THE EFFECT OF DIFFERENTIATED INSTRUCTION PROFESSIONAL DEVELOPMENT ON RESPONSE AND ENGAGEMENT IN THE MIDDLE SCHOOL CLASSROOM

by

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ABSTRACT

AMANDA KENNEDY MACON. The effect of differentiated instruction professional development on response and engagement in the middle school classroom. (Under the direction of DR. COREY LOCK)

This case study examined the effects of a one-day differentiated instruction professional development on teacher implementation and student engagement. All schools provide professional development for teachers and expect student engagement in the classroom; how the training is structured, funded, and implemented is typically up to the school. The data collected focused on implementation of the differentiated instruction strategies presented, teacher views on differentiated instruction, and student engagement. Teacher surveys, teacher interviews, student surveys and classroom observations were used to determine impact of the one-day professional development on student engagement in the classroom.

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CHAPTER I: INTRODUCTION

Young people today live in a world that is more personalized – at least outside of school – than ever. They can watch particular television shows when they want instead of when they are broadcast, they can purchase a single song rather than an entire album, and most technology is personalized to their needs, usage, and style. In some schools, however, students are taught as a single mass as though their readiness, variance, and preferences do not matter. "It is becoming increasingly difficult to pretend that batch processing of a vastly diverse student population supports them as learners or that we are preparing them for productive citizenship in a world with complexities, uncertainties, and challenges that demand the very best from each of them" (Tomlinson & Imbeau, 2010, p. 4).

National organizations that support teachers and establish standards for their practice specifically address the need for each and every teacher to plan and deliver curricula that meets the need of individual students in their classrooms. The Interstate New Teacher Assessment and Support Consortium (INTASC) Standards state that teachers use the understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards and that teachers must understand and use a variety of instructional

strategies to encourage learners to develop a deep understanding of content (Council of Chief State School Officers, 2011). The National Board for Professional Teaching

Standards state that National Board Certified Teachers (NBCTs) are dedicated to making knowledge accessible to all students, they assess the progress of individual students as well as the class as a whole, and they recognize individual differences that distinguish their students from one another and take account of these differences in their practice (2010). The National Middle Level Association's *Keys to Educating Young Adolescents* states that students and teachers should be engaged in active, purposeful learning and curriculum should be challenging, exploratory, integrative, and relevant (2010). These collective voices make the case that all differences matter and quality education is not present without these being recognized and incorporated into the curricula delivered in classrooms.

Curriculum is not a set of standards or a textbook. A high quality curriculum begins with an in-depth understanding of the discipline and includes a clear delineation of the essential knowledge students should have and skills they should possess at the end of the specified unit of study. While curriculum must include state or federal mandates, it also must include a carefully planned sequence of learning experiences that are designed to engage all students with the content and ensure success with the essential knowledge, understanding, and skills (Wiggins & McTighe, 2005). Curricula delivery in classrooms should be designed to engage students; it should have the ability to connect to their lives and positively influence their levels of motivation (Coleman, 2001; Hall, 2002). Each student is not motivated by the same outcomes and is not engaged by the same experiences. In order for classrooms to be a positive learning environment for every

student, teachers need to know each student and have a toolbox of strategies, resources, and experiences to implement in their classroom to meet the needs of their students.

Tomlinson and Imbeau (2010) describe differentiation as "classroom practice with a balanced emphasis on individual students and course content" (p. 14). At the core of the classroom practice of differentiation is the modification of four curriculum-related elements – content, process, product, and affect – which are based on three categories of student need and variance – readiness, interest, and learning profile. These elements must be shaped and cultivated to provide opportunities for every student to maximize his or her learning capacity. Earl (2004) stated, "Differentiation is making sure that the right students get the right learning tasks at the right time. Once you have a sense of what each student holds as 'given' or 'known' and what he or she needs in order to learn, differentiation is no longer an option. It is an obvious response" (pp. 86-87). This state of knowing one's students allows for the teacher to plan learning experiences that are not only geared toward each student's academic ability but taps into their interests and sources of motivation.

Engagement and motivation are particularly important educational constructs because they function as multidimensional pathways to connect students' emotional states to their sought-after educational goals and overall achievement (Skinner, Kindermann, Connell, & Wellborn 2009; Skinner, Kindermann, & Furrer, 2009). Engagement is a manifestation of motivation; one is not present without the other. Educational outcomes of engagement and motivation include better developed skills, achieved educational outcomes, and academic progress in general.

Engagement refers to a student's active involvement in a learning activity (Christenson, Reschley, & Wylie, 2012). It is a multidimensional construct and for this study is discussed consisting of four distinct, yet intercorrelated and mutually supportive aspects of behavior, emotion, cognition, and agency (Reeve, 2013; Reeve & Tseng, 2011). Behavioral engagement refers to how fully students are involved in the learning activity in terms of attention, effort, and persistence (Skinner, Kindermann, & Furrer, 2009). The extent of emotional engagement refers to the presence of positive emotions during task involvement such as interest and the absence of negative emotions such as anxiety. Cognitive engagement reflects how strategically the student attempts to learn using sophisticated learning strategies or higher order thinking (Walker, Greene, & Mansell, 2006). Agentic engagement is the extent of the student's constructive contribution into the flow of the instruction they receive in terms of asking questions, expressing preferences, and letting the teacher know what they need and want in the classroom (Reeve, 2013).

In the school setting, motivation is the process whereby students initiate and persist in classroom activity (Schunk, Pintrich, & Meece, 2008). In order to motivate students in the classroom, their needs, expectations, beliefs and goals must be brought into the teaching process and therefore the learning experiences. Motivation is multidimensional just like engagement and in this study includes the following constructs: psychological need satisfaction, self-efficacy, and mastery goals. Each of these aspects of student motivation is well-defined, highly studied, and conceptually distinct (Covington, 2000; Schunk et al., 2008). Psychological need satisfaction focuses on students' self-report of high class-specific levels of perceived autonomy, competence

and relatedness. Students who score high in this area are positive about their learning, development, and psychological well-being (Deci & Ryan, 1985; Ryan & Deci, 2000). Students self-reporting high levels of self-efficacy have high and resilient expectations in their capacity to cope with and master academic challenges in the classroom (Bandura, 1997; Multon, Brown, & Lent, 1991; Schunk, 1991). Self-reporting high scores in mastery goals describes students who participate in learning activities with the goals to learn new things or to develop and improve their competencies (Ames & Archer, 1988; Elliott & Dweck, 1988). When students are highly motivated, they should be more engaged in the classroom and consequently have higher academic achievement.

National organizations for the advancement of teacher education and student achievement recognize the personalized state of student environments outside of the classroom and the benefits of moving those individualized aspects into the educational process. Curricular elements of content, process, produce and affect must be modified based on student readiness, interest, and learning profile. Using these characteristics of individual students to create curricular experiences where students are successful can lead to higher motivation (psychological need satisfaction, self-efficacy, and mastery goals) and engagement (behavioral, emotional, cognitive, and agentic). Companies have emerged throughout the educational landscape who have crafted professional development programs, books, or sets of materials to help educators understand the whole child, identify the differences among children in a single classroom, and to incorporate differentiated instruction to improve instructional practice. Time To Teach© is one such company and they have produced a single-day professional development module to address these concerns. *Differentiated Instructional Strategies for Student*

Motivation and Engagement was written by a state Teacher of the Year drawing on his experiences and research. The professional development module is focused on presenting a variety of strategies to engage students though an increased number of opportunities to respond to instruction and through incorporation of multiple viewpoints to tap into student background and interests.

Purpose of the Research

The purpose of this case study was to examine the implementation of a one-day professional development session on differentiated instruction in a suburban middle school. *Differentiated Instructional Strategies for Student Motivation and Engagement* is a professional development program which presents multiple strategies to differentiate instruction in individual classrooms. This program claims to increase engagement and motivation in the P-12 classroom. The goal of the professional development program is to introduce teachers to a variety of strategies used to differentiate instruction and increase the number of times teachers solicit responses from students in the classroom. The focus of this study was to examine the impact of this one-day professional development session on differentiation strategies on the engagement of middle school students in the classroom. This study was conducted in middle school social studies classrooms and data were collected by a student self-report survey, teacher survey, and classroom observation.

Significance of the Study

Most school districts in the United States define grade six as the official start of the middle grades. This definition reflects the fact that, despite the more than 30 grade spans found in the schools attended by early adolescent students in the United States, more early adolescent students attend a Grade 6 to 8 middle school than any other school

type (Epstein & MacIver, 1990; Valentine, 2004). As a result, entry into sixth grade corresponds with a school transition for a majority of the students. Further, regardless of the grade span of the school they attend, in many districts sixth graders must adapt to a host of changes such as more departmentalized staffing, larger class sizes, different assessment, grading, testing, and reporting practices, and more challenging and complex instructional programs that begin in the middle grades (Epstein & MacIver, 1990). Consequently, middle school teachers, in particular, need a wide variety of instructional strategies to help reach each middle level learner.

Middle grades students face more complex distractions (bullying, alcohol use, peer pressure, etc.) than when they were younger and they are often recruited into roles that interfere with school involvement (Bowen & Bowen, 1999; Halpern-Felsher et al., 1997; Kowaleski-Jones, 2000). This combination of becoming an adolescent and moving into new organizations of schools with more complex academic and social demands create unique conditions that can push students off the path to achievement and require proactive interventions in the middle grades (Balfanz, Ruby, & Mac Iver, 2002; Ruby, 2002; Useem, Offenberg, & Farley, 2007). In short, students entering the middle grades can experience a range of pull-and-push factors that may promote disengagement from schooling. Therefore teachers must be armed with strategies and desires to motivate and engage students in their classrooms. This study involved 6th, 7th, and 8th grade student classrooms and their teachers.

For some students, disengagement and lack of motivation can lead to dropping out of school later, while still others remain in school physically but have dropped out mentally. These students attend school because in many places it is the law, but they have

disengaged and disconnected with the academic goals and processes in the classroom. They feel that who they are and what they want to become does not matter to teachers and schools. The success of all students should be the primary goal of schools but while students are required to fit into the restrictive school structure, culture, and curriculum, many schools do little to adjust their environment to meet the needs and desires of individual students. Some disengaged students may, ultimately, graduate from high school; their diploma reflects a minimum level of competency rather than the true level of engagement and readiness they may or may not possess for the workforce or postsecondary education.

Just as schools have high expectations for students, young people and their families have high expectations for the schools they attend. Washor and Mojkowski (2010) have identified many expectations of these stakeholders: relationships, relevance, choice, challenge, authenticity, application play, practice, time and timing. These expectations and the resulting engagement must be addressed instead of attempting to only address the issue of students dropping out of school. These expectations must be addressed at the district, school and classroom level. Teachers have a great responsibility to consider these and how they do or should impact classroom practice.

One way to increase motivation and engagement is to increase the success of students in the school building. When students feel successful, they are more motivated to work in the classroom and become more engaged. For some teachers, creating this type of environment that encourages success, motivation, and engagement comes natural and for others it takes concentrated efforts and professional development to increase these aspects of the classroom. Teachers may share best practices or directives may be given by

an administrative team but an external expert may be needed to provide some professional development on instructional strategies to engage and motivate students.

One professional development program, *Differentiated Instructional Strategies for Student Motivation and Engagement,* is comprised of a set of instructional strategies teachers can implement in their classrooms. This shows teachers how to increase the number of opportunities to solicit responses from students in connection to the content. The author of this professional development module compacted the learning for teachers (an overview of differentiated instruction, the need for a change in classroom practice, examination of instructional strategies, and application of strategies for teachers) into a one-day professional development module. Time is one of the barriers for implementing meaningful professional development in the schools: presenters often must be paid for their time, teachers take time out of their professional workdays to attend, or teachers take time out of their classrooms. This study examined the impact in classrooms of teachers who participated in this one-day professional development to determine if student engagement and opportunities to respond provided by teachers changed.

Research Questions

The main research question was this: How does the implementation of a one-day professional development program assist teachers to provide more opportunities to learn and engage students in an economically diverse suburban school in the southeastern US? Data was collected to answer the following three sub-questions:

1. After attending this professional development, do teachers change the number of times they solicit student response to the content?

2. After attending this professional development, do teachers change how they implement differentiated instruction?

3. Are there measurable changes in student off-task behavior and engagement following teacher participation in the program?

Plan of Study

This study measured the impact of *Differentiated Instructional Strategies for Student Motivation and Engagement* on engagement and motivation of students in social studies classrooms in a suburban middle school in the southeastern United States. This descriptive study collected student quantitative data through self-report surveys and classroom observations. Classroom observation data was two part: one, opportunities teachers solicited responses from students and two, observations of student off-task behaviors. Quantitative data from surveys used Likert scales. Qualitative data was also collected though teacher interviews regarding their perception of the professional development, their implementation, and their perception of student engagement changes. A chart summary of research questions and data collection is below in Figure 1.

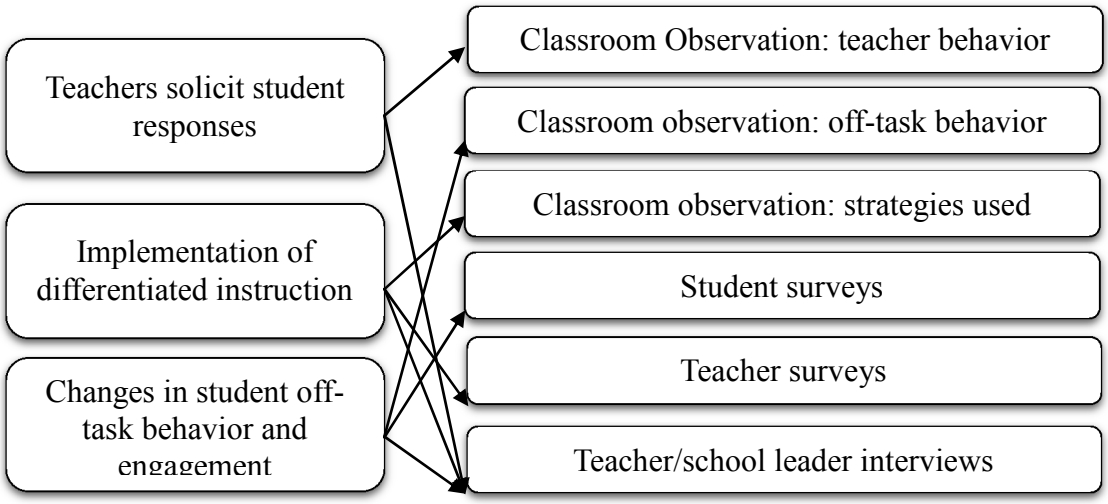

Figure 1: Research sub-questions and data collection methods.

Delimitations

Delimitations are choices that describe the boundaries set for the study; the following parameters were established as delimitations:

(1) Only social studies teachers were included in the study because math and English classrooms utilized a workshop model of instruction; further, the administrator in the building requested a focus on social studies classrooms based on her prior observations of those classrooms.

(2) A sample size of six teachers was chosen.

(3) The professional development was limited to one day, not unlike many other professional development sessions in schools. Follow-up was limited to observations in the classroom and surveys from teachers and students. This allowed the analysis to focus on the effect of this professional development as it was designed.

(4) This professional development occurred after the first quarter of the academic year, after classroom procedures and routines has been established. After attending the professional development, teachers should have been able to implement the 15 strategies without drastically changing current classroom procedures.

Limitations

Limitations are influences that the researcher could not control that limit the ability to generalize findings from the data. The following instances were limitations that occurred within the study:

(1) The only content area studied was Social Studies. In the proposal phase, both science and social studies were identified as possible content areas for study but the building administrator identified six social studies teachers as subjects for the study.

(2) Two teachers were unavailable for pre-treatment interviews and one teacher was unavailable for a post-treatment interview.

