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Implementation of cooperative groups and single gender classrooms

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Implementation of cooperative groups and single gender classrooms

Abstract
The Dr. Walter Cunningham School for Excellence has three single-sex classrooms in place today. It has one all girls classroom at the second grade level, one all boys classroom at the second grade level, and one very unique all boys classroom at the first grade level. This classroom is unique because the teacher and the students will follow with each other all the way through fifth grade.

Since this is the first year of implementing single-sex classrooms there are many educators who need more clarification on this approach to education. In the following pages the researcher focuses on how the Cunningham School can close the achievement gap between boys and girls, based on the results of the Iowa Test of Basic Skills. The researcher conducts a classroom study on the differences between boys and girls when using the cooperative group method that includes some hands on activities. Lastly, the researcher conducts an interview of the teachers who are involved with the single-sex classrooms. Along with this interview, the researcher interviews another teacher who teaches a co-ed classroom, but works closely with the other teachers in the single-sex classes.
IMPLEMENTATION OF COOPERATIVE GROUPS AND SINGLE GENDER CLASSROOMS

Submitted
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INTRODUCTION

Purpose

The No Child Left Behind Act has pushed educators to find best practices that will help close the achievement gap between boys and girls. One outcome of this effort has been the Governors Task Force. This task force chose the Dr. Walter Cunningham School for Excellence and other select schools in the Waterloo School district to implement single-sex classes. The Dr. Walter Cunningham School for Excellence has three single-sex classrooms in place today. It has one all girls classroom at the second grade level, one all boys classroom at the second grade level, and one very unique all boys classroom at the first grade level. This classroom is unique because the teacher and the students will follow with each other all the way through fifth grade.

Since this is the first year of implementing single-sex classrooms there are many educators who need more clarification on this approach to education. In the following pages the researcher focuses on how the Dr. Walter Cunningham School for Excellence can close the achievement gap between boys and girls based on the results of the Iowa Test of Basic Skills. The researcher conducts a classroom study on the differences between boys and girls when using the cooperative group method that includes some hands on activities. Lastly, the researcher conducts an interview of the teachers who are involved with the single-sex classrooms. Along with this interview, the researcher interviews another teacher who teaches a co-ed classroom, but works closely with the other teachers in the single-sex classes.
Significance

Scores from the Iowa Test of Basic Skills suggest there is a major gap between the girls and the boys in the math total scores. After reviewing these results it was very clear to everyone that something needed to be done to close this achievement gap in performance. It is very important to clearly understand how boys and girls learn differently from one another. It is also useful to understand the developmental differences between girls and boys. It is through this knowledge that we reach the needs of both genders. It is through these strategies that students will increase their ITBS scores, have positive peer interactions, and decrease behavioral problems.

Limitations

There were some limitations to this study. Because the Dr. Walter Cunningham School for Excellence just opened in 2002, the researcher was only able to gather two years of data from the Iowa Test of Basic Skills. The classroom study was done with only one classroom in the building. This classroom consisted of 24 students of both sexes. The interview included three teachers who are currently teaching a single-sex classroom and one who is teaching a co-ed classroom with the others. Therefore, the findings will not represent the data for all students at Dr. Walter Cunningham School for Excellence (DWCSFE). The interview data does not provide the opinions of the entire staff at DWCSFE, the parents, or the students.
LITERATURE REVIEW

Introduction

Gender based classrooms are classrooms that include students of the same gender. These classrooms focus on the needs of the students according to their gender. According to the National Assessment of Educational Progress (NAEP) girls outperformed boys in reading, while boys outperformed girls in math thirty years ago (Sax 2005). Today, girls still outperform boys in reading, but boys and girls have been at or near parity in math and science since 1994. Dr. Sax reported that the NAEP also states that the average 11th grade boy writes at the same level as the average 8th grade girl. This data suggests that males are at a profound disadvantage in the performance of the basic skill of writing.

"Educators can't keep allowing boys/girls to keep 'slipping' by just because of their gender. All genders can learn if one allows them ability to be successful in the task" (Sax 2005).

