the support and professional development teachers received regarding the use of multiple instructional strategies varied; and teacher reflection upon the use of multiple instructional strategies varied based on teacher experience, teacher support, and subject area as presented in Table 1 and Table 3. Yet, addressing differentiated strategies could be improved. Teachers might use differentiated strategies in multiple ways through the modification

of content, product, and process. And, meeting challenges to differentiated strategies within the classroom is possible through targeted professional development opportunities and reflection on instructional practices. Tobin (2008) suggested that when teachers incorporate differentiated strategies, they should have "an orientation to planning, decision-making, curriculum selection and instructional flow" which "is flexible and opportunistic" (p. 160). These suggestions made by Tobin were ignored in the data offered by the study's participants. For example, the practice of grouping students that study participants referred to as "flexible grouping" did not represent a differentiated strategy because it did not group in a way to support student learning. For the study, flexible grouping is based on student pre-assessment or formative assessment to create small groups which can change depending on student knowledge, skills, and understandings (Tomlinson, 1999). The structure of flexible grouping should respect and honor the uniqueness and learning potential of each student. However, data from the participant groups shows a discrepancy between what flexible groups are and how flexible grouping are being used.

When teachers learning together and reflect upon that learning, common understandings regarding phenomena can develop and positively impact student learning. Social constructivism relates to the needs of teachers to learn collaboratively and be supported in their personal and professional growth. Vygotsky's (1978) theory of social constructivism informed the study.

When Vygotsky emphasized the collaborative nature of learning, he asserted that social context, multiple realities, and multiple personal perspectives guide the learning of the group. Social constructivists believed individuals could learn material or perform tasks which were more complex when they had guidance or worked in collaboration with peers (Vygotsky, 1978). The belief by social constructivists advanced the rationale for differentiated instruction as a teaching practice through which teachers may reach the diverse needs of the students they serve through

considering student's individual interest, learning style, readiness, or ability when differentiating instruction. Social interaction among teachers, perhaps through peer mentoring, could also be a catalyst for personal reflection after professional development. Currently, the district has no requirements of teachers keeping up with professional development in their curriculum area. However, teachers were required to attend technology-oriented profession developments and special education trainings. No funding exists for teachers to attend conferences although funding exists at the administrative level for conference attendance.

Consider the participants' misunderstanding regarding flexible grouping. Flexible grouping was based on student pre-assessment or formative assessment to create small groups which can change depending on student knowledge, skills, and understandings. The findings indicate that teachers acknowledged the need for flexible grouping. Yet, data from the participant groups reveal a discrepancy between what flexible groups are according to differentiated strategies and how flexible grouping is being use by the study participants.

Although all the participants call the practice flexible grouping, it was not in fact the differentiated strategy of flexible grouping; the findings demonstrate the misunderstanding between practice and actual strategy. As mentioned earlier, flexible grouping is based on student pre-assessment or formative assessment to create small groups can change depending on student knowledge, skills, and understandings (Tomlinson, 1999). Through providing the professional development opportunities centered on differentiated strategies using the concept of social constructivism, such a misunderstanding could be resolved. Social constructivism may be used to inform the needs of teachers to learn and be supported in their drive to acquire knowledge. Or, what the learner cannot manage without help today ought to be what they can do all alone tomorrow. The suggestion is for instruction to advance student knowledge and to configuration

encounters that urge the student to seek after exercises which go just past their capacities (Vygotsky, 1978).

Tomlinson (2015) noted that to provide optimal student learning and to benefit the professional growth of teachers, it is important the teachers have a practical understanding and knowledge base prior to implementing differentiated strategies. Also, these studies demonstrate that when teachers were provided with an understanding of the effectiveness of, and learning opportunities for, students through differentiating strategies, they are far more likely to integrate such strategies into their teaching practices. Teachers could observe the connections students make to learning through informal and formal assessments and reflect upon their teaching practices and the results of those practices. Because the connection, students might invest more in learning the content and then make connections with the new information based on their own prior knowledge. Because teacher knowledge and experience informs and enriches student learning, critical conversations between teachers and other educational stakeholders have value. Professional development should align with the objectives of the educational organization, and those objectives should be flexible to the variable learning needs of professional teachers.

