Running Head: Differentiated Instruction

The Effects of Differentiated Instruction on a Fourth Grade Science Class

A Masters Research Project Presented to

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This Masters Project has been approved

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Abstract

This research topic is rather new to the education community. Forms of differentiated instruction (DI) have been around for nearly 30 years, but until recently, it has not been used in its current form. The purpose of this research was to determine the academic and social effectiveness of DI in a fourth grade science class. To obtain the data, the researcher used a pre-post content test and a pre-post survey to determine students' feelings towards different DI strategies. The researcher chose two science classes, one high achieving and one low achieving. The high achieving science class was not given the intervention, (differentiated instruction), while the low achieving class content was differentiated. The results were consistent with previous assertions about DI. The intervention class was able to improve their scores on the post-test as much as the high achieving science class. Likewise, students reported more positive feelings and attitudes about DI following the intervention.

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Previous research has been done about differentiated instruction (Tomlinson, 2003). Components of differentiated instruction (DI) have been around since the 1980's (Yatvin, 2004). DI had been defined in many different ways but all come to the same consensus that,

> DI is a philosophy that enables teachers to plan strategically in order to reach the needs of the diverse learners in the classrooms today. DI is not just a set of instructional tools but a philosophy that a teacher and a professional learning community embrace to reach the unique needs of every learner. (Gregory, 2008, p. 27)

The purpose of this study was to determine the overall effectiveness of DI in a fourth grade classroom. The researcher also wanted to find the beliefs and feelings toward DI. Data was analyzed to see the percent growth of improvement the two participating classes had. One class was given the intervention, DI, and another science class was not given DI. Specifically, this study finds insights into the following questions: Will DI improve academic scores? Will attitudes toward DI turn positive? Is DI an effective teaching strategy?

Literature Review

This research examines the effectiveness of differentiated instruction (DI) in a fourth grade inclusion science class. The school where the research took place subscribes to a progressive constructivist model of teaching. The researcher/teacher in the study has a full understanding of the teaching strategy and is an active participant in learning more about differentiation. The teacher has been using DI for multiple years including the time the research was being completed. There were two different science classes being studied. The first science class served as the control and their instruction was not differentiated while the second science class received differentiated instruction. Several differentiated strategies such as flexible

grouping, anchoring activities, and experimentation were used on a daily basis during the research period.

The hypothesis was that DI would have a positive impact on student achievement greater than the achievement for the students in the control group. DI is a relatively new term in the world of teaching that is commonly misunderstood or misinterpreted. The researcher was trying to determine if DI would be an effective method to teach fourth grade science. The significance of this research is that the results may be assist teachers in improving their teaching by having a better understanding of how students learn and by implementing a successful research-based practice that improves student learning.

History of Differentiated Instruction

DI is a critical instructional methodology that provides a practical application of constructivist teaching. Constructivist teaching is the philosophy that students are not blank slates and that learning should be built upon prior knowledge by activating related schema. Constructivist teachers suggest that a student will learn better when the student is actively engaged in the construction of knowledge rather than passively receiving knowledge.

In a constructivist classroom, activities are student-centered in a democratic environment. Some examples of constructivist learning activities are experimentation, field trips, and class discussions. Many consider that although differentiation is a new concept, its philosophical roots run deep in American soil (Yatvin, 2004). According to Yatvin, DI was conceptualized in the 1960s and took off in several directions at once. The two main methods that provided the foundation for the current understanding of DI are individualized instruction and the open class room.

According to Yatvin, (2004) individualized instruction varied involved providing students with packets covering a unit of work that was to be completed independently within a given period of time. This methodology failed because it involved little direct teaching and many students lacked the skills or self discipline to make independent progress without instructional support (Yatvin). The second methodology that was a precursor to DI was the open classroom. This practice was developed in Summerhill, England by A. S. Neil. The idea was to have students make all group and individual decisions in the classroom. These decisions included what, where and how they would study, as well as whether they would study at all (Yatvin). As a result, teachers were essentially teaching 25 different curricula which proved to be too much for one teacher to handle and signaled the end of this movement in about a decade.

Out of the ashes of these two failed concepts and other failed concepts came DI. DI is closely related to the constructivist philosophy of learning. "Educators came to believe that motivation is the key to children's learning and that learning means building one's own mental frameworks" (Yatvin, 2004, p. 10). During the 1980s, many new innovative practices arose, such as the idea of multiple intelligences, cooperative learning, learning styles, and the integrated curriculum (Yatvin).

Defining Differentiated Instruction

DI involves finding multiple ways to structure a lesson so that each student has an opportunity to work at a moderately challenging level. It is an organized, yet flexible way of proactively adjusting teaching and learning to meet students where they are, while helping all students achieve maximum growth as learners (Tomlinson, 1999). Instruction may be different in content, process, or product according to students' readiness, interests, or learning profiles (Adams & Pierce, 2006).

There are many variations of the definition of DI' but they all essentially come to the same consensus that,

> DI is a philosophy that enables teachers to plan strategically in order to reach the needs of the diverse learners in the classrooms today. DI is not just a set of instructional tools but a philosophy that a teacher and a professional learning community embrace to reach the unique needs of every learner. (Gregory, 2008, p. 27)

Researchers agree there are two frameworks for DI. The first is complex instruction and the second is parallel curriculum. Complex instruction was developed by Elizabeth Cohen (1986) at Stanford University and the latter was conceptualized by Carol Ann Tomlinson, Sandra Kaplan, Joseph Renzulli, Jeanne Purcell, Jann Lappien, and Debhorah E. Burns (2001).

Complex instruction is a cooperative learning strategy structured to ensure learners work independently at their most challenging level (Gregory, 2008). This model requires teachers to flexibly group students of varying intellectual ability and results in students becoming more responsible for their own learning (Gregory).

Parallel curriculum focuses on three important aspects to a curricula: the curriculum of connections, practice, and identity (Gregory, 2008). This framework helps the teacher plan lessons that address the core curriculum defined by their districts, and helps them consider three aspects to the curriculum.

According to Roberts and Inman (2007), DI has three main principles. The first is that a DI classroom respects diversity, second, it maintains high expectations, and third, it generates openness.

> In an environment where each student is considered a unique individual, a positive self-concept can be developed naturally. Students can learn responsibility and an inner sense of control when expectations and opportunities for choice, sharing responsibilities, and self-evaluation are a planned part of their day. (Clark, 2002, p. 384)

Project-based learning is the purest form of DI (Schlemmer & Schlemmer, 2008). Projects incorporate the most fundamental concept of differentiation because they engage, motivate, and enhance students' learning (Schlemmer & Schlemmer). Projects can be used in a variety of ways to differentiate content, process, or product but can also be used to address student readiness, interests, and learning profiles (Schlemmer & Schlemmer). DI is rooted in project-based learning because each project a student does is not going to be exactly the same as any other. They will have the same guidelines, but will reach a different result that comes from individualized instruction.

A second widely used differentiation strategy is known by many different names but is commonly called academic centers or centers. Centers are designed to incorporate Howard Gardener's (1983) multiple intelligences theory that suggests all people have different types of intelligences. It is not important to have a different center for each intelligence, but more important to provide multiple entry points into the content (Campbell, 2008). Campbell also suggests naming each center after a famous person who has demonstrated that particular intelligence. A few examples would be to name the linguistic intelligence center after William Shakespeare or the visual-spatial center after Pablo Picasso (Campbell).

Components of Differentiated Instruction

Adams and Pierce (2006) created a circle map that weaves together four elements of DI instruction for any content or grade level. They state that classroom management techniques, anchoring activities, differentiated instructional strategies, and differentiated assessment are what make a classroom successful.

The first component of DI is related to classroom management techniques. Classroom expectations should be listed in a positive way and five to seven rules are most effective (Adams & Pierce, 2006). Two critical expectations that should be implemented are that students should use six inch voices and ask three before me (Adams & Pierce). Six inch voices are voices that are not loud and the speaker should only be heard from six inches away. Asking three before me is when a student is required to ask at least three other people his/her question before actually approaching the teacher.

Another component of classroom management closely linked with the previously mentioned expectations is that the teacher needs to have flexible grouping (Adams & Pierce, 2006). Flexible grouping arrangements create opportunities for meeting individual needs (Adams & Pierce). Students can be rearranged for each lesson based on the lesson design and student needs.

The final component related to classroom management is a need for flexible time and space (Adams & Pierce, 2006). Flexible time allows the lesson to be carried out in a natural length of time rather than fitting a round peg into a square hole or trying to fit an estimated 45 minute lesson into a 30 minute time period. According to Adams and Pierce, lessons should be allowed to progress as the student learning dictates, and an estimated 30 minute lesson should be allowed to progress over several days if needed.

Flexible spacing is the idea that desks should be arranged in various configurations to facilitate group work, as well as whole class groupings that encourage sharing of ideas (Adams & Pierce, 2006). It is suggested that teachers have different configurations diagramed and named somewhere in the classroom, so he/she can just call a name out and the students can move their desks into that specific configuration.

