PARTICIPATION IN PROFESSIONAL DEVELOPMENT AND ITS ROLE IN THE IMPLEMENTATION OF DIFFERENTIATED INSTRUCTION IN THE MIDDLE SCHOOL CLASSROOM

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Abstract

Students across Massachusetts, including those attending the middle school studied, have not been meeting state proficiency targets in mathematics and English language arts. Research indicates that the use of differentiated instruction strategies have been successful in improving student achievement for all students. This prompted the district examined in this study to provide a significant amount of professional development to teachers to facilitate the adoption of differentiated instruction across all subjects and grades. Using a constructivist framework, this descriptive case study explored the process by which a suburban, east coast middle school adopted and implemented differentiated instruction strategies into its classrooms; the degree to which differentiated instruction was fully implemented with fidelity in the classrooms of teachers receiving professional development; and the impact professional development had on student achievement in mathematics or English language arts. The study sought to answer the following research questions: (a) What was the process by which Northeast Middle School provided teacher training in differentiated instruction strategies to teachers? (b) What opportunities and obstacles did teachers face when implementing differentiated instruction in their classrooms? (c) What perceived impact has the implementation of differentiated instruction strategies had on improving student achievement in math and English language arts? The study found that, in response to student failures to reach proficiency in mathematics and English language arts as determined by MCAS (the standardized state measure of school and district achievement) the district mandated that all newly hired teachers participate in a graduate level differentiated instruction course. Participation in the differentiated instruction course may have established the foundation for teachers to begin using
differentiated strategies in their classrooms; teachers interviewed, however, indicated that ongoing support for incorporating these strategies into the classroom and more time for instructional preparation was needed. Data, as determined by periodic classroom testing, qualitative teacher feedback and 2015 MCAS aggregate scores, indicated that student achievement and engagement has increased slightly in some classrooms, grade levels and subject areas.  

*Keywords: differentiated instruction, formative assessment, student achievement*
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CHAPTER 1:

Introduction

On any typical school day, a walk-through of a middle school located in a suburban district in the northeastern United States (here on referred to as Northeast Middle School) demonstrates that a variety of teaching styles and seating arrangements exist in the classrooms. Some classes have rows of students lined up in a traditional setting with students obediently seated, notebooks opened, pens perched waiting for the next bit of information to be dispersed by the teacher. Other classes have students in a variety of groupings with the teacher circulating around the classroom responding to the different individual learning styles of the students by varying the instruction to provide the best learning experience possible for each individual student. In other words, this teacher is differentiating instruction.

Students at Northeast Middle School are experiencing challenges that threaten their success. This is evidenced by scores on the state standardized test, the Massachusetts Comprehensive Assessment System (Massachusetts Department of Elementary & Secondary Education School/District Profiles). The 2014 English language arts MCAS scores for all students at Northeast Middle School demonstrated that only 77% of the student population were proficient, while 23% were in need of improvement or in the warning categories. Additionally, the 2014 mathematics MCAS scores for all students at Northeast Middle School demonstrated that only 56% of the student population were proficient while 44% were in need of improvement or in the warning categories. With a goal of meeting the learning needs of all children in the district, Northeast Middle School has decided more must be done to identify the reasons why some students are not
succeeding and to provide appropriate and aligned intervention strategies to promote student success. Although students are not meeting the MCAS proficiency targets on the state standardized test, the vast majority of students are receiving passing grades on their report cards, and no students in the grade studied have been retained.

Differentiated instruction, which takes into consideration the individual learning needs of students when developing lessons, is acknowledged as a beneficial strategy for all learners, including those with special needs, when used in combination with formative assessment (Tomlinson & Eidson, 2001; Duckor, 2014; Hattie, 2009; Hattie & Timperley, 2007). Research indicates that differentiated instruction strategies have successfully improved student achievement for all students; the use of “formative assessment is one of the most powerful ways to raise student achievement” (Black & Wiliam, 1998, p. 141). Differentiated instruction “is responsive teaching” (Tomlinson & Eidson, 2003, p. 2) and involves creating a variety of lessons to meet the needs of all learners in the classroom. Differentiated instruction capitalizes on the strengths and knowledge the student has acquired, and a teacher who is reflective and knowledgeable about differentiated instruction strives to connect new concepts to a student’s prior knowledge in a manner that is attuned to the child’s learning style, interest, and level of readiness. (Tomlinson & Eidson, 2003; Dean, Hubbell, Pittler & Stone, 2012; Guskey, 2010; Jackson & Zmuda, 2014; Hattie, 2009; Danielson, 2007).

Differentiated instruction is not individualized instruction, but it does require the teacher to know the needs of the students in the classroom and to prepare lessons based upon this understanding (Tomlinson, 2005). A differentiated classroom is student-centered and functions on the notion that “teachers offer different approaches to what students learn,
how they learn it, and how they demonstrate what they’ve learned” (Tomlinson, p. 4). Unlike a traditional classroom in which the teacher takes center stage and is heard the majority of the time, a differentiated classroom is a “blend of whole-class, group and individual instruction” (Tomlinson & Eidson, 2003, p. 5).

In a differentiated middle school classroom, the teacher may introduce a new unit to the whole-class and then provide an opportunity for students to break out into smaller groups to explore and investigate the topic based upon their readiness. The teacher circulates around the classroom, assessing student and group progress and provides guidance and feedback for learning based upon a formative assessment. In this classroom, “the teacher proactively plans and carries out varied approaches to content, process, and product in anticipation of and response to student differences in readiness, interest and learning needs” (Tomlinson & Eidson, 2003, p. 7).

The characteristics of a differentiated classroom include: a strong link between assessment and instruction; clear learning goals; variable student grouping; the flexible use of time, space and materials; classroom nature; individual student growth central to classroom success; attention to essential knowledge; understanding of skills; high expectations for teacher and students; and a proactive approach to instruction (Tomlinson, 1999; Tomlinson, 2003; Tomlinson & Eidson, 2001; Tomlinson & Eidson, 2003; Tomlinson, 2010b; Tomlinson & Imbeau, 2010). To be adept at differentiating instruction, a teacher periodically assesses progress using formative assessments. Formative assessments provide the teacher with the necessary information or data to develop further instruction, which should be differentiated to meet the children where they are on the continuum of knowledge acquisition and learning style. Duckor (2014) states, “Because
formative assessment has such a great effect on student outcomes, beginning teachers need to take note… all teachers can develop the requisite expertise and become more skilled formative assessors” (p. 29). Reflective teachers armed with timely formative assessment information have the ability to make a powerful and immediate impact on student learning through the intervention they provide and the follow-up lessons they create (Hall & Simeral, 2015; Hattie, 2009). Equipped with knowledge of where students are in their acquisition of skill development, teachers can develop differentiated lessons designed to meet the level of readiness and learning style of the students in their class.

The Northeast Middle School District recently provided a significant level of professional development to teachers to facilitate the adoption of differentiated instruction across all subjects and grades. The workshops, seminars and courses were taught by the assistant superintendent. Teachers who participated in the differentiated instruction graduate course are now expected to create a differentiated unit that they will then use in their classrooms.

At present, no guidelines stipulate how much professional development or what kind of professional development is required to get a teacher to a place where they are comfortable with delivering differentiated instruction in the classroom. Precisely how students learn in a differentiated classroom is also not entirely clear. The district under study provided weeklong courses on differentiating instruction; however, professional development has not yet been provided that is site-based, long-term, grounded in teachers’ practice, and an ongoing part of the teachers’ work week.

Studies suggest that in order for differentiated instruction to be successful, teachers need to participate in professional development that provides ongoing support (Donovan,
1999; Gilbertson, Witt, Singleteray & VanDerHeyden, 2007; Houk, 2010). The degree to which differentiated instruction is being fully implemented within the classrooms of teachers who participated in the professional development is unclear, and any impact the professional development has had on student achievement in mathematics or English language arts is unknown. Therefore the purpose of this descriptive case study is to explore the process through which Northeastern Middle School adopted and implemented differentiated instruction strategies into classrooms and to assess to what degree the differentiated instruction is being fully implemented with fidelity in the classrooms of teachers who participated in professional development. It also examines what impact, professional development has had on student achievement in mathematics or English language arts.

**Justification for and Significance of the Research Problem**

Strong evidence exists to suggest that the overall academic success of a student is most affected by the quality of instruction they receive from teachers (Hightower, et al, 2011; MacGregor, 2007; Schmoker, 2006; Marzano, 2003; Rothstein, 2004; Bloom, 1984; Black & William, 1998). The practice of teaching effectively is learnable (Cuddapah, J. & Burtin, A., 2012; Jones, B. 2012; MacGregor, R., 2007), and children deserve teachers who have appropriate opportunities to develop the necessary skills and knowledge to teach effectively. Ball & Forzani (2011) state: “Students whose teachers do not develop these qualities lose out” (p. 42). If teaching is a craft or skill that can be learned and honed over time, then school districts should provide effective professional development and teacher support to improve the quality of instruction students receive. Stigler (2002) suggests that “today’s professional development should be site-based, long-term, grounded in teachers’
practice, and an ongoing part of the teachers’ workweek, rather than something tacked on” (p. 6). He further states that teachers need to learn three things: “how to analyze practice…, [how to] be exposed to alternatives…, and [how] to know when to employ which method” (p. 7). Analyzing practice is the ability to look at a student who is having difficulty mastering a concept and diagnose why the child is not successful. Exposure to alternatives involves the interventions or alternative teaching methods used to help a student understand and eventually master a concept. Judgment is the teacher’s ability to know, diagnose and accurately prescribe, for each individual student, the instructional method needed for student success.

Darling-Hammond (1998) explains: “Teachers learn best by studying, doing, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (p. 6). The professional development infrastructure she advises is sustained and readily available; supported by coaching; connected to collaborative work; integrated into school and classroom planning around curriculum, instruction and assessment; and responsive to teacher needs (Darling-Hammond, 2010). Based on Darling-Hammond’s assessment, the Northeast Middle School would be wise to reassess its current approach to providing professional development to teachers and to consider the development of a system that responds to what current research has determined to be effective and needed.

**Deficiencies in the Evidence**

Although the literature suggests that the use of differentiated instruction can meet the needs of all students (Huebner, 2010; Tomlinson, 1999; Tomlinson & Eidson, 2003; Tomlinson, 2005; Buffum, Mattos & Weber, 2010; Guskey, 2010), Northeast Middle
School has not seen results as anticipated by the Massachusetts Comprehensive Assessment System. This is despite the district-wide devotion of a significant amount of funding and time to providing teachers with professional development that focuses on incorporating differentiated instruction in the classroom. The goal of the district in providing this professional development is to improve student achievement. It is important for the district to know how effective the teachers perceive the professional development is in helping them to incorporate differentiated instruction with fidelity into their classrooms. Knowing precisely how teachers perceive the professional development programs prepared to assist them in incorporating differentiated instruction into their classrooms could help the district redefine courses and workshops to better meet the needs of the teachers and, ultimately, the students.

This study was designed to look at the process by which Northeast Middle School provided classroom teachers training for the implementation of differentiated instruction strategies. Additionally, the study explored how teachers who participated in professional development described their experiences in incorporating differentiated instruction with fidelity into their classrooms, and what they found worked well and what challenges they encountered. Teachers were asked to describe what differentiated instruction looks like when it is implemented with fidelity into the classroom and what perceptions they felt this approach had on student achievement in math and English language arts. In addition, educators were asked how they used formative assessments to differentiate their instruction.

Miller (2015), Alyward, (2010), Black, (1998), and other researchers (Guskey, 2010; Buffum et al., 2010; Garrison & Ehringhaus, 2007) claim that true differentiated
instruction cannot fully occur without the use of formative assessment. Alyward (2010) states “Formative assessments include any activities undertaken by teachers and their students that provide information to be used as feedback to modify teaching and learning” (p. 41). Research has examined and shown the importance of formative assessment and “found that there is evidence that improving formative assessment results in significant gains in achievement across age groups, content areas, and countries” (Black, 1998, p. 39). Results from many studies report that “improved formative assessment helped low achievers more than any other students; thus narrowing the gap in student achievement while raising overall achievement” (Black, 1998, p. 41).

**Relating the Discussion to Audiences**

Examining the successes and difficulties teachers encountered when implementing and incorporating the use of formative assessment and differentiated instruction into their classrooms after participating in the school and district-wide professional development could help administrators develop a more effective professional development program. Steinberg (2008) states, “Assessment is a leverage point used by education policy-makers to generate educational reform” and schools are held accountable for all students reaching the proficiency target (p. 42). Determining supports that might be helpful to teachers could help school personnel accomplish several things: (a) devise professional development that meets the needs of the teachers; (b) create systems to support teachers through the adoption of new instructional strategies and provide a safe educational environment in which to do so; (c) design the curriculum to meet the needs of the student; (d) develop and implement interventions; (e) employ instructional techniques that ensure student achievement; and (f)
create programs that provide supplemental services in a way that meets the students’ needs and increases achievement for all student populations.

Hammeken (2007) states: “The rationale for differentiated instruction comes from theory, research and common sense. Today’s classrooms are more diverse than they have ever been throughout the history of this country” (p. 57). In the same classroom, there are students with an assortment of special needs students who speak a variety of languages and only minimal English, gifted students, students from broken homes and two-parent, affluent ones; and students facing an assortment of other social, emotional or psychological concerns. All children are guaranteed access to a free and appropriate education within the public school setting, which places the burden directly on teachers, administrators and schools to find an instructional strategy that meets the needs of all learners and that helps them achieve proficiency.

Research Questions

Using a constructivist framework, this descriptive case study sought to answer the following research questions: (a) What was the process by which Northeast Middle School provided teacher training in differentiated instruction strategies to teachers? (b) What opportunities and obstacles did teachers face when implementing differentiated instruction in their classrooms? (c) What perceived impact has the implementation of differentiated instruction strategies had on improving student achievement in math and English language arts?

Theoretical Framework

Vygotsky’s construct of social cognitive development was used to illuminate the importance of using differentiated instruction when working with students to improve
student engagement and learning. Vygotsky argued that participatory activities that require the use of cognitive and communicative functions allow students to “scaffold” new information with previously learned knowledge (Vygotsky, 1978, 1986). Teachers who successfully use differentiated instruction develop lessons that challenge students without causing them to become frustrated. This is possible through the use of quick, formative assessments that provide teachers with the information they need to prepare follow-up lessons (Hall & Simeral, 2015; Hattie, 2009; Danielson, 2007). These teachers take into consideration the interest, level of readiness, and learning style of the adolescent and prepare lessons that include movement, discussion, and student engagement. As Bertrand (2003) states, “Teachers have noticed that kids learn more by talking to one another and exchanging points of view between them” (p. 274). This brings about the need for students to be given structured opportunities to question, discuss, and mentally wrestle with the material presented. Bertrand (2003) asserts that the “most important goal is to encourage people to challenge their own assumptions, to be critical about the judgments they make when they do not even realize they are making them” (p. 268). When developing differentiated lessons, teachers should include opportunities for student discussions since socialization can lead to the development of critical thinking through shared problem-solving activities.

Vygotsky’s zone of proximal development (ZPD) is defined as the distance between a child’s actual level of development “as determined by independent problem solving” and the higher level of “potential development as determined through problem solving” under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86). Understanding the ZPD as the place where learning is made challenging but doesn’t
overextend or frustrate the student is essential to understanding the ways in which learners make progress. It is also important to take into account the use and effectiveness that assessments lend when trying to determine the level of progress students made toward skill development. Daniels (1996, p. 4) states, “The focus on process as well as product in assessment has become embedded in the range of techniques now called dynamic assessment.”

Constructivist theorists Jerome Bruner, Jean Piaget, and Lev Vygotsky all describe how children think, learn, and process new information. They theorize that the “construction” or creation of new meaning is a joint endeavor that involves the student as an active participant and the teacher as facilitator. Piaget has been revered by generations of teachers inspired by the belief that children are not empty vessels to be filled with knowledge but are active builders of knowledge — “little scientists who are constantly creating and testing their own theories of the world” (Papert, 1999, p. 105). Donovan et al (1999) argue that “[t]he model of the child as an empty vessel to be filled with knowledge provided by the teacher must be replaced. Instead, the teacher must actively inquire into students’ thinking, creating classroom tasks and conditions under which student thinking can be revealed” (p. 15).