Limitations

Yin (2014) explained that the rationale for learning about a small group and then using that understanding as an explanatory case is, "the lessons learned from these cases are assumed to be informative about the experience of the average person or institution" (p. 47). However, there are limitations associated with the case study method of research. Creswell (2008) defines limitations as potential weaknesses or problems with the study identified by the research (p. 207). Limitations existed in the study which affected the interpretations of the research findings. The limitations in the research study are the following:

- Generalization of the results to the wider population;
- Difficulty in replicating the study and its findings;
- Time constraints regarding the data collection and analysis procedures; and
- The researcher's own subjective feelings that may influence the case study.

The first limitation considered the range of teaching grades and subjects was limited to middle grades English and Math. As the study was investigating two subject areas—English and Math—as opposed to more subject areas, the scope of the study and its data were reduced. The study interviewed 12 participants total: six who taught middle grade English and six who taught middle grade Math. Additionally, the study incorporated findings from participant interviews from only one school district. Participants for the study were selected based on the criterion of middle school location, being a teacher of English or Math, years of teaching experience and whether participants had a Bachelor's or Master's degree. All respondents held either a Bachelor's or Master's degree in education as a pre-requisite for employment within the district. The researcher purposefully selected a sample of 12 participants from the 24 responses. This sample size was established because 12 participants selected would be a more manageable purposeful sample size for the interviews which would be conducted as part of the explanatory case study interview. Procedures and processes produced a worthwhile study that responded adeptly to the researcher's questions, yet protected participant anonymity (Stake, 1995). Because the criterion is small, the transferability of the study's findings in limited due to the grade levels taught by the selected participants because the criteria is small.

The initial coding and margin notions were noted by hand on a hard copy of interview transcripts. Interviews were listened to while simultaneously reading the transcripts to ensure accuracy of the transcribed information. Participants' interviews were read several times in efforts

to use the data to comprehend the perceptions of the participants and recognize emerging pattern and themes.

Upon receiving a confirmation of accuracy from each participant, the process of coding began, which is the foundation of data analysis (Creswell, 2007). In coding, data collection and interpretation of data were linked to form the basis of the research analysis. The quality of the research is based on the quality of the coding, according to Strauss (1987). Descriptive coding is use for the sorting of known data information into categories based on a researcher's expertise and is often use for asking questions of the data (Richards et al., 2013). In the second level of coding, the keywords and phrases in each transcript were sorted into categories. An interesting observation during the second level coding was the repeated emergence of four dominant categories; grouping practices, differentiated strategies, professional development, and teacher evaluations.

The keywords and phrases in each transcript were sorted into categories in the second level of coding. While reviewing the categories, commonalities were noted in each of the five transcripts for later use. The data were grouped into the following categories:

- Study participants' responses to initial student assessment practices;
- Study participants' responses to meeting student learning needs; and
- Study participants' barriers for differentiating strategies.

In these three categories, patterns and themes emerged. Table 2 lists study participants' responses to initial student assessment practices. Study participants' responses to addressing student learning needs can be found in Table 3. The coding happened after each transcript was read multiple times to find consistent patterns and themes in the interview data.

Next, those data were analyzed to determine the participants' perspectives on what differentiated strategies teachers use and what challenges teachers face when implementing

differentiated strategies. For each participant transcript, a comparison between each of the 12 transcripts was made to see themes which might emerge. Themes developed as data were parsed into pieces of information with codes to reduce repetition. The goal was to divide the codes into five themes to be use to describe the findings of the case study. The coding resulted in the identification of five themes: time constraints, prescribed curriculum pacing and assessments, lack of knowledge regarding differentiation as a strategy for teaching and learning, different levels of achievement in a classroom setting, and a lack of administrative support. A last reading of each transcript while comparing against identified patterns and themes allows for specific quotes from participants to support the credibility of the data.

A second limitation in the study pertained to the difficulty in replicating the study and its findings. One of the intentions of qualitative research is to describe the different perspectives of participants to readers (Creswell, 1998). The data from the study would be different from another explanatory case study as the responses regarding the in-depth discussion of the phenomena of differentiated strategies would differ based on participants' interview data. However, considering two subject areas allows the researcher to expand the understanding of teacher knowledge of strategies and the use of differentiated strategies.