(3) When the professional development was presented, four of the strategies (Socratic questioning, synectics, exhaustive brainstorming, and nominal group techniques) were omitted from the presentation, and matrix planning was only mentioned due to time constraints. This reduced the number of strategies teachers received in the training. The training lasted from 9:00 AM to 4:00 PM.

(4) The survey instrument used for students was modified from an instrument used with high school students.

Assumptions

The following assumptions were made within the study:

(1) Students truthfully self-reported answers to the engagement survey.

(2) Teachers fully participated in the professional development session.

(3) Teachers applied the professional development to their classroom.

(4) Teachers honestly participated in the post-intervention interview.

Definition of Key Terms

1. Agentic engagement - Extent of a student's constructive contribution into the flow of the instruction he or she receives (ex: student offers suggestions, asks questions, expresses interests, preferences, and likes)
2. Behavioral engagement - Extent of a student's on-task attention, effort, intensity and persistence in the face of difficulties (ex: student shows high on-task attention and concentration, high effort, and high persistence)
3. Cognitive engagement - Extent of a student's cognitive and metacognitive strategies that involve meaningful (i.e. elaborative) processing attempts to connect or integrate new information with existing knowledge in an effort to form a richer, more coherent mental representation (ex: student is planful and strategic with learning; student monitors, checks and evaluates work)
4. Differentiated instruction – Classroom practice with a balanced emphasis on individual students and course content
5. Disruptive behaviors – Anything that stops the flow of instruction in the classroom such as student teasing others, verbally or physically fights, temper tantrum, yells, fails to finish tasks, dawdles in obeying rules, etc.
6. Drop schedule – Schedules reflect a drop of one class per day. In a middle school with four academic classes per day, a student would attend three classes per day and rotate the missed class (ie. Monday – ABC, Tuesday – BCD, Wednesday – CDA, Thursday – DAB, Friday – ABC, Monday – BCD, etc)

7. Emotional engagement - Extent of a student's positive emotions during learning activity, such as interest and enjoyment, and absence of negative emotions, such as boredom and sadness (ex: students shows frequent and strong positive emotions (interest, joy and curiosity) and infrequent negative emotions (anger, boredom, and discouragement))
8. Engagement – Student behaviors exhibiting involvement or interest in their learning and how connected they are to their classes
9. Mastery global (motivation) - Goals to develop competence by improving, learning and making progress (ex: student is focused on the goals of developing high competence and mastering tasks)
10. Motivation – A student's willingness, need, desire, and compulsion to participate in, and be successful in, the learning process
11. Psychological need satisfaction motivation - Experiences of autonomy, competence and relatedness that generate the desire to interact with the environment to advance personal growth, social development and psychological well-being (ex: student shows high confidence, high perceived relatedness and sense of autonomy)
12. Self-efficacy (motivation) - Belief in one's capabilities to organize and execute the courses of action required to produce given attainments (student shows high self-confidence in being able to master class-specific challenges, low anxiety, and low doubt)

13. Workshop model – Method of instruction where teachers act as a mentor with limited direct instruction in the form of mini-lessons at the beginning of each workshop followed by a minimum of 45 minutes of active student work

Summary

Student motivation and engagement are directly correlated with student achievement and persistence in school. This case study examined the effect of a one-day professional development for teachers on student engagement in their classrooms through data collected including student self-report surveys, classroom observations, and teacher interviews. Through analysis, the study found that student engagement can be influenced by the instruction in the classroom and that instruction can be impacted by brief professional development exposure.

CHAPTER II: LITERATURE REVIEW

Classrooms are not static environments where students and teachers can move from day to day without adjustment for learning based on experiences, motivation, and engagement. Student experiences and prior learning impact the functions in the classroom and must be factored in the way lessons are planned and delivered. This literature review focused on motivation, engagement, and achievement in the classroom and the role of differentiated instruction. Differentiated instruction is a way teachers can address differences and changes in the way students learn and interact in the classroom. While these changes are particularly important and have been found to positively impact learning for middle school students, finding the time to train teachers in new methods and for teachers to implement a variety of new or different strategies can be difficult.

The literature review begins with the history, importance, and impact of professional development for teachers. The review presents the need for teacher professional development as linked to the changing needs of students and schools. Differentiating instruction is one avenue through which teachers assist all students and makes content relevant and accessible. Differentiated instruction, in this study, focuses on student readiness, student interest, and student learning profiles. The literature review provides a link between student motivation and engagement and student achievement.

Research Questions

This study sought to answer the question, How does the implementation of a one-day professional development program assist teachers to provide more opportunities to learn and engage students in an economically diverse suburban middle school in the southeastern United States? Data was collected to answer the following three sub-questions:

1. After attending this professional development, do teachers change the number of times they solicit student response to the content?

2. After attending this professional development, do teachers change how they implement differentiated instruction?

3. Are there measurable changes in student off-task behavior and engagement following teacher participation in the program?

Professional Development

Early literature indicates that professional development started as individual pursuits to increase the effectiveness of teacher practice where the teacher deemed necessary. Not until after the launching of Sputnik in 1957 was professional development more organized and focused. The National Defense Education Act in the 1960s emphasized the need for more math, science, and foreign language teachers and provided more opportunities for professional learning of teachers following their initial teacher education program. Most of this professional development involved basic teaching principles and focused on a factory-driven model of education (Ravitch, 1983).

A Nation At Risk, published in 1983, called out ineffective schools and made professional development for teachers a key component in bringing about positive change

in the schools. Similarly, the *No Child Left Behind Act* (NCLB) of 2001 emphasized the importance of professional development to build competency of teachers in multiple parts of the report. Eaker, DuFour, and Bennett (2004) added ideas to the research base to include the implementation of professional learning communities as a mode of professional development or as a place where teachers can discuss application of provided professional development. A recent reform of professional development practices calls for teachers to request and create professional development through collaboration and reflective practices (Dufour, 2007). "If our aim is to help students become lifelong learners by cultivating a spirit of inquiry and the capacity for inquiry, then we must provide the same conditions for teachers" (Sergiovanni, 1996, p. 52). This cross-fertilization of good practice establishes an environment of shared success and collegiality with the common goal of increasing student achievement. Ironically, it was individualized instruction for teachers.

Glatthorn (1995) stated that "teacher development is the professional growth a teacher achieves as a result of gaining increased experience and examining his or her teaching systematically" (p. 410). Speck and Knipe (2001) suggested that professional development is synonymous with professional teaching in that it is lifelong collaborative learning that continually nourishes the growth of educators. They also emphasize that professional development should be learner-centered and embedded in the daily work of educators. Guskey (2000) defined professional development as processes and activities that enhance educators' professional knowledge, skills and attitudes that lead to improved student learning. Chambers, Lam, and Mahitivanichcha (2008) define professional development as "all activities that help education professionals develop the skills and

knowledge required to achieve their school's education goals and meet the needs of students" (p.4). Therefore, professional development is designed to effect change in student outcomes through changes in teachers' practice.

Professional development may take on many forms depending on who is delivering it, the time constraint, and the desire of the participants. Many definitions include a formal experience such as attending workshops, reading professional publications, participating in an online course, and informal forum participation. While contemporary models of high-quality professional development vary widely in their content and format, many share a common purpose: to alter the professional practices, beliefs, and understandings of school persons toward an articulated end. No matter which definition of professional development is used, the end result should be improved student learning.

A goal of professional development is to enable teachers to increase their individual professional capacities and if they do that, then student learning will increase (Cohen & Hill, 2000; Guskey, 1996). While this seems logical, it has not been the case for many schools. "Unfortunately professional initiatives have been criticized for their failures to produce significant changes in either reaching practices or student learning" (Feist, 2003, p. 30). A particular target for criticism is the one-day workshops that often make teacher professional development "intellectually superficial, disconnected from deep issues of curriculum and learning, fragmented, and noncumulative" (Cohen & Hill, 2000, pp. 3-4). Professional development is also often a patchwork of multiple initiatives without a common strand, formal and informal, required and voluntary, planned and disorganized. These pitfalls are compounded by some teachers resistance to let go of their

own practices to adopt novel approaches to teaching (Cuban, 2001). Even with criticisms, professional development is noted as essential and even mandated by some initiatives.

Characteristics of Effective Professional Development

Recognizing the short supply of high quality professional development opportunities available for teachers, the No Child Left Behind Act of 2001 mandated that teachers receive high quality learning opportunities. Schools identified for improvement must spend at least 10 percent of their Title I Part A funds on professional development for the school's teachers and principal that directly address academic achievement. These professional development experiences must meet five criteria:

1. It is sustained, intensive, and content focused.
2. It is aligned with and directly related to state academic content standards, student achievement standards, and assessments.
3. It improves and increases teachers' knowledge of the subjects they teach.
4. It advances teachers' understanding of effective instructional strategies founded on scientifically based research.
5. It is regularly evaluated for effects on teacher effectiveness and student achievement. (NCLB 2002)

Douglas Reeves (2010) defines three essential characteristics of high impact professional learning as (1) a focus on student learning, (2) rigorous measurement of adult practices, and (3) a focus on people and practices, not programs. The link to student learning happens at the classroom level. Teachers must be able to see the direct impact of professional learning in their classrooms through student learning outcomes from specific teaching strategies. Reeves' second characteristic focuses on the observation of adult

practices that influence student learning outcomes. The final characteristic reminds those who plan and implement professional learning to focus on practices, not fads and programs. Teachers must have some buy-in with the content being delivered or it will never be implemented in their classrooms.

Research suggests that professional development should focus on teachers as learners and as intrinsically motivated participants improving their own craft. The focus should be on improving their learning in order to facilitate increased student learning (Darling-Hammond, Wise, & Klein, 1999). Most teachers accept professional development sessions as means of enhancing their skills and strategies but others are more reluctant to accept outside help. The resistance may come from a distrust of the presenter, lack of confidence in their ability to implement, or simple unwillingness to change.

Guskey and Yoon (2009) completed an analysis of nine successful studies on professional development that had positive effects on student learning outcomes. The purpose of their analysis was to extract common characteristics of these successful professional development activities. While workshops have sometimes been criticized, all nine studies included some form or workshop or summer institute. The workshops focused on the implementation of research-based instructional practices, involved active-learning experiences for participants and provided opportunities to adapt the practices to their unique classroom situations. The second commonality between the professional development experiences that produced increases in student learning outcomes was the incorporation of an outside expert. These experts were either program authors or researchers who presented ideas directly to teachers and then helped facilitate

implementation. None of the successful efforts were train-the-trainer approaches, peer coaching, collaborative problem solving, or other forms of school-based professional learning. Time was the third common factor relating to student learning outcomes. Initiatives of 14 or more contact hours that were well organized, carefully structured, purposefully directed, and focused on content and/or pedagogy were most effective.

Impact of Professional Development on Student Learning

Virtually all studies in the Guskey and Yoon research (2009) that showed a positive improvement in student learning outcomes included some sort of follow up after the main professional development session. This analysis of studies also confirmed the position taken by the National Staff Development Council (2001) that the most effective professional development comes from adapting various activities to specific content, process, and context learned in the professional development. There is not a list of "best practices" to use when presenting professional development to educators. Content was the other aspect reviewed in these studies. Student learning outcomes increased for all professional development projects when the material presented was focused on content or pedagogy. The activities were designed to help teachers better understand what they teach and how to present it better for their students. All of the studies allowed for teacher discretion in implementing the content and practices dependent on the students served by the teacher. The intent of this analysis is not to discredit other forms of professional development (coaching, problem solving, or school led initiatives), but to highlight the lack of reliable, valid, and scientifically defensible data to show they work. In summary, "educators at all levels need just-in-time, job-embedded assistance as they struggle to

adapt new curricula and new instructional practices to their unique classroom contexts" (Guskey & Yoon, 2009, p. 498).

In another report focused on the same nine studies, Yoon et al. (2007) discussed the specific effects of professional development on student achievement. The report discusses the fact that translating teacher professional development into student achievement is desirable, makes sense and is logical but is quite challenging. Researchers must establish that there is an empirical link between professional development and student achievement by establishing two points. The first is that there are links among professional development, teacher learning, teacher practice and student learning; the second is to establish that the evidence of those links is of high-quality. The study assumes that professional development affects student achievement through three steps: professional development enhances teacher knowledge, better knowledge improves classroom teaching, and improved teaching raises student achievement. In the nine studies reviewed, average control group students would have increased their achievement by 21 percentile points if their teacher had received professional development.

In one three-year study, Canadian scholars researched the application and effects of differentiated instruction in K-12 classrooms in Alberta. They found that differentiated instruction consistently yielded positive results across a broad range of targeted groups. Compared with the general student population, students with mild or severe learning disabilities received more benefits from differentiated and intensive support, especially when the differentiation was in small groups or with targeted instruction (McQuarrie, McRae, & Stack-Cutler, 2008).

Professional development topics and trends have changed over the years from a focus on teacher delivery methods, data analysis, and incorporation of learning styles to cooperative learning, but the focus while sometimes perhaps indirectly has been to ultimately improve student achievement. Garet et al. (2001) summarized the relationship between professional development and student achievement by stating, "Teacher professional development can improve student achievement when it is focused on teacher knowledge, subject matter, standards, assessments, and how students understand and learn" (p. 192).

"Despite the growing body of literature that supports the relationships among staff development, teaching quality, student learning, and student equity, some educators and policy makers question the value of providing time and resources for professional learning" (Killion, 1999, p.9). There are direct correlations to the increase of student achievements when teachers experience high quality professional development that focuses on contents, understanding diverse students, and traits of high quality teaching, (Elmore, 1997; Yoon et al., 2007). Teachers in Japan, Switzerland, Germany, China, and other countries received an average of 10-20 hours a week for professional development. "Teachers have time each day or week when they do not work with children but, instead, plan curricula, lessons, and evaluate on another's teachings" (McRobbie, 2000, p. 6). Unlike our international counterparts, in 2000 the average teacher in the United States received an average of one day's worth professional development a year.

The National Staff Development Council, the United States Department of Education and other researchers agree that when appropriate, teachers should receive external assistance to strengthen the development of the skills and knowledge acquired

through active participation and reflection through targeted professional development (Elmore, 1997; Killion, 2001; NSDC, 2001; SEDL, 2009).

Differentiated Instruction

Typical classrooms today are made up of students who have a wide variety of individual differences. When students are assigned to a classroom based on common age or years of education, they usually find themselves in a room with students of varied learning abilities, learners more advanced or remedial than they are, students from diverse cultures, students with different economic backgrounds, motivated and unmotivated students, students with a variety of interests, students who fit multiple categories and those with varied preferred modes of learning. It is projected that by 2035, students of color will be a majority in our schools and half of all children will have lived in single-parent homes at some time during their school years (Sapon-Shevin, 2000). The complex culture of these "typical" classrooms is intensified by the emphasis on promoting educational equality for students who might otherwise find themselves in low-expectation environments, an emphasis on mainstreaming special needs students, reduction of separate programs for gifted students, and the push for enhanced literacy instruction for all learners in the regular classroom (Allington, 2003). These shifts push the responsibility for responding to the variety of learning needs to the regular teacher instead of organized services or settings. These changes call for teachers to adjust curriculum, materials, and support to ensure that each student has equal access to high-quality learning (Darling-Hammond, Wise, & Klein, 1999; Schoenfeld, 1999). Empirical studies suggest that both pre-service teachers and in-service teachers view student

differences as problematic rather than as an inevitable phenomenon that offers positive possibilities to the classroom (Paine, 1990; Tomlinson, Callahan, Tomchin, et al., 1997).