Bruner’s constructivist theory for instruction is based largely upon Piaget’s developmental theory, which has had a great influence on the field of education and on understanding how children learn. Piaget and Bruner’s research demonstrates that children move through stages that are significant to their cognitive development. Each stage of intellectual development has particular characteristics that must be understood and taken into account when educating children. The challenge presented to teachers of middle
school children is to determine the readiness, interest, and learning style of each student in an effort to differentiate instructional methods to meet the developmental needs of "all" students. Since not all students in the middle school are at the same stage and oscillate between concrete and formal operational stages, it becomes imperative that lessons be developed to successfully meet the needs of all students at the stage they are currently functioning. This is confirmed by Bruner (2003): “What is most important for teaching basic concepts is that the child be helped to pass progressively from concrete thinking to the utilization of more conceptually adequate modes of thought. But it is futile to attempt this by presenting formal explanations based on a logic that is distant from the child’s manner of thinking …” (p. 38). Bruner further explains:

It can be demonstrated that fifth-grade children can play mathematical games with rules modeled on highly advanced mathematics; indeed, they can arrive at these rules inductively and learn how to work with them. They will flounder, however, if one attempts to force upon them a formal mathematical description of what they have been doing, though they are perfectly capable of guiding their behavior by these rules. Much teaching in mathematics is of this sort. The child learns not to understand mathematical order but rather to apply certain devices or recipes without understanding their significance or correctedness (sic) (1963, pp. 38-39)

An astute teacher guides the child to understand mathematical concepts rather than focusing on the correctness of the answer. This emphasizes the need for teachers to ask probing questions that formatively assess and determine where confusion lies, in an effort to identify and apply appropriate intervention strategies to aid the child’s comprehension.
and ability to grasp the concept. Intervention should provide students with opportunities to revise and expand their thinking. Sarasin (1999) describes:

During a walkthrough one would observe a teacher challenging students to delve deeper and apply what is already known to solve a more complex problem. The joy and excitement of accomplishing something for the first time would be evident within the classroom and elicit a student’s curiosity. The child’s accomplishment of the task would constitute formative assessment and would provide the information needed by the teacher to differentiate further lessons to bring the child further in their academic development (p. 33).

A “differentiated classroom will often appear different from classrooms where the teacher practices one-size-fits all instruction” (Tomlinson & Eidson, 2003, p. 6). One-size-fits-all instruction does not take into account the learning style, needs, or readiness of children. It also does not take into account where the children are on the continuum of progressing toward proficiency and meeting the state standards for a particular grade level. A teacher who differentiates instruction is concerned with “achieving [the] best-fit and maximum growth for each learner” (Tomlinson & Eidson, 2003, p. 6). Teachers who differentiate instruction take into consideration the students’ learning style and prepare lessons that will meet the needs of students who are visual, auditory, or kinesthetic learners. They realize that they can vary the content (curriculum), process (instruction), and product (assessment) in a variety of ways. When instructors and students can identify and articulate the processes that the students use to represent information, solve problems, remember information, and carry out other operations, they can then understand what has
worked and how they can build upon that success. This makes it easier for instructors to understand their students, their needs, and their individual learning styles.

In addition to Piaget and Bruner’s theories, Vygotsky’s construct of social cognitive development stresses the importance of socialization and student engagement in the process of learning. A key feature of this theory is that “higher-order functions develop out of social interaction” (Tharp & Gallimore, 1988, pp. 6-7). Vygotsky argued that participatory activities that require the use of cognitive and communicative functions allow students to “scaffold” new information with previously learned knowledge (Vygotsky, 1962, 1978). Teachers who effectively use differentiated instruction are developing lessons that naturally allow for the scaffolding of material. These teachers take into consideration the interest, readiness, and learning profile of the adolescent and prepare lessons that include movement, discussion, and student engagement. Bertrand (2003) observes, Teachers have noticed that kids learn more by talking to one another and exchanging points of view between them” (p. 274). This brings about the need for students to be given structured opportunities to question, discuss, and mentally wrestle with the material being presented. Bertrand (2003) summarizes, “The most important goal is to encourage people to challenge their own assumptions, to be critical about the judgments they make when they do not even realize they are making them” (p. 268). When developing differentiated lessons, teachers should include opportunities for student discussions since socialization can lead to the development of critical thinking through shared problem-solving activities.

Bruner (2003) asserts that “instruction … even at the elementary level, need not follow slavishly the natural course of cognitive development in the child. It can also lead
intellectual development by providing challenging but usable opportunities for the child to forge ahead in his development” (p. 39). Knowing that the cognitive development of the child is essential allows a teacher to develop challenging lessons that engage the learner but that do not, because they are too difficult, cause the student to grow frustrated, lose interest, and give up in defeat. As Tomlinson & Imbeau (2010) affirm, “Clearly, differentiation is based on acceptance of the reality that learning is shaped by a variety of factors, including prior experiences, culture, economics, language, interests, learning preferences, and support systems.”

Capturing the interest of the child and providing opportunities for socialization during the learning process would increase the likelihood that a student would voluntarily and actively participate in the learning process. This raises the possibility that learning would occur and enhances the probability for increased student achievement. Tomlinson & Allan (2000) emphasize, “Psychologists suggest that interest is a doorway to learning. The topics we are interested in become a priority for us, and we attend to them. Linked to motivation, student interest can be a compelling factor in learning, because interest makes tasks engaging, satisfying, and personally challenging” (p. 19).

Understanding Vygotsky’s ZPD is significant when developing lessons that key into the need for students to socialize and internalize information. Vygotsky defined ZPD as the distance between a child’s actual developmental level “as determined by independent problem solving” and the higher level of “potential development as determined through problem solving” under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86). This statement points to Vygotsky’s view of the role of instruction and assessment. Vygotsky’s “interest was in assessing the ways in which learners make
progress. The focus on process as well as product in assessment has become embedded in the range of techniques now called dynamic assessment” (Daniels, 1996, p. 4).

Bruner’s theory of instruction indicates that children have a predisposition to learning. Information must be structured so that students can readily grasp it, and teachers must determine which sequences most effectively present the curriculum. Differentiated instruction involves harnessing the student’s natural curiosity and interest, developing and executing a lesson designed to meet the student’s learning styles, and understanding how to spiral or scaffold the curriculum in a sequence most suitable for adolescents to grasp. It also necessitates that the teacher be informed about the knowledge that the students already bring to the classroom. In addition to knowing about cognitive development and learning styles, the teacher must constantly assess the progression of knowledge. Student development and needs can be determined through the use of periodic formative assessments. Just as middle school students do not necessarily see connections between lessons and their life until teachers consciously create avenues and pathways for these relationships to become obvious, teachers may not realize how knowledge of developmental theory can help them to create meaningful lessons for their students:

We may not realize that one of theory’s main purposes is to inform practice, nor may we be aware that theory loses much of its vitality if uninformed by reflection on practice. That way students would see the connection…between theory…and its practical value. (Raelin, 2007, 495)

Formative assessment provides the teacher with the “dynamic assessment” needed to guide a student to the “higher level of potential development as determined through problem solving under adult guidance” (Vygotsky, 1978, p. 86). The use of formative
assessment in conjunction with differentiated instruction provides the means through which a higher level of achievement can be attained:

If one respects the ways of thought of the growing child, if one is courteous enough to translate material into the logical forms and challenging enough to tempt him to advance, then it is possible to introduce him at an early age to the ideas and styles that in later life make an educated man. (Bruner, 2003, p. 52)

Respecting the developing child enough to create lessons that both reflect the appropriate stage of development and capture the interest of the student to cause active engagement will advance student learning simply because the student will be present in the learning process. Albert Bandura’s social cognitive theory or social learning theory is related to Vygotsky’s social development theory of child development, but it expands the focus to include the way that adults learn. Bandura (1997) observes: “Most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action” (p. 1). While there has been an abundant amount of professional development on differentiated instruction and formative assessment throughout the district focused on in this study, most behaviors, including methods of teaching, may have been learned by observing and imitating former teachers and professors.
CHAPTER 2:
Literature Review

The overarching goal of Northeast Middle School is to meet the learning needs of all its students. To do this, four years ago, the district identified differentiated instruction as a required course for all newly hired personnel and offered a significant level of professional development to veteran teachers in the form of workshops and seminars. Despite this implementation of professional development, student scores, as measured by MCAS, indicated that students were not meeting proficiency standards. To meet a goal of providing all students with the instruction they needed be successful, it is crucial to first identify the reasons why some students are able to meet state standards while other students fail. It is the responsibility of all teachers, schools and districts to educate students enrolled in their institutions. This demanding task requires teachers, schools and district to design and implement instructional strategies that meet the learning needs students in order to close the achievement gap and ensure student success. Differentiated instruction with the use of various grouping strategies and continual formative assessment is a tool that could provide teachers with the information they need to be informed about students’ levels of readiness on a continual basis.

This literature review includes the following sections: a description of differentiated instruction, analysis of the use of grouping to provide feedback for learning, an explanation of the need for assessment when planning for the use of differentiated instruction, the essential prerequisite for student engagement, and professional development for teachers.
Differentiated Instruction

Differentiated instruction is touted as a method that “consistently yielded positive results across a broad range of targeted groups” (Huebner, 2010). Advocates of the method claim that differentiated instruction will respond effectively to students who consistently have failed to meet state proficiency targets; this assertion indicates the importance of understanding the difficulties teachers encounter when asked to implement differentiated instruction with fidelity into their classrooms.

Differentiated instruction requires teachers to create a variety of lessons that meet the learning needs, interests, and readiness levels of students in their classrooms (Tomlinson, 1999; Tomlinson & Eidson, 2003). The premise of differentiated instruction is that teachers will get to know their students and capitalize on the strengths and knowledge that students have when they enter the classroom. In a differentiated classroom “there is a strong link between assessment and instruction” (Tomlinson & Eidson, 2003, p. 6). The lesson does not begin in the same place for all students; it begins where each learner currently is in the acquisition of skill development, which means teachers strive to meet students where they are and to develop lessons that are challenging for all individuals. Differentiated instruction is student centered and requires that new lessons be built on previously learned material so that students can make connections (Hoffer, 2012; Wiliam, 2014; Chappuis, 2014). The difficulty for teachers is that differentiated instruction requires the development of several different lessons depending on the skill levels of the students in the classrooms (Tomlinson, 1999; Tomlinson & Imbeau, 2010). No longer is one size sufficient for all; differentiated instruction requires the teacher take into consideration what each and every child needs to be successful. In addition to developing
multiple lessons, teachers must now figure out how to deliver multiple lessons simultaneously and they must continually assess students in their skill development so they are properly prepared for the next day’s and week’s lessons (Chappuis, 2014; Duckor, 2014; Tomlinson, 2014). Differentiated instruction allows the teacher to differentiate the process (the instruction and how students go about making sense of what the teacher is presenting), the content (the curriculum standards students must learn at each grade level), and the product (how students demonstrate what they have learned or mastered with respect to the standard; Tomlinson & Eison, 2003).

Teaching is a demanding job. Add to a regular routine the stress of creating lessons that indicate knowledge of each student’s status at any given time and place, and it may seem impossible. Even good intentions to incorporate differentiated instruction with fidelity into lesson planning can easily go awry. Teachers may be more successful in implementing differentiated instruction with fidelity into their classrooms when they are provided with professional development that includes support through coaching and mentoring. Gilbertson et al. (2007) claimed that adequate treatment integrity by the teacher responsible for implementing intervention in a classroom is a critical factor in influencing educational outcomes.” Heeding this assertion, this researcher deemed it essential to examine teachers’ reactions to the implementation process of differentiated instruction and formative assessment. Thus, the research focused on speaking with teachers about their professional development experience and the understandings and misunderstandings that training has created. In addition, teachers were asked to describe the obstacles they faced when trying to implement differentiated instructional strategies and what administrators could do to facilitate the implementation process. Carol Ann
Tomlinson has published articles and books exploring the implementation and use of differentiated instruction. Tomlinson (1999) observed:

In differentiated classrooms, teachers begin where students are, not [at] the front of a curriculum guide. They accept and build upon the premise that learners differ in important ways. Thus, they also accept and act on the premise that teachers must be ready to engage students in instruction through different learning modalities, by appealing to differing interests, and by using varied rates of instruction along with varied degrees of complexity… teachers provide specific ways for each individual to learn as deeply as possible and as quickly as possible, without assuming one student’s road map for learning is identical to anyone else’s. These teachers believe that students should be held to high standards. They work diligently to ensure that struggling, advanced, and in-between students think and work harder than they meant to; achieve more than they thought they could (p. 2).

While restructuring classrooms to use differentiated instruction has been shown to have a positive effect on student achievement (Patterson, Connolly, & Ritter, 2009; Stanford & Reeves, 2009; Boerger, 2005) and has been identified as an instructional approach that can benefit all students (Clark, 1997; Neber, Finsterwald & Oc Urban, 2001; Tomlinson, 1999), hurdles that prevent effective restructuring must be determined and resolved. Small (2010) noted:

We need to find a way to meet the needs of a broader range of students with richer activities. This approach has multiple benefits: More students experience success with meaningful tasks, more students are engaged, more students see themselves as competent… and more students enjoy learning… (p. 29).
Meeting the needs of a wide range of students in a single classroom is more important than ever, given the pressures for school and district accountability. If differentiated instruction can provide a means, the question becomes: How do we identify and overcome the barriers that keep teachers from adopting differentiated instruction with fidelity into their instructional repertoire?

The responsibility of every district, school and ultimately every single teacher is to help students reach a level of proficiency across subjects that meets state standards. This being the ultimate goal, teachers must find an effective way to help all students learn and “effective teaching is central to education success” (Christenbury, 2011, p. 46). Effective teaching means putting students’ needs first and developing the knowledge and skills necessary to assist all students in their pursuit of proficiency. However, to put the students’ needs first, identifying key factors that keep teachers from adopting differentiated instruction effectively is essential. Teachers at Northeast Middle School have claimed they put their students’ interest first; however, not all are incorporating differentiated instruction. Therefore, another question considered was: What did teachers describe as the barriers that prevented them from differentiating content, process and/or products for their students? Tomlinson (2001) identified that differentiated instruction “is not individualized instruction; rather it is the willingness of the teacher to be flexible about the use of grouping recognizing that some students are stronger in some areas but have weaknesses in other areas” (p. 3). Just as teachers must create time to meet with and talk to their students to find out where they are on the continuum of skill acquisition, so too must administrators designate time to consult with teachers to determine how to support them in acquiring the skill of differentiating instruction with fidelity for all students.
Grouping and Feedback for Learning

To effectively work with students and provide feedback for learning, a teacher must be willing to consider alternatives to whole class instruction. Differentiated instruction can provide teachers with a way to combine whole class, small group, partner, and individual instruction. Using different grouping strategies can provide the teacher with valuable time to interact with students to discern how well they understand the concepts. While a teacher may choose to begin and end class with whole group instruction, breaking the class into smaller groups to facilitate comprehension can significantly help students grasp understandings of concepts first presented to the entire group (Roseth, Johnson & Johnson, 2008; Slavin, 1993, 2014; Webb, 2002; Dean et al., 2012). Using a variety of grouping strategies can provide teachers with time to be instructional coaches or facilitators capable of providing groups with lessons designed to meet their needs and feedback designed to challenge their thinking. Hoffer (2012) explained, “While students are working independently or in small groups, teachers can assess and promote thinking and communication skills by engaging in individual conversations” about student understanding (p. 138).

In using differential instruction, each group is assigned a task or lesson based on defined needs and an observed level of readiness. The teacher uses knowledge of the group’s level of skill development and capacity to work independently to develop the lesson. In each instance, the teacher must also determine whether or not coaching or re-teaching is appropriate. For groups requiring additional “teacher” time, the teacher presents the material in another way to allow students a different type of access to the lesson material. Providing the students with additional teacher time and a different
teaching strategy often helps students grasp concepts more readily. For groups that are ready to move ahead, a teacher can monitor their progress and provide feedback essential for learning as the groups move through their lessons (Slavin, 1995, 2013; Wormelli, 2011; Curwin, 2014; Tomlinson, 1999; Wormelli, 2014).

Some students tend to grasp certain concepts faster or easier than other concepts; the use of flexible grouping allows teachers to place students in groups according to their learning style or level of readiness at any given instructional time. Hammeken (2007) asserted, “Learners are expected to interact and work together as they develop knowledge of the new content” (p. 59). The use of clock buddies, puzzle pieces, decks of cards or other grouping methods allows teachers to thoughtfully group students to facilitate learning. It also tells the students that the teacher is curious about who they are as learners and will challenge them appropriately to help them develop the skills needed to meet demands such as the proficiency standards of the MCAS.

Flexible grouping allows teachers to create parallel tasks for the mastery of concepts and allows students to work in different groups over the course of time. Small (2010) observed, “Parallel tasks focus on the same big ideas but have different levels of difficulty, thus taking into account the variation of student readiness” (p. 31). Creating parallel tasks requires the teacher to differentiate instruction. Creating parallel tasks enables the teacher to progressively move students to more difficult tasks that will build confidence and lead to proficiency in the standard the lesson is addressing. Flexible grouping requires teachers to vary the learning activities for different groups of students while the class is working on the same standard; it also allows the teacher to move students in and out of groups to best suit their learning needs. The creation and use of parallel tasks
is especially important because teachers must adhere to the curriculum prescribed for the grade level. It allows students who master standards faster than other students to be challenged without instruction moving to standards that are beyond the current grade level.