Although all qualitative research is vulnerable to personal interpretation and selective data collection (Stake, 2010; Williams, 1987), the explanatory case study method was the most appropriate method for the study because it allows the study to be conducted through personal interviews of participants in two subject areas present within one school district. The research design allows for flexibility within the study's model and did not detract from the study outcomes. The risks to the study subjects inherent in the study were no greater than those normally encountered during regular classroom participation or present during a professional collaborative

planning meeting. Data or other documentation collected as part of the interview process was not shared among teachers. No negative feedback resulted as part of the study from the data collected in subject interviews.

A third limitation in the study would be the time constraints regarding the data collection and analysis procedures. As Creswell (1998) explains, "[q]ualitative research is complex, involving fieldwork for prolonged periods of time, collecting words and pictures, analyzing the information inductively while focusing on participant's views, and writing about the process using expressive and persuasive language" (p. 15). The data gained acquires an in-depth understanding of the issue being studied through the voices of the teachers expressed as part of the interview process. Interviews were time consuming, and the time constraints of getting the research completed in a timely manner did not allow for an extensive number of interviews to be conducted. The research required time for the interviews to be conducted, the coding to be designed and categorized, and the member checking process to be conducted with fidelity.
Procedures and processes were designed to produce a worthwhile study, which responded adeptly to the researcher's questions while protecting participant anonymity (Stake, 1995).

While participants agreed to participation during the interview session, once the length of the interview session was completed and the interview questions were answered, participants could reasonably be expected to feel the interview was completed. A participant might have a longer response to one interview question and not as much to offer regarding a different interview question. Alternatively, because the school district policy to shift from ability grouping students, where students are grouped by similar performance in each curriculum, to balancing the classroom, the teachers felt generally not at ease with their professional ability to use differentiated strategies. In balancing the classroom, a practice new to the district as of the time of the interviews, objective

data from statewide achievement testing results from the students' prior year of instruction and from formal special education identification plan requirements to place students of mixed ability levels in the same classroom. As no district training regarding differentiated strategies accompanied the district policy shift, teachers may feel limited.

Researcher bias may have affected the themes, patterns, and suggestions in the evaluation of study interviews. The ability to express and reflect on researcher bias was critical to the research process. Therefore, introspection and analysis occur throughout the study research to limit such bias by keeping a record of reflective notes to track thoughts during the study. The ability to express and reflect on researcher bias was critical to the research process (Norris, 1997). Due to a background in middle grade English, the main study question narrows to address middle grade English and Math. The professional background presents the possibility of researcher bias in interpretation of the educational background.

Implications of the Results for Practice, Policy, and Theory

A review of the literature shows that through the responsive, purposeful, and visible implementation of differentiated strategies in teaching, teachers are empowered to address the learning needs of each student. As indicated in the findings, while participants expressed a connection between 21st-century learning skills and the newly adopted state standards as the cause for the rapid change in student needs they are attempting to address students' differences have historically existed in education. It is possible to design tasks that respect the needs, interests, and learning preferences of every student which are equally interesting, equally engaging, and provide equal access to essential understandings and skills. Although existing theoretical literature regarding how teachers should modify curriculum and instruction to differentiate content, product, or processes for students, the existing literature rarely included middle grade English or Math

settings which describe what the theory looks like in practice.

Implications of the results for practice. The findings of the study indicate teachers are aware of the need to use multiple methods to address the unique learning needs of students, but in practice, they implement differentiated strategies on a limited basis. As well, findings also reveal that the use of multiple instructional strategies by teachers differed; the support and professional development teachers received regarding the use of multiple instructional strategies differed; and teacher reflection upon the use of multiple instructional strategies was inconsistent based on teacher experience, teacher support, and subject area as presented in Table 1 and Table 3. Recommendations from this study are found through analyzing the patterns and themes drawn from data, which can be replicated with implications for the classroom, the students, and educational practices.