In the inclusive classroom where all students receive high-quality education, teachers must be prepared to provide instruction tailored towards each student's readiness level, interests, and learning preferences, enabling them to maximize the learning for each and every student. Even when pull-out services, like English as a Second Language, special education, enhanced reading instruction, or gifted education are available, it is likely that most of the learners in these programs will spend the bulk of their school careers in regular education classrooms.

In order to maximize the learning in such diverse classrooms, a teacher must approach teaching and learning for students by meeting each student where they are rather than expecting students to modify to fit the curriculum. Teachers should provide students multiple options for taking in information and making sense of ideas. This is the general definition of differentiated instruction used by researchers at the National Center on Accessing the General Curriculum (Hall, 2002). It is probably no surprise that the initial design and development of differentiated instruction as a model began in the general education classroom. The initial application was for students considered to be gifted and who were not significantly challenged in the regular classroom setting. As classrooms have become more diverse with inclusion students and the reality of diversity in public schools, differentiated instruction has been applied to all levels for students with all abilities, learning modalities, and interests (Hall, 2002).

If the goal of the teacher is to ensure that every student is presented with quality instruction given the variety of students learning in one classroom, the paradigm must

shift from a teacher-centered lesson and teacher-planned curriculum to one that is responsive to the variety of differences in the student make-up and that is responsive to the varied needs of the students. Classrooms must be places where rigorous intellectual requirements characterize the curriculum and each student is known well and taught with appropriate means (Mehlinger, 1995). It is no longer a question of whether or not teachers will respond to the diversity in their classrooms but rather a decision of how. Teachers in this ever-changing environment of the modern classroom will have to learn to develop classroom routines and curricular practices that address, rather than ignore, learner variance to maximize student learning.

In a survey of high school teachers, Hootstein (1998) found that 90% of respondents believed that addressing academic differences is important or very important. By contrast, 50% of respondents to a nationwide survey of middle school teachers said that they did not differentiate instruction based on readiness, interest, or learning profile because they saw no need to do so (Tomlinson, Moon, & Callahan, 1998). These survey results showcase the classic problem that many teachers know the right thing to help move students forward but they do not all actually follow through with action. Many teachers believe there are differences in student readiness but only part modify their lessons to meet this need. Properly implementing differentiated instruction is one way to address the varied needs of students.

These changes to meet learning needs of students are collectively referred to by most as differentiated instruction. Differentiation is a pedagogical, rather than organizational, approach to modification of instruction. One way of conceiving differentiation is modification of teaching and learning routines to address a broad range

of learners' readiness levels, interests, and modes of learning (Tomlinson, 2001). Differentiation can be defined as an approach to teaching in which teachers proactively modify curricula, teaching methods, resources, learning activities, and student products to address the diverse needs of individual students to maximize learning opportunities for each student in the classroom (Tomlinson, 2001).

Teachers regularly modify instruction based on academic ability because the assessment of these differences are part of the classroom routine and, for the most part, easy to analyze based on classroom products, summative assessments, standardized tests or prior performance in a class. Thinking about the other areas of variety (ie. interests, talents, prior knowledge, learning profile) is more difficult for teachers and therefore not as frequently addressed. Modifications around differences or variety other than readiness are likely to be improvisational or reactive, rather than preplanned or proactive (Hootstein, 1998; Schumm, Vaughn, Haager, McDowell, Rothlein & Saumell, 1995). Teachers seem to be resistant to adapting or modifying materials, planning lessons for individuals, and changing evaluation procedures (Schumm & Vaughn, 1995; Johnsen, Haensly, Ryser & Ford, 2002). Teachers are unlikely to accept strategies that require them to modify materials, change instructional practices, make long-range plans, or adapt scoring criteria (McIntosh, Vaughn, Schumm, Haager, & Lee, 1994). Students may be included in whole class activities but participate to a limited degree. High stakes testing and pressure to cover material in the prescribed curriculum adopted by the school, district, or state likely exacerbates these problems (Schumm & Vaughn, 1995).

Not surprisingly, students who are dually identified with a learning disability and English as a second language or gifted and learning disability, are dually impaired when

differentiation is addressed. These students may be in a separate classroom to meet one of their needs but they are still taught as a homogeneous group, negating their individual needs as learners. When learning is modified or students are assigned to a teacher, the emphasis is likely to be placed on student deficits rather than their strengths (Whitmore & Maker, 1985). Both theory and practice support movement toward classrooms where attention is given to student variance primarily from at least three core areas: student readiness, interest and learning profile (Tomlinson, 2001).

Student Readiness

Vygotsky (1978, 1986) proposed that individual students optimize their learning while in his or her "zone of proximal development." He describes this concept as the distance between the actual developmental level of an individual as determined by their ability to solve problems on their own and the level of potential development as determined by the ability of that same individual to solve problems under adult guidance or in collaboration with more capable peers. This concept informed Vygotsky's argument against academic, knowledge-based tests as means to gauge student intelligence. He argued that it is better to examine an individual's ability to solve problems independently than the ability to solve problems with the help of an adult. Repetition of cycles of assessment, moderate challenge, and success encourage students to sustain their efforts to learn and face more difficult challenges.

Theory related to student readiness suggests that instruction should always be more challenging than an individual's current level of mastery. Therefore, teachers should teach within each individual's zone of proximal development. If material presented is below their level, no learning will occur and if the material is well above

their current level, they will be confused and frustrated. The idea of giving all students the same task with only minor adjustments will likely lead to limited learning because the tasks will be outside the zone of proximal development for many learners.

A complex, multifaceted qualitative study of adolescents suggests that there is a negative impact on student learning when academic tasks were poorly matched to students' readiness levels. Csikszentmihalyi, Rathunde & Whalen (1993) found when students were asked to complete tasks well above their current cognitive ability, there was a decrease in their achievement and feelings of self-worth. They also found when students were asked to complete tasks well below their current achievement level, they disengaged from the task.

Dissertation studies by Brimijoin (2001) and Tieso (2002) investigated student achievement gains in classrooms that were differentiated. In these classrooms, they found achievement gains across socio-economic groups demonstrated in state standardized tests and pretest-posttest.

Student Interest

Just as readiness varies, so does student interest within the classroom as well as over time. Interest-based classrooms are linked to motivation and appear to promote positive impacts on learning both short and long term (Herbert, 1993; Renninger, 1998; Tobias, 1994). Amabile (1996) and Torrance (1995) also indicate that modifying instruction enhances motivation, productivity, and achievement. Tasks that are interesting to students are more likely to lead to enhanced student engagement, a sense that the work is rewarding, greater student creativity, increased student productivity, and a higher level of intrinsic motivation.

It also appears that interest increases a student's sense of competence and self-determination by providing a positive learning environment and a willingness to accept challenge and persist at it (Csikszentmihalyi et al., 1993). Allowing students to work in their area of interest is likely to help them develop a positive attitude about learning (Amabile, 1996). For students who enjoy cognitive tasks at an early age, they tend to continue seeking opportunities to learn. This time of early learning and interest in cognitive processes also proves to be a catalyst for sustaining academic focus during adolescence (Csikszentmihalyi et al., 1993).

Experts suggest that encouraging students to select their own topics for reading, projects, and discussion will likely engage students and improve reading performance (Carbonaro & Gamoran, 2002). It may be particularly important to motivation and learning to promote situational or contextual interest (student voice, novelty, links to prior knowledge, character recognition, etc.) when students do not have strong individual or personal interests (Hidi & Berndorff, 1998). Many teachers ask, "How can I motivate these students?" Instead, teachers should be asking, "What interests this particular student and how can I create an environment that recognizes those interests and motivates each student to learn?" Differentiating tasks based on student interest is a pillar to the full movement of differentiated instruction.

Student Learning Profile

Just as differentiating for students based on readiness and interest, student learning profiles should be used as a variable when planning curricular experiences. Tomlinson (2004) uses the term *learning profile* to refer to a student's preferred mode of learning that can be affected by a variety of factors including learning style, receptivity

modality, gender, culture, and others. These preferences can change based on the learning environment, emotions, interactions, physical needs, time of day, and physical setting (light, temperature, seating arrangement, etc.) (Dunn, 1996). In a meta-analysis, Lovelace (2005), reported that her analysis overwhelmingly supported the position that matching students' learning-style preferences with complementary instruction improved academic performance and attitudes towards learning. She stated that students exposed to learning-styles responsive instruction have an expected success rate of 70% as compared to those taught with traditional instructional methods who had a success rate of 30%.

Culture likely shapes how students think in areas such as the need for doing verses talking, how status is conferred and accepted, the need for affiliation verses achievement, the need for emotional closeness, task orientation, and others. It is important for educators to understand the context in which each student learns and how they will apply that information in order to adjust the environment or experience for each student (Paine, 1990). Studies of the impact of matching students' learning style and intelligence preference have found positive effects for many groups, including Native American, Hispanic, African American, Caucasian, and Asian American students (Ladson-Billings, 1994, Sternberg & Grigorenko, 1997).

Any individual in a classroom may represent several categories of gender, culture, intelligence preference and learning style. The goal of effective instruction must be adequate flexibility in the teacher's mode of presentation and in a student's options for learning and expressing their learning. Differentiation seeks to accomplish this.

Differentiation, therefore, can be used as an extension of effective instructional practice. If the basis from which modification is made is not sound best practice, then the

resulting instruction will not be effective. Tomlinson et al (2004) suggest all differentiation that effectively responds to learners should have the following characteristics:

1. Proactive rather than reactive
2. Employs flexible use of small teaching-learning groups in the classroom
3. Varies materials used by individuals and small groups
4. Uses variable pacing
5. Knowledge centered
6. Learner centered.

Westberg, Archambault, Dobyns, and Slavin (1993) investigated the classroom practices of a national sample of 1,018 public school elementary teachers and found that teachers were not using differentiated instruction strategies very often, if at all. Teachers responded to a survey and reported activities that occurred in their classrooms for both gifted and average students. This study provided insights into what teachers say they do in their classrooms. Teachers reported infrequently providing challenges and choice to both average and advanced learners. The most common concern that arose when educators attempted to differentiate was classroom management. Other studies have shown that to remedy this, professional development should incorporate classroom management into the differentiated instructional strategies (Tomlinson & Allan, 2000).

Ten years later, Westberg and Daoust (2003) revisited their previous study and found that teachers were still not differentiating instruction to any significant degree. The follow-up observation study found that during 92 observation days across five subject areas, in 84% of all activities no differentiation was provided for gifted students. They

determined the primary pedagogical strategies used by teachers were lecture/explanation, review, written assignments and reading. They also noted discrepancies between desired pedagogy and actual pedagogical practices in schools.

Educators must be comfortable with allowing students the opportunity to express their varied solutions, work on different tasks, and function at different levels within the same classroom. Many strategies require mobility in the classroom which, without proper management techniques, can preclude a teacher from successful implementation of differentiated instruction (Tomlinson & Allen, 2000).

Classroom teachers are put under more and more pressure to push their students academically and to increase the student outcomes in their classrooms. The idea of differentiating instruction for each student in the classroom while addressing the broad curriculum required can seem impossible. If the task seems impossible, it is unlikely they will attempt it at all. Research is lacking to give teachers a place to start (gender, ability, learning style/preference, culture) when moving forward with differentiated instruction.

There is also a lack of evidence regarding teacher development models, whether professional development or pre-service teacher preparation, that enable teachers to turn their attention to student variance and to create a classroom conducive to learning for all students. Unfortunately, many teachers do not integrate differentiated instruction strategies into their classroom because they "believe they lack time, professional development resources, and administrative support" (Carolan & Guinn, 2007, p. 1).

Poor performance of students on state-standardized and international assessments often leads researchers to examine the school as a whole to determine cause and to make suggestions for improvement. Some researchers cite the reasons for the poor

performances of American students are factors related to students' socioeconomic levels, lack of high quality instructional materials, and large class size. The United States Department of Education documented additional reasons that include approaches to testing and accountability, governance, curricula, instructional methods, and the recruitment and training of teachers (Koretz, 2009). Teachers are natural targets for parents, politicians, and other stakeholders; they are frequently blamed for the poor performance of students regardless of other influences on students. Achieving higher levels of student understandings require immensely skillful teachers and schools organized to support continuous learning (Darling-Hammond, 1998). The goal of professional development is to address the poor performances of students by training teachers to deepen their content knowledge, improve their instructional practice, and learn more about the students they teach.

If middle school students differ in readiness, interest, and learning profiles, and if a good middle school attempts to meet each student where he or she is and foster continual growth, a one-size-fits-all model of instruction makes little sense. Rather, differentiated instruction seems a better solution for meeting the academic diversity that typifies the middle school years (Tomlinson, 1995). Teachers moving toward differentiated instruction in an inclusive, integrated middle school classroom find greater success if they (1) have a clear rationale for differentiation, (2) prepare students and parents for a differentiated classroom, (3) attend to issues of classroom structure and management as they move toward more student-centered learning, (4) move toward differentiated at a pace comfortable to both teacher and learners, and (5) plan with team members and other colleagues interested in differentiation (Tomlinson, 1995).

To address many of the aspects of differentiated instruction, a program called Time To Teach© contracted with a state Teacher of the Year to create a one-day professional development module so teachers could engage students in the classroom environment more effectively. *Differentiated Instructional Strategies for Student Motivation and Engagement* is a research-based course created to provide teachers with an overview of differentiated instruction and provide them with specific strategies to implement immediately in their classrooms. The course is presented over a six hour professional development session to any person who works with children (teachers, administrators, etc.). There are six pillars of differentiated instruction used in this training for teachers to accept: responsible risk taking, knowing your craft and subject material, knowing your students, sharing success, being a reflective practitioner, and being flexible with implementation. Throughout the six hours of professional development, the trainer presents each strategy, provides examples of how it could be implemented in classrooms with different content areas, then provides application time for each teacher or team of teachers to think about how they could use it in their classroom. The goal of the professional development training is to provide teachers with a rationale and the tools to incorporate differentiated instruction strategies to increase engagement of students in their classrooms.

Motivation & Engagement as Linked to Student Achievement

Motivation is a crucial part of a student's experience with school from preschool forward. It can affect how students approach school, how they relate to teachers, how much time and effort they devote to school, how they attempt to engage with other students, how they perform on assessments, and more. Terrel Bell, former Secretary of

Education, said, “There are three things to remember about education. The first is motivation. The second one is motivation. The third one is motivation” (College of Education, University of Utah, 2014).

While important at all ages, motivation plays a particularly important role during early adolescence in middle school. This is a period of heightened awareness of emerging adulthood where achievement begins to matter. It establishes pathways in high school, career possibilities, and collegiate career trajectories. Upwards of 40% of high school students, depending on the study, are disengaged form learning, are inattentive, exert little effort on school work, and report being bored in school. Motivation and engagement steadily drop as students progress from elementary to middle to high school (National Research Council, 2004). “Adolescents are too old and too independent to follow teachers’ demands out of obedience, and many are too young, inexperienced, or uninformed to appreciate the value of succeeding in school” (NRC, 2004, pp. 18-19). In a 2006 survey of students who dropped out of school, 70% said they were unmotivated (Bridgeland, Dilulio, & Morison, 2006).

In the past, motivation was often conceived as a personal student attribute but now it is recognized that motivation is influenced by external influences (Pintrich & De Groot, 1990). Academic motivation is now typically studied with consideration to the learning environment which refers to the social, psychological and pedagogical contexts in which learning occurs. The teacher is widely recognized as an important determinant of the learning environment. In particular, teachers’ support of students, teacher involvement, and classroom management and organization are often mentioned in teacher effectiveness and classroom environment research as important indicators of the quality

of the learning environment (Opdenakker & Van Damme, 2006; Alton-Lee, 2003). Nicholas (2006) further stated that "motivation will flourish when the classroom environment is sensitive to and effectively promotes positive student-teacher relationships" (Nicholas, 2006, p. 152). Classroom environment research has been conducted from an observer perspective but much is taken from the student perspective. The very same classroom can be perceived as completely different depending on the student's interaction with the teacher. These interactions and their perception have influence on the student's motivation and engagement in school (Ryan & Patrick, 2001).