Vygotsky argued that participatory activities that require the use of cognitive and communicative functions allow students to “scaffold” new information with previously learned knowledge (Vygotsky, 1978). Teachers who effectively use grouping to facilitate differentiated instruction develop lessons that naturally allow for the scaffolding of material and for the social interaction that Vygotsky’s social development theory states is fundamental in the development of understanding (Vygotsky, 1978). Students naturally make sense of new material when they can relate it to material they already know. This was further supported by Bertrand (2003) who noted that students “learn more by talking to one another and exchanging points of view between them” (p. 274). When developing differentiated lessons, teachers should include opportunities for student discussions, since socialization can lead to the development of critical thinking through shared problem-solving activities. This “draws on Vygotsky’s theory of a zone of proximal development, the notion that with the support of a community, learners can meet more strenuous challenges than they might otherwise succeed at alone” (Hoffer, 2012, p. 2). The full development of the zone of proximal development depends upon the amount of social interaction that children have with adults and peers. The greater the social interaction, the higher the development of the skill level will be compared to when the child is working alone (Vygotsky, 1978; Gerlach, 1994).

Hoffer (2012) claimed that “challenging tasks skillfully designed and facilitated not only promote student thinking but also require and promote collaboration” (p. 58).
Carefully constructed differentiated lessons will create collaboration among students as they work in thoughtfully created groups. The participatory process allows students to discuss their thinking and construct knowledge and meaning connected to previously learned concepts. It avoids students memorizing material for the sake of passing a test and allows them to gain deeper and lasting understanding by working through problems (Dean et al., 2012).

The workshop model is another way to differentiate instruction. In the workshop model “the bulk of classroom time is dedicated to students reading, writing, and talking, not listening to someone else talk” (Hoffer, 2012, p. 5). The workshop model is supported by “the Deweyan notion that understanding is defined within a social unit… in collaboration with both teachers and peers” (Hoffer, 2012, p. 2). Setting up a classroom to function as a workshop entails the use of grouping and differentiated instruction. In the workshop model a teacher divides the class into groups based upon the students’ identified needs, then assigns tasks to each group. Similarly, grouping in a differentiated classroom is determined by the level of readiness, interests, and learning style of students in the classroom.

Science teachers have long used an instructional model similar to the workshop model of instruction to have students work on investigatory labs and experiments. They may or may not have looked at the level of readiness or learning styles when determining groups or partners, but they typically create a more participatory classroom environment where students engage in learning, discuss their thinking, share ideas, and come to a solution. The workshop model of instruction is based on social constructivism and the Deweyan idea that understanding and learning take place within a social unit. When
students are grouped together and given the opportunity to converse and collaborate, they will be able to take on more challenging assignments than they could otherwise do alone (Hoffer, 2012; Warde, 1960). This notion is supported by Vygotsky’s theory of the zone of proximal development and the belief that children’s potential for learning increases when working with adults or more capable peers (Vygotsky, 1978). During workshop instruction, teachers circulate around the classroom offering suggestions, providing feedback, and ensuring student safety. In other words, they are coaches and facilitators as the class is in session. Hoffer (2012) explained, “Students learn best as participants in communities of thinkers that challenge, support, and appreciate all for their contributions to the understanding of the group” (p. 47). A teacher aware of what students have grasped and what they have yet to master can more effectively meet students where they are and provide natural progression in the learning cycle. Ball & Forzani (2011) stated, “One high–leverage practice is the ability to recognize key ways of thinking, ideas, and misconceptions that students in a specific grade level typically have when they encounter a given idea” (p. 44). The teacher must be willing to develop lessons that require facilitation rather than teacher-centered lectures, as these provide time to talk and process with students, and thereby get a flavor for students’ difficulties and misconceptions.

Christenbury (2011) observed, “Good teaching comes not from following a recipe, but from consistently putting the student needs first” (p. 47).

The “recipes” in schools are the lesson plans developed and delivered by the teachers. Having a great lesson plan is only the beginning “because teachers must help others learn, they must see ideas and skills from others’ perspectives. And their students often learn differently from the way they themselves learn” (Ball & Forzani, 2011, p. 41).
One student may easily be distracted while the next child may need to verbally process the information. Another student may need direction and support while yet another may need to manually wrestle with the concept with the help of manipulatives. One child may need very specific details each step of the way in order to see the big picture, while yet another needs to see the big idea first and then process the steps required to get to the whole. Ball and Forzani (2011) stated, “Noticing the difference requires careful listening to the students” (p. 42).

The role and responsibility of all teachers is to ensure that students are successful in meeting the state proficiency standards for the subjects they teach. If students are failing to meet these standards then one question must be whether or not teachers are being provided the tools they need to succeed in meeting the needs of the students in their classrooms. The promise of differentiated instruction meeting that need must be explored, and although the district studied has launched several professional development opportunities for teachers, student success has not been noticeable.

**Learning Styles**

Howard Gardner identified eight different intelligences or learning styles which teachers who differentiate instruction should be aware of and taking into consideration when they plan instruction (Gardner, 1983). These intelligences are verbal-linguistic, bodily-kinesthetic, musical, interpersonal, intrapersonal, spatial, naturalist and logical-mathematical. Students who are bodily-kinesthetic learn best by participating in hands-on lessons in which they are given time to practice or imitate their teacher. Students with strong spatial intelligence turn information into pictures and images and are acutely aware of visual details. Students who are musical learn best when they can develop rhymes,
create musically related products, or listen to music while they work. Interpersonal students learn best when they are allowed to work in groups and are allowed to interact with peers. Intrapersonal students tend to prefer to work alone and are introspective and independent. Verbal-linguistic students are proficient with language and may enjoy expressing themselves in written form. The logical-mathematical student is more comfortable with calculations, patterns and relationships. Recently an eighth intelligence, naturalist, was added. This speaks to students who have a deep appreciation for nature and the environment. These students love to be outdoors and recognize patterns in the natural world of plants and animals (Silver, Strong & Perini, 2000).

American psychiatrist William Glasser is most known in education circles for his quote “We learn 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we see and hear, 70% of what we discuss, 80% of what we experience, 95% of what we teach others.” While students may have one dominant learning style, they will almost always benefit from being offered instructional opportunities that engage more senses than one. Differentiated instruction, with the opportunity for teachers to group and continually assess students’ levels of skill acquisition, provides teachers with a tool to meet students where they are and help them achieve so they can meet the state proficiency standards. Silver, Strong & Perini (2000) stated, “In classroom settings, teachers often target specific intelligences through activity centers (Armstrong, 1994) by setting up stations throughout the classroom with learning tools relating to each intelligence” (p. 13). A bodily-kinesthetic center may include manipulatives and items that provide students with a hands-on activity. A verbal-linguistic center might include the use of computers, books and other research materials, while a naturalist center may provide students with an opportunity to
investigate objects like rocks and minerals in an effort to determine their features and patterns.

**Assessment**

Assessment should be considered an essential part of the instructional process and is essential to differentiating instruction (Demos & Foshay, 2009; Moss & Brookhart, 2009; Aylward, 2010; Tomlinson, 2001; Garrison & Ehringhaus, 2007; Brimijoin, Marquissee & Tomlinson, 2003). First and foremost, teachers must know the level of readiness of each student in the classroom. Differentiating instructing means creating a lesson designed to fit the needs of all the learners in the classroom; to do that a teacher needs to know where each child is in the acquisition of skill development. Once that has been established, the teacher must be clear about the lesson standard and objective for each class, letting students know what they will be able to do as result of being an active participant in the class.

This process begins with carefully planning each day’s lessons with tasks for each group and also with assessments built into the day that will give the teacher information with which to build the next day’s lessons. Ball & Forzani (2011) stated, “Asking purposeful questions, carefully listening and responding to students, creating norms for talking and listening, choosing and guiding students’ use of specific artifacts, connecting students’ contributions…” (p. 44) all can be used to determine where students are in the continuum of knowledge acquisition. This formative feedback is essential when planning future lessons. It is also essential for knowing if students are prepared to move on or need more time to master the material presented. This is where the parallel lessons become
essential. The creative teacher creates lessons that challenge the more gifted students as well as lessons that support struggling learners.

Moss and Brookhart (2009) described formative assessment as “an active and intentional learning process that partners the teacher and the students to continuously and systematically gather evidence of learning with the express goal of improving student achievement” (p. 6). Checking for understanding is an essential element when differentiating instruction, and formative assessment provides teachers with the feedback they need to plan further instruction. Talking to students about their thinking and learning not only provides a basis for determining a student’s conceptual knowledge, but also provides a teacher with an opportunity to ascertain which learning style best meets each student’s needs. Tomlinson (1999) stated:

“In a differentiated classroom, assessment is ongoing and diagnostic. Its goal is to provide teachers day-to-day data on students’ readiness for particular ideas and skill, their interests, and their learning profiles… Assessment is today’s means of understanding how to modify tomorrow’s instruction. (p. 10)

The teacher must continuously assess where students are on the continuum of proficiency. This is the necessary feedback loop that provides the teacher with essential guidance for planning future instruction. The assessment can be as simple as an observation or discussion with the student, or it may be more in-depth and involve written questions such as an admit slip, warm-up or do now at the beginning of class or an exit ticket or 3, 2, 1 at the end of the class. Whatever the assessment is, it should provide the teacher with enough information to plan lessons that promote student understanding and achievement. The goal is to eliminate any student being bored in a class while waiting for
peers “to catch up,” or for other students to feel they are being left behind because they do not understand what is being taught. Since formative assessments provide teachers with essential information regarding student learning, they should not be graded. Teachers should use them to design their lessons and to guide the learning process. Formative assessments should also inform the teacher and the student how learning is progressing, and ultimately to improve student achievement.

Aylward (2010) asserted, “Formative assessments include any activities undertaken by teachers and their students that provide information to be used as feedback to modify teaching and learning” (p. 41). One formative assessment strategy would be the teacher’s ability to frame and deliver “questions precisely and purposefully and eliciting and interpreting displays of student understanding” (Ball & Forzani, 2011, p. 43). Grouping students gives the teacher the time and opportunity to circulate around the classroom and talk with students to determine their level of understanding. The teacher can provide additional guidance, clarify misunderstandings, or encourage a student to uncover deeper meaning. Initiating teaching where the student is rather than where the curriculum guide starts ensures that each student receives instruction that helps them develop skills and master the content. Christenbury (2011) stated, “Effective teachers alter, adjust, and change their instruction depending on who is in the classroom and the extent to which those students are achieving” (p. 48). Formative assessment lets a teacher know exactly what a student has learned and identifies where additional work is needed so corrective activities can be assigned. Guskey (2010) wrote, “When students complete their corrective activities, they take a second, parallel formative assessment that addresses the same
learning goals… but includes somewhat different problems, questions, or prompts” (p. 53-54).

Corrective activities must provide students different avenues for mastering the material. It is not sufficient for students to repeat the same activities or hear the same explanations a second time. Fry & DeWit (2011) argued, “Some students need more time, others need specific scaffolding, and some need to experience a success or two so they can find value in the curriculum or discover confidence in themselves” (p. 71). While these students are working on activities designed to help them master entry level standards, more adept students should be assigned more challenging tasks that require them to demonstrate a deeper understanding of the skill.

Advancing student knowledge and achievement requires the teacher to know where the confusion lies and be able to create new strategies for the student to create meaning and develop understanding. It may mean that teachers learn to “explain less and listen more; to answer fewer questions and to ask better ones; to avoid rescuing students from confusion and instead to be patient with their uncertainty… in short, … let the students do the work of thinking” (Hoffer, 2012, p. 2). Students must develop their own understanding of the material. This can be accomplished by offering students opportunities and promoting activities that force them to get engaged, confront their own confusion, and develop their own ideas and connections. Warde summarized the pedagogical approached used by progressive schools based upon John Dewey’s theory of education as the following:

Interest shall be the motive for all work. Teachers will inspire a desire for knowledge, and will serve as guides in the investigations undertaken, rather than as task-masters. Scientific study of each pupil’s development, physical, mental, social
and spiritual, is absolutely essential to the intelligent direction of his development.

Greater attention is paid to the child’s physical needs, with greater use of the out-of-doors. (Warde, 1960, p. 5)

Teachers teach through a desire to help students succeed. This desire may, at times, lead some to rescue students too early and not allow students to “struggle” with a concept. When lessons are designed at an appropriate level, students should find them challenging. They should not be so easy that no learning takes place or so difficult that students become frustrated. The skillful teacher is able to find balance and scaffold the learning so students are able to build new knowledge on information they have already learned. This is where formative assessment and differentiated instruction meet. Teachers need to get to know their students’ needs, interests and readiness levels. As we have discussed, this can be done in a myriad of ways. Next, teachers need to take that information and design lessons that are appropriate for the developmental and skill level of each of their students.

**Student Engagement**

Like Dewey’s progressive school teachers, all teachers should inspire children to learn by creating high interest lessons that have been designed to meet the development needs of the adolescent while engaging them in the process. Hoffer (2012) stated, “Rooted in social constructivism, Dewey’s notion that understanding is defined within a social unit, workshop model instruction motivates students to learn in the role of cognitive apprentice, growing understanding in conversation and collaboration with both teachers and peers” (p. 2). In addition, students who know their teachers care about their learning and progress are more likely to respond positively to the rigorous demands placed upon them in the classroom. Teachers who practice differentiated instruction demonstrate an unspoken
understanding of their students by developing lessons designed to meet their particular needs, interests and levels of readiness. Their lessons are developed to present students with just the right amount of challenge and support to help students grow in their understanding of concepts while inspiring them to delve deeper in their exploration of the standard. Fry and DeWit (2011) state, “Excellent teachers put students first, help each student meet high expectations… they interact with their students and ask questions that enable them to understand students’ thinking. They keep learning, and they relate course content to students’ lives” (p. 73). To keep learning means that teachers as well as their students must be willing to try new things and persevere even when a plan goes awry or a lesson doesn’t quite meet student needs.

A teacher who wholeheartedly believes that all students can learn and have the ability to reach proficiency does not give up and does not lose hope. These teachers believe in the potential of all children and express a “you can do it attitude” when working with students. They also believe that they themselves can do the work necessary for all students to succeed. Wormelli (2011) stated:

We can prepare our students’ minds for every success by being both proactive – for example, by focusing on experiential learning – and interactive, for example, by offering them team-building experiences. We create a real future on the basis of what we do with today’s young adolescents, not what we do to them. (p. 53)

Teachers who work with their students to create a relationship through discussion and interaction can transform their classrooms into active leaning centers that students want to be in.
These teachers have the ability to create supportive classrooms where students feel safe taking academic risks. They know that even if they try and do not succeed, they will still receive the feedback need to move forward toward success. These teachers continuously use assessment, both formative and formal, to determine how well their students are mastering the standard. The purpose of formative assessment is to provide “a deeper understanding of individuals as learners, not just performers” (Hargreaves, 2005, p. 219). Formative assessment should be “viewed as a part of the learning process, not as separate from it” (Hargreaves, 2005, p. 219). Differentiated lessons, while time consuming to construct, give the teacher freedom to observe the learning process and time to gather formative information about who is or is not succeeding.

During a differentiated instruction period the teacher would circulate from group to group gathering essential information on individual student progress, ask critical questions that provide the teacher with insight into the student’s ability to think critically, and redirect students or correct misunderstandings. These lessons also allow the teacher to discuss the learning process with the student, which helps with the construction of future lessons that allow students to progress toward conceptual understanding and skill mastery. A differentiated lesson provides the teacher with time to “Ask students what kind of practice with today’s topic would most benefit their learning” (Wormelli, 2011, p. 52) and the teacher could use that information to create upcoming lessons. While differentiating lessons take time to create beforehand, during class time it frees up the teacher to become the facilitator and the guide. The teacher can circulate among students, provide feedback and gather essential information during class time that will be used to prepare future lessons.
Tomlinson (2010b) stated, “Great teachers approach their craft with humility. They know there is no instructional strategy, textbook, lesson plan, classroom management approach, motivational method, or timetable that will work for every individual in the kaleidoscopic mix of learners they encounter daily” (p. 13). Teachers who take the time to get to know their students and who are willing to use differentiated instruction in conjunction with formative assessment may have the tools they need to yield extraordinary student achievement results. Getting to know the student is essential when practicing differentiated instruction because that is where lesson planning begins. Differentiated lessons are designed to meet the students’ needs, interests and ability level. Teachers who differentiate can determine which element of the lesson they wish to differentiate: the content, the instruction or the product.

Understanding that all students do not learn in the same way is critical, and all lessons should be presented so that all students have access to the material. Teachers need to realize that students may be visual, kinesthetic, linguistic, auditory, logical, interpersonal, intrapersonal, or musical in nature and that lessons need to be developed to meet a variety of learning styles. Typical classroom settings address the auditory and possibly the visual, but many neglect to tap into the other learning styles especially the kinesthetic and interpersonal, which may be easier to do in a differentiated classroom through the use of grouping. Christenbury (2011) stated, “Because the goal is learning, effective teachers must adjust the curriculum, methods, and pacing to meet the needs of the students” (p. 48). When the teacher is free to circulate throughout the classroom while the students work, that teacher can take note of what is working for individual students and also can have conversations with students and determine what does not work for others.
The teacher must be flexible and willing to become an interventionist able to diagnose difficulties and deliver instruction that facilitates learning and the acquisition of skills.