Implications drawn from the data results of the study regarding practice demonstrate a need for comprehensive professional development for teachers of middle grades English and Math in the district. Teachers knew about the need to utilize numerous techniques to address the multiple needs of students, yet, their use of differentiated strategies demonstrates a misunderstanding regarding the execution of differentiated strategies. A recommendation based on the study's findings is an increase in the comprehensive professional development opportunities provided for middle grade English and Math teachers. Professional development could be an underlying cause of teachers' lack of understanding of differentiated strategies, and the lack of professional development in differentiated strategies would also impact how to analyze or use data to inform their instruction. As participant M4 stated, "[p]rofessional development in differentiated strategies is inconsistent. I heard the term 'differentiated strategies' being use, but I didn't know I was doing it by grouping students based on their skills and abilities." Professional development could align

with the learning objectives of the student and with the curricular objectives recognized by the emerging professional teacher. In the absence of further opportunities for professional conversations to follow up on those professional developments, it would be difficult for teachers to meet the unique learning needs of students. An increase in district-wide professional development opportunities for teacher regarding differentiated strategies would benefit the study's participants.

Implications of the results for policy. Implications drawn from the data results of the study regarding policy demonstrate that middle grade English and Math teachers in the district need guidance regarding differentiated strategies from the administrative level first, followed by support from teacher leaders. Participants offered individual responses to Interview Question 7: "After having taught heterogeneous classes for [information redacted] years, what advice would you give to someone who is just starting to teach heterogeneous classes?" Based on the study's findings, the recommendation is to unify advice given to emerging teachers, or those lacking experience in differentiating strategies, relevant guidance regarding differentiated strategies from the administrative level first, followed by support from teacher leaders could be provided. Washbourne (1953) indicated that when research regarding differentiated strategies first emerged, it may have evolved alongside academic testing, curriculum standardization, instructional sequencing, and the professional development of teachers. Yet, the implementation of differentiated strategies in education has not consistently been supported (Smoker, 2015).

Teachers face challenges in acquiring knowledge about how to use strategies to differentiate for student learning and how to receive support and professional development in efforts to enhance student learning. The study's findings lead to the conclusion that without administrative guidance and support from teacher leaders regarding differentiated strategies, it would be inappropriate to expect teachers to be able to implement differentiated strategies with

fidelity. As well, although teachers can use whatever strategies they wish, a teacher's decision not to differentiate could be due to deficits in the professional development of teachers, teacher experience, or in the teacher's willingness and energy to apply them. The literature reviewed and study data supported that teachers would do well to create classroom learning communities to encourage them to learn more about students as individuals.

As well, data findings from the study suggested that student engagement in instruction depends on the connection created among teacher, classmate, and information. Therefore, efforts to improve the use of strategies which modify content, product, or process should include evidence of increasing student engagement in the classroom. Evidence from the study supports incorporating differentiated strategies into daily student instruction in classroom environments.

As a result, students may invest more in learning the content and then make connections with the new information based on their own prior knowledge. Teachers could observe the connections students make to learning through informal and formal assessments and reflect upon their teaching practices and the results of those practices.

Implications of the results for theory. Based on the data from the explanatory case study, implications suggest that teachers can and should be the architects of their own professional development with guidance of administration and support of teacher leaders.

Research supports professional development which provides opportunities for lively, proactive learning supporting teachers as they to acquire and apply knowledge to practice with colleagues that is rigorous and continuous over time (Darling-Hammond & Richardson, 2009). When teachers reflect upon these collaborative professional discourses, they may be more capable of determining ways in which they can use diverse strategies to complement their teaching styles and the classroom environment. Study data informs that none of the participants teaching English

indicate whether professional development specifically in differentiated strategies would benefit them or their students. As M3, who received training in differentiated strategies eight years earlier, stated: "I have been thrown a bunch of terms but never asked about how I use any of them." M5 was looking outside the classroom for professional growth opportunities due to a lack of any recent training in teaching using diverse strategies. M4 stated, "[p]rofessional development in differentiated strategies is inconsistent. I heard the term 'differentiated strategies' being use, but I didn't know I was doing it." When reviewing the participant data collected, the researcher found no evidence existed of district-wide professional development related to differentiated strategies having been conducted within the previous two years although data on professional development on differentiated strategies was requested. However, the offerings of professional development were dependent on the individual school district. The participant group unanimously indicates that training should be time efficient and content specific to maximize the teachers' time and efforts. Mentor partnerships should also be encouraged between teachers with recent training; however, for those participants with little experience and those with outdated training, there was little experience from which to draw.