In the following sections, the literature review will examine the need for gender-based classrooms. First, the physical differences between girls and boys will be discussed. Second, the differences in the way boys handle stress compared to girls will be introduced. Third, the way that movement enhances learning in boys will be discussed. Fourth, strategies that address the different learning styles of boys and girls will be recommended. Finally, the benefits of using cooperative groups as a strategy will be analyzed.

Physical Differences

Boys and girls develop mentally and physically at different paces. Dr. Sax (2005)
reported on a study that Hanlon did with 224 girls and 284 boys from age 2 months to 16 years old. She found that the fine motor and language skills of girls were about four years ahead of the boys. When it came to gross motor skills, spatial memory, and visual targeting, boys were about four years ahead of the girls. Another important consideration is that girls have a sense of hearing that is two to four times better than the boys (NASSEP 2004). Girls can hear sounds that are much softer than the faintest sounds audible to the boys. This could explain why some boys fail to listen and pay attention to their female teachers. The teacher may not be talking loudly enough for the boys to hear. When boys fail to pay attention, teachers often “jump the gun” and misinterpret it as Attention Deficit Disorder. Perhaps that is why there are so many boys on medication.

**Stress**

The genders also handle stress differently. Sax (2005) states that stress has a diametrically opposite effect in females compared with males. Stress enhances learning in males but impairs learning in females. This is important when planning lessons. When organizing a game between one another, boys get excited and motivated to prove themselves, while on the other end of the spectrum, girls get nervous and have a hard time performing under the conditions.

Girls and boys also differ in the way they respond to teachers. Girls will make eye contact and keep that eye contact with the teacher. They will give him/her the gestures to show that they are listening, and they won’t interrupt while he/she is talking. Girls are also more likely to say that they agree with the teachers, and they will sympathize with them. They will give the speaker some sort of positive response when they are finished
talking. Boys, on the other hand, will **not** make eye contact. They prefer to sit/stand shoulder to shoulder. They will hardly ever smile. When one is working with a classroom full of boys, it is very important to be constantly moving around (Kunjufu 2002). It helps keep the boys interested in the subject matter. Dr. Sax says that when working with a male one-on-one, the educator needs to remember to not wait for him to speak first. When finished speaking teachers should ask, “You okay with that?” and then shake on it. That makes it official between the educator and student.

When girls and boys are in gender-based classrooms they are more likely to experiment with things they wouldn’t have if they were in co-ed classrooms. Boys are more likely to pursue interests in art, music, dance, drama and culinary arts. Girls are more likely to assert themselves in physical education and computer sciences. The “I forgot my gym shorts” saying no longer exists in a single gender classroom. That is why Sax states “single-sex education promotes interest in the humanities for boys and that interest continues into college and career.”

Because there are so many differences between the sexes, Dr. Sax believes that instead of using drugs to control students, society needs to find a better way to teach them (Kunkle 2005). Michael Gurian (2001) says, “We’re at the point where we’ve identified more then 100 differences between the male and female brain.” In coeducational education, it is more difficult to build teaching strategies based on those innate differences. It seems to actually reinforce the traditional gender stereotypes (Davila 2004).
Movement

In general girls do not need to move around as much while they are learning. Movement in boys seems to stimulate their brains and manage and relieve the impulse behavior. Allowing boys to move around more often decreases behavioral problems, which leads to more learning opportunities. Gurian (2001) says that allowing stretch breaks, 60 second movement breaks, or placing something (Nerf Ball) into the hands will help stimulate the brain and lower the disruptive behavior.

Learning Styles

According to Michael Gurian (2001) boys tend to be more deductive in their conceptualizations. They start their reasoning process frequently from general principals and then apply it to individual cases. Whereas girls tend to favor inductive thinking. They add more and more to their base of conceptualizations. They tend to begin with concrete examples and build to general theory.

With the audit of No Child Left Behind, teachers need to focus on best practices for their classrooms. There are many different ways to teach literature, math, science, social studies, and the arts to boys versus girls (Hale 1982). In literature, the best practices for teaching boys includes the use of non-fiction. Books should contain photographs rather then drawings. Questions about feelings should be minimized. Boys don’t like to discuss their feelings about things. Assignments, should be concrete and tangible. In math, it is important that an educator starts with numbers. Once the number principle is firmly grasped, then one would introduce “real-world” applications. Boys love to have computation challenges, especially when speed is emphasized. When
teaching science and social studies, is it very important to make it exciting and emphasize the differences between past and present.