The second component of DI, according to Adams and Pierce (2006), is the anchoring component. Students use anchoring activities when they are waiting for the teacher to assist them before they can go any further, have completed their work and are waiting for the day's lesson to begin, or at the beginning of the class period to get the students ready to work. These activities can also serve to extend the content by providing additional places or resources to find the information (Adams & Pierce).

The third component of DI, according to Adams and Pierce (2006), is differentiated instructional activities. The main instructional strategy for all DI is called tiered lessons. To tier a lesson, the teacher must have a good understanding of student readiness. A tiered lesson is like a three leveled wedding cake in which the lesson has three tiers: below grade level, at grade level, and above grade level (Adams & Pierce). Students can be tiered by learning profile or interests. An example would be a lesson tiered to focus on three learning styles: auditory, visual, and kinesthetic. The students would be placed in the tier that best matches their learning style and their ability levels will be varied (Adams & Pierce).

The fourth and final component of DI is differentiated assessment (Adams & Pierce, 2006). Differentiated assessments can be formative or summative. Formative assessment is an informal assessment to see where the students stand and gives a picture of where the students are in their learning. This is an informal assessment where the student is generally not graded and

gives the teacher a chance to adjust or further design learning experiences (Adams & Pierce). A few examples of formative assessments are: student-teacher conferences, exit cards, journaling, small group interviews, graphic organizers, and surveys.

Summative assessments are given at the end of a unit or a large block of study. They are typically graded and recorded. These generally make up the grade seen on a student's progress card. In formative assessments, the teacher uses a grading rubric. Not all summative assessments are pencil and paper, as some can be alternative assessments. Some examples of alternative assessments include portfolios, projects, and other authentic tasks (Adams & Pierce, 2006).

The two components of DI most relevant to this research study are classroom management and anchoring activities. The reason that classroom management is relevant to this study is because the classroom teacher uses flexible grouping and spacing. The teacher groups the students based on interest level through the use of a learning profile and ability levels. The teacher has a list of how the students learn best and places them in groups based on the specific demands of the lesson.

The teacher also uses many anchoring activities that intertwine with the flexible grouping. The teacher will has entrance question that determines the tiered ability level of the student. As the teacher gives the entrance question, the students have been assigned an anchor activity they are to be working on. The lowest ability level group stays with the teacher for instruction, (i.e., flexible grouping), at the smartboard to work together to solve and expand upon the entrance question.

The components of DI that pertinent to the present research are differentiated strategies and differentiated assessment. There are many differentiated strategies, however the main one is

the use of tiered lessons. Tomlinson (1999) describes tiered lessons as the "meat and potatoes" of DI. A tiered lesson is differentiation strategy that addresses a particular key standard, key concept, and essential understanding, but allows several pathways for students to arrive at an understanding of these components, based on the students' readiness, interests, or learning profiles (Adams & Pierce, 2006). Essential understandings are "the key principles and generalizations that develop from the fact base…They are the 'big ideas' that transfer through time and across cultures" (Erickson, 2001, p. 47).

Differentiated Assessment

Differentiated assessment is made up of two main subgroups with greater emphasis on one rather than the other; formative and summative assessment. The idea behind formative assessment is to provide ongoing assessment and not to wait till the end of a unit to see if and what students are learning. Examples are exit cards, tickets, and graphic organizers (Adams & Pierce, 2006). Exit cards are small pieces of paper or cards with questions related to the lesson objectives written on it. They are generally given to the student just before recess or lunch as a quick way to see if the student understood what happened during the class. They are given a prompt and expected to give a response to wrap up the day's lesson. For example, if the objective of the lesson was to have students understand and use adjectives, the exit card may ask for the definition of an adjective and ask students to write a sentence using two adjectives.

A graphic organizer is a way for ideas or learning to be organized. A teacher asks students to fill out a pre-established or partly filled in organizer, depending on the age level, to be turned in after a large learning block just before recess or lunch. At the top of the organizer should be the main overall lesson objective with boxes below the objective descending in size

and importance to the lesson. The student will be expected to fill in the boxes closer to the objective with greater detail than the boxes further away from the objective at the top.

Assessment can be either formative, summative, or a combination of both. In a differentiated classroom, teachers are constantly studying their students (Adams & Pierce, 2006). They gather data in every lesson through a variety of methods making assessment an integral part of every lesson that informs the learning process (Adams & Pierce).

Formative assessments can also take the form of more traditional tests administered at the end of a unit providing an indicator of student learning over time. However, teachers that practice DI don't limit themselves to traditional tests. A teacher practicing DI would include alternative assessments as a part of their summative assessments. Alternative assessments include portfolios, projects, and other more authentic tasks (Adams & Pierce , 2006).

According to McTighe and O'Connor, (2005) "summative assessments summarize what students have learned at the conclusion of instructional segment. These assessments tend to be evaluative, and teachers typically encapsulate and report assessment results as a score or a grade" (p. 11). The authors believe that summative assessments alone "are insufficient tools for maximizing learning. Waiting until the end of teaching period to find out how well students have learned is simply too late" (p. 10). Summative assessments are important as a part of DI, however, they should not be the only barometer of success in an effective differentiated classroom.

The Intent of Differentiated Instruction

DI is a responsive instruction method, as it allows teachers to become more increasingly proficient in understanding their students as individuals, increasingly comfortable with the meaning and structure of the discipline they teacher, and increasingly flexibly in order to match

instruction to student need with the goal of maximizing the potential of each learner in given area (Tomlinson, 2003).

The intent of DI can be summed up into three categories (Tomlinson, 2003). The three categories can be easily understood if viewed as three cogs of DI in clock work. The cogs include, the student seeking, the teacher responding, and curriculum and instruction as the vehicle (Tomlinson). The student seeks affirmation, contribution, power, purpose and to be challenged (Tomlinson). These ideas can be flexible but provide a good starting point for a teacher new to DI.

The second cog is the teacher responding in order to connect with students (Tomlinson, 2003). The components of this cog include invitation, opportunity, investment, persistence, and reflection (Tomlinson, 2003). Once again, this list can be altered to fit an individual classroom or teacher, but provides a good starting point for a teacher new to DI. The third and final cog is curriculum and instruction that provide the vehicle. The parts of this cog are: important, focused, engaging, demanding, and scaffolded. Again, these ideas can be adapted or modified somewhat to fit the vantage point of the teacher (Tomlinson). An effective DI classroom does not try to balance the elements of student need, teacher response, and the role of curriculum and instruction. Rather, it is a classroom in which it is clear that unless the three elements remain carefully in check to work together, each element will inevitably be reduced to failure (Tomlinson).

Students vary in many different ways, from the ways they learn, to their social skills and athletic prowess. Student differences are the premise of DI. The premise of DI is that while students have the same basic needs, those needs will manifest themselves in different ways, depending on the student's gender, culture, general life experiences, talents, interests, learning

preferences, affective development, cognitive development, and support systems. (Tomlinson, 2003). The philosophy of DI says that the same classroom experiences often affect different learners in different ways.

Differentiation does not meant that every single lesson or unit includes differentiated content, process, and product for each and every student's interest, readiness level, and learning profile (Glass, 2009). As Tomlinson (1999) states, "Teachers may adapt one or more of the curricular elements (content, process, product) based on one or more of the student characteristics (readiness, interests, learning profile) at any point in a lesson or unit" (Tomlinson, 1999, p. 11). A common misconception of DI is that more work is given to the high achievers and drill and practice work is given to the lower achievers. DI is woven in and out of each unit and lesson. DI can be done in many different ways and two different teachers can have the same objectives for their students but go about differentiation in a totally different way.

Using Differentiated Instruction in Science

Differentiating science instruction ensures that all students' learning strengths are shown. One fundamental differentiated science instruction belief is making sure that science instruction engages students with purposeful interaction; it is equally import to ensure that, when necessary, instruction gets altered so that all learners have access (Hamm & Adams, 2008). "A good science curriculum is the foundation of effective differentiation" (Hamm & Adams, p. 71).

Collaborative learning is one of the best approaches that middle school science teachers can use as a part of DI (Hamm & Adams, 2008). Within a collaborative learning classroom, there are many and varied strengths among students. Hamm and Adams believe the most successful way to use DI in a science classroom is to use collaborative learning through the use of aforementioned centers, tiered activities, and to make learning more challenging. Hamm and

Adams recommend a change in focus from textbooks and interdisciplinary skills to cross-subject and mixed-ability teams. Teachers should begin to make connections among science, math, and the real-world. For real-world connections, the authors propose using the newspaper as a good starting point. An example of using a newspaper in a differentiated cross-subject science-based lesson would be to encourage students to bring in articles they found in the daily newspaper that relate to science. Students are practicing their reading and research skills as well as building their science content. This lesson can be differentiated by providing some students with a copy of a newspaper where the articles contain science content. The teacher could go even as far as adapting the readability level so it is at an appropriate reading level for a group of students.