Recommendations for Further Research

Potential studies for future researchers here could contribute to the subject of what strategies of differentiation teachers use in their practice of teaching and learning and what challenges teachers face when implementing differentiated strategies. Based on the results of the study and the results of the analysis of the researcher's questions, three recommendations are suggested for future research.

Based on analysis of the data gathered in the study, middle grades English and Math teachers in the district have a limited understanding of how to authentically modify content,

process, or product in differentiating strategies. One recommendation for further study would be a case study asking what strategies of differentiation teachers use in their practice of teaching and learning and what challenges teachers face when implementing differentiated strategies where the participant groups were middle grade social studies and science teachers.

A second recommendation for further study would be conducting research with teachers from multiple districts serving as participants within the same district. A comparison of what strategies of differentiation teachers use in their practice of teaching and learning and what challenges teachers face when implementing differentiated strategies could be beneficial so as to compare characteristics from strategies and challenges which may present themselves among multiple school districts. A comparison study using the researcher's questions posed in the study could offer further insight offered by teachers.

A third recommendation for further research would be a longitudinal study of middle grade English and Math teachers regarding what strategies of differentiation teachers use in their practice of teaching and learning and what challenges teachers face when implementing differentiated strategies. By doing so, the researcher may find more support for the data than the explanatory case study provides. As the study considered participants' perspectives about strategies of differentiation teachers use in their practice of teaching and learning and what challenges teachers face when implementing differentiated strategies, it is possible that a longitudinal study may produce results that are more reliable. The participants within the study may produce further evidence over the course of several years.

Overall, data from the study reveal a need for further study to assess the long-term effects of the methods of differentiated strategies examined in the study. The explanatory case study ought to be replicated on a bigger scale to check whether these outcomes remain constant for different

districts. Future researchers could consider how elementary schools and secondary schools demonstrate their accomplishment with differentiated strategies. Research including a bigger participant group of teachers may give more noteworthy fluctuation and particularly contrasting instructional strategies utilized by educators in relations to addressing the necessities of all students. Because the existing empirical literature rarely includes middle grade subject- specific settings, which describe what the theory looks like in practice, it would be valuable in future research to see whether the data findings are replicable in other subject areas. The hope is that education practitioners and stakeholders will benefit from the recommendations the study offers as they contribute to the overall body of literature in the field of education.

Reflection

Differentiated strategies must give all students challenges and inspiration to put forth a concentrated effort in new ways (Smutny, 2003). Teachers must incorporate a variety of educational strategies to support student learning. Multiple pedagogical backgrounds, multiple views and multiple realities inform one's perspective and a constructivist view of information may enrich a learning environment. If teachers are to impact student learning in a positive way, they must be supported and allows to learn through professional development on differentiated strategies for content, product, and processes. Teachers can implement solutions to address the unique learning needs of students. As well, the personal perspective teachers bring to a diverse group of students has the greatest impact on student learning when multiple methods and strategies are use. The study extended the extant knowledge concerning differentiated strategies and barriers to differentiated strategies through the evaluation and interpretation of these variables.

At the onset of the study, the anticipated findings were that the participants generally would not differentiate strategies consistently for their students. Even though the participants expressed