Ball and Forzani (2011) observed, “At its heart, teaching involves being able to ‘unpack’ something one knows well to make it accessible to and learnable by someone else” (p. 40).

If differentiated instruction is the vehicle for helping students master the concepts and skills required of them, then it must also be considered when developing workshops, seminars and courses designed to help teachers develop new skills, strategies, and techniques to be used with their students. Setting up professional development to meet the needs of the learners may mean developing a variety of teaching strategies and options for teachers to demonstrate knowledge and the acquisition of skills, just as one would do in a middle school classroom. The final section of this chapter addresses this idea.

**Professional Development**

In the district studied here, professional development has consisted of a three credit graduate course as well as several single or multiple day workshops. Participants in the graduate level course are required to create a differentiated unit to be used in their classroom as a final project. While participants are fulfilling the obligations of the course, it is not evident through classroom observations and walkthroughs, that these lessons or units are actually being used with the students. What else is needed and what are the barriers that teachers have encountered?

Today more than ever before, federal and state mandates intensify the need for districts to develop effective ways to train and support teachers to meet the needs of all learners. Ball & Forzani (2011) stated, “First, students are… expected to achieve ambitious goals that include producing disciplined reasoning and solving problems, not
simply recalling basic information and procedures. Second, the explicit aim is that all
students will achieve these outcomes” (p. 40). To make it possible for struggling middle
school students to attain proficiency on rigorous state tests, their teachers must understand
the cognitive development of students, know their subject material, be aware of different
learning styles, and be able to determine why a child is not able to grasp a concept. Ball &
Forzani (2011) wrote, “Figuring out what others find difficult or intriguing or how
experience shapes their interpretations is far from simple. And yet teaching without
attention to learners’ perspectives and prior knowledge is like flying a plane in a fog
without instruments” (p. 41). Likewise, for the district to keep providing the same
professional development without getting feedback from the teachers about what they feel
they need in order to be successful in raising student achievement would be similar to
teachers not communicating with their students about their needs and interests and
readiness levels with respect to the standards that are expected at each grade.

**Adult Learning**

If teachers are expected to use differentiated instruction and formative assessment
in their classrooms, these practices should be modeled and practiced during professional
development workshops and courses. Albert Bandura’s research and contributions to
social cognitive theory established that personal, social, behavioral, and environmental
influences play a critical role in human development and interactions (Bandura, 1994). He
also determined that modeling and self-efficacy plays an important function in people’s
motivation, thoughts, and actions. He regarded self-efficacy as the basis for human
motivation and personal accomplishment, indicating that “unless people believe that they
can bring about desired outcomes by their actions, they have little incentive to act or to
persevere in the face of difficulties” (Craighead & Nemeroff, 2001, p. 50). Bandura’s social learning theory provides insight into the significance of self-efficacy and the similarities between child and adult learning needs. Donovan et al. (1999) stated, “Many approaches to teaching adults consistently violate principles for optimizing learning” (p. 24) as numerous “professional development programs for teachers frequently are not: learner centered…, knowledge centered…, assessment centered…, or community centered...” (p. 24). Donovan et al.’s research on adult learning indicates that teachers would benefit from participation in workshops and courses that meet their needs, follow-up conversations designed to provide constructive feedback, and ongoing coaching to hone their skills in the use of different instructional and assessment methods (Donovan et al., 1999). Donovan et al (1999) added, “Teachers need visual models of practice, and support over an extended period of time as they attempt to use the curriculum. They need to have questions answered, and they need feedback when what they observe is different from what they expect” (p. 26). Bertrand (2003) observed, “An individual may know exactly what to do and yet fail in doing it because he or she feels incapable of succeeding” (p. 164). Bertrand (2003) also noted:

According to Bruner and Bandura, an aspect of this representation in social-cognitive theory is that perception is related to action. Individuals’ learning and actions depend on their judgment of their abilities. Thus, their perception that they are capable of performing a given task is undeniably going to influence the results of their future behavior. The more they believe in their success, the better their chance of succeeding (p. 163).
Lecture has long been the primary instructional model for educating children and adults. Today’s teachers have seen and experienced lecture used successfully in the majority of their courses, workshops, and seminars. Even those courses and professional development venues that urge the use of differentiated instruction typically use lecture to convey the material and need. Like our students, teachers need differentiated learning experiences that are applicable and thought-provoking, and that provide opportunities for active participation (Houk, 2010). Houk (2010) stated, “To be most effective, professional development must be job-embedded – specific to teacher concerns – and presented in nonthreatening ways.” Professors, mentors, and coaches should model differentiated instruction and use formative assessment in their courses and workshops. Wei et al (2009) concluded, “For teacher learning to truly matter… professional development should be sustained, coherent, take place during the school day and become part of a teacher’s professional responsibilities and focus on student results.” By incorporating modeling in classrooms and providing teachers with sustained support and coaching along with the course instruction that is already being provided, professional development may have more influence on student achievement and the fidelity with which the use of differentiated instruction and formative assessment are used in the classrooms of Northeast Middle School.

Additionally, teachers “need to learn how to filter the avalanche of information, and how to convert reliable information into knowledge and wisdom” (Bertrand, 2003, p. 162). Teachers who participate in professional development would benefit from “opportunities for continued contact and support as [they] incorporate new ideas into their teaching” (Donovan et al., 1999, p. 24). Continued contact, support, and feedback could be provided
by educational coaches who meet with particular teachers on a set schedule. These coaches could be integral in helping the teacher integrate differentiated instruction and formative assessment into the curriculum. Teachers “need to have questions answered, and they need feedback when what they observe is different from what they expect” (Donovan et al., 1999, p. 24).

**Knowles’ Theory of Andragogy**

Knowles’ theory of andragogy focuses on adult learners and their needs, which should be considered when designing professional development activities. Knowles’ principles indicate that adults: need to know why they are being expected to learn something new, learn through experience, must be ready to learn, prefer task-centered or problem-solving learning experiences, and are more responsive to professional development when they are intrinsically motivated to learn. Professional development in this paper is defined as “systematic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students” (Guskey, 2002a, p. 381). Research into andragogy indicates that there is a need to develop professional development activities for the adult learner that model the use of differentiated instruction and formative assessment. Donovan et al. (1999) stated:

A critical feature of effective teaching is that it elicits from students their preexisting understanding of the subject matter to be taught and provides opportunities to build on – or challenge – the initial understanding… Drawing out and working with existing understandings is important for learners of all ages. (p. 10)
Donovan et al. (1999) also emphasized, “Learning theory does not provide a simple recipe for designing effective learning environments” (p. 131). However, learning theory does indicate that that the learning environment of adults, as well as children, should be “learner centered, knowledge centered, assessment centered, and community centered” (Donovan et al., 1999, p. 131). Designing effective professional development activities requires the collection of data and feedback about its usefulness and value. Just as teachers are expected to know the learning styles and current knowledge of their students, professors and professional development instructors should determine the learning styles and current knowledge level of the adults in their workshops or courses when designing lessons.

Knowles popularized the word “andragogy” to refer to any type of adult learning, especially those used by organizations to train adults. Knowles’ principles included involving adults in the planning of their instruction, providing opportunities for practice and activity during instruction, making professional development relevant to their profession or life, and creating a problem-centered learning environment. Donovan et al. (1999) stated, “This requires that teachers be prepared to draw out their students’ existing understandings and help to shape them into an understanding that reflects the concepts and knowledge in the particular discipline of study” (p. 2).

Donovan et al. (1999) argued, “For teachers to change their practice, they need professional development opportunities that are in-depth and sustained” (p. 27). While professional development has been abundant, opportunities to provide ongoing support have not existed. Even as teachers are expected to use formative assessment to differentiate their instruction, the district under study has missed the opportunity to ensure
adoption by providing coaches who can support the teachers and sustain the momentum of change within the classroom. This need is supported by Bandura’s research, which indicated “that most learning comes from observational learning and instruction rather than from overt, trial-and error behavior” (Miller, 2002, p. 178). One of the results of this research was to suggest a professional development model that supports teachers in the adoption of formative assessment and differentiated assessment as observed in the classroom during walkthroughs. Helping teachers adopt and implement intervention strategies such as differentiated instruction and formative assessment with their students may involve administrators talking to teachers about their thinking, learning, and behavior more frequently using daily balanced feedback. Balanced feedback is the use of positive feedback about the implementation observed along with constructive comments about areas that need improvement or strengthening. Gilbertson et al. (2007) stated, “Implementation increased after given daily detailed feedback… This finding is critical because most often consultation follow-up occurs via an informal meeting” (p. 313) in which teachers are asked how they felt the intervention was going. Gilbertson, et al. (2007) agreed, “Prior investigations have demonstrated that performance feedback can have a powerful influence on implementation of intervention within a consultation process in educational settings. Whereas daily feedback has been shown to improve intervention integrity and child outcomes” (p. 313). It is important to examine how a teacher might unpack his or her understanding of teaching and students in order to more effectively assist with the adoption of a differentiated instruction process. Additionally, it is important to look at how a teacher might align his or her practice with the goals of the school and the state mandated curriculum standards. Within the high visibility of the state and federal
accountability system, teachers may feel pressured to “cover” the grade level standards but fail to recognize that implementing instructional strategies that enhance student understanding will yield more positive state testing scores.

A research review conducted by Donovan et al. (1999) indicated:

For teachers to change their practice, they need professional development opportunities that are in-depth and sustained. Many of the learning opportunities provided for teachers and other professionals violate the principles for optimizing learning. Teachers need opportunities to be involved in sustained learning, through teaching that models the methods that they are being urged to adopt. (Donovan et al., 1999, p. 27).

**Conclusion**

Differentiated instruction is a not the teaching approach most teachers have experienced as students. While teachers may have heard about or taken a course in differentiated instruction, it is likely that these classes were taught in traditional lecture style. Differentiated instruction is student centered and requires teachers take into account student learning style, readiness level and student interests as they develop lessons. Teachers can differentiate the content (the curriculum), the process (the instructional method they use to help students understand the content), and the product (the way students will demonstrate their understanding of the content).

Teachers who differentiate instruction should consider using grouping to facilitate instruction. While it may make perfect sense for a teacher to begin and end the class with whole class instruction, it may be more beneficial for students to work in a variety of groups throughout the work period. Grouping can be accomplished in multiple ways and
should be done based upon knowledge of student competencies and progress toward mastery of the standard. Even though students are in groups, and their access to the standard may be entirely different, all students should be working on the same standard. This can be accomplished through the use of parallel tasks where all students work on the same standard at varying levels of difficulty so that all students are challenged appropriately.

Assessment and differentiated instruction go hand in hand. In order for teachers to differentiate instruction, they must assess their students. Assessments need not be time consuming and elaborate, but they must provide the teacher with sufficient information about the student’s level of readiness, learning style, and interests. Teachers who get to know their students will be able to develop lessons that are more suitable for their students and will engage the learner in the lesson.

Teachers who engage students in the learning process are demonstrating an understanding of their students as learners. They are creating lessons that meet their students’ learning styles, needs, levels of readiness, and interests. In addition to having fewer discipline problems, engaged students focus on their work and are more likely to achieve greater educational gains than students who are bored and disengaged in the classroom.

This researcher acknowledges that there are times when whole-class, non-differentiated instruction is necessary and appropriate; however, it should not be the primary instructional method as it does not take into consideration student readiness, interest, and learning style. However, this researcher also acknowledges that the degree to which teachers are able to implement differentiated instruction with fidelity depends upon
the consistency, dependability and reliability of the professional development they have received. Steinberg (2008) stated, “Assessment is a leverage point used by education policy-makers to generate educational reform” (p. 42) and schools are held accountable for all students reaching the proficiency target. While there may be pockets of differentiated instruction, it is not taking place as frequently or with fidelity in the majority of classrooms in Northeast Middle School. This researcher believes that exploring what might be helpful to teachers will lead to professional development that meets the needs of the teachers, systems that help teachers adopt new instructional strategies and provide a safe educational environment in which to do so, curriculum that provides a roadmap for teachers to follow, systems that assists teachers to develop and implement interventions, instructional techniques that ensure student progress, and programs that will provide supplemental services in a way that will meet the students’ needs and increase achievement for all student populations.
CHAPTER 3:

Research Design

Students across Massachusetts, and in the middle school under study, have not been meeting the state proficiency targets in mathematics and English language arts. Research indicates that differentiated instruction strategies have been successful in improving student achievement for all students (Tomlinson, 1999; Tomlinson, 2003; Tomlinson & Eidson, 2001; Tomlinson & Eidson, 2003; Tomlinson, 2010b; Tomlinson & Imbeau, 2010). This prompted the district to provide a significant amount of professional development to teachers to facilitate the adoption of differentiated instruction across all subjects and grades. However, the degree to which differentiated instruction is being fully implemented with fidelity in the classrooms of teachers who participated in the professional development is unclear. In addition, the impact, if any, that this professional development has had on student achievement in mathematics or English language arts has yet to be determined.

Using a constructivist framework, this descriptive case study sought to answer the following research questions: (a) What was the process by which Northeast Middle School provided teacher training in differentiated instruction strategies to their teachers? (b) What were the opportunities and obstacles teachers faced when implementing differentiated instruction into their classrooms? (c) What perceived impact has the implementation of differentiated instruction strategies had on improving student achievement in math and English language arts?
**Purpose Statement**

The purpose of this descriptive case study was to describe the process by which a suburban, east coast middle school adopted and implemented a strategy of differentiated instruction, to get insight into the degree to which differentiated instruction was being fully implemented with fidelity in the classrooms of teachers who participated in the district-wide professional development course, and determine if this had any effect on student achievement in mathematics and English language arts. Differentiated instruction was generally defined as creating structured learning environments that addressed the variety of learning styles, interests, and abilities found within a classroom.

**Positionality Statement**

I was the principal of Northeast Middle School. My concern for this problem of practice was rooted in my own personal observations of classrooms, where I had observed heterogeneity in the fidelity of implementation of differentiated instruction. While I was responsible for teacher evaluations, I did not evaluate the teachers in this study. Additionally, it was made clear that the data collected in this study was not to be used in any way as evidence in any teacher’s annual performance review. Because I held a position of power, it was important that I shared with the participants my role as a student researcher from Northeastern University, and that the data collected from this study would be used for that sole purpose.

It was my professional perspective that there may be have been a disconnect between participation in the district-wide professional development in and implementation of differentiated instruction with fidelity into the classroom setting. It has long been assumed that there is a strong and direct relationship between professional development
and an increase in student proficiency. The effectiveness of professional development has
to be questioned when the content and information presented in workshops and courses is
not subsequently observed in the classrooms, and student scores on state standardized tests
are not showing an increase. This disconnect leads one to question if the instructional
approach used with the teachers was effective.

I acknowledged there are times when whole-class, non-differentiated instruction is
necessary and appropriate; however, I felt it should not be the sole or primary instructional
method as it does not consider student readiness, interest, or learning style. Furthermore,
data provided by the state indicated that Northeast Middle School students were not
meeting the English language arts and math proficiency targets. As the primary
investigator, I realized that I was the main instrument for collecting and analyzing data
(Merriam, 2002). Qualitative researchers must be aware of how their own experiences and
beliefs can shape the interpretation of the data they collect. Therefore, I was mindful of the
assumptions and biases I brought to this research.

I completed a three credit graduate course on differentiated instruction while I was
a science teacher. This was followed by a one week, graduate level, summer course,
Backward by Design, taught by Grant Wiggins and Jay McTighe. Wiggins and McTighe
are the authors of Backward by Design, most recently titled Understanding by Design. I
participated in several other courses, seminars, and workshops, including two summer long
institutes at Simmons College (EnviroNet), that helped me incorporate hands-on,
differentiated activities into my science lessons and units. The differentiated instruction
courses I took were not the same as those the teachers in Northeast Middle School took,
which could lead to some of the differences in what the other teachers and I believe
differentiated instruction to be. As a result of my participation in these courses, and experience with differentiated instruction in my own teaching, I believe differentiated instruction must be paired with formative assessment to be successful. A teacher who formatively assesses students knows where to begin effective instruction. In my opinion that teachers cannot maximize gains without using formative assessment to learn where students are in relation to the skills they need to acquire.

In contrast to my voluntary experience, teachers at Northeast Middle School are required to participate in a differentiated instruction course within their first three years of employment. The course, taught by the assistant superintendent, was instituted in 2010 in response to declining state MCAS scores in mathematics and English language arts. Teachers received three college graduate credits for taking the course, and over the past five years two different assistant superintendents have taught the course. The course is offered for one week over the summer, and the teachers are required to produce a differentiated instruction unit as their final project. However, implementation of the project within the teacher’s classroom was not required, nor were the teachers provided with any follow up coaching. Since I had not taken or participated in the district-wide differentiated instruction course, I did not know if differentiated instruction was modeled during the course or if the course was taught in traditional, whole-class lecture style.