Summary

DI has its roots in many different teaching philosophies that have tried and failed over the years. DI is mainly are based on earlier concepts of individualized instruction and open classroom. Although these two models failed in the eyes of some, many things were learned and incorporated into modern day DI.

DI is used to instruct on tiered levels so that all students are equally challenged. There are four main components of DI that must be integrated into the classroom in order for DI to be effective. DI also calls for different types of assessment that include formative and summative assessments. The intent of DI is for the student to seek, the teacher to respond, and to use instruction as the vehicle.

Method

The purpose of the study was to determine if and how effective differentiated instruction is on a fourth grade rural science class. The study was done in two separate fourth grade classes. One class acted as the control where they did not receive DI while the second class received DI.

Students were given both a pre-post test and pre-post survey in order to detect differences that could be attributed to DI.

Participants

The participants in this study are from a general education fourth grade science class that practices the full inclusion of students with disabilities, in rural southeastern Ohio. Specific participants were not chosen by the researcher, rather the classes were chosen by the researcher. The students are from a low socioeconomic (SES) background. In the two classes there were nearly equal numbers of males and females with ages ranging from eight to ten years of age. The control class had 24 students and the intervention class had 22 students participate. In the intervention class there were 8 males and 14 females that participated in the test and survey. For the post test and survey there were 9 males and 13 females that participated in the control class. The control classroom had 11 males and 13 females participate in the pre test and survey. For the post test and survey there were 11 males and 12 females participating. No student that participated in the study had been retained in any grade prior to fourth grade.

Each group had an equal amount of students with disabilities that included learning disabilities, cerebral palsy, and other health impairments. One science class was considered at a "higher" level than the other science classes because of their prior academic achievement. This class did not receive differentiated instruction (DI) and served as the control group. The lower of the two science classes served as the intervention group and received differentiated instruction.

Instruments

There were two tools used to collect data for this study. The first was a pre-post test to determine differences in science content knowledge over the course of the study. The pre-post test was made up of 24 multiple choice questions and students were asked to circle the correct

answer. This content was later taught by the cooperating teacher using DI with one class and using traditional teaching methodology (no differentiation in the instruction based on student ability, interest, or skills) with the other. The pre-post test contained content knowledge that a typical fourth grader is expected to know by the end of the fourth grade. The questions on the instrument were written at a fourth grade reading level and also read aloud to the students. See Appendix for copy of the pre-post test.

The second instrument that was used to collect data was a pre-post survey of student's perceptions of DI. There were a total of 22 multiple choice questions that pertained to their perceptions of DI with one question asking their gender. An example from the pre-post survey would be: *Do all students learn the same way? Circle Yes or No*. The pre-post survey contained questions that were compiled from interested teachers and administrators about how students felt about different aspects of DI. Questions were also drawn from the literature on the subject of DI. These questions were also written at a fourth grade reading level and read aloud to the students. This was also multiple-choice in format and students were encouraged to be honest and circle the correct answer. See Appendix for a copy of the survey.

The reliability of both the pre-post test and survey is untested due to the age of the participants, in addition to other external factors. A few things that weakened the reliability of the instruments was that it was hard to determine how the students were feeling on the day the data was collected, as the instrument relied on self-report. Students could be having a really good day or they could be having a bad day, totally unrelated to the type of instruction they were receiving, which would affect the reliability of the data.

A second way the reliability of the data was impacted was whether or not all the students were present for both data collection periods. In addition, the instrument did not measure how

often, how long, or what kinds or types of DI strategies the cooperating teacher used. One group could have been receiving differentiation while a group sitting right next to them was not receiving the same type of instruction. Because of the very nature of differentiated instruction, no student received the exact same instruction as another student. Additionally, some students may have tried harder the second time around on the assessment or vice versa. A final way the reliability was questionable is that not all students read and comprehend at the same level. Although the instruments were read aloud to the students, comprehension of the question cannot be quantified if they student does not fully understand what is being asked.

The internal consistency of the pre-post test is not as strong as the pre-post survey. The reason is that the survey included many more questions that asked the same kind of question in a different way, to increase reliability. The content pre-post assessment was weaker because there were only a few questions covering the content for each concept. Participants were asked in multiple ways who the inventor was for an invention. This makes the internal reliability stronger but most other questions were not asked again. Some questions were repeated to make the internal reliability stronger on the pre-post test. They were the same style of question that asked if something was copyrighted, trademarked, or patented.

The internal consistency of the pre-post surveys, as mention before, was the stronger of the two instruments. An example of this is question 11, 13, and 14 ask similar questions about how a student learns best. Another example of strong internal consistency in the surveys is found in questions 20, 21, and 22. The questions focused on how the students felt about small groups and small group instruction. Both of these examples raise the internal consistency of the instrument which in turn raises the reliability.

Validity

The validity of the study can also be categorized as questionable. The conclusion suggests that the intervention or DI did have an effect on the academic outcomes of the students as measured by the content assessment. The scores on the post-test improved, but it is difficult to say what actually caused the growth. There is no doubt that differentiation helped but there are other external factors that could be affecting the data. Some possible external factors that could be affecting the data are: some material was emphasized more than another by the teacher, a student could have been absent, and student attitude toward the test.

The external validity is rather strong in that this study could be generalized to other classrooms. The effectiveness of DI largely depends on how well versed the teacher is in the strategy and how well the strategy is implemented. It would also depend on if the teacher is practicing effective DI strategies. If this study was done in a similar classroom and grade level, it would be possible to expect to see the same results. The numbers may vary slightly but one could expect an increase in student academic growth attributed to the use of DI.

Procedures

The students were given the pre test and survey at the beginning of the science and technology unit that is usually done during this time during a fourth grade science class. Students were asked to keep the papers turned down until the proctor told the students to turn their papers over. The students were told not to put their names on their paper and each paper had a number at the top of each test and survey. Each student was given the same number on all the tests and surveys in order to accurately compare the data. Before the pre test and survey, the participants were encouraged to do their best work and be honest on the survey. The students were then asked to flip the paper over and wait for further instructions. The proctor told the students that they may not work ahead and to stay with the class. The proctor then read each

question once and up to three times only if requested by a student. After the students completed the pre test and survey, they were collected and data was compiled from them.

The post test and survey was given to the students at the end of the science and technology unit. The students were told that the post test was going to be used as an assessment and taken down for a grade. The post test and survey were then handed out and not to be flipped over until the proctor had said so. The post test and survey were then explained to the students. Students were told that the post tests and surveys were the same ones that they took at the beginning of the science and technology unit. The participants were given the same number on their post test and survey as they had for their pre test and survey. For the students that were absent for the first test and survey, they were given an alternate number. There were students that were absent for the post test and survey. Their data was used for the pre test and survey. All data that was collected was used in this study.

After the post tests and surveys were handed out, the proctor asked the students to turn their papers over and begin. Students were asked to not work ahead of the proctor. The proctor then read each question at least once and up to three times if requested by a participant. After the post test and survey were over, the proctor collected all the papers and began compiling the data.

Results

The data was analyzed by looking at the overall change in students' pre-post test scores and attitudes towards DI. Change was determined using the results of the pre-post test and survey. The overall percent correct on the pre and post-tests were compiled and compared for each class. The differences of the scores were also compared to determine differences between the classes.

The 24 question survey was broken down in five clusters where similar attributes of each question were shared. The first cluster asked students whether a teacher should continue to learn new ways to teach and their feelings about using different learning materials. The second cluster rated students' feelings about individualized instruction and if everyone learns the same way. Cluster three focused on students' feelings about getting extra help in the classroom. The fourth cluster related to assessments and extra time. The final cluster focused on students' feelings toward flexible grouping.

Pre and Post-Test

Class one (the control group) did not receive any DI and class two (intervention group) received DI. The pre-test was given to the students before the content was taught and the post-test was given after the subject was taught. The same survey was given to both classes before and after the intervention was implemented.

Class one, the control class, improved their scores from the pre-test to the post-test. On the pre-test the first class scored 25% and after instruction their scores raised to 57% correct, an improvement of 32%. The second class, the intervention class, also improved their scores from the pre-test to the post-test. On the pre-test they scored 18% and after DI their scores raised to 50% correct, also an improvement of 32%.

The bar chart shows the means for the pre-post tests for both classes. The control class earned a mean of 25% of the questions correct on the pre-test and after instruction they earned an average of 57% correct. Although this is still failing, there was an average improvement of 32%.

Like the control class, there was a average improvement of 32% for the intervention class. On the pre-test the intervention class mean was 18% correct and after the intervention the mean rose to 50% correct.

Figure 1. *Percent Correct by Group: Pre-Post Test Means*.