strong support for the use of multiple strategies for students, the interview results indicate participants seldom applied multiple strategies. The anticipation was finding that teachers' content areas and years of teaching experience would influence their implementation of differentiated strategies. However, Tables 1, 2, 3, and 4 demonstrate that while participants vary regarding their teaching content areas and years of teaching, teaching practices are inconsistent within subject areas regarding the implementation of differentiated strategies. The existing body of literature regarding how teachers should modify curriculum and instruction to differentiate content, product, or process for students rarely includes middle grade English and Math settings to describe what the theory looked like in practice. Additionally, although there was research to be found regarding middle grade English and Math, its quantity was limited and its findings inconsistent. Like Westberg et al.(2003), data from the study shows that participants are disheartened that they are not addressing the unique learning needs of students their first objective in education. Study participants indicate in the data collected in the interviews that while are aware of some of the verbiage associated with differentiated strategies, evidence did not support that teachers had an in depth enough understanding of how to modify content, product, or process for students effectively. For example, although Math participants shared the use of collaborative group assignments, their understanding of what these terms describe was inconsistent with what these terms mean regarding differentiated strategies. Once participants indicate how seldom they received professional development regarding differentiated strategies, it was only slightly surprising to learn that the use of differentiated strategies did not increase with years of teaching experience. Yet, through professional support for differentiated strategies training, research suggests, the unique needs of student learners might be addresses.

Although it might be expected that teachers differentiate more frequently as they gain

experience, the findings did not support the assumption. At the beginning of the research, it appeared the participants by and large did not separate techniques reliably for their students. Even though the participants communicated that they use numerous systems for students, the data in Tables 1, 2, 3, and 4 exhibited that while participants shift regarding their showing content zones and years of educating, showing participants are conflicting inside branches of knowledge as to the usage of separation systems. In looking at the participants' responses by content area, it was surprising to find little difference in the frequency with which they reported incorporating differentiated strategies components. Likewise, teachers perceived the utilization of differing methods by enabling students to expand upon student content area strengths and enhance their learning. However, the data provided insight into the low frequency of differentiated strategies use.

Based on the research, the findings suggest teachers must create learning opportunities that are appropriate, engaging, and beneficial for all students. Equipping today's teachers with a full range of differentiated strategies, providing them with support systems, and using delivery models that best meet student needs are essential to allow students to achieve academically. By using diverse teaching strategies within the classroom, teachers can better manage the individual differences of students and address specific learner needs. In doing so, teachers can appropriately challenge the academic abilities of students while providing remediation to students with diverse learning needs.

Conclusion

In recent years, there has been an increased call to provide purposeful curriculum and instruction for students. For middle grade English and Math, federal measures to increase student learning including No Child Left Behind (NCLB, 2001) and Race to the Top (USDOE, 2009)

continued to influence and place pressure all educational stakeholders. As well, many states have recently adopted the Common Core State Standards (2009), which require teachers to modify the objectives and content of English and Math instruction. In addition to these federal measures, many methods of instructional delivery and initiatives are thrust upon teachers by local and state regulations regarding education. Such barriers may include class size, diverse student learning needs, implementation of new curriculum(s), and measures of testing achievement. Because multiple outside influences affect classroom instruction, these barriers can move a teacher's instructional focus away from direct impact on meeting the needs of individual student learners. Teachers must still, however, know how to address the needs of student learners. Because the outside influences affecting classroom instruction, the study addresses what strategies of differentiation teachers use in their practice of teaching and learning, and what challenges teachers face when implementing differentiated strategies.

Considerations in the study include the challenges of implementing differentiated strategies and the needs of teachers to learn and be supported as they differentiate. In terms of the study, a thorough account of the data provided the greatest transparency in assessing whether goals had been met or must be modified. To ensure ongoing assessments by teachers are effective and relevant to student instruction, collaborative learning environments must adjust to the learning needs of students, and teachers must adjust their instructional strategies to adequately address the learning needs of students. Within the preparation of curriculum, assessment, and collaboration, students in differentiated classrooms are critical partners with teachers in classroom success. When teachers have opportunities to collaborate and reflect, teachers can develop their own strategies and practices through collaborative approaches, recognizing the different interests, learning styles, strengths, and academic needs of students.

Challenges in evaluating the application of differentiated strategies by teachers exist even when a teacher is equipped with knowledge about how research-based instructional practices can be used to support the unique learning needs of each student. Additional challenges teachers face included subject area taught, teacher readiness, the pacing of curriculum, and time constraints. With differentiated teaching practices, both students and teachers can adapt and expand their content area understanding.