As stated above, boys’ brains are “wired” differently. They are “wired” in a way that language is a more difficult skill for them to acquire (Laster 2004). That is why it is important for educators to use movement and manipulatives in the classroom when teaching language and story problems in math. These strategies keep the boys’ brains stimulated.

Cooperative Learning

Cooperative learning is one approach to addressing the different learning styles of girls and boys. Cooperative learning groups are groups of students in the same classroom working together to accomplish a single goal/task. Within these groups each student is given a specific job to perform to complete the final task. During the groups the students are able to help each other out, work together, and explore new things. This allows a higher level of learning to occur. Michael Gurian (2001) states that brain-based research cries out for teachers to make group process a basic component of learning. The more projects that groups can accomplish together, the more varied the human learning experience. This is critical for both boys and girls.

It has been found that students possess different learning styles and cooperative learning is one successful teaching method that can assist instructors in reaching the needs of the learner (Burpo 1994). Recent reviews show that cooperative learning leads to positive outcomes such as higher achievement, increased positive attitudes toward the subject area, higher self-esteem, enhanced verbal skills, greater acceptance of differences
among peers, greater persistence, greater retention, and enhanced conceptual development across content areas (Towns, Kreke, & Fields, 2000; Johnsson 1985).

Cooperative learning groups allow students to work face-to-face, have positive conversations, and work together toward a common goal. They are able to divide the work among each other and coach and encourage each other through the process. The boys tend to focus on performing the task well, without considering the emotions of others around them. When using cooperative groups with boys, it is important to remember that “picking order” is extremely important. Boys tend to be stressed if they are not at the top of everyone’s “picking order,” so it may be easier if a teacher assembles the groups prior to the lessons. Also, the boys are not picking up higher sounds at this time, so they are not distracted by the other conversations in the classroom. Since cooperative groups have shown positive improvements in boys, a teacher in an all boys classroom at Flowood Elementary decided to arrange the classroom with desks facing each other in small groups (Hayden 2004). This allows them to “bounce ideas off of each other,” and stand up while working.

A study was conducted that investigated sex differences in interaction patterns and achievement in small groups in two junior high school mathematics classes (Webb, 1984). The sample consisted of seventy-seven students who worked for two weeks in majority-female, majority-male, or groups with equal numbers of males and females. Interactions were analyzed among same-sex and cross-sex groups; six interactions were focused on, including giving, asking for, and receiving explanations and giving, asking for, and receiving procedural information. The results showed that achievement and
interactions are related to the ratio of females to males in a group and to the use of cooperative small groups. The types of interactions that take place in a cooperative learning environment do have an affect on the amount of learning that occurs in the cooperative groups throughout the class.

Cooperative groups allow educators to boost learning and make it fun (Prescott 2001). They allow students to realize that math is not something they are forced to do and never use, but allows them to use it in everyday situations. Researchers state that when students are given both an opportunity to discover and invent new knowledge and an opportunity to practice what they have learned improves student achievement. Gurian (2001) states that cooperative groups are one of the most effective methods emphasized both group goals and individual accountability.

METHODS

Introduction

The research question to this project was: Does cooperative group work and hands on activities in math help close the achievement gap for boys? Data included 4th grade math scores over the past 2 years. The district analyzed the Iowa Test of Basic Skills Test scores and considered proficiency at the 41st percentile or higher. As a classroom assessment the pre and post-test method was used to show growth after using cooperative groups and hands on manipulatives. The results were analyzed to see if the use of cooperative group work and hands on activities helped increase the development of boys vs. girls. Finally, four teachers were interviewed to determine how they teach boys vs. how they teach girls. Views on single sex classrooms were investigated to see if that
would make an impact on closing the achievement gap.