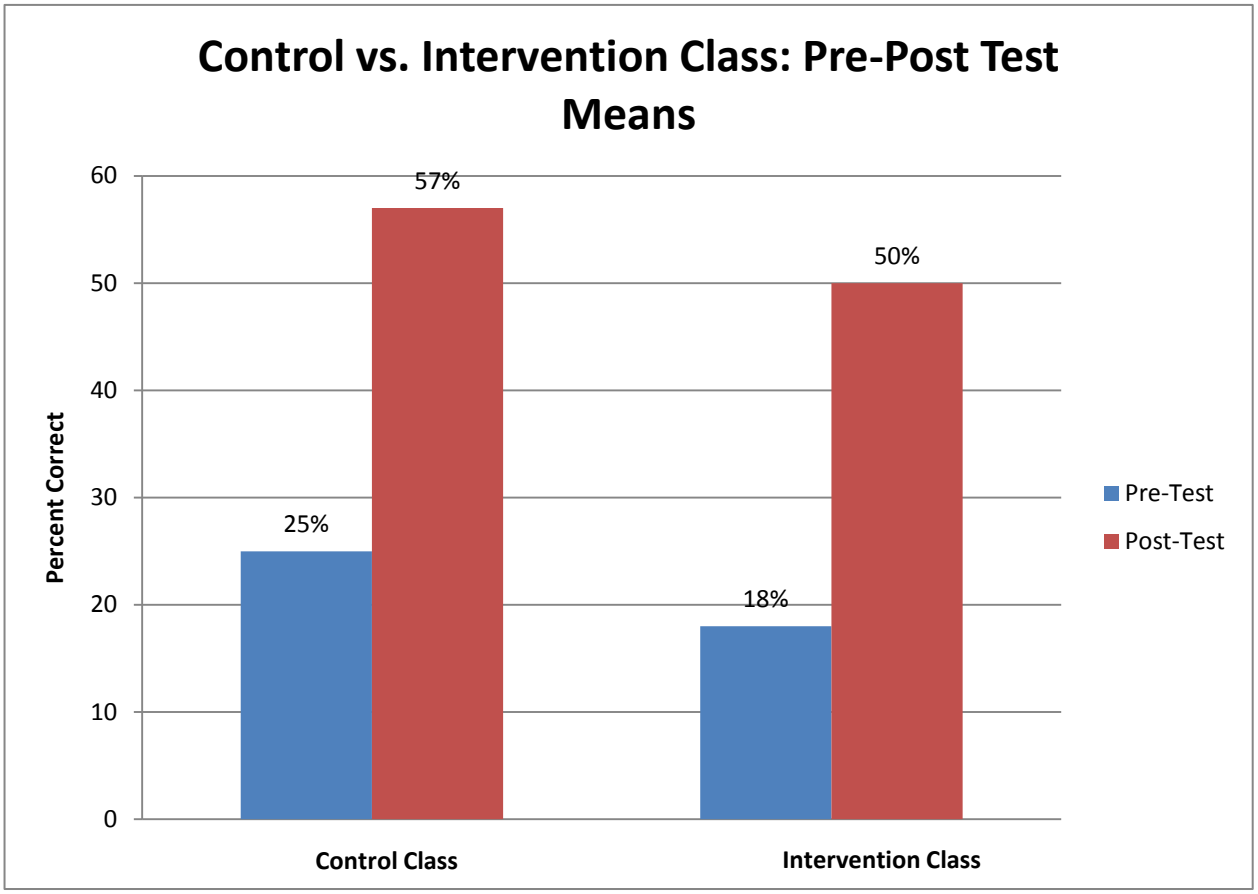


Figure 3 shows the individual scores each student got correct compared to the class median on the pre-test for the control class. The median score for the class was seven correct. There were 10 students to score above the median, while there were 12 students that scored at or below the median.

Figure 2. *Control Class Individual Scores of Correct Answers vs. Median Score on the Pre-Test*

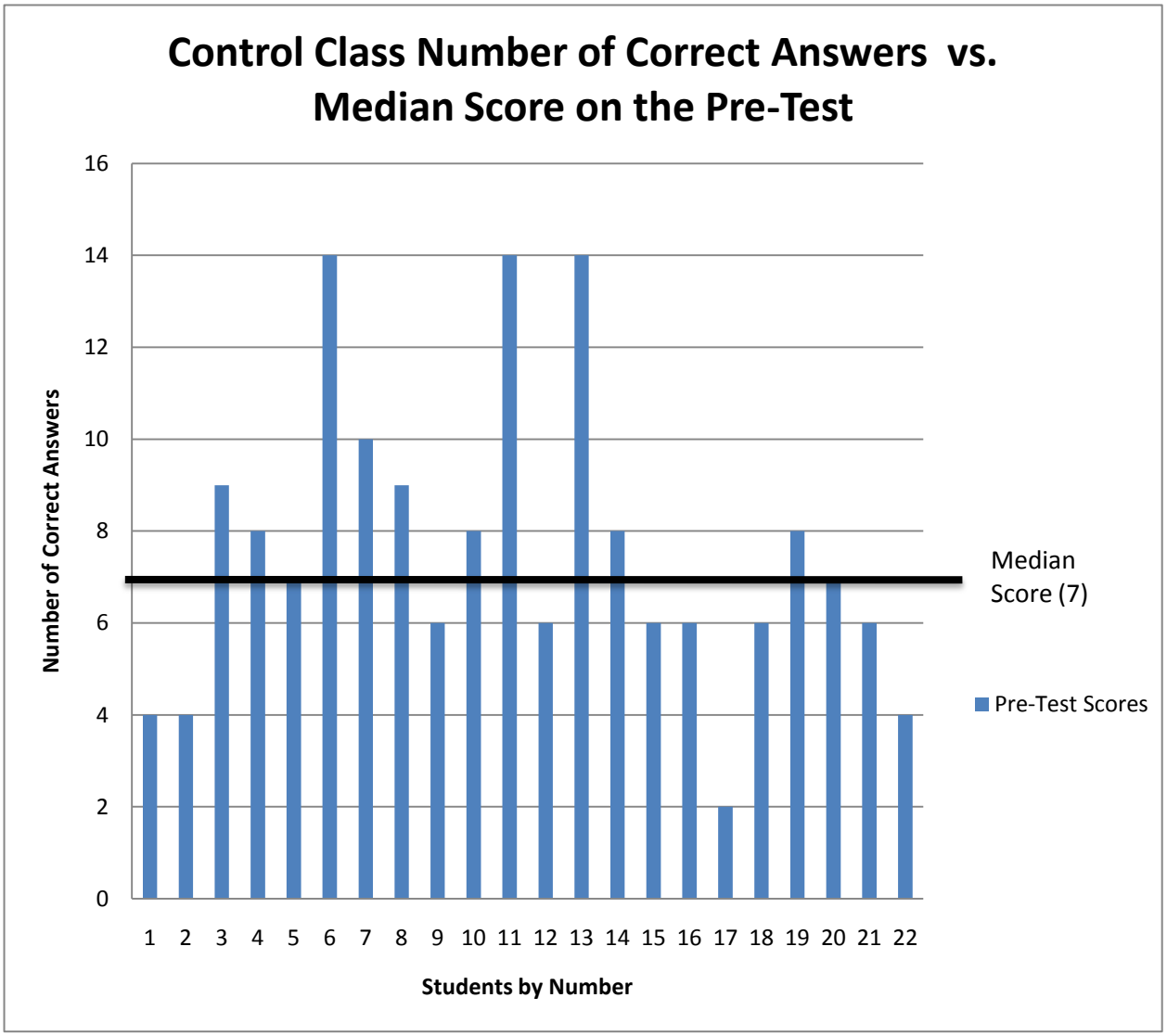


Figure 4 shows the individual scores for each student in the intervention class for how many questions correct compared to the class median on the pre-test for the intervention class. The class median score was 4.5 correct. There were 11 students to score above the median, while there were 11 students that scored at or below the median.

Figure 3. *Intervention Class: Individual Scores of Correct Answers vs. Median Score on the Pre-Test*