**Research Design**

The paradigm chosen for the study was constructivism-interpretivism (Ponterotto, 2005). This paradigm was appropriate because the study sought to understand the unique lived experiences of multiple stakeholders. For example, despite the fact that the teachers in this study shared the same professional development training, they each uniquely made
sense of the training based on each individual’s lived experiences. This gave rise to many equally valid understandings of the theory behind differentiated instruction and their ability to implement its strategies in their classrooms. Stakeholders were able to reflect on their experiences by engaging with the researcher in interview conversations, which allowed deeper meaning to be uncovered. Through a member checking process, the researcher co-constructed findings from these interviews with the participants.

A qualitative research design was aligned with the research paradigm of constructivism-interpretivism (Merriam, 2009). A qualitative approach was appropriate because participants’ understanding of the events associated with the case emerged in an inductive manner as the participants and researcher co-constructed meaning. A qualitative design was also appropriate because the study took place in a natural setting, incorporated multiple sources of data, and provided a holistic account of events (Creswell, 2009). Qualitative researchers are interested in how participants make meaning of a situation (Merriam, 2002). Qualitative researchers assume that people construct various explanations or truths that evolve over time. Similarly, qualitative researchers attempt to determine how participants make interpretations at a given time within a particular social setting (Merriam, 2002).

**Research Tradition**

Yin (2009, 2013, 2014) and Merriam (1998, 2009) asserted that case study is a specific and valid research strategy. Yin (2014) stated that researchers who seek to explain why a social phenomenon works should use a case study. It is also a good research method to use when a researcher’s questions require an extensive and in-depth description of some social phenomenon in a real life setting. Case studies should have explicit boundaries and
address a specific, complex functioning entity such as a person or a program (Stake, 2000). Yin (2009) stated that data collection could include quantitative data, qualitative data, or both.

Stake’s (1995) descriptive collective case study was chosen over other methods because the unit of analysis needed to be teachers’ sense-making of differentiated instruction rather than the teachers themselves. A collective case study approach allowed teachers’ sense-making of differentiated instruction and the ideas they built from it to be examined through different teachers (cases) within varied social contexts (e.g. grade level meetings, common planning time, common teacher preparation time).

Of the traditions available to qualitative researchers (Creswell, 2013b), a case study approach was chosen for this study. A case study was appropriate because this study explored contemporary phenomenon within its real-life context over which the researcher had no control, and sought to answer “how and why” questions related to process (Yin, 2014; Stake, 1995, 2000). The most appropriate type of case study for this study was a descriptive, single, embedded case study design. This design was appropriate because the study sought to describe the process by which a suburban, east coast, middle school adopted and implemented differentiated instruction strategies into its classrooms. It was a single case study design because it focused on a single, suburban middle school. It was embedded because the experiences of multiple teachers were the primary units of analysis.

Descriptive case study extended through multiple cases (i.e., collective case study) was the research tradition for this study because of its ability to investigate the issue of teachers’ sense-making of participation in a mandatory district-wide professional development differentiated instruction course (Stake, 2000). Creswell (2013c) stated that
in a single descriptive case study the researcher focuses on a single issue or concern and identifies a case to portray this issue. Collective case study allowed this researcher to investigate the central issue – how teachers engaged in sense-making of the mandatory district-wide professional development differentiated instruction course and the ideas they constructed through multiple cases (each middle school teacher) in order to gain a deep understanding of how teachers constructed ideas of the course (Stake, 2000).

Each case or teacher was selected because it represented the issue in a unique way. The collective case study showed diversity in sense-making since teachers are more or less active in their sense-making and have distinctive experiences and beliefs relative to their participation in the course: beliefs in differentiated instruction, and participation in a variety of social contexts during the professional development and school community. The collective case study approach focused on each teacher’s level of engagement and discourse style (Spillane, Reiser & Reimer, 2002). This required that each case was examined deeply, contexts studied comprehensively, and activities described in detail so the reader could learn about the overarching interests (Stake, 2000). The collective case study included the following research steps: creating research questions, data collection, and analysis and interpretation (Stake, 1995).

The Case

Northeast Middle School was purposefully chosen for the case to study the problem of how to best deliver differentiated instruction to middle school students. Northeast Middle School is representative of the phenomena under study as the stakeholders were required to receive professional development related to differentiated instruction and were expected to fully implement differentiated instruction strategies with fidelity in their
classrooms. It was also chosen because it is the school at which the researcher served as the principal. The case was bounded in that it explored the period of time from when the initial decision was made to provide professional development to teachers to the present, and will include only the key stakeholders who engaged with the Northeast Middle School campus.

Northeast Middle School is a school situated within a larger suburban district in Eastern Massachusetts. The mandatory professional development under study was provided to the entire district. Since the summer of 2010, newly-hired teachers were required to participate in a district-wide course on differentiated instruction. This course was taught by the assistant superintendent and replaced the previously required Skillful Teacher course taught by Teachers21, an independent contractor. This change resulted from the district being classified as “Level 2” since none of the schools’ accountability data indicated that the students were meeting state proficiency levels in mathematics and English language arts. The Northeast Middle School teachers participated in the mandatory district-wide differentiated instruction professional development course and were in the process of implementing the strategies into their classrooms. The researcher proposed that she be allowed to have full time access to the participants who volunteered to be in the study to gain quality data. In between classroom observations, the researcher conducted interviews and collected data from the participants.

Participants

Qualitative research usually relies on a purposeful sample of participants (Creswell, 2013). The participants for this study included administrators and middle school teachers affiliated with Northeast Middle School.
**Teachers.** The teachers were purposefully chosen from Northeast Middle School because they had direct experience with the professional development provided by the district and because the teachers were from the same school. Being from the same school allowed the researcher to more easily access the participants and created an opportunity to co-construct meaning within the school. Participants who represented a range of backgrounds, teaching styles, exposure to district-wide differentiated instruction professional development, years of teaching experience, teacher preparation, certification type, and age (Merriam, 1998) were chosen to create maximum variation. Such diversity among study participants allowed their stories to be meaningful to readers who may be policymakers, administrators, and teachers of various backgrounds.

Purposeful selection as well as maximum variation sampling was utilized in this study to ensure that teachers who were relatively new to teaching, 5 to 10 years, as well as those who were veterans, more than 10 years, were selected to participate in this study. This would help explore any difference in the mindset or adaptability of individuals who have experienced differences in teacher preparation (licensing) programming. Furthermore, teachers with different licenses, general (elementary education) versus subject specific (math, ELA, etc.), were interviewed to contemplate the possibility of one differentiating more or finding greater ease with doing so and why that might be so.

**Administrators.** Administrators were purposefully selected to participate in this study because they represented the assistant superintendents who taught the district-wide differentiated instruction courses. Additionally, one of the assistant superintendents was instrumental in the decision that required all nonprofessional status teachers to participate in the course within the first three years of employment. Therefore, it was important to
collect data from this particular administrator to explore beliefs and gain insight about the thoughts, philosophies and ideas involved in instituting a mandatory district-wide differentiated instruction course.

**Recruitment and Access**

As stated previously, the researcher was an administrator in the district in which the participants were employed. In this capacity, the researcher had access to archival student data and professional development materials, classrooms for observations, and teachers and administrators for interviews.

Prior to starting the study, the researcher gained permission from the district superintendent to conduct this research at Northeast Middle School. Contact information including mailing addresses, email addresses, and phone numbers for the participants was requested from the district. Because the researcher also worked at Northeast Middle School, she had face-to-face access to participants during the interview process. All processes and proceedings related to this study were kept confidential and professional at all times. Careful attention was made during the study to position the researcher as a doctoral student and not as an administrator, and she used only her Northeastern University contact information when she engaged with the participants.

**Protection of Human Subjects**

Prior to the recruitment and access stage of research the researcher gained approval to conduct this research project from Northeastern University’s Institutional Review Board (IRB) and the Office of Human Subjects’ Research Protection (OHSRP) at Northeastern University. The OHSRP (2010) stated that the researcher’s main responsibility in human participant research was to maintain the rights and well-being of the subjects involved.
This required protecting them from unnecessary risks. Federal statutes require a review of the procedures a potential researcher will employ with human subjects before any research can start. The institutional review board (IRB) at Northeastern University performs these reviews. Therefore, the researcher completed an application for approval for use of human participants in research. Additionally, the researcher submitted a signed assurance from the principal investigator (Northeastern University faculty advisor). The appendix contains recruitment letters and informed consent forms (Appendix B and C), interview questions (Appendix D and E), and document analysis forms (Appendix F) that were approved by the IRB and used in this study.

The researcher ensured protection of human subjects by protecting the identity of both the school and the research participants by using fake names. The scope of the study was fully explained to participants, and participants were allowed to withdraw from the study at any time. All interview questions were vetted through the Office of Human Subjects’ Research Protection to ensure that the questions did not pose a threat to the psychological well-being of the participants.

Prior to the beginning of the study, each participant was provided with a consent form (see Appendix B & C). The participant’s signature on the informed consent form indicated an agreement to participate in the study, have their quotes published in the final report, and have their rights protected. Informed consent was an ongoing process that required ensuring that each participant had a full understanding of the research and their role within it prior to an agreement to participate being signed (Kvale, 2007; OHSRP, 2010).
During the informed consent process, the participants learned about the purpose of the research, its potential risks and benefits, as well as the main parts of its design in order to determine if they wanted to engage in the study (Kvale & Brinkmann, 2008; Seidman, 2006).

**Data Collection**

The primary actions of the researcher relative to data collection were “inquiring” (asking teachers about their professional development experiences and ideas), “experiencing” (observing teachers), and “examining” (documents) in order to gain a holistic understanding of sense-making and the ideas each teacher has constructed (Wolcott, 1992, p. 19). Data collection relied on all three sources as no single source could provide the data needed to understand the research questions. Data collection was interactive as it was inseparable from data analysis (Merriam, 2009). These qualitative research data collection methods are common to case study approaches (Stake, 1995). Data were collected using interviews with administrators and professional status teachers, physical artifacts such as professional development documents from the differentiated instruction course, MCAS archival data, and observations. Each class was observed a minimum of three times for a period of thirty minutes each time (Maxwell, 2009; Stake, 1995; Yin, 2009; Yin, 2013). Additionally, the researcher used memos and reflective notes to capture thoughts and ideas as they occurred during interviews and observations. These memos and reflective notes were coded as pieces of data.

**Interviews**

In a qualitative study,
open-ended interviews and field studies of complex human behavior do not employ instrumentation that can be pre-tested for reliability. Instead, exceedingly careful attention to consistency of procedures across people, contexts, and time; ongoing inspection of recorded data for evidence of unexplained or unexpected content; and persistent effort to maintain high accuracy must provide the support for claims about the reliability of what is captured in the data record. (Locke, Silverman, & Spirduso, 2010, p. 85).

The researcher followed Creswell’s (2009) recommendations for interview protocol development (See Appendix B) in which he suggests that the interviewer provide the interviewees with approximately five open-ended questions and space to record their answers. Each participant was asked the same set of questions to assure uniformity and standardization. The protocol included probes and prompts to facilitate the interview process.

These questions were developed from the central research questions and the sub-questions of this study (Appendix A), the literature reviewed in Chapter 2, and the theoretical framework outlined in Chapter 1. The researcher used the conversational approach of Rubin and Rubin during interviews. This approach was chosen to build rapport with participants in an effort to allow them to share their experiences and perceptions more deeply and openly. Participants were allowed to choose the location and time of their interviews, which lasted no longer than 60 minutes. Data were collected using interviews of teachers who participated in the district-wide differentiated instruction course. Teachers were interviewed off site in a location close to Northeast Middle School that had a private conference room. Yin (2009) described a focused interview as a short, open-ended,
conversational interview based on an established protocol. The interviews were recorded using the Super Note App on an iPhone so that the exact words of the participants could be captured to ensure that the thoughts and perspectives of the participants were conveyed as accurately as possible (Yin, 2013). The researcher also took notes during the interview process using the two-column note taking method proposed by Creswell (2009).

**Observations**

The researcher was a nonparticipant observer and conducted unannounced overt observations of each classroom a minimum of three times for thirty minutes each time to collect observation data (Maxwell, 2009; Stake, 1995; Yin, 2009; Yin, 2013) to get a feel for and an understanding of how often differentiated instruction was occurring with fidelity in the classroom. These observations were overt as the researcher entered the classroom, took a seat to observe, or mingled among student desks or pods based on what activity was taking place. Observation data were collected through the use of field notes, recorded quotes, and student engagement activity records. The student engagement activity record was used to collect data on the types of learning activities that engaged students in differentiated instruction. A chart of the seating arrangements was drawn at the beginning of each observation. At 15 minute intervals, the researcher recorded the activity in which each student was engaged. Codes were developed for whole group instruction, small group instruction, independent work, one-to-one instruction, and not engaged in instruction. Notes were added to indicate if the learning target with which the student was engaged represented pre-teaching, teaching, re-teaching or enrichment. Comments made by students or teachers that were directly related to the research questions were recorded.
Data Storage

Data were stored in a locked cabinet off campus in the researcher’s home office until the research was completed. At that time, all logs, observation notes, and interview tapes were destroyed. Confidentiality was maintained by coding each individual’s log, observation and interview notes. All digital data were stored on the researcher’s password protected personal laptop in electronic folders within a superordinate folder titled Allie. All digital files were created using Microsoft Word and replicated with PDF copies. The researcher created backups (printed copies of files) of all master data sources and files in case of loss, damage, accidental erasure or theft (Corti, 2008; Richards, 2009). A backup copy of each digital file was stored on a flash drive kept in a locked steel file cabinet within the researcher’s locked, brick and steel constructed school office at Northeast Middle School.

Data Analysis

Data analysis required sorting through enormous amounts of information to create themes, large patterns within the data that could be used to demonstrate how middle school teachers interpreted and misinterpreted aspects of the district-wide differentiated instruction professional development (Creswell, 2009). Stake (1995) proposed four methods of data analysis: categorical aggregation (development of minor themes), direct interpretation, establishing patterns, and the development of naturalistic generalizations. Stake also suggests that researchers focus on thick descriptions about what is going on with each case rather than waste time and effort making comparisons between cases.

The qualitative data were captured through interviews, observations, and the collection of documents such as professional development materials. The interviews were
conversational in nature and all interviewees were asked the same questions using the Teacher Protocol Tool (see Appendix D) or the Assistant Superintendent Protocol Tool (see Appendix E). The observations were unannounced and overt. During the observation, the researcher used field notes, recorded quotes and recorded the engagement activity level of students. Professional development materials were requested and collected from the assistant superintendents who taught the differentiated instruction courses.

**Interview data**

Interview data were recorded using the Super Note App on an iPhone. The interviews were transcribed using Rev.com. After all interviews had been transcribed, the researcher presented the transcriptions to the interviewees for review, editing and feedback. The researcher also examined the transcribed document for accuracy and for information that could potentially identify the participants.

According to Saldaña (2009), descriptive coding is appropriate for all types of qualitative research and with studies using various data sources. The defining characteristic of descriptive coding is the assignment of a word or phrase that concisely captures the topic of the data (Saldaña, 2009). Open coding was used for the first cycle of coding. All interviews, observation notes, professional development materials and archival data were coded. Coding was done by labeling segments of the information collected with a short phrase or word to describe the data (Creswell, 2009). Coding was used to develop themes within the study and was an emergent process (Creswell, 2009). During the process of coding the researcher evaluated the data that had been collected for evidence of similarity, difference, frequency, relationship, and causation (Saldaña, 2009).
In the second cycle of coding the data were re-analyzed using pattern coding. Patterns distinguished in the data were classified into major themes to develop a detailed understanding of the implementation of the district-wide differentiated instruction course from the teachers who participated and the administrators who taught the course (Saldaña, 2009).

**Professional Development Materials**

Hard copies of professional development materials were requested and scanned as PDFs. A table was developed that compared what authors of differentiated instruction state is essential and the actual professional development materials used in the district-wide course. For the purposes of this study it was assumed that the differentiated instruction courses were based on the same curriculum since the syllabi are the same and the credits are provided by the same university. Year to year differences may result from instructor nuances.

**Archival data**

Archival data, such as the school’s MCAS scores for mathematics and English language arts for the past five years, were available online from the Massachusetts Department of Elementary and Secondary Education. The researcher compared the MCAS data for the past five years to seek indications of increases in student achievement since the inception of the district-wide differentiated instruction course.

**Theme Development**

The final step in the data analysis was to make meaning of the data, thereby adding to the body of knowledge about professional development (Creswell, 2009). The researcher developed themes for each research question. Codes are labels that describe
segments of the collected data and themes are generated from the codes (Creswell, 2013c; Merriam, 1998). Constant comparison is a process of generating minor themes that emerge from continually reviewing data. The researcher continually compared codes to codes, minor themes to codes and minor themes to other minor themes as they emerged to find any repeated or noteworthy ideas (Creswell, 2009, 2013). During this constant comparison there was an ongoing effort to form a coherent network among codes, minor themes and concepts by checking to see which pieces of the data, ideas, or concepts fit within a minor theme (Creswell, 2009; Saldaña, 2009).