Setting

ITBS Participants

The 2003-2004 ITBS data from the entire 4th grade class at the Dr. Walter Cunningham School for Excellence were examined. The students included regular education as well as special needs students. The students at Dr. Walter Cunningham School for Excellence are predominately poverty level to middle class African Americans. Eighty percent of Cunningham’s students are on free and reduced lunch, and may take part in the before school breakfast program. Cunningham’s population is composed of 52 Caucasians, 299 African Americans, 9 Hispanics, 2 Asians, and 1 Native American. The mobility rate between schools may not be high, but the students’ mobility rate from home to home is high.

Classroom Participants

This classroom contained 24 students. Out of those 24 students there was 1 Caucasian, 1 Hispanic student, and 22 African American students. Ten students were boys and fourteen of them were girls. 79% of the students participate in the free and reduced lunch program. In addition, there are 2 students who are in special education rooms all day except for specialists, 5 students who get pulled out for extra reinforcement in specific areas, and approximately 5 other students reading below grade level.

Interview Participants

There were four teachers interviewed. These teachers were selected to be interviewed because three of them are currently teaching single gender classrooms and
one if them is the only multi-gender teacher in second grade. Teacher A was the first single sex teacher interviewed. He is in his 6th year teaching. He has taught many grade levels throughout his career, and he is now teaching a 1st grade classroom full of 15 boys. He will travel with these boys through their fifth grade year. The researcher interviewed teacher A after school in the researcher’s classroom. There were minimal interruptions.

Teacher B was the second single sex teacher interviewed. She is in her 6th year teaching and completed her masters degree last May. She is now teaching second grade to a group of 16 girls. She does not plan on traveling with her girls through the grades, but she is hoping that they will stay together through 5th grade. The researcher interviewed teacher B after school in the researcher’s classroom. There were no interruptions.

Teacher C was the third single sex teacher interviewed. She is in her 15th year of teaching and has had her masters for a few years now. She is now teaching second grade to a group of 16 boys. She does not plan on traveling with the boys through the grades, but she is hoping that they will stay together through 5th grade. The researcher interviewed teacher C after school in the researcher’s classroom. There were minimal interruptions.

Teacher D is the fourth teacher interviewed. She is in her 5th year of teaching. Teacher D teaches 2nd grade to a multiple sex classroom. She works closely with the other two 2nd grade teachers even though they have single sex classrooms. She plans with the other 2nd grade teachers and is in constant contact with them. The researcher interviewed teacher D after school in the researcher’s classroom. There were minimal
interruptions.

Measures/Instruments

Standardized Assessment

The district defines proficiency on the Iowa Test of Basic Skills at the 41 percentile or higher. There is a focus on the 4th grade scores. For the building wide analysis, the reading comprehension scores and the math scores for the 4th grade over the past 2 years were examined. The reading comprehension scores and math total scores were examined to determine how many students are performing at proficiency (41% or higher) and how many students are performing below proficiency (40% or lower). Then the results between the years were compared to determine the progress.

Chapter Tests

The students were pre-evaluated using a chapter test from the 5th grade math manual. On this test the students answered questions using a data table and graphs. The students also had to create a graph using the information given. Some of the questions required the students to compare more than one data table or graph to each other to come up with the best answer. In addition, the students had to gather their own data. They had to conduct a quick interview. They had to create a data table, take five minutes to collect the data around the classroom, and then complete the table. Using the information from the data table, they had to create a graph and create questions to be answered through the table and graphs. This information allowed the researcher to see where the teacher needed to focus. Students who scored 85% or higher were considered proficient. Students who scored between 84-70% were considered developing, while students who
scored below 70% were considered needing improvement. Both pre- and post-tests are paper-pencil; therefore, they were scored by the percentage of the number correct out of the total number of problems.

Interviews

These interviews were conducted before or after school individually. There were very few interruptions in all of the interviews. The interview consisted of five initial questions. The questions were as follows:

1. What are your thoughts about gender based classrooms?
2. What concerns do you have about this change?
3. What do you think needs to be done to make this a positive change?
4. What type of teaching methods do you use to support your students?

PROCEDURES

Data Collection

ITBS Assessment

The researcher analyzed the entire 4th grade class that took the ITBS test in the year 2003 and 2004. The researcher looked at just the reading comprehension scores and math total scores to determine how many students are performing at proficiency (41% or higher) and how many students are performing below proficiency (40% or lower). Then compared the results between the years and determine the progress.