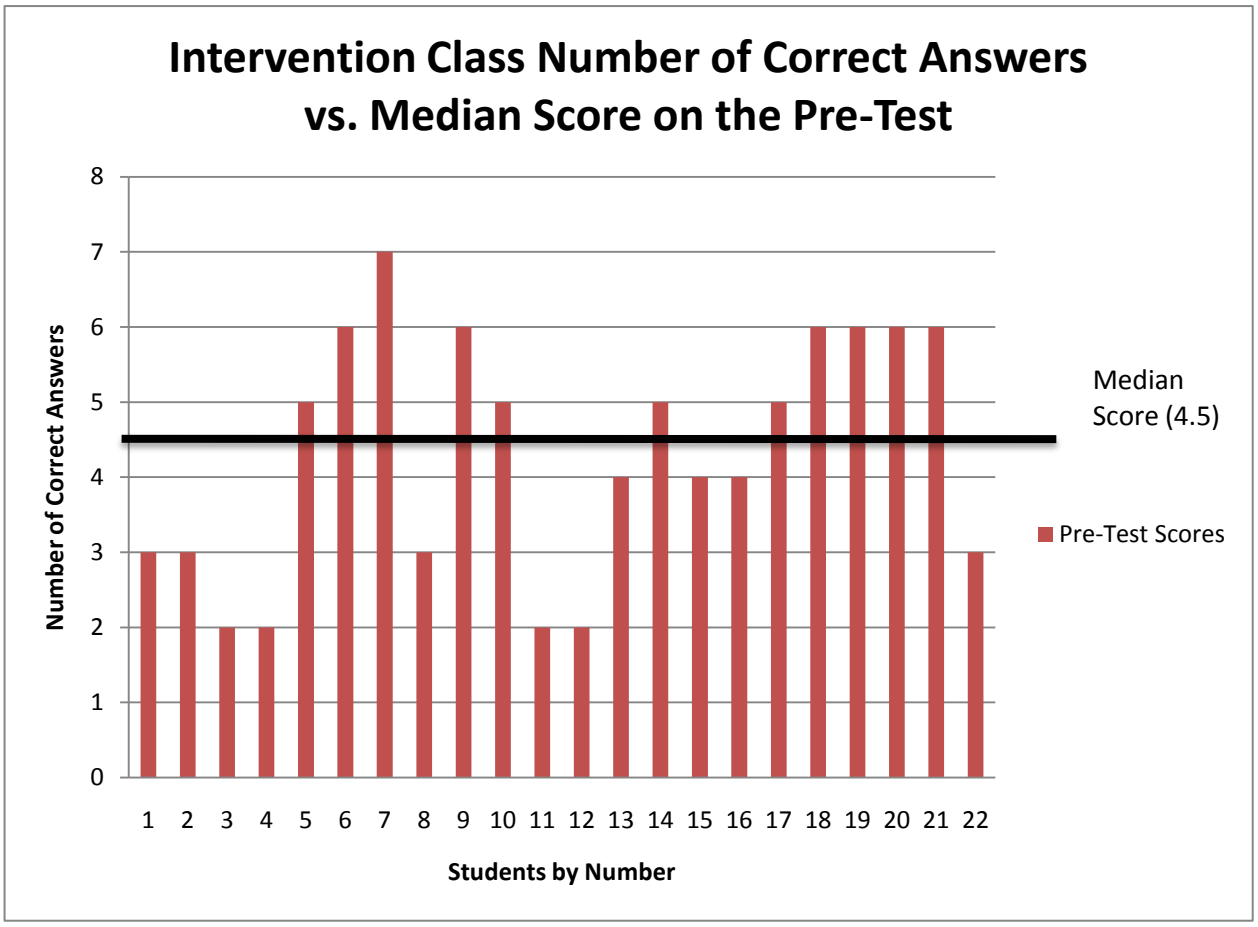


Figure five shows the individual scores of each student of how many questions they got correct compared to the class median on the post-test for the control class. The class median score was 10.5 correct. There were 12 students to score above the median, while there were 12 students that scored at or below the median.

Figure 4. *Control Class Individual Scores of correct Answers vs. Median Score on Post-Test.*

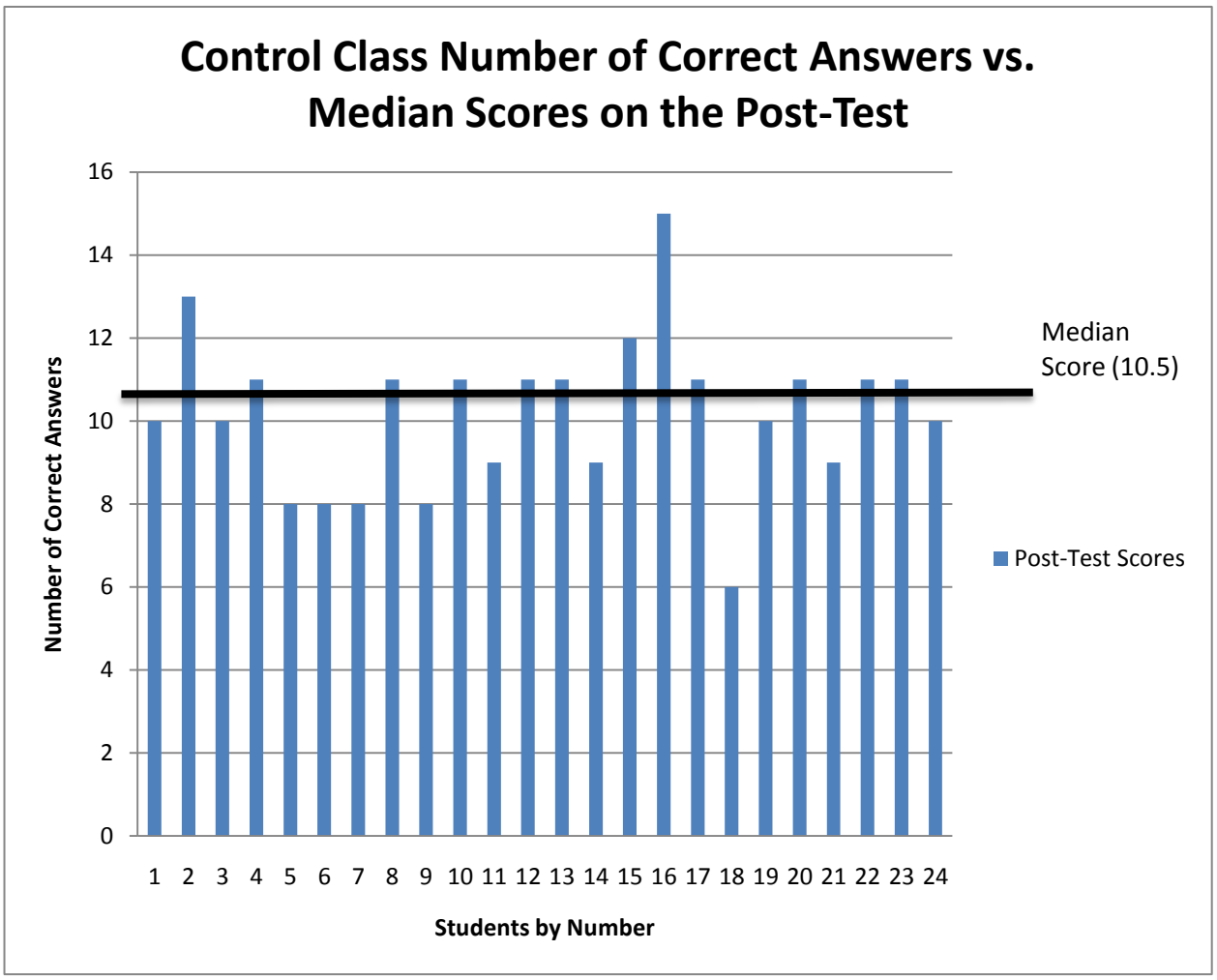
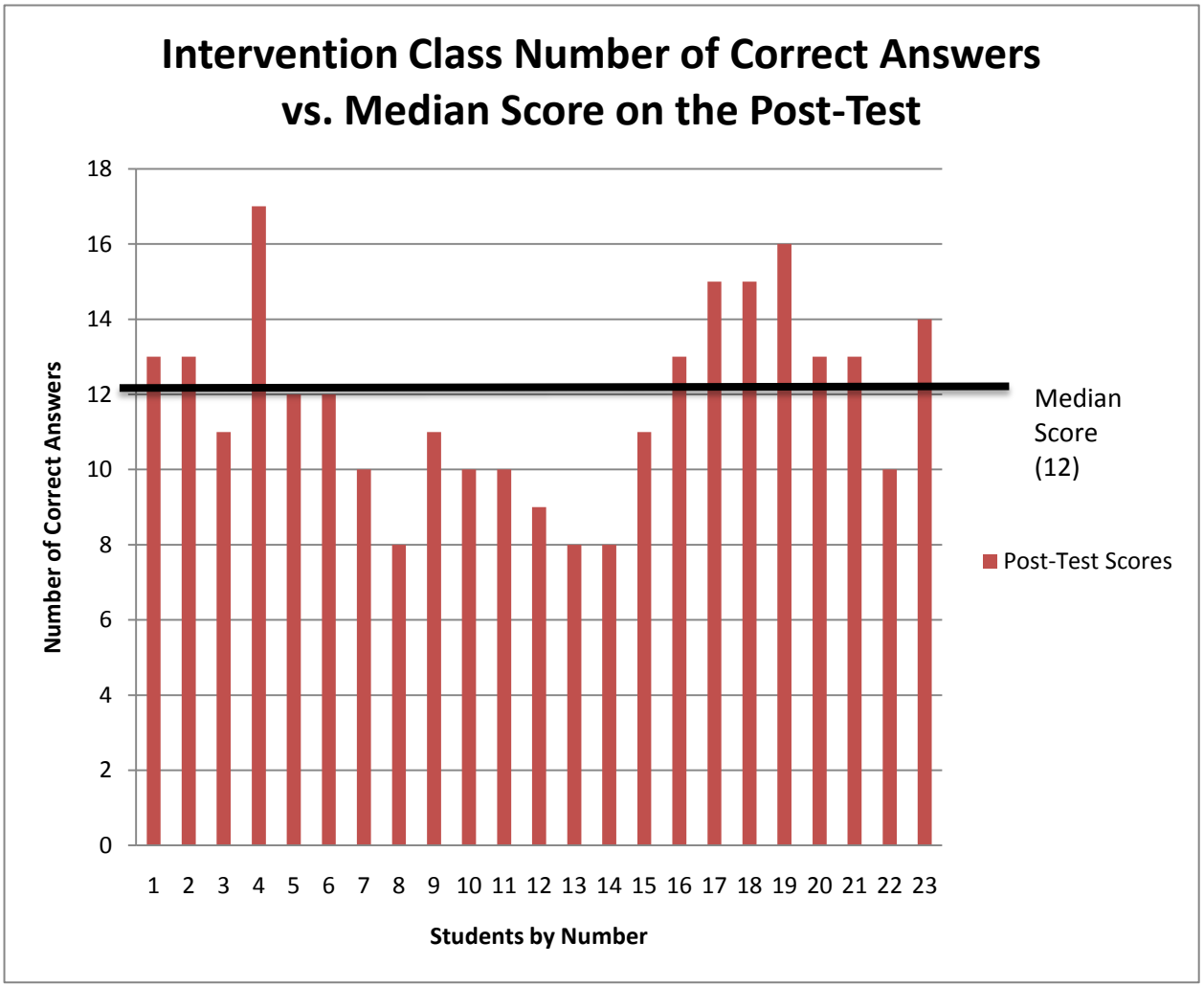