**Limitations**

Because this research focused on a small sample of participants within a single school, the ability to make claims about generalizing the finding of this research beyond the setting researched was limited (Maxwell, 2009). Findings from this school cannot be transferred to teachers in other schools or to other teachers within the district.

**Trustworthiness**

In order for readers to trust this research it must create valid and reliable knowledge for the reader (Merriam, 2009). Qualitative research should assure the reader that the proper methods have been followed. Trustworthy case study research should also provide a rich description of the actions in sufficient detail that the researcher’s conclusions make sense to the reader (Merriam, 1998). This research project followed Merriam’s (1998) recommendations about internal validity, external validity and reliability.

Trustworthiness requires that the researcher report findings and events accurately and truthfully (Merriam, 1998). As an administrator at Northeast Middle School where this study was conducted, the researcher implemented strategies to safeguard against
biases. Qualitative researchers must be aware of how their own experiences and beliefs can shape the interpretation of the data they collect. Therefore, the researcher was mindful of assumptions and biases brought to this research so she could allow the participants’ meanings to emerge. To do this, the researcher had clarified that she was an administrator in the school and implemented safeguards to ensure that the data and information collected was valid. In addition, the researcher employed triangulation of data, member checking and rich, thick description to ensure external validity (Creswell, 2013c). The researcher had been an administrator in the school the past nine years and has employed multiple data sources from all stakeholders to triangulate the data in an effort to provide the most accurate description of the case under study while minimizing the voice and perspective of the participant-observer (Yin, 2013).

Care was given to checking and clarifying statements to ensure that participants’ viewpoints were accurately represented and that all data were precise. The researcher employed member checking and “solicit[ed] participants’ views of the credibility of the findings and interpretations” (Ely, Anzul, Friedman, Garner & Steinmetz, 1991; Erlandson, Harris, Skipper & Allen, 1993; Glesne & Peshkin, 1992; Lincoln & Guba, 1985; Merriam, 1998; Miles & Huberman, 1994). This was the most critical facet for establishing validity and required that the researcher bring a rough draft of the data, analysis, interpretations and conclusions back to the participants for review so that they could examine and refute, edit or approve the findings (Stake, 1995).

Finally, use of rich, thick description allows readers to determine transferability of the study. Because the researcher describes the participants and the setting in detail, the reader is able to determine if the findings would be transferable to other settings based
upon similar characteristics. Rich, thick description required the researcher to use participant quotes and action verbs.

To guard against threats to internal validity, the researcher recruited a sufficient number of participants to allow for unexpected mortality, and participants all took the district-wide differentiated instruction professional development course. Subject characteristics and attitude may have had an influence on findings and may be an important factor in the study, and were not used to rule a participant in or out. Social constructionism holds that ideas or meanings are usually built collaboratively within communities of practice through discourse, negotiation, and shared experiences (Lave & Wenger, 1991; Palinscar, 1998; Vygotsky, 1978, 1986). A constructivist paradigm, such as the one used, required that research questions be open ended and general (Merriam, 2002). Such questions allow participants to construct a response that considers their social context without being led toward an answer (Creswell, 2009; Merriam, 2002).

Transferability refers to the extent to which the conclusions of this research can be applied to other settings. This would allow the reader to take what they understand from this case study and generalize the findings to a comparable situation (Merriam, 1998). The main goal of this case study research was to allow the reader to gain a deeper grasp of teacher understanding of differentiated instruction after participation in the mandatory differentiated instruction course.

Dependability refers to the degree to which the findings of a study can be reproduced (Merriam, 1998). Gaining dependability in a qualitative study can be difficult due to the variability of the participants’ memory as well as the numerous perceptions and interpretations participants assign to common events.
Conclusion

Professional development is a key element of teacher learning and is of fundamental importance in students reaching proficiency standards. The historical move of the state to require students to meet proficiency targets, and then holding teachers, administrators, schools, and districts accountable for student achievement, has had a significant effect on education. This case study shows how middle school teachers related to the professional development required by the district, how they engaged with it, the ideas they constructed, and the instructional strategies they implemented as a result of their participation. Furthermore, this case study may inform professional development practice, teacher education and policy writing as it informs educational reform.
CHAPTER 4:

Findings

This chapter presents findings, triangulated from interviews with administrators and teachers, archival documents, and observations, about the experiences of teachers with a mandated professional development program and its role in the implementation of differentiated instruction in a middle school classroom. The chapter begins with a thick description of the research context followed by themes that emerged in response to each of the following research questions: (a) What was the process by which a suburban, east coast middle school adopted and implemented differentiated instruction strategies into its classrooms? (b) To what degree was differentiated instruction being fully implemented with fidelity in the classrooms of teachers who participated in the professional development? (c) What impact, if any, has the professional development had on student achievement in mathematics or English language arts?

Research Context

Northeast Middle School is situated within a suburban district of about 11,500 residents in eastern Massachusetts, approximately 50 miles from the state capitol and has approximately 600 students. The district’s demographics can be summarized as 91.9% White, 3.9% Hispanic, 0.8% African American, 1.2% Asian, and 2.2% Multi-Race, Non-Hispanic. Northeast Middle School does not have an identified population of English Language Learners but 14.5% of its students are on individualized education plans and 12.8% of them have been identified as economically disadvantaged and receive free or reduced lunch (Massachusetts Department of Elementary and Secondary Education School/District Profiles, 2015).
Research Question 1

This section describes the process by which Northeast Middle School adopted and implemented differentiated instruction strategies into its classrooms. Differentiated instruction strategies introduced to teachers included how to link assessment to instruction; set clear learning goals; vary student grouping; use time, space, and materials flexibly; determine and chart individual student growth and progress; and use a proactive approach to instruction (Tomlinson, 1999; Tomlinson, 2003; Tomlinson & Eidson, 2001; Tomlinson & Edison, 2003; Tomlinson, 2010b; Tomlinson & Imbeau, 2010).

Professional Development Adoption

The impetus to provide district wide professional development in differentiated instruction was in reaction to poor student academic performance and observations that students were not engaged. Student scores in the district as determined by MCAS, the standardized state measure of school and district achievement, failed to reach proficiency in mathematics and English language arts (MA DESE, 2008). The district was categorized as a Level 2 district since none of the school’s accountability data indicated that students were meeting state proficiency levels in mathematics and English language arts. The inability of students to meet or exceed the proficiency standards set by Massachusetts created great concern among district administration, school committee members, faculty, parents, and the community.

This decision to provide professional development in differentiated instruction was made not only in response to MCAS scores, but also in response to classroom observations that showed a lack of student engagement. This was substantiated by one assistant superintendent who stated:
Some of the facial emotional features that we could see, based on students feeling like they weren't really engaged or accessing what was happening in class, and then, certainly, the ways that we were able to see it in their academic achievement whether it was scores, or grades, or even just the qualitative data about what teachers would see from year to year the skills students weren't able to attain.

**Professional Development Implementation**

As a result of test scores and observational data, in 2010 the district mandated that professional development in differentiated instruction be provided to the entire district and that all newly hired teachers also participate in a graduate level differentiated instruction course. Teachers interviewed stated that they were not consulted or involved in the decision to change from Skillful Teacher, a course previously taught by an independent contractor. One teacher participant shared, “I know that when I first started it was a different type of course and then it was switched at some point and I ended up taking the DI class.” Speaking to the importance of providing quality professional development to the district’s teachers, one administrator stated, “… if there is a silver bullet in education, its professional development and you just have to try to find a way to get teachers to get the support they need.” Another administrator added, “The other thing that I think is really important is whatever requirements you set as a district for new teachers, that you are sending a message, not only to those new teachers, but to everybody, district-wide, that this is something that is so important to us.”

The graduate level course on DI provided to the district was designed and taught by the assistant superintendent, who was also an adjunct professor at a local college. By using the assistant superintendent, the district did not incur additional costs for a course
instructor. As the course instructor, the assistant superintendent described the need to
“build your activities and assessments in the course as real things that they'll [teachers] use
in their practices so that it's authentic and meaningful and individualized.” The graduate
course on differentiated instruction was provided over one week, consisting of five seven-
hour days during the summer, and was followed up with two afternoon sessions in the fall
when the participants came together to present their differentiated units to their peers.

The differentiated instruction course was grounded in modeling and provided ample
time for students [teachers] to work in groups, move around the classroom, complete
projects and collaborate. The administrator described this process as:

…where we'll take some time out, use a protocol, and I try to model things that can
be used in the classroom where I teach the teachers how to do a reading, how to
pull out important elements and share it in a group to really think deeply and think
reflectively about their teaching and how they could improve it, and also, to lean on
their peers.

She also described the need to “build your activities and assessments in the course as real
things that they'll [teachers] use in their practices so that it's authentic and meaningful and
individualized.”

The instructor took into consideration teachers’ prior knowledge and content areas
and asked each teacher to provide positive feedback and constructive criticism to peers on
their projects throughout the course. Teachers were required to write reflections as they
worked on the development of actual differentiated lesson and unit plans to be used in their
classrooms. The instructor used the reflections as an assessment tool to help her
differentiate her instruction to meet the needs of the teachers in the classroom.
Research Question 2

This section describes the degree to which differentiated instruction was being fully implemented with fidelity in the classrooms of teachers who participated in this professional development at Northeast Middle School. Teachers who participated in the graduate level differentiated instruction course and adopted these strategies into their classrooms were interviewed to determine how the course had impacted their teaching, the successes and/or obstacles they had encountered, and what they suggested to improve the course or their experience with adopting and/or implementing differentiated instruction strategies into their classrooms.

Fidelity of Differentiated Instruction

While all of the teachers who participated in the differentiated instruction course interviewed claimed to have used the units and lessons they created during the course, they reported that creating additional units and lessons was extremely time consuming and observations of their classrooms after the professional development revealed that differentiated instruction didn’t always occur with fidelity. Observation data collected indicated that differentiated instruction was used with fidelity 47% of the time, while 53% of the time a more traditional instructional technique was being utilized by the teacher. Additionally, classroom observations indicated that teacher participants varied in their ability and readiness to incorporate differentiated instruction strategies into their classrooms with fidelity. Some teachers were much more proficient than others with offering students choices and providing tiered assignments. Some teachers observed were at the beginning stages of incorporating differentiated instruction into their teaching.
repertoire, while others were adept at offering students three different levels of assignments based upon their knowledge of their skill acquisition.

One teacher, adept at differentiating instruction when observed, explained:

My co-teacher and I created our 3-tiered lesson. With her help we created a process of Tier 1 is the foundation of the house. That’s your basis for all your learning. Tier 2 is the walls of the house that would be an extension onto the foundation of your house. Then Tier 3 is the roof of the house. That would really be your higher order of thinking.

These teachers have a diagram of a house displayed in their classroom for students to see. The foundation, walls and roof are clearly labeled with Tier 1, 2 and 3 respectively. All students in this class begin at Tier 1 and as they meet with success with one tier move on to the next tier which is more challenging, but on the same standard. Students do not have to complete all tiers to become proficient for grade level expectations.

Not Enough Time

Teachers overwhelmingly described time as one of the biggest obstacles they faced when trying to implement differentiated instruction into their classrooms. One respondent stated:

The only obstacle is the time that it takes to create these three different tiers. On top of that you have to make an engaging lesson that appeals to different varieties of learning styles. I think the obstacle is just that it is time consuming. You have to put in a lot of effort.

Teachers expressed frustration at the amount of time planning differentiated lessons and units took and stated that once you tried these lessons and units they weren’t always
successful so it required additional time to rework the lesson or unit for future use. One teacher said that differentiating instruction into three tiers of instruction was

like creating three separate lesson plans. There’s no book out there that has anything that we have created. Then you have to also be able to go back and say, this worked, but this didn’t work. Be organized enough to take that stuff out that didn’t work and add on to the things that did work.

Another teacher explained:

It definitely took some more planning and you really have to be planners, and sit there and really go through your plans and be willing to change them daily. Our obstacles are making sure everyone got something and that we didn’t let any kids slip under the radar.

**Need for Planning**

Teachers overwhelmingly described planning as the second-biggest obstacle they faced when trying to implement differentiated instruction into their classrooms. One respondent stated:

It definitely took some more planning and really ... You really have to be planners, and sit there and really go through your plans and be willing to change them daily. That's what we did so some of the struggles, I felt, are meeting these higher level kids, the kid that did get everything right.

This sentiment was echoed by the majority of the teachers interviewed. Teachers stated that prior to taking the differentiated instruction course they tended to create lessons for students who were struggling academically but after participating in the course they began to think more about all students and especially those for whom academics were not
challenging. Another teacher summed it up this way, “it's harder to think about techniques and methods that you can use to help those students that need a little more of a challenge in the classroom…” and participation in the course forced the participants to do just that.

**Need for Ongoing Support**

Teachers reported that ongoing support throughout the year, as they tried implementing different strategies, would have been beneficial. They found that if they tried something and it didn’t work they were likely to give up, whereas if they had had support and feedback they may have been able to determine how to do it differently and continued using the differentiated strategies they had initially been taught. As one participant stated:

I think it would have been nice to have some way to kind of check in or reflect or get back in touch with the instructor over the course of the year. But I think it would be nice to find ways to also talk to some of the other teachers that we were able to work with that week. Because we had the collaborative piece and then after the course was over, that was kind of it for us. We said goodbye and parted ways. So it might be nice to kind of set up some forum where we can get together and talk about the techniques that we used, and what worked, and what didn't and have some support so we could continue using the strategies. That's really my only criticism. Or suggestion for improvement.

**Research Question 3**

This section describes the impact the professional development has had on student motivation and achievement in mathematics or English language arts.
Impact of Differentiated Instruction in the Classroom

Teachers who participated in the graduate level differentiated instruction course and adopted these strategies into their classrooms were interviewed and asked, based upon their work with their students, how they thought their participation in the course might impact student MCAS achievement scores. Teachers reported that they found they were able to meet the needs of a variety of learners by developing tiered or differentiated lessons. They also stated that building more choices for students into their lessons, which provided students with more ownership, increased student engagement and decreased behaviors that detract from the learning process. A teacher summed it up in this way:

When you make lessons that have different access points for different student abilities, you're able to see what the students growth are based on, this is where they started. With your support this is where they're at and then taking what they've learned mixed with your support, you're able to see what they can do independently.

Teachers reported feeling that participation in the differentiated instruction course has had a positive impact on their teaching and student achievement in their classrooms. As one respondent stated:

You have to sit and think of the individual student in that room, and when you do that, you know what those kids' strengths and weaknesses are, so you try to hit that in your planning with the differentiated instruction, which obviously is going to benefit them on the MCAS instead of just browsing through it and keeping the train going when they're not ready.

Another teacher summed it up with:
When you make lessons that have different access points for different student abilities, you're able to see what the students' growth are based on, this is where they started. With your support this is where they're at and then taking what they've learned mixed with your support, you're able to see what they can do independently.

**Benefits to Students**

Teachers reported that they found they were able to meet the needs of a variety of learners by developing tiered or differentiated lessons. They also stated that building more choices for students into their lessons, which provided students with more ownership, increased student engagement, and decreased behaviors that would previously detract from the learning process. A teacher summed it up in this way:

When you make lessons that have different access points for different student abilities, you're able to see what the students' growth are based on, this is where they started. With your support this is where they're at and then taking what they've learned mixed with your support, you're able to see what they can do independently.

**Challenging all Learners**

Teachers reported that using differentiated instruction in their classrooms allowed them to increase student movement, create lessons that challenged the advanced learners as well as the students who had difficulty learning, and group students in a variety of ways. Teachers realized that developing lessons to meet students’ needs and weaknesses created a more collaborative classroom environment which freed them up to work with individuals
and groups of students in ways they had not been able to while instructing the whole group. As one respondent stated:

You have to sit and think of the individual student in that room, and when you do that, you know what those kids' strengths and weaknesses are, so you try to hit that in your planning with the differentiated instruction, which obviously is going to benefit them on the MCAS instead of just browsing through it and keeping the train going when they're not ready.

**Summary**

The study found that in response to student failures to reach proficiency in mathematics and English language arts as determined by MCAS, the standardized state measure of school and district achievement, the district mandated that all newly hired teachers participate in a graduate level differentiated instruction course. Participation in the differentiated instruction course may have laid the foundation for teachers to begin using differentiated strategies in their classrooms, but teachers interviewed indicated that ongoing support for incorporating these strategies into the classroom and more time for instructional preparation and collaboration would be beneficial. Data, as determined by periodic classroom testing, qualitative teacher feedback of 2015 MCAS aggregate scores, indicate that student achievement and engagement is increasing slightly in some classrooms, grade levels and subject areas.
CHAPTER 5:

Discussion of Research Findings

The purpose of this descriptive case study was to describe the process by which a suburban, east coast middle school adopted and implemented a strategy of differentiated instruction, to gain insight into the degree to which differentiated instruction was being fully implemented with fidelity into the classrooms of teachers who participated in the district-wide professional development course, and to learn if this had any impact on student achievement in mathematics and English language arts. Differentiated instruction was generally defined as creating structured learning environments that addressed the variety of learning styles, interests, and abilities of the students found in a classroom.