Chapter Test

The students were pre-evaluated using a chapter test from the 5th grade math manual. The students were instructed that this test was going to be used as a tool to help
the teacher find out what they already know about the subject. The students had 30 minutes to complete the test. Through the analysis of the pre-test the researcher knew what the students already knew, and used the data to plan the unit according to their needs. The post-test was administered two weeks after intense teaching and hard work.

**Interviews**

These interviews were conducted before or after school individually. There were very few interruptions during the interviews.

**Teaching Method**

In the classroom assessment the students were able to work in cooperative learning groups. In these groups the students worked on a variety of different projects to get them engaged in the overall goal of the unit of data interpretation. Along with the cooperative groups the students used hands on activities; they wrote in math journals; and they performed different tasks individually. For a more detailed description of this unit, refer to appendix A.

**Single Sex Classrooms**

According to the No Child Left Behind Act, the African American boys are scoring far below proficiency level at Dr. Walter Cunningham School for Excellence. The Governors Task Force decided to create a classroom of African American boys to see if their academic achievement will increase as the years progress. These boys will also have the same teachers from 1st grade through 5th grade. At Dr. Walter Cunningham School for Excellence, there is also one 2nd grade classroom of girls and one 2nd grade classroom of boys. Data will eventually determine if students learn at faster rates if they
are divided into classrooms according to their gender.

RESULTS

Introduction

According to the ITBS analysis, there was a need to improve the achievement gap between boys and girls in math. The classroom assessment showed that through the strategy of cooperative group work and the use of hands on activities, students increased their scores. The interviews showed that boys and girls learn differently and it is important to teach to their learning style.

Standardized Assessment

The results indicate that Cunningham students are performing lower than children nationwide. The percentage of proficient students in the Fall 2002-2003 in math total without computation was 26.03% and in 2003-2004 it was 32.88%. That is an increase of 6.85%. In reading comprehension, the percentage of proficient students during 2002-2003, 35.62% proficient. In 2003-2004 the proficiency was 47.95%. That is an increase of 12.33%. According to the analysis, 51% of the fourth graders were proficient in both math and reading. 14% of the students were proficient in math and not reading. On the other hand, 20% of the students were proficient in reading and not math. When males were compared to females, 26.67% of the males were proficient in math, and 42.22% were proficient in reading comprehension in 2002-2003. In 2003-2004 the males 35.56% were proficient in math, and 44.44% were proficient in reading comprehension. In comparison, the females were 25% proficient in both reading and math. In 2003-2004 the females scored 28.57% in math, and in reading comprehension 53.57% were proficient.
After analyzing the data, reading and math scores appear to be related. The analysis also shows that when the males increase reading scores the math scores also improve. On the other hand, when the female reading scores increased dramatically, it didn’t have a significant impact on the math scores. Since there are only two years of data to compare, caution is urged in identifying “trends” because the cohorts of children in 2002-2003 may be very different. However, major changes are worth continued close review and analysis.

Chapter Pre-Tests

Based on the results of the pre-assessment (Appendix B), learning goals set for this study were reasonable and appropriate for the students to accomplish. All but one out of 24 students did not meet the expectation of 75% or higher for any goal. Students were able to work cooperatively to gather data, collate it in a matter that made sense to them, graph the information, find the mean, median, and range. Then they were able create and answer questions related to that specific information.

Quiz

On Friday of week two, the students were given a writing quiz. This quiz required them to explain the mean, median, and range through words. The results of the quiz showed that 70% of the students understood these concepts. If the students were able to explain how to find the mean, median, and range, then the teacher knew that they were ready to progress. On the other hand, if the student was unable to put the process into words, then the teacher knew that the individual needed more assistance to master the process.
Chapter Post-Test

Overall, the students improved on the chapter test. Out of the twenty-four students, sixteen were considered proficient with proficiency being 85% or higher. Five of the students were considered at the developing stage, 84-70%, and three of the students still needed assistance, 70% or lower. There was a 41% increase in goal one between pre-assessment and post-assessment, while there was a 37% increase in goal two; there was a 23% increase for goal three, and a 14% increase for goal four.