Figure six shows the individual scores of each student of how many questions they got correct compared to the class median on the post-test for the intervention class. The class median was 12 correct. There were 10 students to score above the median, while there were 13 students that scored at or below the median.

Figure 5. *Control Class: Individual Scores of Correct Answers vs. Median Score on Post-Test*



The control class, as expected, had a median score of seven questions correct on the pre-test, while the intervention class had a median of 4.5 correct questions. This is a 2.5 question disparity. The intervention was intended to close this gap.

After the intervention, the control class had a median score of 10.5 questions answered correctly while the intervention class had a median of 12 correct questions. This is a substantial improvement even though both classes' scores are still considered to be failing. The control class improved by 3.5 questions after basic instruction while the intervention class improved by 7.5 correctly answered questions. This nearly doubled the improvement for the control class, demonstrating the intervention was effective in improving students' tests scores.

Cluster One

Cluster one pertains to survey questions three and eight. Cluster one's purpose was to determine students' feelings on whether a teacher should continue to learn new ways to teach and their feelings about using different learning materials in the classroom.

On the pre-survey for the control class, 82% of the students felt they should be using many different learning materials and the teacher should be continuing to learn different ways to teach (91%). On the post-survey the students' opinions did not change in that 82% of the students felt they should be using multiple learning materials. However, there was a slight decrease in the percentage of students who felt that teachers need to continue to learn new ways to teach (77%).

The results for cluster one for the intervention class shows that on the pre-survey 83% of the students felt they should be using different learning materials in the classroom with 83% of the students saying that teachers should continue to learn new ways to teach. On the post-survey 100% of the students felt that multiple learning materials should be used and 70% of the students felt teachers should continue to learn new ways to teacher. This is a slight decline from the pre-survey results where 83% felt that teachers should continue learn new ways to teach.

Cluster Two

Cluster two included questions 4, 5, 11, 12, 13, 14, and 24. This is the largest cluster and the purpose of this cluster was to determine students' feelings about individualized instruction and learning styles.

Results of cluster two for the control class shows that on the pre-survey 82% of students think the lesson should be made interesting and also believe teachers should change the lesson to be more interesting to the students (64%). Accordingly, 84% of students felt that not all students learn the same way and that is important for a teacher to use different ways to learn such as: using the smartboard, pictures, music, reading buddies, study guides, and/or listening to books on tape/CD (84%). It was also determined to be "little important" for a teacher to use just more than worksheets to teach (41%). However, 84% of the students felt some students learn better when reading about something while other students learn better by doing something. Lastly, students felt that by doing an experiment (41%), working with others (24%), and through rhythm or music (18%) were the best three ways for students to learn.

On the post-survey for the intervention class, 64% of students thought the lesson should be made interesting to them but they were evenly divided (50%) as to whether or not a teacher should change the lesson to make it interesting to the students. Most students (91%) felt that not all students learn the same way and that is important for a teacher to use different ways to learn. Both of these increased from the pre-survey, up from 84%. It was also determined to be "not important" for a teacher to use more than just worksheets to teach (64%). This was a change from "a little important" (41%). However, 68% of the students felt that some students learn better when reading about something while other students learn better by doing. Lastly, students felt that by doing an experiment (45%), working with others (29%), and using rhythm or music (21%) were the best three ways for students to learn.

Cluster two results for the pre-survey for the intervention class showed that 88% of students thought the lesson should be made interesting to them and 58% felt that a lesson should not be changed for individual students. Most students (96%) felt that not all students learn the same way and that is important for a teacher to use different ways to learn (92%). It was also determined to be "very important" for a teacher to use just more than worksheets to teach (38%). Accordingly, 58% of the students felt that some students learn better when reading about something while others learn better by doing. Lastly, students felt that by doing an experiment (40%), working with others (22%), and using rhythm or music (17%) were the best three ways for students to learn.

Cluster two results for the post-survey for the intervention class shows that 83% of students think the lesson should be made interesting to them and 70% felt that a lesson should not be changed for individual students. Students suggested a stronger opinion that teachers don't need to change their lesson plans for individual students with 70% of students agreeing, up from 58% on the pre-test. Nearly three-fourths (74%) felt not all students learn the same way and that is important for a teacher to use different ways to learn (100%). It was also determined to be "very important" for a teacher to use more than just worksheets to teach (61%). This number increased nearly two fold, suggesting a stronger opinion. Accordingly, 65% of the students felt that some students learn better when reading about something while others learn better by doing, which was an increase from 58%. Lastly, students felt that by doing an experiment (46%), working with others (25%), and using rhythm or music (23%) were the best three ways for students to learn.

Cluster Three

Cluster three was comprised of questions 9, 10 and 13 on the survey. This cluster was designed to determine students' beliefs about receiving extra help from an adult.

Cluster three results for the pre-survey for the control class show that 91% of students noticed that other students are getting extra help and 36% of the students claim that it "sort of bothers" them. Thirty eight percent said that they would be "sort of excited" if given a learning contract.

Post-survey results for control class showed that 86% of the students noticed that other students are getting more help than they are, which was down from 91%. Forty–one percent felt that it was "unfair" for another student to be receiving extra help. This was a change from it "sort of bothering" them to being "unfair". Students also reported they would be "sort of excited" if they received a learning contract from the teacher (41%).

Cluster three results for the pre-survey for the intervention class indicated that 75% of the students noticed another student getting more help than them. There was an equal split (33%) between being "unfair" and "sort of bothers" them when they see another student getting more help than them. Twenty-nine percent of the students said they would be "sort of excited" to create a learning contract between them and the teacher.

The post-survey results showed that 83% of the students noticed that another student was getting more help than they were. This is a slight increase from 75% from the pre-survey data. It was also determined that 30% of the students said they were not bothered when another student got more help. Thirty-one percent of students reported they would be "sort of excited" if they were allowed to create a learning contract with the teacher which is slightly up from 29%.

Cluster Four

Cluster four contained questions 6, 7, 15, 16, and 17. This cluster was designed to determine students' feelings about different ways of grading and having extra time to complete a task.

Cluster four results for the pre-survey for the control class showed that 64% of students felt teachers should give extra time to some students and not others. Fifty-four percent thought teachers should make work harder for some students and easier for other students and 82% thought quizzes/tests should be changed because some information is not interesting. Students also felt tests and quizzes should be graded differently for some students (59%). If the tests were graded differently, 32% reported that it wouldn't bother them.

Post-survey results for control class indicated that 64% of the students thought teachers should not give extra time to some students, which is a dramatic change from the pre-test. Sixty-eight percent thought teachers should not make tests and quizzes harder for some students. This was also a change from the pre-test where students felt teachers should make tests/quizzes harder for some students (82%). Many students (77%) thought a teacher should change a test or quiz because some information is not interesting and 64% thought tests/quizzes should not be graded differently. The latter is a significant change from the pre-test. If tests were graded differently, 72% said that it would not bother them.

Cluster four results for the intervention class on the pre-test said that 88% of the students felt teachers should give extra time to some students and not others. A majority of the students (58%) felt teachers should not make work harder for some students and not for others. Students also felt a teacher should change a test or quiz because some information is not interesting (71%). Many (67%) said that quizzes and tests should not be graded differently for some students. If this were to happen, 46% of the students said that it would be unfair.

Post-test results for the intervention class indicated that 70% felt a teacher should not give extra time to some students and not to others. Students indicated teachers should not make work harder for some students and not others (70%) and that teachers should change a test if the information is not interesting (71%). This data is consistent with the pre-survey results. However, 61% of the students said that tests/quizzes should not be graded differently for some students and not others. Lastly, students felt if tests and quizzes were graded differently it would not bother them (35%).