Wentzel (1997) carried out a longitudinal study of 248 middle school students and found the students' perception of caring by their teachers to be strongly and significantly related to their motivation. Students perceived not only their teacher caring for them as an individual but about the teacher listening, providing feedback, and caring about teaching in this study. This points to the idea that teachers do have impact on student motivation.

Students' beliefs about learning also impact their motivation. One study showed that if a student believes, for whatever reason, that he or she has a limited capacity for learning or feels they are unlikely to succeed, that student will not be as academically motivated (Pintrich, 2003). Another study by Dweck (2010) showed that students who see knowledge as a fixed quantity a person either has or does not have is less likely to be motivated to learn. Multiple studies showed that students who felt like there was a correlation between effort and success were more likely to put forth effort (Murray, 2011; Barry, 2007; Pintrich, 2003).

Lee and Reeve (2012) utilize three categories of motivation in their research: psychological need satisfaction, self-efficacy, and mastery goals. Ryan and Deci (2000)

describe psychological need satisfaction as the extent to which students function positively in the classrooms based on their classroom experience. Students perform at optimal levels of learning, development and psychological well-being when their environment supports their needs for autonomy, competence, and relatedness. Another form of motivation comes from a person's belief in their capabilities. Bandura (1997) identifies this type of motivation as self-efficacy. People who have high self-efficacy have high aspirations, think soundly, set lofty goals and commit themselves to meeting those goals. The final form of motivation studied by Lee and Reeve was mastery goal achievement. Elliott & Dweck (1988) describe students who have high mastery goal achievement motivation as those who continually work to increase their performance and understanding. These students are focused on mastering content, processes, and constant improvement.

Motivation is very difficult to measure outside of student self-report but is more frequently measured as the resulting engagement. Low student engagement in academic school activities can lead to school failure and adverse life outcomes (e.g., dropping out of school early, unemployment, etc.). Student engagement in school is often conceptualized in the quality of students' participation with learning activities or their involvement in academic activities. Many researchers see this engagement as an outward manifestation of a student's motivation (Skinner, Kindermann, & Furrer, 2009). On-task behavior, class participation, and academic behaviors are examples of ways engagement is measured or observed. Other displays of engagement may be emotional in the form of interest, enjoyment, and enthusiasm.

Motivation in the classroom refers to the extent of a students' active involvement in classroom learning activities (Skinner, Kindermann, & Furrer, 2009). Most theorists define motivation as multidimensional and complex. Lee and Reeve (2012) focus their study on four types of motivation: behavioral, emotional, cognitive, and agentic. The extent to which students persist in a learning activity through on-task behavior is labeled as behavioral engagement (Skinner, Kindermann, & Furrer, 2009). To measure student enjoyment, interest, and enthusiasm while focused on an academic task in the classroom is referred to as emotional engagement (Skinner, Kinderman, & Furrer, 2009). Engaging in academic tasks is more than simply being on task and interested in the work. Cognitive engagement refers to the extent to which students plan their work, elaborate on or revise their work (Greene & Miller, 1996). The final area of engagement Lee and Reeve use in their research is rather new to the research base. Agentic engagement refers to the student's contribution to the way the class is structured and influences the flow of instruction to create a more positive and supportive learning environment for themselves (Reeve & Tseng, 2011). Each of the components of motivation contributes to the overall experience of students in classrooms.

Studies have shown that motivation and engagement are related to achievement in reading and math, as well as IQ (Broussard & Garrison, 2004; Gottifried, 1990; Lange & Adler, 1997). In a study of third grade students, Broussard & Garrison (2004) showed students who are intrinsically and extrinsically motivated students had higher achievement levels in both math and reading. It also showed that the relationship between motivation and achievement strengthened with age. Students with high levels of motivation consistently had higher achievement levels and class grades than those with

lower levels of motivation. Lange & Adler (1997) reported that students in third and fifth grades who were intrinsically motivated had higher academic self-efficacy, higher levels of mastery behavior, and higher reading and math achievement. They found that the level of motivation was a predictor of achievement over the effects of ability. They stated that motivation leads to achievement.

Gottifried (1990) reported a similar correlation but maintained that the causal relationship works in the opposite direction. She stated that children with higher academic motivation tend to have higher achievement and IQ, more positive perceptions of their academic competence, and lower academic anxiety. In her study, early achievement more strongly predicted later motivation than the reverse. She speculates that motivation may be predictive of achievement in the longer-term through one of two possible mechanisms. First, motivation is strongly related to achievement, which is highly predictive of later achievement. Second, early motivation is predictive of later motivation, which is strongly related to achievement.

Studies have shown that student engagement is positively related to achievement, and that disengagement leads to poor academic outcomes in a variety of subjects (Glanville and Wildhagen, 2007; Rotermund, 2008). In a review of the Education Longitudinal Study of 2002, Glanville and Wildhagen (2007) and Rotermund (2008) found strong relationships between student engagement and achievement as measured by GPA and test scores. Bempechat et al. (2010) compared higher and lower achievers on engagement and quality of experience when doing their schoolwork. Higher achievers reported not only significantly higher engagement but also greater feelings of understanding and competence when completing their work compared to lower achievers.

High achievers were also more likely to express three types of mastery-related behaviors and habits. They reflected enjoyment over learning new things, were more persistent when working towards achievement, and held themselves to high standards concerning their academic work. Lower achievers invested effort inconsistently, avoided work, failed to see the purpose in working hard on academic tasks, and took their academic tasks much less seriously than high achievers.

As teachers are under pressure to increase the academic achievement of individual students in their classrooms, they should consider the motivation and engagement of students since research has shown to link both aspects of student experience to academic achievement. Classes that include whole class effective instruction and behavior intervention practices are likely to have positive teacher-student interactions and to promote student learning and engagement while minimalizing problem behaviors.

Opportunities to Respond Linked Student Engagement

Engelmann and Carnine (1991) emphasize that the school environment (quality of instruction) is the primary variable that influences student outcomes. Effective instruction is a key component of successful classroom management and includes practices that maximize the likelihood of student participation, active responding, and correct responding while minimalizing errors (Scott et al., 2001). One effective instruction strategy is providing high rates of Opportunities To Respond (OTRs) (Sutherland & Wehby, 2001; Barbetta & Howard, 1993).

Increasing instructional pacing through OTR's is a questioning, prompting, or cueing technique that begins a learning experience. This technique helps to increase the number of active student responses, which can result in the increases in correct responses

and engagement of all students in the classroom. Although OTRs vary in type and characteristic (e.g., individual responses, choral responses, written responses, visual or auditory cues), all types of OTRs generally include the following components:

- Increasing rates of teacher academic language that includes repeated verbal and visual types of prompting for responding
- Presenting information in a way that increases student correct responding
- Frequent checks for understanding
- Individualized instructional modifications appropriate for students' levels of functioning
- Wait time for students to respond
- Corrective feedback, error correction, and progress monitoring (Stichter & Lewis 2006).

When researchers increase rates of OTR, they have found increases in on-task behavior and in correct responses, as well as fewer disruptive behaviors by students (Brophy & Good, 1986; Sutherland, Adler, & Gunter, 2003).

Examples of an OTR are when the teacher asks the entire class or an individual student during language arts class, "How many syllables are in the word 'computer'?" Or during math class "What is 64 divided by 8?" OTRs may also be whole class response through writing or response cards. OTR is an important teaching strategy because teachers can promote frequent responses from students, check for comprehension, and adjust questions to meet the skill level of students. Finally, the purpose of using OTR is to increase the number of correct responses and the amount of time students are engaged during instruction.

Researchers have suggested that by focusing on the relationship between instruction and problem behavior together, academic difficulties and levels of disruptive and aggressive behavior can be reduced. Specifically, if rates of effective instruction are increased, then rates of problem behavior may decrease (Deno, 1998; Gunter & Denny, 1998; Wehby et al., 1998).

Researchers have shown that teacher increases in OTR result in more time on-task, an increase in correct responses, and less disruptive behavior (Barbetta, Heron, & Heward, 1993; Sterling, Barbetta, Heward, & Heron, 1997). Haydon (2009) conducted a study to examine a teacher's use of opportunities to respond in a 5th grade general education classroom setting. Results indicated that when the teacher increased the rates of opportunities to respond, the student's on-task behavior and correct responses increased, while the student's disruptive behavior decreased. This particular study was conducted in a 5th grade classroom of a first year teacher and focused on one 11-year-old female student who exhibited chronic disruptive behavior and at-risk indicators for Emotional Behavior Disorder.

Much of the research on OTRs originated in special education classrooms or with a focus on special education students. Students who have been identified as having a disability are at risk for developing challenging behaviors, are at high risk for aggression, or who engage in problem behaviors receive fewer OTRs than their peers who are less at-risk (Van Acker, Grant, & Henry; 1996).

Increasing OTRs is beneficial for all participants in the classroom. From a teacher's perspective, the benefits include increased time in learning activities, improved student relationships, and decreased time spent dealing with disruptive behaviors

(Gettinger, 1995). From a student's perspective, benefits include being successful and enjoying instructional activities, having few occasions to disrupt class, and fewer instances of being removed from the classroom (Gunter, Hummel, & Conroy, 1998).

Summary of Research Review

In many teachers' classrooms, students vary in their readiness, personal interests, and student learning profile. Teachers are required to teach a set of standards for their content to all of their students no matter the differences they exhibit in these three areas. This is a difficult task for any teacher, novice or veteran. In the current state of education, accountability for academic rigor and performance is apparent in any school across the country. In order to meet high standards, to show growth and to move students forward academically and socially, teachers must increase engagement and motivation in their classrooms.

Increased student learning should be the focus for all teachers in schools. Research shows that professional development is one way to build teacher capacity which should increase overall student learning. According to the reviewed literature, professional development for teachers should be student-centered and share research based practices though sustained efforts, possibly through the incorporation of an outside expert. Time and follow-up on application are other factors linked to increased student learning outcomes. There is not a list of "best practices" for professional development but some studies link these aspects with outcomes. While there is some criticism in the literature for one-day workshops, schools and districts have limited funding and a long list of needs for their schools, teachers, and students. Policy makers also question the value of providing paid time and resources for professional learning for teachers. The

literature in this review describes some guidelines for components necessary for effective professional development and it does reveal conflicting views on the necessity of professional development and how it fits into the responsibilities of teachers. While the one-day professional development model may not be the most desirable, high-quality one-day professional development may have a great impact on the struggle around delivery, resources, and needs of teachers and students.

Continued learning is important for teachers as the make-up of classrooms is constantly changing. Change happens when new district lines are drawn, the socio-economic composite for the area changes, technology innovations occur, or curriculum changes. Teachers must be ready to use a variety of strategies to reach all students in their classrooms, no matter who the students are or what the curriculum is. The student population in one classroom may be made up of a wide variety of students when their interests, readiness, and learning profiles are considered. Some teachers view the student differences in their classroom as a source of problems to be solved rather than an inevitable phenomenon that offers possibilities in the classroom. Most schools use the practice of the inclusive classroom to add depth to the experience and provide the best, least restrictive environment for all students. This challenge requires teachers to consider their classroom practice and to address each students' needs in their lesson planning and delivery. Incorporating the use of differentiated instruction into the classroom allows teachers to impact instruction for all levels of students and to address their interests and learning modalities.

Many teachers agree that addressing academic and interest differences is important but many do not differentiate based on readiness, interest, and learning profile.

Academic differences are not a new phenomenon and ways to modify instruction and assessment based on ability are more commonly incorporated in classrooms. Considering student interest and learning profile are less likely to be considered in common practice of modifying instruction. Modification based on variety other than readiness is typically informal and unplanned. When meaningful efforts are made to address other types of variety in the classroom, students feel more connected, motivated, and can be more engaged in the classroom as a whole. The gap in the literature is exactly how to do this in each and every classroom. There are suggestions made or the reiteration that teachers should differentiate based on these aspects (interest, readiness, and student learning profile), but no prescription of best practices to achieve each of these in a classroom without overwhelming the teacher with a mountain of strategies and no succinct plan of action. Attempting to address each area of the curriculum and differentiate for an entire class of individual students can be overwhelming.

Student engagement and motivation can be increased through the number of opportunities students are given to respond to instruction. Instructional pacing can also be accelerated by increasing the number of questions, prompts and cueing techniques used in the classroom. When a variety of techniques are used to incorporate student interaction with the content, there is more academic language used in the classroom and students are more engaged in their learning experiences. Much of the literature presented focuses on opportunities to respond in the special education classroom or with students who have been diagnosed with behavioral disabilities; there is much less research available on opportunities to respond and their impact in the general education classroom.

School leaders and teachers must find appropriate professional development for teachers to help them incorporate differentiated instruction to address the variety of differences students exhibit in their classrooms. The professional development should address needs of individual classrooms, time constraints of school districts, be easily applicable to the classroom and show student learning outcomes. This study was designed to review the implementation of one professional development session and its impact on the opportunities that teachers provide for response and student engagement as observed through off-task behaviors and student survey.

CHAPTER III: RESEARCH METHODOLOGY

Encouraging, monitoring and responding to student engagement and motivation are critical teaching skills for all teachers. Student engagement and motivation are reliable predictors of students' learning and achievement (Ladd& Dinella, 2009; Skinner, Kindermann, & Furrer, 2009). Engagement is a very public student act that teachers can note by observing the extent to which students are paying attention, putting forth effort, and persisting to accomplish tasks. Motivation is more difficult to assess because it is a private, subjective and difficult to observe experience for individual students (Middleton, 1995). The ability to identify the level of engagement and motivation of individual students in a classroom creates an opportunity for teachers to create instructional shift and increase student learning and achievement.

Differentiated Instructional Strategies for Student Motivation and Engagement is a Time to Teach© program designed to increase the number of opportunities teachers solicit responses from students around content presented in a classroom. The strategies taught in this very specific, one-day professional development program were designed to increase teacher knowledge and awareness of ways to engage and motivate each student in the classroom. The purpose of this study was to determine if teachers who attended this professional development incorporated strategies taught during the session and if those strategies increased the engagement of students in their classrooms.

Research Design

This study was designed as an experimental case study that examined the effects of a one-day professional development session on the engagement of middle school students through a change in teacher instructional practices. Case study research is an approach used when the participants are in a single unit or bound system (e.g., individual teachers, a classroom, or a school). This study focused on the outcomes of a small group of teachers in one school who participated in the professional development provided. Yin (2003) and Stake (2005) both describe case study research as not a methodological choice, but as a choice of what to study. In this study, the participants were studied within the context of the school in which they teach. Case study research encourages educators to consider new thinking and ideas in an educational curriculum, emphasizing communication and relationships (Zucker, 2009). The curriculum studied focuses on the professional development delivered to teachers and its implementation in the classroom.

A case study was most appropriate for this study due to the bound system in which the study was conducted, the importance of the context of the school, and the curricular focus.

Research Questions

The main research question was this: How does the implementation of a one-day professional development program assist teachers to provide more opportunities to learn and engage students in an economically diverse suburban school in the southeastern US? Data was collected to answer the following three sub-questions:

1. After attending this professional development, do teachers change the number of times they solicit student response to the content?

2. After attending this professional development, do teachers change how they implement differentiated instruction?

3. Are there measurable changes in student off-task behavior and engagement following teacher participation in the program?

This case study examined multiple data points to determine the effects of this program in one school. The data sources included structured observations of social studies classrooms to gauge opportunities to respond, strategies used, and student off-task behavior before and after implementation of the professional development program; structured teacher interviews before and after the professional development to discuss use of strategies and perceived student engagement; structured interview with the school leader before and after implementation of the professional development program to discuss teacher practices and student engagement; and student reported engagement and teacher use of instructional strategies before and after implementation of the professional development program.