Discussion of Findings in Relationship to the Literature

The following discussion speaks to how the findings of this study relate to the literature.

Adoption of Professional Development in DI

Persistently poor student achievement across the district was the impetus for district administration to require new teachers to adopt and implement differentiated instruction into their classroom repertoire of teaching strategies in a concerted effort to meet the needs of all students throughout the district. Student scores in English language arts and mathematics, as determined by MCAS, the standardized state measure of school and district achievement, failed to reach proficiency. This caused abundant concern, as did the overall lack of observed student engagement.
In response, the district mandated professional development in differentiated instruction. This move by the district was rooted in research that suggests that differentiated instruction, which takes into consideration the individual learning needs of students when developing lessons, is a beneficial strategy for all learners, including those with special needs, when used in combination with formative assessment (Tomlinson, 2001; Duckor, 2014; Hattie, 2009). Research indicates that differentiated instruction strategies have been successful in improving student achievement for all students and the use of “formative assessment is one of the most powerful ways to raise student achievement” (Black & Wiliam, 1998). Differentiated instruction was publicized as an instructional method that “consistently yielded positive results across a broad range of targeted groups” (Huebner, 2010). It requires teachers to create a variety of lessons that meet the learning needs, interests, and readiness levels of students in their classrooms. The premise of differentiated instruction is that teachers get to know their students and capitalize on the strengths and knowledge that their students have as they enter the classrooms. The lesson does not begin in the same place for all students; rather it capitalizes upon the strengths and knowledge the student has acquired. A teacher who is reflective and knowledgeable about differentiated instruction strives to connect new concepts to the student’s prior knowledge in a manner that is attuned to the child’s learning style, interest, and level of readiness (Tomlinson & Eidson, 2003; Dean et al., 2012; Guskey, 2010; Jackson & Zmuda, 2014; Hattie, 2009; Danielson, 2007). Vygotsky argued that participatory activities that require the use of cognitive and communicative functions allow students to “scaffold” new information with previously learned knowledge (Vygotsky, 1978, 1986).
Teachers who effectively use differentiated instruction develop lessons that allow for the scaffolding of material and challenge students without causing them to become frustrated. Since differentiated instruction is student centered and requires that new lessons be built on previously learned material so students can make connections, teachers must develop several different lessons based upon the skill levels of the students in the classrooms. Teachers reported that this takes a significant amount of time. In addition to developing multiple lessons, teachers must also figure out how to deliver these lessons simultaneously, and continually assess students in their skill development so that they are properly prepared for the next day’s and week’s lessons as a single classroom likely contains “students who struggle mightily with one or more subjects… and children with vast reservoirs of background experience share space with peers whose world is circumscribed by the few blocks of their neighborhood” (Tomlinson & Allan, 2000, p. 5).

A differentiated classroom is student centered and functions on the notion that “teachers offer different approaches to what students learn, how they learn it, and how they demonstrate what they’ve learned” (Tomlinson, p. 4). Bruner’s theory of instruction indicates that children have a predisposition to learning. However, information must be structured so that students can readily grasp it, and teachers must determine the most effective sequence in which to present the curriculum. Differentiated instruction involves harnessing the student’s natural curiosity and interest, developing and executing a lesson designed to meet the students’ learning styles, and understanding how to spiral or scaffold the curriculum in a sequence most suitable for adolescents to grasp. Equipped with information gleaned from the formative assessment, the teacher would be informed about the knowledge that his/her students bring into the classroom and would be better prepared
to tap into the child’s “zone of proximal development” (Vygotsky, 1978). These teachers
would then be able to provide students with classroom work that offers a moderate
challenge and which would differ from student to student. Unlike a traditional classroom in
which the teacher takes center stage and is heard the majority of the time, a differentiated
classroom is a “blend of whole-class, group and individual instruction” (Tomlinson &
Eidson, 2003).

Implementation of Professional Development in DI.

Concerned with the lack of student achievement and engagement, as indicated by
state testing and administrative walkthrough data, district leadership mandated a graduate
course in differentiated instruction for all teachers newly hired to the district. What
teachers comprehend and implement with fidelity in the classroom as a result of
participation in a mandated professional development course on differentiated instruction
depends upon the interaction of the educator’s cognitive structures, the social context, and
how the reform message has been represented (Spillane, Reiser & Reimer, 2002; Yanow,
1996).

Lack of time. Teachers needed time to develop and refine lessons and units for
their students, and teachers also needed time to hone their skill development and use of
differentiated instruction strategies.

Differentiated instruction is student centered and requires that new lessons be built
on previously learned material so students can make connections. The difficulty for
teachers is that this requires them to develop several different lessons based on the skill
levels of the students, which, the teachers reported, takes a significant amount of time. As
schools and districts move to adopt differentiated instruction, consideration must be given
to the time teachers will need to implement these strategies with fidelity into their classrooms.

What Northeast Middle School teachers learned from and about differentiated instruction strategies was related to their experiences with the differentiated instruction course as teacher learners and as teachers. These experiences equipped them with a developing understanding of the differentiated instruction content and process. This suggests that the teachers may be slowly developing an understanding of differentiated instruction strategies. It can take districts between 5 and 10 years to fully implement a curriculum reform (Collins, 1997; Fullan & Stiegelbauer, 1991). Ball & Forzani (2011) stated, “Students whose teachers do not develop these qualities lose out” (p. 42).

If teaching is a craft or skill that can be learned and honed over time, then school districts should provide effective professional development and teacher support that will have an impact on the quality of instruction students receive. Just as teachers must create time to meet with and talk to their students to find out where they are on the continuum of skill acquisition, so too must administrators carve out time to consult with teachers to determine how best to support them in acquiring the skill of differentiating instruction with fidelity for all students. Donovan et al. (1999) stated, “Teachers need visual models of practice, and support over an extended period of time as they attempt to use the curriculum. They need to have questions answered, and they need feedback when what they observe is different from what they expect” (p. 26).

**Need for planning.** Darling-Hammond (1998) explained, “Teachers learn best by studying, doing, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (p. 6). She advised having a
professional development infrastructure that is sustained and readily available; supported by coaching; connected to collaborative work; integrated into school and classroom planning around curriculum, instruction, and assessment; and responsive to teacher needs (Darling-Hammond, 2010). While all teachers who participated in this study may not have been equally successful incorporating differentiated instruction with fidelity into their classrooms, they were all united in their frustration at the amount of time planning differentiated lessons and units took. They added that when they tried these lessons and units, they weren’t always successful; it required additional time to rework the lesson or unit for future use.

Ball & Forzani (2011) stated, “Asking purposeful questions, carefully listening and responding to students, creating norms for talking and listening, choosing and guiding students’ use of specific artifacts, connecting students’ contributions…” (p. 44) all can be used to determine where students are in the continuum of knowledge acquisition. This formative feedback is essential when planning lessons. It is essential that the teacher continuously assess where students are on the continuum of proficiency standard. This feedback is needed to provide the teacher with essential information to guide future instruction. Getting to know the student is essential when practicing differentiated instruction because that is where lesson planning begins. Differentiated lessons are designed to meet students’ needs, interests, and ability level. Teachers who differentiate can determine what element of the lesson they wish to differentiate: the content, the instruction or the product. As one respondent stated, “it definitely took some more planning and really ... You really have to be planners, and sit there and really go through your plans and be willing to change them daily.”
**Need for support.** While a mandate for all newly hired teachers to participate in a differentiated instruction course was seen as a strategy to increase student achievement scores on the state standardized test, MCAS, this has not happened. A mix of professional development activities for veteran teachers and a top-down requirement for all newly hired teachers to participate in a graduate level differentiated instruction course has left Northeast Middle School student achievement at the same level. Teacher feedback gathered during this study indicated that there was insufficient support throughout the year as the teachers who participated in the differentiated instruction course tried to adopt and implement differentiated instruction strategies into their classrooms.

Donovan et al. (1999) stated, “Many approaches to teaching adults consistently violate principles for optimizing learning” (p. 24) as numerous “professional development programs for teachers frequently are not: learner centered…, knowledge centered…, assessment centered…, or community centered...” (p. 24). Donovan et al.’s research (1999) on adult learning indicated that teachers would benefit from participation in workshops and courses that meet their needs, from observations that include follow-up conversations designed to provide constructive feedback, and from ongoing coaching to hone their skills in the use of different instructional and assessment methods. Donovan et al. (1999) stated, “Teachers need visual models of practice, and support over an extended period of time as they attempt to use the curriculum. They need to have questions answered, and they need feedback when what they observe is different from what they expect” (p. 26). Some experiences of Northeast Middle School teachers supported their understanding, while other experiences, such as a lack of coaching or continued support, inhibited understanding.
Donovan et al. (1999) stated, “For teachers to change their practice, they need professional development opportunities that are in-depth and sustained” (p. 27). While professional development has been abundant, opportunities to provide ongoing support have not existed and still do not exist. It is important to examine how a teacher might unpack his or her understanding of teaching and students in order to more effectively assist with the adoption and implementation of the differentiated instruction process.

**Impact of Professional Development on DI**

Teachers reported feeling that participation in the differentiated instruction course has had an overall positive impact on their teaching and student achievement. However, teachers also reported that ongoing support throughout the year, as they tried implementing different strategies, would be beneficial. They found that if they tried something and it didn’t work they were likely to give up, whereas if they had had support and feedback they may have been able to determine how to do it differently and may have continued using differentiated strategies. This is supported by Stigler (2002), who suggested that “today’s professional development should be site-based, long-term, grounded in teachers’ practice, and an ongoing part of the teachers’ workweek, rather than something tacked on.” He further stated that teachers need to learn three things: “how to analyze practice…, [how to] be exposed to alternatives…, and [how] to know when to employ which method.”

Additionally, Darling-Hammond (1998) explained, “Teachers learn best by studying, doing, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (p. 6). Looking at what Darling-Hammond and Stigler advised, Northeast Middle School would be wise to reassess what is currently being done, and to develop a professional development system that would take into
account what current research and this study have determined to be effective. A systematic professional development approach that provides teachers with a long-term, site-based program grounded in the teachers’ practice that assists them with analyzing their practice, exposing them to alternative teaching strategies and mentoring to brainstorm when and how to employ which methods might provide a more supportive professional development model. This would instill more confidence in the teachers, which may in turn result in the differentiated instructional techniques implemented with greater fidelity in the classrooms. This model would provide teachers with the opportunity to collaborate with peers throughout the learning process, use their own students’ work to hone their craft, and allow them to be supported by a coach as they integrated their newly acquired skills into their instructional planning and assessment.

Donovan et al. (1999, p. 27) stated, “For teachers to change their practice, they need professional development opportunities that are in-depth and sustained.” While professional development has been abundant, opportunities to provide ongoing support have not existed. Even as teachers are expected to use formative assessment to differentiate their instruction, the district has missed the opportunity to ensure adoption by providing coaches who can support the teachers and sustain the momentum of change within the classroom. This need is supported by Bandura’s research, which indicates “that most learning comes from observational learning and instruction rather than from overt, trial-and error behavior” (Miller, 2002, p. 178).

**Discussion of Findings in Relationship to Theory**

The following discussion speaks to how the findings of this study relate to theory.
Adoption of Professional Development in DI

In response to poor academic achievement and motivation, the district under study moved away from the skillful teacher model of professional development to providing a course on differentiated instruction. Vygotsky’s construct of social cognitive development can be used to understand the importance of using differentiated instruction when working with students to improve student engagement and learning. Vygotsky argued that participatory activities that require the use of cognitive and communicative functions allow students to “scaffold” new information with previously learned knowledge (Vygotsky, 1978, 1986).

The skillful teacher course included “a wide array of skills such as communicating belief in students’ capabilities, motivating and engaging students, demonstrating cultural proficiency, planning engaging lessons, making concepts and skills accessible, and continuously assessing student understanding” (Research for Better Teaching, 2016). After years of requiring new teachers to take the skillful teacher course, central office administration unilaterally decided that this course, with what they considered to be “generalized teachings,” was not preparing educators for the challenges they faced to meet the needs of the students in their classes. Thereafter a differentiated instruction course was instituted. The differentiated instruction course, they determined, would better prepare teachers to develop lessons that would increase student engagement, participation, and communication in class and teachers would learn to monitor student progress and growth toward state standards through the use of ongoing assessments.

Constructivist theorists Jerome Bruner, Jean Piaget, and Lev Vygotsky all described how children think, learn, and process new information. They theorized that the
“construction” or creation of new meaning is a joint endeavor that involves the student as an active participant and the teacher as facilitator. Building from this theory, adopting differentiated instruction made sense since teachers who effectively use differentiated instruction would develop lessons that naturally allow for the scaffolding of material. These teachers take into consideration the interest, readiness, and learning profile of the adolescent and prepare lessons that include movement, discussion, and student engagement. Bertrand (2003) stated, “Teachers have noticed that kids learn more by talking to one another and exchanging points of view between them” (p. 274).

Vygotsky’s “interest was in assessing the ways in which learners make progress. The focus on process as well as product in assessment has become embedded in the range of techniques now called dynamic assessment” (Daniels, 1996, p. 4). Teachers who effectively use grouping to facilitate differentiated instruction are developing lessons that naturally allow for the scaffolding of material and allow for the social interaction that Vygotsky’s social development theory states is fundamental in the development of understanding (Vygotsky, 1978, 1986). Students naturally make sense of new material when they can relate it to material that is already known. During the DI course, teachers were taught to include opportunities for student discussions since socialization can lead to the development of critical thinking through shared problem solving activities. This “draws on Vygotsky’s theory of a zone of proximal development, the notion that with the support of a community, learners can meet more strenuous challenges than they might otherwise succeed at alone” (Hoffer, 2012, p. 2). The greater the social interaction, the greater the skill that can be developed compared to when the child is working alone (Vygotsky, 1978, 1986; Gerlach, 1994).
Implementation of Professional Development in DI

Participation in the differentiated instruction course may have laid the foundation for teachers to begin using differentiated strategies in their classrooms, but teachers interviewed indicated that ongoing support for incorporating these strategies into the classroom and more time for instructional preparation would be beneficial.

Lack of time. Teachers expressed an overwhelming concern for the amount of time needed to construct differentiated lessons.

Understanding the zone of proximal development as the place where learning is made challenging but doesn’t overextend or frustrate the student is important to comprehending the ways in which learners make progress and sense out of new material (Vygotsky, 1978). Since differentiated instruction is student centered and requires that new lessons be built on previously learned material so students can make connections, the difficulty for teachers is in finding time to develop several different lessons based upon the skill levels of the students in the classroom. Differentiated lessons, once constructed, give the teacher the freedom to observe the learning process and time to gather formative information in an effort to determine who is or is not succeeding. These lessons also allow time for the teacher to discuss the learning process with the student in an effort to construct future lessons that allow students to make progress toward conceptual understanding and skill mastery.

Differentiated instruction and lessons take time to create, which according to the teachers interviewed can be frustrating because there are no written materials or textbooks to which you can turn for reference. These must be teacher created based upon knowledge of the students in each class, which involves a lot of time every day. As schools and
districts move to differentiated instruction, consideration must be given to creating schedules that will allow teachers time to create these lessons so that they don’t fall back on one-size fits all instructional strategies. To that end, if teachers are expected to differentiate instruction then they will need to be provided with the time to do it appropriately.

**Need for planning.** While all teachers who participated in this study may not have been equally successful at incorporating differentiated instruction with fidelity into their classrooms, they were all united in their frustration at the amount of time planning differentiated lessons and units took. They added that once you tried these lessons and units they weren’t always successful, so it required additional time to rework the lesson or unit for future use. Ball & Forzani (2011) stated, “Asking purposeful questions, carefully listening and responding to students, creating norms for talking and listening, choosing and guiding students’ use of specific artifacts, connecting students’ contributions…” (p. 44) all can be used to determine where students’ are in the continuum of knowledge acquisition.

This formative feedback is essential for the teacher to have when planning lessons and it provides the teacher with essential feedback to guide future instruction. To do this effectively, it would be best if teachers understood Vygotsky’s Zone of Proximal Development “as the distance between a child’s actual developmental level as determined by independent problem solving” and the higher level of “potential development as determined through problem solving” under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86). Adult guidance and understanding of the child enables a teacher to effectively differentiate lessons to meet the students’ needs, interests and ability level. Teachers who differentiate can determine what element of the lesson they
wish to differentiate: the content, the instruction, or the product and as one respondent stated, “it definitely took some more planning and really ... You really have to be planners, and sit there and really go through your plans and be willing to change them daily.” Teachers who were observed creating three tiers of differentiated lessons and moving around the classroom having discussions with their students to gain information and insight into what the students did or did not understand obtained the formative assessment data they needed to create lessons that kept the students appropriately challenged.