Cluster Five

Cluster five contained questions 18, 19, 20, 21, and 22. The purpose of this cluster was to determine students' opinions about flexible grouping. Cluster five results for control class on the pre-survey indicated students enjoy when groups are switched around (54%). Accordingly, students prefer smaller groups as opposed to larger groups (68%) and it is important to students when the teacher works with a small group (45%). Many (82%) students enjoy centers/stations. Likewise, 82% of students enjoy working with a parent, another teacher, or college student individually.

Post-test results for intervention class show that 82% of the students enjoy it when groups are switched around. Students also prefer smaller groups as opposed to larger groups (72%). Accordingly, it is very important to a student when a teacher works with a small group of students (45%). Most students (91%) reported enjoying working in centers or stations. Most (88%) also enjoyed it when a parent, another teacher, or college student works with them individually.

Cluster five results for the pre-survey for the intervention class indicated that 54% of the students enjoy it when groups are switched around. Many (86%) prefer small groups over larger

groups and indicated it was a "little important" when a teacher works with a small group of students (29%). Students preferred to work in centers or stations (84%) and 92% said that they like it when a parent, another teacher, or college student worked with them individually.

Post-test results indicated that 78% of the students enjoyed it when groups are switched around and 87% preferred smaller groups over larger groups and felt it is important for a teacher to work with students in these smaller groups (28%). Many (91%) enjoy working in centers or stations. Lastly, students enjoy working with a parent, another teacher, or a college student individually (96%).

Discussion, Recommendations, and Conclusion

Discussion

This study was designed to examine the effectiveness and student attitude toward DI. The findings demonstrate there was an improvement in academic scores when DI was used and student attitudes toward DI grew to be more positive towards this specific teaching method. Students in the intervention classroom dramatically improved their scores to a level unexpected by the cooperating teacher. Students' negative attitudes towards student learning styles, extra time, and grouping became more positive after the intervention. Each cluster of student beliefs' about DI changed after the intervention to a more positive view.

The following section provides insight and information about the specific research questions: Will DI improve academic scores? Will attitudes toward DI become more positive? Is DI an effective teaching strategy?

Academic scores in the intervention class did improve, as expected, and the growth was equal to the growth of the control class. Each class improved their test scores by 32%. This

shows that DI worked because when the "low" students were given what they needed to succeed (DI), they made comparable growth to their peers with more advanced abilities.

The results support the original hypothesis that DI would be effective and raise student test scores. It was proposed that the scores would have improved more than the control group but scores equal to the control group are considered to be successful. The "low" class had the same academic improvement as the "high" class.

Attitudes did improve toward DI in each cluster. In cluster one, students' attitudes using different learning materials improved from 83% to 100%. This means they enjoyed using many different learning materials on a regular basis after the intervention. As a part of the intervention, using multiple learning materials is a key component of DI.

In cluster two, students were asked if it was important for a teacher to use more than just worksheets to teach and in the pre-survey students reported that it was not important. After the intervention, students' attitudes toward this method became more positive. Students reported it is important for teachers to use more than just worksheets to teach. This is important because when a teacher uses DI, they must use more than just worksheets to teach. Using multiple teaching tools is another key component of DI.

Cluster three attitudes about DI improved as well. Results in this cluster found students noticed that other students were getting more help than them and it bothered them before the intervention. After the intervention, students reported they were aware of other students getting more than they were, but it no longer bothered them. In DI, many times teachers will work with individual students and groups which can be perceived to unsuspecting students that another student is getting more help than they are, which might bother them. After the intervention, students' attitudes changed and were more accepting of this idea. Students realized that others

were not getting extra help but receiving what they needed to be successful and at times this means more attention from the teacher.

Cluster four indicates attitudes improved toward DI as well. In the pre-survey, students stated lessons should not be tiered for students and after the intervention most students agreed that lessons should be tiered for students. Students agreed that tiering lessons for groups of students is an effective strategy and were not bothered by this practice. This is important because one of the aspects of DI is to tier lessons for groups of students.

In the last cluster, it was reported that slightly over half of the students enjoyed it when groups were switched around. Having flexible groups is a key component of DI. After the intervention, students reported a much higher acceptance of flexible grouping.

The final research question was to determine the effectiveness of DI. It has been determined that DI is effective because of the increased test scores. Also, attitudes towards DI became more positive. When there is a positive attitude toward something, it is more likely there will be success. When students and teachers alike enter DI with a positive attitude, the chance of having a higher success rate is improved. DI has already been determined to raise test scores, the next step is raise them even higher and improve the student and teacher relationship.

Limitations and Recommendations for Future Research and Practice

While the findings show that DI is an effective strategy, this study generally follows the suggestions in the research about what DI strategies are seen as effective. Several limitations must be considered when generalizing this information to a larger population. First, the sample size was very small. Findings from this group may not generalize to a larger population as only two classes (49 students) participated. Findings about this fourth grade science class may not generalize to other fourth grade science classes or other multi-grade general education classes.

Second, there are limitations related to the instruments. Many of the students could have been feeling anxiety on the pre-test because they saw the word "test" and got worried. Other students may not have cared and answered questions in any way because they thought it was not going to be for a grade. On the surveys, students could have been scared to put down their true feelings in fear they might get in trouble for what they believed. Similar to the pre-test, students might not have cared and circled any answer. Additionally, both instruments were created by the researcher and have not be subjected to any formal tests of reliability or validity.

Also, there were limitations for what the teacher actually taught. Some of the material included in the post-test was not covered by the instruction which impacted the data. In the future, the researcher should be sure the material on the post-test had been covered and if some information was not covered, then those questions should be dropped.

Finally, DI strategies used in the classroom were not documented by the researcher . It was not determined which, for how long, and how many DI strategies the teacher used. The teacher could have used multiple strategies but they were not documented. This would affect generalizing to the population in that there were no set DI strategies to follow. The teacher used her best judgment as to which strategies would be effective and some strategies that worked in this classroom may not generalize to another classroom.

Conclusion

These findings support the research already done on DI. In the literature, it was stated that flexible grouping, tiered lessons, and creating learning profiles for the students were successful (Pierce & Adams, 2006). This research project not only showed academic growth with the use of the previously stated strategies but also showed that attitudes towards these techniques were positive. This study's findings further suggest that when a teacher creates a

learning profile for students and uses DI, the students are more likely to succeed academically and socially.

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Appendix A

Pre-Test: Science and Technology

Directions: Answer each question to the best of your ability. Be sure to answer all questions.

Multiple Choice

1) Garret Morgan's invention would most affect you when:
    a. Baking a cake
    b. Driving a car
    c. Playing baseball
    d. Talking on the phone

2) Alexander Graham Bell was born in:
    a. New York, New York
    b. London, England
    c. San Diego, California
    d. Edinburgh, Scotland

3) Without Dr. Robert Goddard's invention which one of the following would NOT exist today:
    a. Space travel
    b. Car travel
    c. X-Box 360
    d. Microwave

4) Ben Franklin created the invention we talked about in class because:
    a. He was tired of switching glasses to correct his myopic eye condition.
    b. He wanted to find a better way to listen to the radio.
    c. He thought that new inventions only made life worse.
    d. He thought that being able to print words on paper made life easier.

5) James Murray Spangler main reason for creating his invention was because:
    a. He wanted to make a lot of money.
    b. He thought that cleaning carpets was important.
    c. He wanted to improve vision.
    d. He was extremely allergic to dust.

6) Thomas Edison was born in which of the following places:
    a. Cincinnati, Ohio
    b. Milan, Ohio
    c. Pass-a-Grille Beach, Florida
    d. Chicago, Illinois

Matching

Directions: Match up the inventor to their most famous invention. Choose the letter that best fits.

Garret Morgan	A. Light Bulb
Alexander Graham Bell	B. Liquid propelled rocket
Robert Goddard	C. Bifocals
Ben Franklin	D. Traffic Light
James Murray Spangler	E. Telephone
Thomas Edison	F. Vacuum Cleaner

True or False

Directions: Put a capital "T" for true sentences and capital "F" for false sentences.

7) _____ A patent lasts for 17 years.

8) _____ A patent number can be used more than once.

9) _____ The purpose of a patent is to NOT prevent others from making, using offering for sale, or selling the invention in the U.S. or importing the invention into the United States.

10) _____ A trademark does NOT prevent others from making the product.

11) _____ A trademark is a word, name, symbol or device which is used in trade with goods to show the source of that product and to tell them from the goods of others.

12) _____ Copyright is NOT a form of protection provided to the authors of "original works".

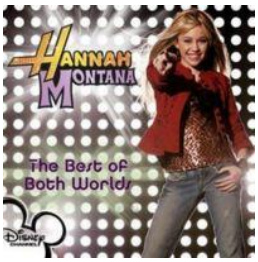
13) _____ A copyright would protect Hannah Montana's song "Best of Both Worlds" from being copied and sold as someone else's song.