Context

The sample of participants for this study was taken from teachers at one middle school, grades 6-8, in a southeastern state. Among the participating teachers was a balance of veteran (2) and early career (4), 2 males and 4 females, and all were traditionally trained and licensed before entering the classroom. The school is located in a suburb of a major metropolitan area. Approximately 30,000 students attend school in the district with 1,100 of those attending the studied school. At the time of the study, the student body was comprised of 21% black, 21% Hispanic, 1% American Indian, 3% Multiracial, and 53% White (District Demographics, Accountability Services,

http://www.cabarrus.k12.nc.us/Page/3759). In the 2011-12 academic year, the school met expected growth according to the state's school report cards and had an overall performance composite of 75.3% (ABCs Accountability Model, NCDPI, http://abcs.ncpublicschools.org/abcs/abcVol1List.jsp?pYear=2011-2012&pSchName=cabarrus+county+schools&Submit22=GO&pPage=2).

This particular school was chosen for the study because of the changes in student population over the last 5 years. While the teacher retention was high in this particular school, the student population had become more transient, lower socio-economically, and lower achieving based on standardized test scores. Teachers and the administration expressed concerns over student motivation and engagement with this new population. This study aimed to provide ways for teachers to improve motivation and engagement in their individual classrooms, therefore impacting student achievement. School leadership also expected teachers who participated in the study to share their new knowledge with their Professional Learning Communities to increase the impact across the school.

In the Fall of 2007 the dynamics of the school changed; the geographic areas from which students were assigned changed based on the addition of a nearby middle school and the conversion of a neighboring middle school to a magnet school. In the previous year (2006-2007), the school's performance composite was 82.1% and they met high growth for the year. The following year (2007-2008), the performance composite dipped to 74.9%. Even with the major changes in the student population, the teacher population has remained fairly stable. Over a five year average, teacher turnover in the county is 10.02% (Public Schools of North Carolina 2013). With the changing demographics comes a different type of student learner with varied challenges. Teachers in this

changing environment struggled with the new types of learners and their resistance to engage.

In this setting and at this time, mathematics and English Language Arts teachers were currently implementing specific programs for instruction. The mathematics teachers were working with a faculty member from a local state university to implement Math in Context, a structured mathematics instruction program. English Language Arts teachers had adopted Reading, Writing Workshop as the basis of their curriculum and presentation of material. Douglas Reeves' (2010) Law of Initiative Fatigue states that when the number of initiatives increases while time, resources, and emotional energy are constant, then each new initiative will receive fewer minutes, dollars, and ounces of emotional energy than its predecessors. Due to this phenomenon, the researcher asked school leadership to identify teachers in Social Studies and Science who could most benefit from the professional development. All teachers who were identified by the school leadership and agreed to participate were Social Studies teachers. All teachers at the school were invited to the program presentation but this study focused on teachers identified by leadership and who agreed to participate.

Treatment

The program presented was *Differentiated Instructional Strategies for Student Motivation and Engagement* produced by Time To Teach©. The author of this program presented the program and the researcher was present to observe fidelity of the program presentation and to verify which strategies were reviewed. The researcher also made note of the presentation components and interaction with participants. The session was approximately six hours long on a scheduled professional development calendar day in

October 2014 held in the school library. All teachers and staff from the school were invited to participate in the program but the data collection concentrated only on the six Social Studies teachers identified by school leadership and who agreed to participate. IRB approval was obtained to study this subset of teachers.

The day was loosely structured around the five components of differentiated instruction that encompassed 10 of the 15 strategies in the workshop text. To begin the day, the presenter introduced himself and described how he became interested in differentiated instruction. This was followed by some introductions to the five components of differentiated instruction (Promoting Positive Feelings, Promoting Attention/Interest, Promotion Connectedness and Relevance, Promoting Self Efficacy, and Sharing Best Practices), as well as information regarding multiple intelligences, and modalities of learning. When each of the strategies was introduced, participants were exposed to the basic concept and presented with examples for use in classrooms. For some strategies, participants were given time to construct applicable examples for their classrooms.

Each of the strategies introduced during the professional development session are detailed in the sections below and summarized in the Table 1.

Table 1: Strategy Outline

Components of Differentiated Instruction	Strategies
1. Promoting Positive Feelings	Bring Yourself Into the Classroom Vote With Your Feet Concentric Circles Target in the Middle Feedback Systems
2. Promoting Attention and Interest	Randomization Storytelling
3. Promoting Connectedness and Relevance	What's the Story With
4. Promoting Self-Efficacy	Dynamic Tension
5. Sharing Best Practices	Matrix Planning

In the component of Promoting Positive Feelings, the instructor shared five different strategies. Bring Yourself Into the Classroom was the first strategy shared. This is a time in which the teacher brings their personal hobbies, talents, and passions into the classroom. It allows the teacher to share a part of themselves with students and helps them to appear more relevant and real to students. This can also create an enjoyable and relaxed environment. This was followed by the Vote with Your Feet strategy. In this strategy, teachers assign areas of the classroom to predetermined responses or degrees of agreement among students in response to questions posed. Once students choose their answer, they walk to the predetermined area of the classroom and discuss their choices with their peers who made the same selections. This requires students to discuss their answer and justify their response. Concentric Circles is another strategy in the component of promoting positive feelings. In Concentric Circles, students form two concentric circles facing each other. The teacher plays music and circles rotate in opposite directions. When the music stops, students pair up with the other student facing them in the circle and discuss a question or prompt. Target in the Middle starts in a circle and when a question is asked or a topic is shared; students take steps toward the center to

show their level of understanding of the topic. This assesses their confidence in the topic rather than their actual knowledge. The teacher begins from the outside in asking students to share their knowledge. The final strategy shared in this component was Feedback Systems. This is often referred to as entry or exit tickets and allows students to summarize information learned in the class period or share questions they have. Feedback Systems can also be done throughout the class to show knowledge or understanding of concepts but requires a response from every participant.

The second component of the session was Promoting Attention and Interest in which the instructor described two strategies: Randomization and Storytelling. Randomization is a strategy of selecting students or groups for a response. It is as simple as assigning numbers to individual students or groups of students then rolling a die to determine who responds. Storytelling is a method of instruction, either at the beginning of a unit of study or the end, where the teacher conveys information in the form of a story with key components. For each component, the teacher must assign a verbal, kinesthetic, visual, and emotional (if possible) cues. When the story is presented, students actively participate in the storytelling process. For more advanced students or those who have used the strategy before, students can be required to invent the cues to tell the story.

Promoting Connectedness and Relevance was the third component from the professional development and the only strategy shared in this section was What's the Story With. In this strategy, students are shown a picture or video then asked to respond to the question of "What's the story with?" and share their responses in small groups or out loud.

The fourth component of the professional development was titled Promoting Self-Efficacy and was shared through one strategy called Dynamic Tension or the hot seat. When implementing this strategy, one student sits in a seat in the front of the room and is asked a question. If the student does not know the answer, he or she may ask for help from another student in the classroom. The second student must stand behind the student in the chair and whisper the correct answer to him or her. If that student does not know the correct answer, another student can be added to the line. Ultimately the first student in the hot seat must give the correct response.

The final component was a framework through which teachers can share best practices. Matrix Planning is a way for teachers to organize their most effective strategies to share them with other teachers. The matrix incorporates Bloom's Taxonomy across the top of each column and Gardner's Multiple Intelligences down the first column to label each row. Teachers insert strategies into the box that best fits the activity. Reviewing the chart by unit allows the teacher to determine if he or she is not addressing a certain area of either framework. If the matrix is shared across grade levels or content areas, it allows teachers to share best practices.

Instrumentation, Data Collection and Analysis

One week before the professional development and six weeks after the professional development, classroom observations, student surveys, and teacher interviews were collected. Pre-implementation data was used to determine prior knowledge and use of differentiated instruction, number of opportunities teachers solicited responses from students, and the level of student engagement. Six weeks

following the professional development day, the same forms of data collection were used to note any possible impact of the session.

Observations

Classroom observations were conducted prior to the professional development day and six weeks following the professional development day. Teachers were asked to provide the researcher with optimal days for the classroom observations to take place to be sure that instruction was being given, and to avoid testing or other passive learning days. The same class was observed in both the pre and post observation but, due to the drop schedule utilized by the school, some of these observations occurred during different times of the day. Observations used a protocol (Appendix F) that utilized a chart (Appendix G) for tallies in the categories of opportunities to respond (whole class), opportunities to respond (individual), and off-task behaviors (aggression, behavior, attention). There was also a column to note which of the differentiation strategies was used as well as a space for notes. Individual students were not identified or noted during the observations.

Opportunities teachers solicited student responses were recorded, using a frequency count, when the teacher asked a question (of an individual or a group) that required a specific response. “To be counted, the question must have sought a specific response that was related to the lesson being observed.” (Sutherland, Alder, and Gunter, 2003, p. 241). Tallies were placed in the “whole class” box if the question required a response from each student. Example of whole class opportunities to respond included a question where all students must write a response on their papers for discussion or each student must hold up a response on a card. Individual opportunities to respond are

typically more frequent in a traditional classroom where the teacher asks a general question and calls on one student for a response. All students can consider the question but the response is only sought from one student.

When a student exhibited a behavior that interrupted, or had the potential to interrupt, instruction in the classroom, it was noted on the chart with a tally mark in the "off-task behavior" row. Disruptive behaviors were coded using the categories standardized in the Sutter-Eyberg Student Behavior Inventory (Burns and Owen, 1990). Behaviors were identified as Aggression Towards Others (e.g., teases/provokes others, verbally or physically fights, acts bossy, interrupts), Oppositional Pattern of Behavior (e.g., temper tantrum, pouts, whines, cries, yells, acts defiant), and Attentional Difficulties (e.g., difficulty staying on task, easily distracted, fails to finish tasks, dawdles in obeying rules). A flexible protocol was used to allow notes of other observations that might have been helpful in the explanation of data. Both sets of observations (prior to the professional development day and six weeks after) were completed using the same protocol and observations of the same classes. This school used a drop schedule which so this was a slight challenge but detailed communication with the teachers helped to ensure this takes place.

The rate of opportunities provided by each teacher for students to respond per class was compared both pre and post implementation and was compared across teachers. Each data set was compared to assess changes within teacher and across teachers to determine the extent of the change following the professional development session.

Interviews of Teachers and School Leadership

Teachers were interviewed prior to the professional development and following the final observation to discuss their definition of student engagement, perception of student engagement in their classrooms, and their use of differentiated instructional strategies in their classrooms. Lee and Reeves (2012) found that teacher perception of engagement and motivation were positively correlated with student self-report each area of engagement and motivation.

The school leader was also interviewed to discuss the definition of student engagement and any concerns about student engagement overall in the building. The follow-up interview with the school leader discussed her perception of the professional development and suggestions to continue the impact throughout the school.

On the day of professional development, teachers were asked about their use of the strategies discussed (See Appendix A). They could respond with "I have used it before," "I have never used it before but I plan to," or "I do not plan to use it." Six weeks following the professional development session, they were asked similar questions on a survey form ("I have used it since the professional development," "I have never used it before but I plan to," or "I do not plan to use it") (See Appendix B). This is a modified survey based on the Teacher/Peer Reflection on Differentiation Survey by Tomlinson and Allan (2000).

Survey of Students

Students were asked to complete a survey prior to the teacher professional development session and six weeks after the session. This survey established a baseline for student engagement. The survey was modified from one created by Lee and Reeve

(2012) which contained four measures of engagement (agentic, behavioral, emotional, and cognitive engagement) and three measures of motivation (psychological need satisfaction, self-efficacy, and mastery goals). For this study, students only responded to questions focused on engagement. For each measure, the survey used a 1-5 bipolar response scale ranging from "strongly disagree" to "strongly agree." To assess each measure, Lee and Reeve used a previously validated measure. Table 2 indicates the source for each measure and the reliability gained in the study completed by Lee and Reeve.

The student survey instrument created by Lee and Reeve (2012) is comprised of 38 items and was originally given to students in Korea. The survey was written in English, translated to Korean, then the results were reported in English. Due to the length of the study and the possible translation errors, a pilot study was conducted of a modified version using only the engagement items. A pilot study was used as a "small scale version or trial run in preparation for a major study" (Polit, Beck, & Hungler, 2001, p. 467). Baker (1994) noted that a pilot study is often used to pre-test or try out a research instrument. Although a pilot study does not guarantee success in the main study, it greatly increases the likelihood. The pilot study gave advanced warning of possible weaknesses in the proposed study. This pilot addressed the issues of time to take the survey and understanding of the survey items. During the pilot study, three students from the same school district with ages within one year of the target students were asked to complete the survey in a think--aloud study. The survey took the pilot students between 4 and 7 minutes to complete, which is reasonable to expect of middle school students. Students were asked to think about their answer for each question aloud. This allowed the

researcher to determine if there were repetitive questions or questions that did not make sense to them. During the pilot, when students encountered a reverse-coded question, they would read it a second time carefully and answer appropriately. This also caused them to slow down their pace in answering subsequent questions. The feedback was used to determine the final version of the student survey used in the study.

Summary

Through mixed methods, a case study was conducted on the implementation and impact of a one-day professional development on the engagement of students in a suburban middle school. The researcher was interested in the incorporation of the strategies taught in the professional development and the impact on student engagement as exhibited through a self-report survey, classroom observations of off-task behavior and perceptions of teachers and the school leader. The use of case study methodology was to understand how the change occurred in one school and to describe successes and barriers within that context. Interviews with teachers and the school leader yielded information on the implementation of differentiated instruction and the perceived success of the professional development session. Student surveys were collected to determine the impact on students' self-reporting of engagement in the classroom. Classrooms of participating teachers were observed to assess implementation of strategies taught during the professional development and off-task behaviors of students as a manifestation of student engagement. Both qualitative and quantitative examinations were performed to analyze the data descriptively. Qualitative data included teacher and school leader interviews. Quantitative data included classroom observations of strategy use and student off-task behaviors and student surveys of engagement.

Table 2: Aspects of engagement and motivation with source and validity score

Aspect	Conceptual definition	Source	Reliability
Behavioral engagement	Extend of a student's on-task attention, effort, intensity and persistence in the face of difficulties	Engagement vs. Disaffection with Learning	Acceptable internal consistency (*alpha* = .80)
Emotional engagement	Extent of a student's positive emotions during learning activity, such as interest and enjoyment, and absence of negative emotions, such as boredom and sadness	Engagement vs. Disaffection with Learning	Acceptable internal consistency (*alpha* = .82)
Cognitive engagement	Extent of a student's cognitive and metacognitive strategies that involve meaningful (i.e. elaborative) processing attempts to connect or integrate new information with existing knowledge in an effort to form a richer, more coherent mental representation	Wolters Self-Regulated Learning and Disorganized Scale	Minimally acceptable internal consistency (*alpha* = .65)
Agentic engagement	Extent of a student's constructive contribution into the flow of the instruction he or she receives	Agentic Engagement Questionnaire	High internal consistency (*alpha* = .91)

CHAPTER IV: ANALYSIS

This study focused on the implementation of a one-day professional development program to assist teachers in adjusting their instructional practice to increase student opportunities to respond and engage students in their classrooms. This type of professional development can be used to engage teachers in reflective practices about the instructional choices they make in the classroom to encourage learners to engage more with the content. The financial constraints of current school and district budgets, particularly around professional development opportunities, requires school leaders to be good stewards of limited funds and to ensure there are tangible outcomes from experiences they provide for teachers to improve practice.