According to the results of the post assessment, 63% of the students met goal one, 100% of the students met goal two, 89% of the students met goal three, and 73% of the students met goal four. Prescott says that through the use of cooperative groups, writing, and hands on manipulative use will increase student knowledge.

Interviews

Each interviewee was asked one question at a time. Their responses are presented in this section, in the order in which they were shared.

Question 1: “What are your thoughts about gender based classrooms?”

Teacher A stated that he is extremely excited to have this opportunity with these boys. This is his opportunity to be the “father figure” in their lives. It also gives him the ability to set his classroom up so that they boys are constantly learning in their own way. Teacher A states that boys learn differently than girls, and this gives him the opportunity to focus on the strategies that works best for his boys.

Teacher B’s response to the first question was that at first she was very scared. Now she loves it. She states that there is so much they can accomplish in one day
compared to the non-gender based classroom. She also states that it gives her the opportunity to really focus on what strategies work best for her girls.

Teacher C stated that she was very concerned about being a female teacher teaching a group of boys. Now that she has been teaching this group for nine weeks, she knows that it doesn’t matter what the gender of the teacher is as long as the teacher understands the learning styles of the students.

Teacher D sees the reasoning behind the single sex classrooms, but she is very concerned how they are going to react once they get back into the non-gender classroom settings.

**Question 2: “What concerns do you have about this change?”**

Teacher A doesn’t seem to have any concerns at all. He is confident that the boys will be better citizens when they leave his classroom, so they will know how to act around girls. He also stated that his boys still eat lunch with girls and play outside at recess with girls also, so that they are not totally isolated.

Teacher B is worried about what is going to happen to her class after this year. She is also worried about how they will interact with the other gender at a later date.

Teacher C stated the same concerns about how her boys are going to interact with the other gender once they leave her classroom. Teacher C, like teacher A, is very confident that they will be able to adjust greatly.

Teacher D’s concern is how the students in the single sex classrooms are going to react once they get into a non-gender classroom. She is concerned that if their needs are not met all the time then their disruptive behaviors may start to appear.
All four teachers stated that communication is the key component to making change successful after being asked questions three. They also believed that everyone has to be on board and know what is going on with the latest research based information in order for things to run smoothly and be successful.

Question 3: “Do you see a classroom climate change with your class? If yes, how so?”

This question was only asked to the teachers with the single gender classrooms. Teacher A states he sees a major climate change. He said that his boys are striving to follow the 6 character pillars, and that this allows his classroom to be calm. He also states that teaching boys specific strategies helps them stay on task. When they are bored or don’t understand is when they have started the behavior problems.

Teacher B states that her classroom has more on task time. She is noticing the girls bond with one another. She also states that they are so loving!

Teacher C states that her boys love the sports theme in her classroom, and that is having a huge effect on the climate. She states that once the boys bought into the concept she now hears them commenting on the same things outside of the classroom. She said that climate is calm as long as she is using the learning strategies that work for her students.

Question 4: “What type of teaching methods do you use to support your students?”

The answers from all four teachers were similar so the researcher summarized the responses. All four teachers stated that they try to use more technology in their lessons. They know that technology is becoming part of everyday life and the students need to
become comfortable with it. They also know that students are able to explore many things through technology. They are also using more hands on activities in their lessons to allow for exploration. When students are able to explore things on their own they are able to make the learning more personable/memorable/expandable. Teacher A and Teacher C have to change their lessons often to keep the attention of the boys, but Teacher B's girls are able to focus for longer periods of time, so she is able to have more seat time. Teacher D said that she uses a variety of these lessons in her classroom throughout the day in order to reach every student in her classroom.

DISCUSSION

Introduction

Does cooperative group work and hands on activities in Math help close the achievement gap with boys? According to the ITBS results over the past two years, the number of boys and girls performing at proficiency in math has increased. The number of boys performing at proficiency has increased 8.89% and the number of girls performing at proficiency has increased 3.57%. The classroom analysis shows that 67% of the students were proficient by the end of this unit. Sixty percent of the boys were considered proficient at the end of this unit while 57% of the girls were proficient. After talking to the interviewees, it is very obvious that boys and girls learn differently. The boys are constantly changing to keep up with their attention span and that allows the climate to be calmer and students to be on task.
Interpretation

Through the analysis of the ITBS it was clear that there was a need for this major focus on improving the math scores with both boys and girls. Even though the boys had a higher increase than girls, there are still 64.4% of boys not performing at proficiency. With this big of a percentage not performing at proficiency, the researcher wanted to implement the strategy of cooperative groups and hands on activities in a math unit. The researcher set four goals for students to reach by the end of this unit.