Need for support. Teachers cannot implement an instructional strategy they do not fully understand if they do not receive appropriate support and feedback for adopting it (Bandura, 1997). Knowles’ theoretical principles indicate that adults: need to know why they are being expected to learn something new, learn through experience, must be ready to learn, prefer task-centered or problem-solving learning experiences, and are more responsive to professional development when they are intrinsically motivated to learn. A mix of professional development activities for veteran teachers and a top-down requirement for all newly hired teachers to participate in a graduate level differentiated instruction course has left Northeast Middle School student achievement at the same level.

Teacher feedback gathered during this study indicated that there was insufficient support throughout the year, as the teachers who participated in the differentiated instruction course tried to adopt and implement the differentiated instruction strategies into their classrooms. Some of the experiences Northeast Middle School teachers had supported their understanding, while other experiences, such as a lack of coaching or continued support, inhibited understanding. Bandura regarded self-efficacy as the basis for human motivation and personal accomplishment, indicating that “unless people believe
that they can bring about desired outcomes by their actions, they have little incentive to act or to persevere in the face of difficulties” (Craighead & Nemeroff, 2001, p. 50). Providing teachers with coaches or another form of support as they venture to use newly developing differentiated instructional strategies may help motivate and sustain even the most hesitant and uncertain teachers.

**Implementation and Impact of Professional Development in DI.**

Data, as determined by periodic classroom testing, qualitative teacher feedback, and 2015 MCAS aggregate scores, indicate that student achievement and engagement is increasing slightly in some classrooms, grade levels and subject areas.

Frustrated with stagnant student achievement scores, as determined by MCAS, the district dropped the skillful teacher course, which had been taught for years, and mandated that all new teachers participate in a DI course. Armed with the knowledge that research was indicating that differentiated instruction strategies could improve student achievement, and that the use of “formative assessment is one of the most powerful ways to raise student achievement” (Black & Wiliam, 1998), Northeast Middle School decided all teachers would adopt differentiated strategies into their classrooms. In the classrooms observed in which teachers were more proficient with the differentiated instructional strategies, as demonstrated by the use of three tiers of instructional levels, student achievement has increased overall as measured by MCAS. Student engagement has increased in all of the classrooms observed whenever students were offered opportunities to work collaboratively and whenever lessons were differentiated. This aligns with Vygotsky’s construct of social cognitive development which stresses the importance of socialization in the process of learning.
Implications for Practice

The following discussion speaks to how the findings of this study relate to practice. If teachers are expected to use differentiated instruction and formative assessment in their classrooms, these practices should be modeled and practiced during professional development workshops and courses. Donovan et al. (1999, p. 24) stated, “Many approaches to teaching adults consistently violate principles for optimizing learning” as numerous “professional development programs for teachers frequently are not: learner centered…, knowledge centered…, assessment centered…, or community centered…” Donovan et al.’s (1999) research on adult learning indicates that teachers would benefit from participation in workshops and courses that meet their needs, from observations that include follow-up conversations designed to provide constructive feedback, and from ongoing coaching to hone their skills in different instructional and assessment methods. Donovan et al. (1999, p. 26) stated, “Teachers need visual models of practice, and support over an extended period of time as they attempt to use the curriculum. They need to have questions answered, and they need feedback when what they observe is different from what they expect.”

Houk (2010) stated, “To be most effective, professional development must be job-embedded – specific to teacher concerns – and presented in nonthreatening ways.” Professors, mentors, and coaches should model differentiated instruction and use formative assessment in their courses and workshops. Wei, et al, (2009) stated, “For teacher learning to truly matter… professional development should be sustained, coherent, take place during the school day and become part of a teacher’s professional responsibilities and focus on student results.”
As a result of this research, it is suggested that modeling differentiated instruction lessons in the classrooms, as well as providing teachers with sustained support and coaching along with the course instruction that is already being provided, may improve student achievement and the fidelity with which the use of differentiated instruction and formative assessment are used in the classrooms of Northeast Middle School.

**Implications for Future Research**

The research on professional development and its role in the implementation of differentiated instruction in the middle school classroom should not end with this study. Additional research should be conducted on a much broader scale to more accurately define the relationship between sustained teacher support and coaching and teachers’ adoption and implementation of differentiated instruction strategies with fidelity in the classroom. Additionally, this study was conducted in one school with only a few teacher participants. Future studies should be expanded to include an entire district or several districts.

**Limitations**

The findings of a qualitative research study such as this with a small sample size do not generalize or transfer to other settings (Merriam, 2009). Therefore, because this research focused on a small sample of participants within a single school, the ability to make claims about the findings of this research beyond Northeast Middle School is limited (Maxwell, 2009). Findings from this school cannot be transferred to teachers in other schools or to other teachers within the district. Another limitation of this study is that researcher biases can influence the results of the study (Stake, 2000).
Summary

In summary, suburban, east coast middle school administrators realized that students were not reaching proficiency as measured by MCAS, the standardized state measure of school and district achievement, and unilaterally implemented a change to professional development which mandated teacher participation. While teachers report participation in this professional development has been beneficial to them and their students, this research revealed that it is possible that a professional development approach that included additional coaching and embedded support for teachers during the implementation phase may have produced higher gains both for teachers and students.
References


managing a differentiated classroom. Alexandria, VA: Association for Supervision and Curriculum Development.


Appendix A

Central Question 1: What is the process by which Northeast Middle School provided teacher training and implemented differentiated instruction strategies into their classrooms, and what impact, if any, has this professional development had on student achievement in mathematics or English language arts?

Sub-question 1: What was the process by which participation in the district-wide differentiated instruction course became mandated for all teachers within the first three years of employment?

   Sub-Question 1a: How did stakeholders of Northeast middle school acknowledge a need for professional development in differentiated instruction?

   Sub-Question 1b: What was the curriculum and pedagogy of the professional development training for differentiated instruction for classroom teachers?

   Sub-Question 1c: How do classroom teachers describe their experience participating in the differentiated instruction professional development training?

Sub-question 2: What are the opportunities and obstacles teachers face when implementing differentiated instruction into their classrooms?

Sub-question 3: What perceived impact has the implementation of differentiated instruction strategies had on improving student achievement in math and English language arts?
Appendix B

Informed Consent Form for Middle School Teachers Who Volunteer to Participate in this Study

Northeastern University: College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000
Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

Principal Investigator: Principal Investigator: Dr. Kelly Conn: k.conn@neu.edu
Student Researcher: Debra L. Pincince: pincince.d@husky.neu.edu

Title: Participation in Professional Development and its Role in the Implementation of Differentiated Instruction in the Middle School Classroom

You are invited to participate in a research study that will take place from June 16, 2015, through June 30, 2015. This form is offered to you so you can decide if you would like to participate. The researcher has explained the study below but you may ask her any questions that you may have at any time. When you are ready, you may tell the researcher if you want to participate or not. Your participation in this research is completely voluntary. You do not have to participate if you do not want to. If you want to participate, the researcher will ask you to sign this statement. You will get a copy to keep. We are asking you to participate because you are a teacher who has participated in the district-wide differentiated instruction course.

The purpose of this study is to explore how middle school teachers who participated in the district-wide differentiated instruction course understand and implement the strategies into their classroom. This task is my doctoral thesis research project for Northeastern University. If you decide to be part of this study you will be asked to participate in a one-hour interview at a date and time of your choosing. During the interview you will be asked about:

- your experiences with the professional development course;
- the successes you experienced implementing differentiated instruction into your classroom; and
- the challenges you experienced implementing differentiated instruction into your classroom.

Participation will also include the researcher observing common planning time and randomly observing your classroom a minimum of three times for a period of thirty minutes each time. Lastly, the researcher will collect documents related to differentiated instruction.

I do not expect that your participation in this study will present risk or discomfort to you. If you do experience discomfort the researcher will tell you where you can get help.
Informed Consent Form for Middle School Teachers Who Volunteer to Participate in this Study

Northeastern University: College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000
Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

There will be no cost or payment for your participation. However, there will be many benefits of this research. The responses you give can aid the district in its decision-making and implementation process regarding how and when professional development is offered in an effort to improve professional development opportunities and bring about student achievement. The results of this research could help find which parts of the professional development are misunderstood.

Your part in this study will be confidential. Only the researcher and her Northeastern University faculty advisor will know your identity. You will be referred to by a pseudonym throughout the research process. Your identity will not be connected to your statements on any document. The identity of the district and school will also be referred to with pseudonyms.

You can refuse to answer any question during interview. The interview will be recorded and transcribed word for word by the researcher. Some of the statements you make may be included in a published report. The published report will not use information that can identify you as a part of this project. You do not have to answer any question if you feel uncomfortable. You may listen to the recording and review the transcript of your interview. You may request that statements you make to the researcher be withdrawn. You also have the right to see the final report so that you may identify things that are not fair or correct.

Digital files that state your identity, such as the record of the interview and this consent form, will be kept in secure locations. Paper files will be kept in a locked cabinet in a locked door within the researcher’s office. The files that contain your identity will be destroyed at the end of the study. Northeastern University staff may ask the researcher to see information about you. They may do this to make sure you are protected.

Even if you begin the study, you may quit at any time. If you do not participate or if you decide to quit, you will not lose any rights or benefits that you would otherwise have.

If you have questions or problems with this research you may contact Debra L. Pincince. Debra’s email address is pincince.d@husky.neu.edu and her phone number is 774-276-0358. You may also contact Dr. Kelly Conn, the principal researcher, at 857-205-9585. Dr. Conn’s email address is k.conn@neu.edu.
Informed Consent Form for Middle School Teachers Who Volunteer to Participate in this Study

Northeastern University: College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000
Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

If you have any questions about your rights as a person involved in this study you may contact Nan Clark Regina. Ms. Regina is the director of Human Subject Research Protection at Northeastern University. Ms. Regina’s telephone number is 617-373-4588; her email address is n.regina@neu.edu. You may contact Ms. Regina without saying your name.

Thank you,
Debra L. Pincince

Please complete the information below ONLY if you wish to volunteer to participate in this study. You may return this form to me in person or through email at pincince.d@husky.neu.edu.

I have read this form. I understand the content of this form. I voluntarily agree to participate in this research.

______________________________________________
Signature of person agreeing to take part

Date

______________________________________________
Printed name of person above

Date

______________________________________________
Signature of person who explained the study to the participant above and obtained consent

Date

______________________________________________
Printed name of the person above

Date
Appendix C

Informed Consent Form for Assistant Superintendent

Northeastern University: College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000
Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

Principal Investigator: Dr. Kelly Conn: k.conn@neu.edu
Student Researcher: Debra L. Pincince: pincince.d@husky.neu.edu

Title: Investigating Participation in Professional Development and the Implementation of Differentiated Instruction in the Middle School Classroom

You are invited to participate in a research study that will take place from June 16, 2015, through June 26, 2015. This form is offered to you so you can decide if you would like to participate. The researcher will also tell you about the study. You may ask her any questions that you have. When you are ready, you may tell the researcher if you want to participate or not. Your participation in this research is completely voluntary. You do not have to participate if you do not want to. If you want to participate, the researcher will ask you to sign this statement. You will get a copy to keep. We are asking you to participate because you are a teacher who has participated in the district-wide differentiated instruction course.

The purpose of this study is to explore how middle school teachers who participated in the district-wide differentiated instruction course understand and implement the strategies into their classroom. This task is my doctoral thesis research project for Northeastern University. If you decide to be part of this study you will be asked to participate in a one-hour interview at a date and time of your choosing. During the interview you will be asked about:

- your experiences teaching the professional development course; and
- your interactions with the teachers before, during and after the professional development course.

Lastly, the researcher will seek to collect all documents related to the differentiated instruction course.

I do not expect that your participation in this study will present risk or discomfort to you. If you do experience discomfort the researcher will tell you where you can get help.
Informed Consent Form for Assistant Superintendent

Northeastern University: College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000
Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

There will be no cost or payment for your participation. However, there will be many benefits of this research. The responses you give can aid the district in its decision-making and implementation process regarding how and when professional development is offered in an effort to improve professional development opportunities and bring about student achievement. The results of this research could help find which parts of the professional development are misunderstood.

Your part in this study will be confidential. Only the researcher and her Northeastern University faculty advisor will know your identity. You will be referred to by a pseudonym throughout the research process. Your identity will not be connected to your statements on any document. The identity of the district and school will also be referred to with pseudonyms.

You can refuse to answer any question during the interview. The interview will be recorded and transcribed word for word by the researcher. Some of the statements you make may be included in a published report. The published report will not use information that can identify you as a part of this project. You do not have to answer any question if you feel uncomfortable. You may listen to the recording and review the transcript of your interview. You may request that statements you make to the researcher be withdrawn. You also have the right to see the final report so that you may identify things that are not fair or correct.

Digital files that state your identity, such as the record of the interview and this consent form, will be kept in secure locations. Paper files will be kept in a locked cabinet in a locked door within the researcher’s office. The files that contain your identity will be destroyed at the end of the study. Northeastern University staff may ask the researcher to see information about you. They may do this to make sure you are protected.

Even if you begin the study, you may quit at any time. If you do not participate or if you decide to quit, you will not lose any rights or benefits that you would otherwise have.

If you have questions or problems with this research you may contact Debra L. Pincince. Debra’s email address is pincince.d@husky.neu.edu and her phone number is 774-276-0358. You may also contact Dr. Kelly Conn, the principal researcher, at 857-205-9585. Dr. Conn’s email address is k.conn@neu.edu.

If you have any questions about your rights as a person involved in this study you may contact Nan Clark Regina. Ms. Regina is the director of Human Subject Research Protection at Northeastern University. Ms. Regina’s telephone number is 617-373-4588; her email address is n.regina@neu.edu. You may contact Ms. Regina without saying your name.
Informed Consent Form for Assistant Superintendent

**Northeastern University:** College of Professional Studies, 50 Nightingale Hall, 360 Huntington Avenue, Boston, MA 02115-5000

Human Subject Research Protection, 960 Renaissance Park, Boston, MA 02115-5000

Thank you,

Debra L. Pincince

I have read this form. I understand the content of this form. I voluntarily agree to participate in this research.

______________________________________________
Signature of person agreeing to take part

______________________________
Date

______________________________________________
Printed name of person above

______________________________
Date

______________________________________________
Signature of person who explained the study to the participant above and obtained consent

______________________________
Date

______________________________________________
Printed name of the person above

______________________________
Date
APPENDIX D

Teacher Interview Protocol: Participation in Professional Development and its Role in the Implementation of Differentiated Instruction in the Middle School Classroom

Time of Interview:

Date:
Place:
Interviewer:
Interviewee:

Questions:

1. Please tell me about yourself and your teaching experiences. (i.e. Educational background, previous teaching experiences, etc.)
2. What process was used to develop the mandatory, district-wide differentiated instruction course for all nonprofessional teachers during their first three years of employment?
3. In the planning stages, what were the critical elements that became the basis for the course?
4. What year did you participate in the district-wide differentiated instruction course?
5. Please describe the process the instructor used to teach the differentiated instruction course?
6. If I asked you to reflect on and describe how participation in the differentiated instruction course has impacted your teaching, what would you tell me?
7. Describe the successes, if any, that you may have encountered as you have incorporated the differentiated instruction strategies into your teaching repertoire.
8. Describe the obstacles, if any, that you may have encountered as you have incorporated the differentiated instruction strategies into your teaching repertoire.
9. How do you think participation in the differentiated instruction course can potentially impact student MCAS scores in English language arts/mathematics?
10. What could be done to improve the district-wide differentiated instruction course?
11. Is there is anything else that you would like to share regarding the district-wide differentiated instruction course?

Prompts: Previously, you stated __________. Can you tell me more about that?

I’d like to go back to your statement about __________. [Connect that statement to the next question to re-focus the interview.]

Thank you for participating in this interview. All responses will be kept confidential.
APPENDIX E

Assistant Superintendent Interview Protocol: Participation in Professional Development and its Role in the Implementation of Differentiated Instruction in the Middle School Classroom

Time of Interview:
Date:
Place:
Interviewer:
Interviewee:

Questions:

1. Please tell me about yourself and your professional experiences. (i.e. Educational background, previous teaching/administration experiences, etc.)
2. What process was used to develop the mandatory, district-wide differentiated instruction course for all nonprofessional teachers during their first three years of employment?
   a. Probe: What were the critical elements that became the basis for the course?
3. What year(s) did you teach in the district-wide differentiated instruction course?
4. Please describe the process you used to teach the differentiated instruction course?
5. What component of the differentiated instruction course do you believe is most beneficial for participants?
6. Describe any obstacles that you believe teachers may have encountered as they incorporated the differentiated instruction strategies into their teaching repertoire.
7. How do you think participation in the differentiated instruction course can potentially impact student MCAS scores in English language arts/mathematics?
8. What could be done to improve the district-wide differentiated instruction course?
9. Is there is anything else that you would like to share regarding the district-wide differentiated instruction course?

Prompts: Previously, you stated __________. Can you tell me more about that?

I’d like to go back to your statement about __________. [Connect that statement to the next question to re-focus the interview.]

Thank you for participating in this interview. All responses will be kept confidential.