As detailed in Chapter III, data were collected from structured observations of classrooms, student surveys, teacher interviews and school leadership interviews. Six classroom observations were conducted prior to the one-day professional development and the same classrooms were observed again six weeks following the professional development. Student self-report surveys on student engagement were administered with 163 students in those same classrooms prior to the professional development and 160 students responded to surveys six weeks following the professional development in the same classroom. Surveys were handed out by teachers and compiled at the school to deidentify all student data. The researcher received only classroom level data identified

with teacher name. The six teachers in the study were asked to be interviewed prior to the professional development and six weeks following the professional development. Two teachers were unavailable prior to the professional development and one declined the interview following the professional development. The school leader was also interviewed before and following the professional development. A survey of strategy usage was also collected from each teacher following the professional development and six weeks following to determine level of use of strategies from the session.

Data collection occurred between October 2014 and December 2014, which falls during the second quarter during the academic year. This time frame was chosen to allow teachers to get to know their students during the first quarter and for new teachers to become established in the school and in their classrooms before the study. This study sought to examine the impact in classrooms of teachers who participated in a professional development session to determine if student engagement changed. This chapter is organized around three sub-questions:

1. After attending this professional development, do teachers change the number of times they solicit student response to the content?
2. After attending this professional development, do teachers change how they implement differentiated instruction?
3. Are there measurable changes in student off-task behavior and engagement following teacher participation in the program?

Findings – Solicitation of Student Responses

The primary focus of the professional development was to expose teachers to a variety of instructional strategies targeted towards engaging students in conversation

around content through increasing the number of opportunities they were provided to interact with the content. Classroom observations were used to record the number of opportunities teachers solicited responses from the whole class and from individual students. The number of OTR teachers provided for students is shown in Table 3.

Table 3: Instances of teacher solicitation of responses

Teacher	Pre Whole Class	Pre Individual	Pre Total	Post Whole Class	Post Individual	Post Total	Change Total
Jennifer	2	25	27	0	0	0	-27
Melissa	4	7	11	15	4	19	+8
Sarah	5	39	44	5	11	16	-28
Heather	0	32	32	0	24	24	-8
Michael	6	13	19	1	38	39	+20
Chris	0	19	19	0	36	36	+17
Total	17	135	152	21	113	134	-18

The researcher also noted the types of instruction taking place during each class period to help with the explanation of the opportunities provided for response. These observations are in Table 4.

Table 4: Primary forms of instruction during each observation

Teacher	Pre Types of instruction	Post Types of instruction
Jennifer	Lecture, independent work	Independent work
Melissa	Lecture, independent responses, pair work	Lecture, independent work, pair work, whole class discussion
Sarah	Lecture, individual responses, pair work	Lecture, independent work
Heather	Whole class discussion	Group work
Michael	Lecture, pair work	Lecture, whole group discussion, independent work
Chris	Lecture, independent work, group work	Individual work, whole group discussion

Findings – Implementation of Differentiated Instruction Strategies

The professional development presented was designed to share fifteen different strategies to increase the use of differentiated instruction and increase opportunities for teachers to elicit responses from students. Due to time constraints during the session and the presenter's preferences, four of the fifteen strategies were omitted from instruction (Synectics, Exhaustive Brainstorming, Nominal Group Techniques, and Extempore) and two others were briefly touched on (Socratic Questioning and Matrix Planning). All of the above mentioned strategies were available in the text provided to teachers who attended but were not part of the professional development.

During the two classroom observations, the researcher made note of the strategies used in each class period. These observations of count and strategy names are shared in Table 5.

Table 5: Professional development strategies used during observed periods

Teacher	Pre Number of strategies used	Pre Strategies used	Post Number of strategies used	Post Strategies used
Jennifer	0	0	0	0
Melissa	0	0	2 (27 instances)	Randomization, Vote with your feet
Sarah	2	Bring yourself into the classroom, Feedback systems	1 (3 instances)	Feedback systems
Heather	0	0	1 (2 instances)	Randomization
Michael	0	0	1	Dynamic tension
Chris	0	0	0	0

The researcher observed one class period before and one after the professional development session. This limits the exposure of the researcher to the overall incorporation of the strategies. To account for the missing data, the researcher asked for

teachers to submit a survey of their strategy usage and brought this up during their post interview. During the observations, the researcher observed teachers using Randomization, Vote With Your Feet, Dynamic Tension, and Feedback Systems. In the post conferences, teachers stated they used Randomization (4), Storytelling (3), Concentric Circles (2), Socratic Questioning, Vote With Your Feet, and Dynamic Tension in lessons not observed.

The teachers were surveyed at the end of the professional development session and six weeks after to report about their prior knowledge of the strategies and their implementation or plan to do so. One teacher did not submit a post-treatment survey to the researcher. Strategies not discussed during the professional development have been omitted from these results, which are shared in Table 6.

Table 6: Teacher reported knowledge, use and intent of use for each strategy

Strategy	Pre (n=6) I have used this before	I have never used this but plan to	Post (n=5) I have used this since the PD	I have never used this but plan to	I do not plan to use this
Bring yourself into the classroom	4	2	3	2	0
Vote with your feet	3	2	2	2	1
Concentric Circles	0	6	2	3	0
Target in the Middle	0	6	1	4	0
Feedback Systems	2	4	3	2	0
Randomization	3	3	3	2	0
Storytelling	1	5	1	4	0
What's the Story with	1	5	0	5	0
Dynamic Tension	1	5	0	5	0

During the final teacher interviews, they were asked what strategies they have used so far in their classroom. The results were slightly different from those reported in

Table 6. In the interviews, no teachers stated they used Bring Yourself into the Classroom, Target in the Middle or Feedback systems yet they indicated they did on the survey. Teachers were asked to describe how they used the strategies and they may have forgotten to mention some of those noted in the survey. Teachers also may have been unsure of the names of each strategy. Prior to the professional development, teachers did note other strategies used to engage students including turn-and-talk, incorporation of technology, video clips, group work, whole group discussion, and varied groupings. Following the professional development, teachers were able to more accurately define engagement strategies and understood that some of the strategies they listed before were instructional techniques but were not necessarily engagement strategies.

During the final interview, teachers were also asked about barriers they encountered when implementing the new strategies in their classrooms. Those that emerged were the number of strategies shared in a short amount of time, concerns over planning time, struggles with the number of school/district-wide initiatives, and the classroom management needed to implement the strategies.

Nine unique strategies were detailed in the one-day professional development session offered to participating teachers. In the post-interview, most teachers struggled to articulate the names of the strategies and most took some time to reflect and try to remember all of the strategies they implemented. As a solution, Melissa requested a refresher session or a one-pager with the strategies listed. She said, “If you don’t try to use the strategies, you will start to forget them.” Sarah shared a similar concern by saying, “It is just a matter of having that in the forefront of my mind when I am planning.” The school leader interviewed echoed the teacher analysis of the number of

strategies shared. She said, “I don’t know that every one of the strategies resonated with each of the teachers but each one walked out with at least two or three ideas they could use in their classroom.” All participants received a text outlining each of the strategies but a concise reminder of each strategy may have helped during planning sessions.

Planning new and engaging experiences for students does take time. Jennifer said she was concerned about time to plan and reflect on her lessons and the students in her classroom. There was plenty of class time but she struggled to consistently add these strategies during her lesson planning. Sarah stated a similar problem because she feels she does not have enough deep content knowledge to implement Storytelling. The school leader discussed the need for teachers to go a little deeper during planning and ensure they are including all perspectives in the classroom. She specifically spoke about the strategy Concentric Circles, “What I typically see is turn and talk. I haven’t seen what I would like to see more of, which is more like, I don’t get the name right, but the inside outside circle type thing. They (students) get more opportunities to respond to multiple classmates that way. Whether they have been positioned in their seats because of behavior or if they have chosen because it is a friend; I think they are missing out on some other perspectives or really valid points based on where they are seated.” It takes a significant amount of time for teachers to think through the standards that must be mastered and link them with content and student-appropriate strategies.

Another concern around planning was the implementation of a variety of initiatives across the school. The school leader mentioned the idea of teachers involved in the implementation of a plethora of initiatives, “They are maxed out, we have given them so much in terms of content resources…now they know they have resources, and now

they want to know how to deliver it so that it is not just a worksheet. Now that we have taught them to use the devices and how to manage a blended learning type setting,…what are the other steps we can do to keep students engaged?"

Michael, an early career teacher, said, "it is hard to keep track of what exactly I have to do. It is a struggle to keep up with the literacy strategies I have to do, and these. I am trying to tackle everything." Chris agreed, "I am trying not to focus on one initiative but incorporate them all in my classroom." With early career teachers, it may be difficult to see the connections between initiatives and not see them as all separate concepts that must be layered on top of one another.

When implementing the strategies, teachers also expressed a concern around the classroom management aspect of new strategies. Sarah said, "When we get up, we had to practice a couple of times. They would get up and I would be like, 'no, sit back down' then I would try it again on the next day. They have been more engaged because they are like 'we have to do it right this time'…I feel like the more you do it, the better kids respond." Jennifer also said, "It takes them some time to settle down, to understand something is going to be different." The school leader agreed with the teachers' concern about the management aspect of trying new strategies, "any activity they are going to do, they need to explicitly instruct children on what they want them to do…I think they underestimate the loss of a few minutes up front with giving proper instruction and practicing procedures but it is offset by what you gain in the end with content engagement. I struggle with that. The 'sit and get' checks off the objective that you taught it but that doesn't mean they learned. So, are you going to invest in the front end with something fun and engaging or are you going to have to back track after the

standardized assessments to show your students didn't learn?" Teachers must determine where they want to invest their instructional time; they want to be successful and often it takes investment prior to the lesson or activity in order for that success to come to fruition.

Teachers were also asked about their successes in implementation. Teachers mentioned positive aspects of the training and implementation around the themes of their favorite strategy of Randomization, novelty, finding a variety of ways to implement strategies and general comments about the impact.

Melissa remarked that her implementation of randomization had been successful. She numbered the backs of her chairs and used dice to call on students. She moved the chairs around frequently so students got new numbers. She stated that, "The kids like it better because I am not individually calling on students so they don't feel like I am singling them out. They are more willing to answer the questions or at least try to answer them…So I have seen really huge improvement in that." Michael has also had success with Randomization. "I use the dice all the time now, not all the time. The students have numbers. Before I was just waiting on kids to raise their hands. By randomly calling on them, it keeps them more engaged, I definitely use that. All of my kids know they are responsible for each question. If I know I taught the material, I make them responsible." Sarah has also incorporated Randomization in her class, "I have been using the dice; that is fun. The kids really like it and I like that I can call on kids again. I can tell that makes a difference."

Jennifer made reference to the novelty of new strategies by saying, "They like what they like, they like anything different…yes, I do think doing different things helps."

Chris also found the novelty of strategies as a positive take away from the professional development. “It was unique, they weren’t expecting it.” School leadership mentioned novelty in terms of teachers’ willingness to look for new strategies. She felt like attending the session got teachers thinking about other tools they might add to their “arsenal of strategies.” She mentioned, “one teacher in particular. When I went to do his classroom observation, there was some station work and other things. I was pleasantly surprised because I had not seen that at all. It was so incredibly traditional before. In other places, just their desire to look for different or new ways of doing things.”

A few teachers noted they had used the strategies for a variety of purposes in their classroom. Sarah said, discussing Concentric Circles, “I have done it for my closing activity where I have them answer some questions, I have also done it with the end of a unit to review.” Heather used Randomization to call on students, assign groups, and to determine presentation order. Chris discussed that he found all strategies do not work with every topic. He said, “I am just trying to make notes on what works and what doesn’t work. For those that don’t, I try to teach the content with another strategy and not abandon a strategy just because it doesn’t work that time; I try it on a new topic.”

Teachers also had comments about overall impact of the implementation of the strategies. Melissa stated, “I think I am more aware of what the kids want and what they need to be successful.” Sarah said, “I think learning these strategies and being able to implement them, making things more fun, overall I feel like it will stick with them more. I feel like those strategies allow them the opportunity to just think for themselves instead of me just giving them the answers on a PowerPoint…I definitely think there is positive impact.”

In her interview, the school leader focused on a few other positive areas teachers did not mention but that showed overall impact of the professional development. She said it was beneficial for the professional development to be delivered by someone other than her administrative staff. “There was nothing evaluative about it. There was this freedom to try the new strategies; almost like an expectation for risk taking. I feel like we have that culture here but it is different when someone else is doing the monitoring.” Another aspect of the implementation that teachers did not mention but that was noticed by the school leadership was collaboration as teachers began to implement the strategies in their classrooms and discuss them during their Professional Learning Community meetings. She said, “there has been a lot of dialog about strategies. Especially quick strategies you can take into your classroom and do the next day. The phrase ‘bringing yourself into the classroom’ is used more often when they are giving each other feedback. Teachers will say to their peers things like ‘you need to bring yourself into the classroom, the kids need to see you doing that.’” Some of these barriers are in the forefront of the school leadership team’s planning efforts. They are forecasting professional development needs and areas for school wide improvement.

Findings – Measurable changes in off-task behaviors and engagement

For this study, student engagement was measured with three different instruments both pre and post. Student engagement was observed in the classrooms through tracking off-task behaviors, assessed in the student engagement survey, and the perception of student engagement was asked during teacher interviews.

During each observation, student off-task behaviors were tallied in three categories: aggression towards others, oppositional pattern of behavior, and attentional

difficulties. Across classrooms, most off-task behaviors were categorized as attention difficulties and very little aggression and oppositional behaviors were noted. For analysis, all behaviors were collapsed into one category. Behaviors observed were spread over each classroom; individual student off-task behavior was not tracked but it was noted by the researcher that most off-task behavior was spread over the class, not prominently with one individual student in any class. While not a focus for the study, the researcher observed Jennifer, Melissa, Sarah, and Heather at different times of day with the same class of students due to the school's drop schedule. Michael and Chris were observed at the same time of day both pre and post. A summary of behaviors is found below in Table 7:

Table 7: Classroom off-task behaviors pre and post

Teacher	Pre Off-task behaviors	Post Off-task behaviors	Change
Jennifer	63	19	-44
Melissa	25	13	-12
Sarah	26	18	-8
Heather	104	12	-92
Michael	32	15	-17
Chris	31	11	-20
Total	281	88	-193

During the same period while teachers were being observed for implementation of strategies and off-task behaviors, students completed two self-report surveys describing their engagement. Survey items were designed to address four types of engagement: behavioral, emotional, cognitive, and agentic. Four items were reverse-coded and identified as such in the table below. Table 8 shows survey items and the types of engagement they address:

Table 8: Types of engagement addressed by student survey items

Survey question	Type of engagement	Reverse Coded?
I try to work very hard in this class	Behavioral	No
When I am in this class, I listen very carefully		No
I put a lot of effort into this class		No
Even on really difficult problems, I keep working hard		No
When I am in class, my mind often wanders and I think about other things		Yes
When I am in this class, I feel good	Emotional	No
Class is fun		No
This class is very interesting to me		No
My curiosity is constantly stimulated in this class		No
During this class, I often feel unhappy and discouraged		Yes
Before starting an assignment for this class, I try to figure out the best way to do it	Cognitive	No
In this class, I keep track of how much I understand the work, not just if I am getting the right answers		No
If what I am working on in this class is difficult for me to understand, I try to figure out another way to learn the material		No
When I study for this class, I often don't know where to start or what to do		Yes
I find it difficult to make sense of what we are learning in this class		Yes
During this class, I ask questions	Agentic	No
I tell my teacher what I like and what I do not like		No
I let my teacher know what I am interested in		No
During this class, I express my preferences and opinions		No
I offer suggestions about how to make class better		No

Student survey responses were given a value based on the answer (Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1). For each category of engagement, scores were averaged for each teacher and category of engagement pre and post. Table 9 displays these values:

Table 9: Calculated values for each category of engagement pre/post-professional development (B=Behavioral, E=Emotional, C=Cognitive, A=Agentic)

n			Behavioral			Emotional			Cognitive			Agentic		
Teacher	Pre	Post	Pre B/5	Post B/5	Change from /5	Pre E/5	Post E/5	Change	Pre C/5	Post C/5	Change	Pre A/5	Post A/5	Change
J	24	23	4.18	4.24	-0.06	4.38	4.23	0.14	3.83	3.64	0.19	3.38	3.28	0.11
M	16	28	4.32	4.08	0.24	3.91	3.88	0.03	3.44	3.55	-0.11	3.04	3.16	-0.13
S	18	25	3.57	3.48	0.09	3.49	3.79	-0.31	3.42	3.12	0.30	2.85	2.90	-0.05
H	33	33	3.76	3.55	0.21	3.56	3.08	0.48	3.33	2.99	0.33	2.60	2.68	-0.08
M	22	24	3.79	3.78	0.01	3.99	3.87	0.12	3.37	3.46	-0.09	2.89	2.91	-0.02
C	30	27	3.81	3.84	-0.03	3.42	3.25	0.17	3.37	3.44	-0.07	2.59	2.61	-0.01

J=Jennifer, M=Melissa, S=Sarah, H=Heather, M=Michael, C=Chris

In the post intervention interviews, teachers were asked, “on a scale of 1-5, 1 being not engaged at all and 5 being very engaged, how engaged are your students on a typical day?” There are only three teachers, Jennifer, Melissa, and Sarah, for which pre and post interviews are available. Michael and Chris were unavailable for pre-intervention interviews and Heather declined the post-intervention interview.