Through this unit both boys and girls were engaged in many different activities. 60% of the boys were proficient after this unit and 57% of the girls were proficient. This is not a significant difference, but this may indicate that boys will improve relative to the girls on the ITBS. The graph below indicates that the boys performed at a lower percentage than the girls did on the pretest, and after the unit filled with cooperative group work their scores increased a great deal.

Boys Chapter Test Results
Prior to this action research these students did not have a lot of cooperative group work in the mathematical setting. It is concluded that through the use of cooperative groups and hands on activities students gained the ability to work cooperatively and think at a higher level. Through the results of the students’ surveys and observations, it is clear that students enjoyed working together in groups to come up with the answers and they understood this unit at a deeper cognitive level.

According to the interviews it is clear that the teaching strategies used with boys are different than the strategies used to teach girls. The teachers pointed out that boys need activities that keep them moving and interested. Working in cooperative groups in math is a very productive way to keep the boys interested in learning the concepts and staying focused on the ideas. The data from the classroom analysis shows that boys are very successful through cooperative teaching strategies. Through the observations, the boys were learning a lot from each other and were on task about 95% of
the time. Research also states that boys require the teacher to move around a lot as well as him or herself. This occurs often in cooperative groups. The interviews also showed that the climate in the gender classrooms is better. In the classroom with girls, it is quieter and they are able to get more finished within a day, and in the classrooms with the boys the climate may not be "quiet" but it is exciting and the boys are on task. In the single-gender classrooms, boys and girls are able to express themselves more freely with enthusiasm without intimidation of the opposite sex. Both genders seem to get the same experiences and advantages from these classrooms.

Single-gender classrooms are justified by a growing body of scientific research showing differences in the structure and cognitive abilities of male and female brains that translates into differences in different learning styles. Teachers need to remember that boys perceive things differently than girls. The hearing in a boy is still developing at age 10; therefore, boys don't hear higher sounds. In contrast, girls are more sensitive to noise at that age. When boys are up moving around and talking out, it may not be because of ADD or ADHD; it may be because that is the way they learn best.

Recommendations and Future Research

In gender-based classrooms one can focus lesson plans on gender specific learning styles and conduct the classroom in the manner that will effect students positively. While it is important to mix the genders throughout the school year for certain instructional purposes, separating the genders can be an effective strategy. Single-gender classrooms allow for exploration without intimidation, specific learning environments to reach the learners, and a more intense understanding between students
and teachers.

It is important to continue to receive more information supporting the gender classrooms. At this time, teachers at the Dr. Walter Cunningham School for Excellence are receiving professional development from Dr. Sax and Dr. Kunjufu. It would be helpful to continue the in-services from Dr. Sax based on the very specific strategies he has shared already about what works with boys and what works with girls. It is also important to keep the staff updated on the latest scientific findings from the use of these strategies. Every teacher is always interested in what is working and what is not working. This is a very critical stage of this intervention. The more supportive research found on single-sex classrooms, the more support will be received from within the building, the parental community, and the outside community.

It is very helpful for all teachers to know the skills that work with both genders. It is also important for teachers to know the positive effects that the single-gender classrooms have on the students. Cooperative groups work for both genders, but it reaches the most "common" learning style in boys. Cooperative groups allow movement throughout the day in the groups and it allows for a lot of communication. Cooperative groups could also allow for academic competition within the classroom and that is another strategy from which boys benefit.