Participants implement differentiated strategies on a limited basis and indicate and inconsistent understanding of differentiated strategies to reach student learning objectives and extend student learning. The inconsistent understanding by participants of the influence of learning styles was supported by the research from Weisberg and Daoist (2003) and Wormeli (2007) which suggests multiple teaching practices consistently fail to be incorporated appropriately by teachers. Participants in the case study supported the utilization of strategies modifying content, product, or processes to enhance understudy learning and engagement in their learning by reacting to the different learning styles of students. In interview question 5, E5 provided ways to differentiate instruction to modify content; E5 would "chunk information, offer one-to-one instruction, provide reading aloud of English materials, use tiered questioning strategies, and change learning styles or challenge levels." As well, learning styles are mentioned by E1 reported grouping students in class so "students are exposed to a variety of learning styles or levels." E1 expanded on the response, noting in cooperative learning groups the intent to group students by different areas of strength in English. As Tomlinson (1995) noted, these barriers to differentiated strategies can also cause can make teachers have something unique added to educational learning without the help or the ability to manage a classroom with a classroom with multiple learning styles of student occurring in the meantime.

The participants grouped students based on formative assessments of content performance, but no participant mentioned during the interview that grouping was done based on student interest. With the desired effect of responding to the various learning needs of individual students, teachers may use differentiated strategies to explore how learners' interests, learning styles, and multiple intelligences connect to improve educational instruction in efforts to best serve the student learner.

The study's significance lies in its ability to add to the body of literature regarding ways in which teachers demonstrate inconsistent understanding regarding differentiated strategies to facilitate the unique learning needs of students and the challenged face in differentiating strategies. Through professional conversations, teachers can discuss strategies to reach student learning objectives beyond connecting data to academic testing performance. Within the grade level, teachers should share ownership of student data and design instruction based on pre- assessments and individual student learning objectives. As well, there should be an understanding of the crosswalks that exist between grade levels, so the best instructional practices may offer continuity between grade levels. Multiple stakeholders, including in the field of academically and intellectually gifted education and in the field of special education, are valuable in the process of planning instruction.

Furthermore, efforts to improve the use of multiple strategies to modify content, product, or processes should include recognition of the evidence suggesting that student engagement in classroom instruction depends on the connection created between teacher, classmate, and instructional content. Because the study may help guide multiple stakeholders in extending the current understanding regarding diverse teaching strategies, it may also guide other investigations

about how teaching can be more responsive and lead to deeper levels of student comprehension in English and Math.

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Appendix A: Institutional Permission Form

05.27.16

Dear Superintendent,

I am a doctoral candidate at Concordia University Portland. As part of my dissertation work requirement, I would like to invite middle grade English and Math to participate in this study.

The study would ask participants to engage in a brief interview about their curriculum differentiated strategies practices. This researcher only considered teacher methodology for this study and does not involve collecting personal data from students.

In signing this form, permission is granted for institutional permission to conduct this research study in your school district.

Administrator:

_____	_____	_____
Print Name	Signature	05.27.16

Appendix B: Participant Data Collection Inventory Questions

Name: _____

Age:_____Gender: _____

Contact Preference? _____

Phone:_____Email: _____

Teaching information:

Degree: _____

Number of years as a teacher:_____Number of classes taught annually: _____

Appendix C: Interview Questions

1. How are students grouped within your classes?

2. What do you think are some important ways to support student learning in your teaching?

3. Talk to me about what it is like to teach English/Math with the students you have.

4. How do you initially assess the unique learning needs of the students you teach?

5. Talk to me about the strategies you use to meet the learning needs of all students in your classroom.
6. What are the barriers you face in trying to meet students' learning needs in the classroom?
7. After having taught heterogeneous classes for___years, what advice would you give to someone who is just starting to teach heterogeneous classes?
8. Is there anything else you think I should know to understand a teacher's use of differentiated strategies?

Appendix D: Statement of Original Work

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University-Portland Academic Integrity Policy during the development and writing of this dissertation.
2. Where information and/or materials from outside sources has been use in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for the use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association.*

Yvonne-Nicole Maisel de St. Croix
Digital Signature

Yvonne-Nicole Maisel de St. Croix
Name (Typed)

October 11, 2017
Date