Jennifer stated prior to the professional development that her students would rate approximately a three or four on the engagement rating scale. “The class you are going to see is the gifted class, they are pretty engaged. The other classes maybe not as much but they are good kids and like school.” Following the professional development and her implementation of engagement strategies, she felt like her students were a solid four.

"Without reminders, they are a four. This class is pretty engaged. Like today, when I had to run to another class, I told them to sit quietly and do their work and they did." The teacher perceived that the students were more engaged based on their behavior.

Before the professional development, Melissa stated her students would rate approximately two or three on the engagement rating scale because the class time was sometimes split by lunch (the school utilizes a drop schedule) and it was difficult to get this group back on task. After the implementation of the engagement strategies, she stated it was "at least a four for most of them. Just because I like to make history fun and it has to do with the stuff you guys have taught me. They don't have a lot of time to be sleeping or off-task." Melissa tied her engagement rating of the students to their time on task and participation in class activities.

Sarah stated her class would probably rate at a three on the engagement scale when she was first interviewed, citing her own struggles with teaching strategies and content as a primary cause. She taught two subjects to the same group of students and felt they may be more engaged in the other content area because it is her strength. In her post-interview, Sarah said her students were between a three and four. She attributed some of the change to the content in the new unit but also to her rising comfort with the content area. She felt more comfortable taking suggestions from her Professional Learning Community and putting her own spin on the strategies. She has also incorporated engagement strategies from the professional development. In the interview she said that she is now taking more time to look for fun things to do with the students, now understanding that engagement leads to achievement and retention of information.

The data showed a decrease in the number of off-task behaviors observed for each class but this could be due to many factors, including the professional development session on motivation and engagement. The student self-report surveys showed minimal changes and not all changes were increases in engagement. All teachers did report incorporating strategies from the professional development in their planning and their perceived engagement of students increased. They noted concerns around implementation but all voiced a desire to continue incorporating the strategies to further increase engagement.

Results – Solicitation of student responses

The first sub-question from this study asked if teachers change the number of times they solicit student responses to content. The raw data in Table 3 showed an overall decrease in the number of responses teachers solicited from students, from 152 to 134, a decrease of 18 response opportunities. In a review of the instructional strategies implemented with each teacher, both pre and post, the number of student responses does vary based on the instructional strategy used. Teachers who used independent or group work as a primary strategy solicited fewer responses from students than those who incorporated discussion as a part of their instructional menu for the period observed. Three of the six teachers observed showed an increase in the number of opportunities they solicited responses from students (Melissa, Michael, and Chris) while the others (Jennifer, Sarah, and Heather) had a decrease in the overall number of responses sought.

The goal of the professional development was to share strategies to encourage interaction between students and the teacher in the classroom. The number of times teachers solicited student responses was an indicator of those questions and interactions.

Michael and Chris had the highest increase in the number of times they interacted with students and asked for their responses. Both teachers moved from lecture, independent and group work to whole group discussion in their lessons. During these discussions, students were asked leading questions and asked to turn-and-talk with a partner. In these interactions, students were discussing content and making it meaningful to their lives. The other teacher who showed an increase in responses, Melissa, also incorporated whole group discussion. The discussion in her classroom also incorporated some of the strategies shared during the professional development.

Given the type of instructional strategies used in the post treatment observations, it is not surprising that the number of opportunities, overall, decreased. Three classes observed were primarily group work or independent work throughout the entire class. If those three classes (Jennifer, Sarah, and Heather) were removed from the data set, the overall change in student responses solicited would be 45 more than the pre-treatment observation; on average this would equate to a change of plus 15 for each teacher. These classes incorporated a variety of instructional strategies that included lecture, pair work, and whole group discussion. Whole group discussion was the one instructional strategy not used by the three teachers who were primarily using quiet-seated work during the post-treatment observation. As an observer in the class, students were actively engaged in the whole group discussion as opposed to passively engaged in seatwork. In these discussions, students considered multiple points of view, addressed misconceptions, and applied prior knowledge to new problems. Overall, teachers who used a variety of instructional strategies solicited more responses from students and invited them to engage in conversation around the content presented.

Results – Implementation of differentiated instructional strategies

The second sub-question was this: After attending the professional development, do teachers change how they implement differentiated instruction? Through various data points, including observation, teacher survey, teacher interview and school leader interview, the study found that, in this particular case study, teachers do change the way they implement differentiated instruction following the professional development.

Based on the observation data, four teachers implemented a total of four different strategies from the professional development (Randomization, Vote with Your Feet, Feedback Systems, and Dynamic Tension) when in the pre-treatment observation they only implemented two (Bring Yourself into the Classroom and Feedback Systems). While only four different strategies were implemented in the post-treatment observations, there were 33 instances as compared to 2 in the pre-treatment observation. Melissa alone had 27 instances of use during the one class period. She used Randomization throughout class and Vote with Your Feet multiple times to engage students.

The final observation also showed more teachers incorporating whole class discussion into their instructional strategies. While this was not a strategy named in the professional development, there was conversation throughout the training focusing on involving students in content discussions and reminding teachers that there is a difference in active participation through discussion, feedback systems, moving around the classroom or other means and passive compliance.

Teachers also stated in their interviews that they were implementing strategies into their planning and no teachers said they were not working on implementation. They all saw value in the strategies but did have some struggles with implementation and

execution. Some common barriers for robust implementation were the number of strategies shared, concerns over planning, multiple ongoing initiatives and classroom management. While the presenter excluded some of the material in the text written for the professional development, training teachers on proper implementation of nine strategies is difficult. Teachers were able to actively participate in a few strategies by discussing them, participating in a few examples using content, and discussing how to implement them into their classrooms. Other strategies were simply discussed and the group moved on to the next due to time constraints. Teachers stated that they could not remember some strategies and others they tried to implement were not successful because they did not have enough knowledge about the specific strategy or had classroom management concerns when implementing. While there are always struggles when incorporating new strategies into a classroom, there are also successes.

All teachers interviewed discussed Randomization as a successful strategy and the novelty of the strategies as a benefit to their classrooms. Randomization is the simplest strategy from the professional development and easiest to implement. Every teacher selects students in some way to answer a question or share an idea. Randomization simply adds an element of engagement to that process. This strategy was discussed by every teacher from the study as a success in their classroom because it was so easy to implement while other strategies had to be incorporated during the planning process or took much more time to process before implementing. Teachers were also given a set of polyhedral dice to use with this strategy. All teachers also mentioned the new strategies as novelty in the classroom, something new to engage students. This also brought a sense of rejuvenation to teachers as they went back to their planning sessions or Professional

Learning Communities with fresh ideas. The school leader said she had a sense that teachers were more willing, after the professional development, to look for new ways to engage students. The professional development sparked their interest to think differently about instruction and how content was delivered to students.

Overall, the professional development brought awareness to teachers of the impact of engaging instruction on student learning. One teacher said she was more aware of what students needed to be successful while another talked about the fact that if learning was more fun then students would remember the content better. The school leader stated that teachers were now realizing there would be time investment on one end or the other to move students forward in their learning. Teachers would either invest time up front planning engaging instruction or after the assessment remediating students who did not gain the appropriate knowledge. The data showed teachers were spending the time up front thinking about the strategies to engage their students and they had a desire to understand each strategy more in order to implement it successfully in the classroom.

Results – Measurable change in off-task behaviors and engagement

As teachers planned lessons and utilized different instructional strategies, they had to plan the overall experience of students in the classroom. These experiences included the physical set-up of the classroom, grouping of students, and classroom management needed for the instruction to flow smoothly. Each teacher was asked to provide observation days where there would be active learning taking place, not a day of assessment. Each teacher offered a few days for observation and the researcher selected a day when the most teachers could be observed in the same day both pre and post. During the observations, each teacher used different instructional strategies which prevented the

data from being directly compared from one class to another. Even within the comparison between pre and post for the same teacher, the instructional strategies were different (see Table 4). It is expected that some instructional strategies would elicit more opportunities for students to respond (i.e. group discussion and lecture) as opposed to more independent strategies (i.e. independent work or group work). These assumptions were reflected in the total number of instances teacher solicited responses from students (see Table 3). Teachers who used similar instructional strategies in both the pre and post classroom observations did show an increase in the number of opportunities to respond. Melissa, Michael and Chris all used similar strategies in both observations and showed an increase in the number of times they sought student responses following the professional development. Jennifer, Sarah, and Heather had more independent-type work during the second observation.

Off-task behaviors associated with specific types of instruction were also evident in the observation data. For teachers who moved to more independent or group work from pre to post observation, the off-task behavior decreased 74.6% (Jennifer, Sarah, and Heather). While others had less of a change there were still substantially less off-task behavior. Melissa, Michael and Chris decreased their combined off-task behavior by 55.7%. Teachers who had the greatest increase in opportunities to respond to instruction with similar instructional strategies did show a decrease in the amount of off-task behavior exhibited during the observations.

While not a focus for this study, observations for some teachers pre and post were conducted at different times during the day due to the school's drop schedule. Jennifer,

Melissa, Sarah, and Heather were all observed at different times during the day, unlike Michael and Chris who were observed at the same time of day both pre and post.

Students in participating classrooms did complete the survey to assess student engagement both pre and post implementation of the professional development.

Summary

In this chapter, the researcher presented the results and findings of a case study on the implementation of a one-day professional development on differentiated instruction in a suburban middle school. Classroom observation data, student survey results, teacher interviews, and interviews with the school leader provided data for each of the three sub-questions posed in this study.

The first research sub-question asked if teachers changed the number of opportunities they provide for students to respond to instruction following the provided professional development. When the overall number of opportunities to respond was analyzed, the number post-professional development was less than before the professional development due to the types of instructional strategies used. For teachers who taught using similar instructional strategies (lecture, discussion, group work and independent work), they did show an increase in the number of times they solicited responses from students. Comparison of other teachers is difficult given their drastic change in instructional strategies which do not require or expect much interaction with students (i.e. independent or group work).

The second question asked if teachers changed how they implemented differentiated instruction in their classrooms. In the pre-implementation interviews, teachers described instructional strategies they used in their classrooms and most allowed

for differentiation based on ability but rarely incorporated student interest and student learning profiles. Following the professional development, they described more interaction with students and incorporation of interest and student learning profiles. Teachers used different strategies (2 strategies overall before professional development and 5 strategies post) and had an increase in the instances of taught strategies within a class (2 to 33). This was expected because the researcher was looking specifically for the strategies taught in the professional development. In the interviews, teachers praised the strategies and described their struggles of implementation and their successes.

Overall, teachers wanted to continue incorporating the strategies into their classrooms but needed more time. The study only spanned two months of the school year and teachers reported needing time to digest the strategies, think about how they fit in their curriculum, integrate them into other active initiatives, and continue to fine-tune the classroom management techniques for each strategy. Responding teachers did feel the professional development had positive impacts on their classroom because it made them think differently about instruction and student engagement with the content.

One of the differences the researcher noticed in strategy use was an increase in the whole class discussion. This was not explicitly described in the professional development as a strategy to increase engagement or student achievement, but it does apply many of the principles taught in the session. Teachers applied content to student lives and asked students to discuss connections between new material and prior learning during the discussion.

The final sub-question from this study was asked to determine if there were measurable changes in student off-task behavior and engagement following the

professional development. Off-task behaviors decreased across all teachers by 68.7%. Of teachers who used similar instructional strategies, there was a decrease in off-task behavior by 55.7%. This could have been a result of the teachers knowing their students better, or perhaps a simple progression of the school year, but the decrease was dramatic. Teachers also perceived students were more engaged following the professional development. They realized the benefit of planning engaging instruction and incorporating fun activities in their classroom.

Overall, the data showed positive impact from the professional development on all participating teachers. More substantial impact was observed with Melissa, Michael, and Chris since the classes observed could be directly compared. Conclusions of the study and suggestions for further research are described in Chapter 5.

CHAPTER V: CONCLUSION

The purpose of this case study was to examine the implementation of a one-day professional development session on differentiated instruction in a suburban middle school. Six social studies teachers from sixth, seventh, and eighth grades participated in a one-day professional development at their school and data was collected through student surveys, teacher interviews, school leader interviews, and classroom observations to assess the impact of the professional development on student engagement, off-task behaviors, and teacher implementation of differentiated instruction. Results from the study will be helpful to suggest how one-day professional development can be most impactful, in modification of future professional development presentations of the program and for the continued change in teacher professional development for the school studied. The primary research question was "How does the implementation of a one-day professional development program assist teachers to provide more opportunities to learn and engage students in an economically diverse suburban school in the southeastern US?" Three sub-questions were used to organized data collection.

Research Questions Summarized

Sub-question 1: After attending this professional development, do teachers change the number of times they solicit student responses to content?

The professional development sessions presented to teachers at the study site focused on differentiated instructional strategies designed specifically to increase the number of times teachers elicited responses from students. Teachers who used similar instructional strategies during the pre-treatment observation and post-treatment observation did increase the number of times they solicited student responses.

Multiple studies (Brophy & Good, 1986; Sutherland, Adler, & Gunter, 2003) found instances of on-task behavior and correct responses both increased as teachers offered more opportunities to respond to instruction. In this study, teachers who used similar instructional strategies (Melissa, Michael, and Chris) from pre to post and increased the number of opportunities they solicited student responses had less instances of off-task behaviors than in their pre-treatment observations. Other studies (Deno, 1998; Funter & Denny, 1998; Wehby et al, 1998) showed a relationship between instruction and problem behavior. The increase of effective instruction reduces academic difficulties and causes a decrease in the levels of disruptive and aggressive behavior. The observations in this research study confirmed the findings from these studies.

Overall this study confirmed the findings in the literature that an increase in the number of opportunities for student response does decrease the amount of off-task behavior of students. Many of the research studies focused on students identified with learning or behavior disabilities in elementary schools. This study was conducted in regular education classrooms in a middle school where there was some inclusion of students identified as gifted or with learning disabilities.

Sub-question 2: After attending the professional development, do teachers change how they implement differentiated instruction?