Matching

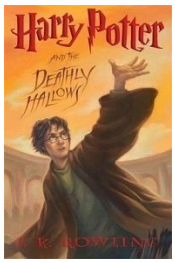
Directions: For each picture write down the correct protection it falls under. Write (Copyright, Trademark, Patent)

14) _____

15) _____


HANNAH MONTANA
The Best of Both Worlds

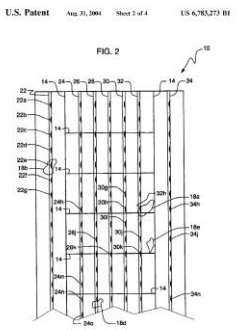
16) _____


Harry Potter
AND THE
DEATHLY HALLOWS
J.K. ROWLING

17) _____


Coca-Cola
classic

18) _____


U.S. Patent
FIG. 2

Appendix B

Post-Test: Science and Technology

Directions: Answer each question to the best of your ability. Be sure to answer all questions.

Multiple Choice

19) Garret Morgan's invention would most affect you when:
   a. Baking a cake
   b. Driving a car
   c. Playing baseball
   d. Talking on the phone

20) Alexander Graham Bell was born in:
   a. New York, New York
   b. London, England
   c. San Diego, California
   d. Edinburgh, Scotland

21) Without Dr. Robert Goddard's invention which one of the following would NOT exist today:
   a. Space travel
   b. Car travel
   c. X-Box 360
   d. Microwave

22) Ben Franklin created the invention we talked about in class because:
   a. He was tired of switching glasses to correct his myopic eye condition.
   b. He wanted to find a better way to listen to the radio.
   c. He thought that new inventions only made life worse.
   d. He thought that being able to print words on paper made life easier.

23) James Murray Spangler main reason for creating his invention was because:

a. He wanted to make a lot of money.
b. He thought that cleaning carpets was important.
c. He wanted to improve vision.
d. He was extremely allergic to dust.

24) Thomas Edison was born in which of the following places:

a. Cincinnati, Ohio
b. Milan, Ohio
c. Pass-a-Grille Beach, Florida
d. Chicago, Illinois

Matching

Directions: Match up the inventor to their most famous invention. Choose the letter that best fits and write it on the line next to the inventor

Garret Morgan	G. Light Bulb
Alexander Graham Bell	H. Liquid propelled rocket
Robert Goddard	I. Bifocals
Ben Franklin	J. Traffic Light
James Murray Spangler	K. Telephone

Thomas Edison L. Vacuum Cleaner

True or False

Directions: Put a capital "T" for true sentences and capital "F" for false sentences.

25) _____ A patent lasts for 17 years.

26) _____ A patent number can be used more than once.

27) _____ The purpose of a patent is to NOT prevent others from making, using offering for sale, or selling the invention in the U.S. or importing the invention into the United States.

28) _____ A trademark does NOT prevent others from making the product.

29) _____ A trademark is a word, name, symbol or device which is used in trade with goods to show the source of that product and to tell them from the goods of others.

30) _____ Copyright is NOT a form of protection provided to the authors of "original works".

31) _____ A copyright would protect Hannah Montana's song "Best of Both Worlds" from being copied and sold as someone else's song.

Matching

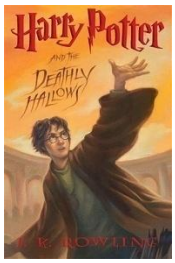
Directions: For each picture write down the correct protection it falls under. Write (Copyright,

Trademark, Patent)

32) _____

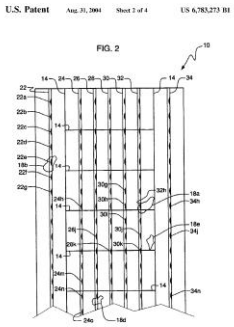
33) _____

34) _____



35) _____

36) _____



Appendix C

Pre-Survey

Directions: Please answer all questions to the best of your ability. Put the answer on the answer sheet. Remember there is no right or wrong answer. Please be honest.

1) Are you a boy or girl?
   a. Boy b. Girl
2) How old are you?
   a. 8 b. 9 c. 10 d. 11
3) Do you enjoy using many different learning materials?
   a. Yes b. No
4) Do you think lessons should be made for what is interesting to you?
   a. Yes b. No
5) Teachers should change their lesson plans for individual students?
   a. Yes b. No
6) Teachers should give extra time to some students and not other students?
   a. Yes b. No
7) Teachers should make work harder for some students and easier for other students?
   a. Yes b. No
8) Teachers need to keep learning new ways to teach?
   a. Yes b. No
9) Do you ever notice if another student is getting extra help than you in class?
   a. Yes b. No
10) How does it make you feel if another student gets more help than you?
   a. Doesn't bother me b. Unfair
   c. Sort of bothers me d. Makes me really mad
11) Do all students learn the same way?

a. Yes b. No

12) Is it important for a teacher to have you use different ways to learn? Examples: using the Smartboard, using pictures, using music, reading buddies, study guides, or listening to books on tape.

a. Yes b. No

13) How important is it to you that a teacher uses more than just work sheets to teach?

a. Not important b. Little important

c. Important d. Very important

14) Do some students learn better when reading about something while other students learn better by doing something?

a. Yes b. No

c.

15) Do you think a teacher should change a test or quiz because some information is not interesting or if the class isn't ready to be tested on a subject?

a. Yes b. No

16) Should tests and quizzes be graded differently for some students?

a. Yes b. No

c.

17) How would it make you feel if tests and quizzes were graded differently?

a. Doesn't bother me b. Unfair

c. Sort of bothers me d. Makes me very upset

18) Do you enjoy it when groups are switched around?

a. Yes b. No

19) Do you prefer large groups or small groups?

a. Large b. Small

20) How important is it to you when the teacher works with a small group of students?

a. Not Important b. Little important

c. Important d. Very important

21) Do you enjoy centers or stations?

a. Yes b. No

22) Do you enjoy it when a parent, another teacher, or OU student works with you individually?

a. Yes b. No

23) How would it make you feel if you got a learning contract? A learning contract is an agreement between you and the teacher about how you like to learn and be taught. You set specific goals together.

a. Not excited b. Sort of excited

c. Excited d. Very excited

24) Circle the ways that you learn best:

By doing an activity or experiment	By working with others	Through writing or reading
Through math or logical reasoning	By working with your surroundings	Through looking at pictures or visualizing
Through rhythm or music	Other	

Appendix D

Post-Survey

Directions: Please answer all questions to the best of your ability. Put the answer on the answer sheet. Remember there is no right or wrong answer. Please be honest.

1) Are you a boy or girl?
   a. Boy b. Girl
2) How old are you?
   a. 8 b. 9 c. 10 d. 11
3) Do you enjoy using many different learning materials?
   a. Yes b. No
4) Do you think lessons should be made for what is interesting to you?
   a. Yes b. No
5) Teachers should change their lesson plans for individual students?
   a. Yes b. No
6) Teachers should give extra time to some students and not other students?
   a. Yes b. No
7) Teachers should make work harder for some students and easier for other students?
   a. Yes b. No
8) Teachers need to keep learning new ways to teach?
   a. Yes b. No
9) Do you ever notice if another student is getting extra help than you in class?
   a. Yes b. No
10) How does it make you feel if another student gets more help than you?
   a. Doesn't bother me b. Unfair
   c. Sort of bothers me d. Makes me really mad
11) Do all students learn the same way?

a. Yes b. No

12) Is it important for a teacher to have you use different ways to learn? Examples: using the Smartboard, using pictures, using music, reading buddies, study guides, or listening to books on tape.

a. Yes b. No

13) How important is it to you that a teacher uses more than just work sheets to teach?

a. Not important b. Little important

c. Important d. Very important

14) Do some students learn better when reading about something while other students learn better by doing something?

a. Yes b. No

c.

15) Do you think a teacher should change a test or quiz because some information is not interesting or if the class isn't ready to be tested on a subject?

a. Yes b. No

16) Should tests and quizzes be graded differently for some students?

a. Yes b. No

c.

17) How would it make you feel if tests and quizzes were graded differently?

a. Doesn't bother me b. Unfair

c. Sort of bothers me d. Makes me very upset

18) Do you enjoy it when groups are switched around?

a. Yes b. No

19) Do you prefer large groups or small groups?

a. Large b. Small

20) How important is it to you when the teacher works with a small group of students?

a. Not Important b. Little important

c. Important d. Very important

21) Do you enjoy centers or stations?

a. Yes b. No

22) Do you enjoy it when a parent, another teacher, or OU student works with you individually?

a. Yes b. No

23) How would it make you feel if you got a learning contract? A learning contract is an agreement between you and the teacher about how you like to learn and be taught. You set specific goals together.

a. Not excited b. Sort of excited

c. Excited d. Very excited

24) Circle the ways that you learn best:

By doing an activity or experiment	By working with others	Through writing or reading
Through math or logical reasoning	By working with your surroundings	Through looking at pictures or visualizing
Through rhythm or music	Other	