The activities within the cooperative group unit in math worked very well for boys and girls. It is also important to notice that within the unit there were other teaching strategies used in order to reach all of the student's learning styles. In future studies, one could work through this same unit but eliminate some of the other teaching strategies, to
determine the most effective strategy for boys. In this unit one could also make sure to have all boys in groups together and all girls in groups together, to monitor the progress closer. Additional interviews the teachers to see their perspective on the gender classes after almost a full year could be completed. One could also investigate specific strategies used daily with groups, the positive and negative effects of the gender classes on the students, and the recommendations to other teachers.
APPENDIX A

Cooperative Learning Unit Overview

Monday
- Pre-Assessment (Goals 1, 2, 3, and 4)

Tuesday
- Large Group - Go through the process of creating a data table. Ways to set up the table, ways to label the information, and ways to organize the information.
- Small Group - Fingerprint Activity
- Share findings with the class

Wednesday
- Large Group - As a class collect quick data by using tally marks, transfer that information into a data table. (For review of Goal 1)
- As a class create a line graph and bar graph using the information from the class created data table. (Make sure to focus on correct set up, numbering, labeling, and titles.)
- Small Group - Hand out the Fingerprint Activity
- Have each group decide what types of graphs they want to use to represent their data
- Create two graphs (using correct data, labeling, and titling)
- Share and explain their graphs to the class

Thursday
- Large Group - Review steps to collecting data, creating a data table, and creating different types of graphs
- As a class create a list of questions that can be answered by the data given
- Decide what questions are easy, kind of easy, or thinkers
- Explain to the students why it is so important to always include thinkers when writing questions...able to make taking the ITBS easier as well as problems they may face in the “real world”
- Now create 5 more thinker questions as a class...and answer them
- Small Group - Hand back the Fingerprint Activity pages
- Using the data given in your activity...create seven questions to be answered by the classmates. Make sure that four of those questions are thinkers.
- Rotate the Fingerprint activities around so that each group has to answer another groups questions
- Discuss some good challenging questions and what made them challenging questions, and then discuss how some questions my be improved to make then good thinkers.
Friday
- Large Group- Take a quick quiz to check for understanding on the concepts of collecting data, organizing data, creating charts and graphs, and producing higher level questions to go along with the data given.
- Individual Practice- Each student will work independently using their own knowledge on a book assignment to show that they are able to do this on their own.

Monday
- Large Group- Introduce the process of finding the Mean
- Enter into their Math Journals
- Lots of class practice until they get the feel of it
- Have each student come up to the board and explain a problem to the class...they have to teach the class like they have no idea what they are doing
- Small Group- Hand out the Fingerprint Activity
- As a group find the Mean for each type of fingerprint
- Share findings as a group
- Share findings to the class
- Do a homework sheet to show understanding

Tuesday
- Large Group- Review Mean
- Introduce Median
- Invite students up to the board to explain the process to their classmates
- Small Group- Fingerprint Activity
- Find the Median of each type of fingerprint
- Share findings as a group
- Share findings as a class
- Do a homework sheet to show understanding

Wednesday
- Large Group- Review Mean and Median
- Introduce Range
- Invite students to the board to explain the process to their classmates
- Small Group- Fingerprint Activity
- Find the Range of each type of fingerprint
- Share findings as a group
- Share findings as a class
- Do a homework sheet to show understanding

Thursday
- Day of review over: data collecting, creating a data table, creating different types of graphs (using all elements), writing “thinker” questions, and finding the mean, median, and range.

Friday
- Short Review
- Take a journal quiz...they need to explain each process in words
Monday

- Administer the post-test

Activities

**Fingerprint Activity** - In this activity the children will collect the thumbprint of each student in the classroom. In groups they need to identify each print as an arch print, whirl print, or a loop print. Once they have this information they need to transfer it into a data table. Throughout the unit the students will be creating graphs, story problems, finding the mean, median, and range to go along with this information.

**Individual Practice** - On this practice activity the students will show their understanding of using a data table to answer questions, using a data table to create a graph, and answering questions.

**Homework Sheets** - All of the homework sheets focus on one skill at a time and allows for a lot of extra practice.

**Journal Questions** - As a quiz the students will explain in words the process to finding the Mean, Median, and Range.

- Explain how to find the Mean
- Explain how to find the Range
- Explain how to find the Median
APPENDIX B

Girls Chapter Test Results

Boys Chapter Test Results
REFERENCES