The treatment in this study was a one-day professional development focused on exposing teachers to multiple strategies to incorporate differentiated instruction in the classroom. Teachers were encouraged to incorporate the strategies into their classroom practice and to share the strategies with other teachers in their grade level meetings or during their Professional Learning Committee meetings.

Eaker, DeFour, and Bennett (2004) spoke to the implementation of professional learning communities as a mode of professional development or as a place where teachers could discuss application of professional development within the context of their school or content. Speck and Knipe (2001) suggested that professional development and continued professional learning are synonymous. They stated that continuing education for teachers should be learner-centered and embedded in the daily work of the teachers in the context in which they work. Teachers at the study school discussed the strategies from the professional development treatment in their Professional Learning Communities. The school leader said, "There has been a lot of dialog about strategies. Especially quick strategies you can take into your classroom and do the next day. The phrase 'bringing yourself into the classroom' is used more often when they (teachers) are giving each other feedback." During interviews, teachers discussed working with others to think through application of the strategies and also to work out struggles of implementation, specifically around the classroom management of incorporating more physical movement in the classroom.

Teachers in the treatment school used some of the time in the professional development, as well as subsequent meetings with their Professional Learning Communities, to adapt the research-based strategies into their unique classroom

situations. This confirmed one of Guskey and Yoon's (2009) suggestions for professional development that has positive effects on student learning outcomes. Teachers must work together to apply new strategies within their context and content areas. These researchers also suggested some sort of follow-up after the main professional development session. Having these extension conversations about implementation speaks to the need for changes across curriculum, materials and support to ensure that each student receives equal access to high-quality learning (Darling-Hammond, Wise, & Klein, 1999; Schoenfeld, 1999). In this study, teachers did discuss the learnings during their Professional Learning Communities and in whole-school staff development but there was no formal follow-up from the presenter. The researcher did meet with each participant teacher for the post-interview and gave some feedback but not further instruction. Multiple teachers and the school leader expressed an interest in a follow-up session of professional development to continue the learning and application of the strategies.

Engelmann and Carnine (1991) emphasized that quality of instruction is the key component of successful classroom management. Tomlinson & Allen (2000) noted that many of the differentiated instructional strategies require mobility in the classroom which, without proper management techniques, can preclude a teacher from successful implementation. Teachers in the study school expressed the same concerns in the post-treatment interviews. Jennifer and Sarah expressed classroom management as a barrier to proper implementation. The school leader also emphasized the need for proper classroom management when adding new strategies. She said, "Any activity they are going to do, they need to explicitly instruct children on what they want them to do." These concerns confirm the statements by the four prior researchers.

Sub-question 3: Are there measurable changes in student off-task behaviors and engagement following teacher participation in the program?

Motivation is a crucial part of a student's experience in school from preschool forward, but especially in the early adolescent years of middle school. Motivation itself is very difficult to measure outside of student self-reports but is more frequently measured as the resulting engagement. Pintrich & De Groot (1990) discussed the change from motivation being conceived as a personal student attribute to a construct influenced by external influences such as the learning environment. The teacher is widely recognized as an important aspect of the learning environment. Teachers in this study who used similar instructional strategies for both observations demonstrated how the teacher can influence the engagement of students in the classroom. The incorporation of differentiated instruction increased the number of opportunities students were given to respond to content and decreased off-task behavior.

Ryan and Deci (2000) agreed that students function positively in the classroom based on their classroom experiences. Teachers who incorporated student interest and student learning profiles in their lesson planning noticed more engagement from their students and more persistence in their thinking.

Larger Implications for the Field

In the literature review, three primary gaps were identified and this study addresses these with some implications: adequate amount of time for professional development, best practices for implementing differentiated instruction, and the impact of opportunities to respond on regular education classrooms. Based on the sample size and

limited application of the strategies, these are not generalizable implications but are noted in the section below for further research.

There is a large body of research on professional development and multiple philosophies around what is best for teachers and how programs should and could be implemented. In this study, the one-day professional development was successful in starting conversations around differentiated instruction and some general application of the concepts. Multiple teachers and the school leader requested a follow up session or structured questions for Professional Learning Communities to discuss. They found the one-day professional development to be helpful but wanted more instruction or conversation to enhance their application of strategies in the classroom.

This study also adds knowledge to the application of differentiated instruction in the classroom. Similar to the research on professional development implementation, there is not a definitive list of best practices for implementing differentiated instruction in every the classroom, the list grows with each adaptation of strategy in the classroom because each classroom is different. Teachers who successfully incorporated the strategies from the professional development in their classrooms found them effective and applicable to various units of study or classroom practices. They found the strategies shared to be useful in their classrooms and could be easily adaptable to suit their personal teaching style and the content. A longer study would reveal other impacts of the professional development and its application in the classroom.

Prior research on opportunities to respond focused primarily on special education classrooms or on specific students with special needs. This study applied similar concepts to regular education classrooms and some gifted classrooms. For classes that were similar

in the lesson structure for pre and post observation, as the teacher increased the number of opportunities to respond to instruction for students, the number of off-task behaviors decreased. This indicates that the teachers can encourage engagement in the classroom through a change of instructional practice.

Further Research

This study contributed to existing literature on single exposure professional development and on the impact on engagement of opportunities to respond. Research extending from the study to other areas of professional development and opportunities to respond to instruction is needed.

This study focused on a single-exposure professional development in the middle of the first semester of the academic year, primarily for social studies teachers who were selected by school leadership and who agreed to participate. Simply changing the participants in the professional development could have an impact on the results in the school as a whole. Autonomy and choice are important for students in classrooms and for teachers to determine the professional development they feel would be most helpful in moving their instruction forward. Whole school professional development would have increased the number of participants who could discuss implementation of strategies and would have provided a richer environment in the Professional Learning Communities for discussion around the strategies.

Another way to add to the research base for these topics would be to modify the professional development through the considerations of the participants. Teachers expressed barriers around classroom management and application of the strategies. To modify the professional development, the researcher suggests allocating time with each

instructional strategy to discuss classroom management techniques and to allow time for teachers to discuss application. Depending on the size of the group, teachers could discuss application of each strategy with their Professional Learning Community, typically by content, and share out ideas to the larger group. This practice of sharing application could help teachers remember strategies and have a list of ways to incorporate them immediately into their classroom.

One other suggestion based on teacher and school leader interviews would be to incorporate a structured follow-up. To keep the primary professional development a one-day event, a list of structured questions or activities could be given to Professional Learning Communities to continue the conversation and discussion around the topic of differentiated instruction and to guide their continued implementation.

The research on Opportunities To Respond (OTR) is primarily focused in elementary schools and with students with special needs. Research could be conducted strictly with students who have not been identified with a learning or behavioral disability as this study did not identify individual students in the classroom or possibly learning problems. Researchers could also collect Opportunities To Respond and off-task behavior for individual students in order to disaggregate the data on these factors.

This study observed six teachers for one class period before and one class period after the professional development session. This limited the exposure of the researcher to the content and instructional strategies that could be used in one class period. A more intense case study on one teacher, observing them multiple times before and after the professional development may have yielded different results. The researcher would have

been able to link opportunities to respond and off-task behaviors to specific instructional strategies for better comparison.

Overall, there is still much to learn about student engagement through opportunities to respond to instruction and the impact of single day professional development. This study, however, has contributed to the knowledge base on these topics and has clearly focused the topics that must be considered for additional research.

Limitations Revisited

Four limitations were identified during the research design of this study. Those are revisited here and discussed based on the results of the study.

(1) The only content area studied was social studies.

This limitation allowed the presenter to focus on strategies and application ideas for the attendees. The strategies can easily be adapted to other areas of study. This limitation does prevent direct application of the results to other content areas. The teachers in the study did share some of the strategies they learned in faculty and grade-level meetings with teachers in other subject areas. The boundary of limiting the study to one school and one content area in that school made the pool of participants very small. The results can be applied to a similar school and can inform program improvement.

(2) Two teachers were unavailable for pre-treatment interviews and one teacher was unavailable for a post-treatment interview.

This limitation does affect the interpretation of results and the discussion of some changes. The absence of these interviews caused only half of the participants to have both pre and post interviews. The small sample size contributed to this limitation and therefore only implications can be drawn from a comparison of pre and post interviews.

(3) When the professional development was presented, four of the strategies (Socratic Questioning, Synectics, Exhaustive Brainstorming, and Nominal Group Techniques) were omitted from the presentation, and Matrix Planning was only mentioned due to time constraints. This reduced the number of strategies teachers received in the training.

While this was limitation to the review of the entire professional development program, the general concepts and process could still be reviewed. All of these strategies were in the textbook participants received during the professional development. The strategies were mentioned in the professional development session but not heavily discussed.

(4) The survey instrument used for students was modified from an instrument used with high school students.

Teachers did not report that students struggled with the content of the instrument. Instead, students were not motivated to complete the survey; therefore, they did not take it seriously. The results of the survey did not show substantial change over the short timeframe of the study. Student motivation may have showed change over the timeframe used for a longer study.

Conclusions

This case study examined multiple data points to determine the effects of a single-day differentiated instruction professional development on the engagement of students in middle school classrooms. The literature implied that single-session professional development for teachers was not ideal but on the topic of differentiated instruction, was incorporated into effective classroom practice, it would impact engagement. According to

the classroom observations and interviews of teachers and the school leader, the integration of the strategies shared in the professional development were successful in increasing the engagement of students but the one-day professional development needed follow-up to be more effective, even if it was informal. While classroom observations varied by teacher and lesson observed, responding teachers reported that the professional development had a positive impact on their instructional practice and the engagement in their classrooms.

In order to make the results of this study more effective and the result more generalizable, it could have been conducted with a larger group of teachers over a longer period of observation time. Another adjustment to the methodology to improve this study would be to begin with a larger pool of participants to ensure both pre and post data were available for each participant. A final adjustment would be in the assessment of student motivation. The researcher could interview students with similar questions from the survey, offer incentives for survey completion, or determine another data point to triangulate data for motivation.

The conclusions of this study do have implications for professional development practice in schools, incorporation of instructional strategies in the classroom, and the application of Opportunities To Respond in the regular education classroom.

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APPENDIX A: TEACHER SURVEY PRE-TREATMENT

Now that you have learned about the strategies, please tell us how often you have used similar strategies in the past and if you plan to use them in the future. Place a check mark in the appropriate box.

Strategy	I have used it before.	I have never used it before but I plan to.	I do not plan to use it.
Bring yourself into the classroom			
Vote with your feet			
Concentric circles			
Target in the middle			
Feedback systems			
Randomization			
Socratic questioning			
Storytelling			
Synectics			
What's the story with?			
Exhaustive brainstorming			
Nominal group techniques			
Dynamic tension			
Extempore			
Matrix planning			

APPENDIX B: TEACHER SURVEY POST-TREATMENT

Now that you have learned about the strategies, please tell us how often you have used similar strategies in the past and if you plan to use them in the future. Place a check mark in the appropriate box.

Strategy	I have used it since the professional development.	I have never used it before but I plan to.	I do not plan to use it.
Bring yourself into the classroom			
Vote with your feet			
Concentric circles			
Target in the middle			
Feedback systems			
Randomization			
Socratic questioning			
Storytelling			
Synectics			
What's the story with?			
Exhaustive brainstorming			
Nominal group techniques			
Dynamic tension			
Extempore			
Matrix planning			

APPENDIX C: TEACHER INTERVIEW QUESTIONS

Teacher Interview Questions (Prior to PD)

1. How do you define student engagement?
2. What does engagement look like in your classroom?
3. On a scale of 1-5, 1 being not engaged at all and 5 being very engaged, how engaged do you think your students are on a typical day in your classroom?
4. What strategies do you use to get students engaged?

Teacher Interview Questions (Following PD)

1. How have you implemented strategies or techniques from the professional development?
    a. I have not: Why have you not implemented those strategies or techniques?
    b. To some extent: Have you seen other changes in your classroom based on implementation?
2. On a scale of 1-5, 1 being not engaged at all and 5 being very engaged, how engaged do you think your students are on a typical day in your classroom?
3. Discuss data from observations (opportunities to respond, off-task behaviors, strategies used).

Data	Before	After	Change
Opportunities to respond (individual)			
Opportunities to respond (whole class)			
Off-task behavior			
Strategies used			

APPENDIX D: SCHOOL LEADERSHIP INTERVIEW QUESTIONS

School Leadership Interview Questions (Prior to PD)

1. How do you define student engagement?
2. What does a highly engaged classroom look like?
3. Do you have any concerns about student engagement in your school?

School Leadership Interview Questions (After to PD)

1. What impact, if any, have you seen from the professional development on differentiated instruction?
2. Discuss aggregate data from observations and student surveys (opportunities to respond, off-task behaviors, strategies used, student survey responses).

Data	Before	After	Change
Opportunities to respond (individual)			
Opportunities to respond (whole class)			
Off-task behavior			
Strategies used			

APPENDIX E: STUDENT SURVEY

Please respond to each of the following statements with a rating from 1-7.
(1)Strongly agree, (2)Agree, (3)Neutral, (4)Somewhat disagree, (5)Strongly disagree

1. I try to work very hard in this class
2. When I am in this class, I listen very carefully
3. I put a lot of effort into this class
4. Even on really difficult problems, I keep working hard
5. When I am in class, my mind often wanders and I think about other things
6. When I am in this class, I feel good
7. Class is fun
8. This class is very interesting to me
9. My curiosity is constantly stimulated in this class
10. During this class, I often feel unhappy and discouraged
11. Before starting an assignment for this class, I try to figure out the best way to do it
12. In this class, I keep track of how much I understand the work, not just if I am getting the right answers
13. If what I am working on in this class is difficult for me to understand, I try to figure out another way to learn the material
14. When I study for this class, I often don't know where to start or what to do
15. I find it difficult to make sense of what we are learning in this class
16. During this class, I ask questions
17. I tell my teacher what I like and what I do not like
18. I let my teacher know what I am interested in
19. During this class, I express my preferences and opinions
20. I offer suggestions about how to make class better
21. In this class I have opportunities to be active rather than just listen to lecture

APPENDIX F: CLASSROOM OBSERVATION PROTOCOL

1. The observation start and finish time are noted on the top of the observation sheet and should include the entirety of a class period.
2. Opportunities teachers solicit student responses to instruction will be marked as tally marks in a box labeled “Whole Class” or “Individual Student.” To be counted, the question must have sought a specific response that was related to the lesson being observed.
3. Disruptive behavior will also be tracked on the chart. When a student performs a behavior that interrupts, or has the potential to interrupt, instruction in the classroom, it will be noted by an identifying number based on the behavior on the observation sheet:

(1) aggression towards others (e.g., student teases/provokes others, verbally or physically fights, acts bossy, interrupts)

(2) oppositional pattern of behavior (e.g., temper tantrum, pouts, whines, cries, yells, acts defiant)

(3) attentional difficulties (e.g., difficulty staying on task, easily distracted, fails to finish tasks, dawdles in obeying rules)

4. A list of strategies to engage students will be kept on the observation sheet.
5. A notes section will also be kept in order to record other behaviors or events that occur during the class that may later be helpful in data analysis and explanation.

APPENDIX G: OBSERVATION RECORD SHEET

Observation Sheet

Teacher (circle one): A B C D E F

Observation date and time: _____

Number of students in attendance: _____

Opportunities to Respond (Whole class):	Strategy	Frequency
	Bring yourself into the classroom	
	Vote with your feet	
	Concentric circles	
Opportunities to Respond (Individual):	Target in the middle	
	Feedback systems	
	Randomization	
	Socratic questioning	
Off-task behavior(s): Aggression Behavior Attention	Storytelling	
	Synectics	
	What's the story with?	
	Exhaustive brainstorming	
Notes:	Nominal group techniques	
	Dynamic tension	
	Extempore	
	Matrix planning	