

HOW DO KENTUCKY EDUCATORS' OPINIONS OF SINGLE SEX
CLASSROOMS DIFFER BETWEEN THOSE WITH EXPERIENCE IN SINGLE
SEX CLASSES AND THOSE WITH NO EXPERIENCE IN SINGLE SEX
CLASSES?

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ABSTRACT OF APPLIED PROJECT

An applied project submitted in partial fulfillment
Of the requirements for the degree of
Education Specialist at Morehead State University

by

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Director of Applied Project: _____

The effectiveness of single gender classrooms has been a question on the minds of many educators. This study attempted to analyze the opinion of educators in Kentucky regarding the effectiveness of this type of grouping on academic performance, attendance, and behavior.

Before school leadership begins the change to single sex classes, they need to understand how their faculty and staff view this type of classroom organization. Without the buy in of the staff, it will be difficult to successfully implement this type of classroom.

The data for the study were obtained using twenty two Likert type statements. The survey was e-mailed to Kentucky educators and responses were separated into two groups, those with experience in single gender classes and those with no experience in single gender classes.

The Chi Square test was used to test three hypotheses and answer three research questions. The data indicated that there was a statistically significant difference in opinions between the two groups.

Accepted by: Sam Wright, Chair
Tuesday Bullock
David Barnett

APPLIED PROJECT

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Accepted by the graduate faculty of the College of
Education, Morehead State University, in
partial fulfillment of the requirements for the
Educational Specialist Degree in
Administration and Supervision.

Sam Wright

Director of Applied Project

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CHAPTER ONE

INTRODUCTION

The purpose of this study was to analyze the opinions of Kentucky educators regarding single gender organizational classrooms, in relation to academic performance, attendance and behavior. This study may serve as an aide to educators planning to implement single gender classes.

Educators are searching for more effective instructional strategies. Strategies that appeal to each gender may be easier to implement in a single gender classroom. Educators must continue to study the programs that have been successful, to determine the most appropriate setting for all students. Sharing the results may provide the staff of a school with enough confidence in single gender classes to allow for successful implementation.

Lawrence (2007) reported in Edutopia magazine that thirty percent of students enrolling in high school do not finish in four years. "Among African American and Hispanic teens, on time graduation rates can be less than fifty percent" (p. 17).

Many young people are not driven to attend or complete school for a variety of reasons. In one survey of dropouts, many students said their classes were not interesting and they were not motivated to work hard (Lawrence, 2007, p. 17). The result was that many students were failing their classes.

Further evidence of the decline of our students can be found in the many studies that have been done. Sykes (1995) found that "American students are not achieving at the same levels as students in many other countries, especially in subjects like math and science. In tests measuring the mathematical ability of eighth graders in twenty countries, American students finished tenth in arithmetic, twelfth in algebra and sixteenth in geometry" (p. 17). The gaps exist at the elementary and high school level.

Students in other countries are performing better than American students even though their buildings are in bad shape, they have large classes and in general, their teachers are not as well trained (Sykes, 1995, p. 3). "Education is failing in the United States because the practices and theories it is based upon are incorrect"

(p. 4). This lack of achievement by our young people will have a detrimental effect, not only on their own success, but also on the success of our country and the future of our economy.

To prevent the decline of our nation, educators must reconsider the present situation. Too few children develop adequate academic skills and too few develop the work habits needed to prosper. Our teachers must focus on strategies that engage students in purposeful activities that result in learning the desired skill or concept (Schlechty, 1997, p. 44-45).

Purpose of the Study

The purpose of this study was to analyze the opinions of educators regarding single gender organizational classrooms in relation to academic performance, attendance, and behavior. This study may serve as an aide to educators that are attempting to implement single gender classes.

Most classes are taught with little regard for any differences in learning styles. With so many students performing poorly in school, many educators are beginning

to consider single sex classes as a possible alternative to the present classroom organization.

Researchers believe single gender classes may offer educators a way to meet the needs of both boys and girls. Hughes (2006) believes that single gender classrooms can provide equal opportunities for both genders. "Student achievement and behavior will improve. Less fortunate and minority students will achieve at higher levels because learning style differences will be better met" (p. 1). Gurian (2001) believes that teachers must understand how the brain develops and the resulting impact on the child's learning ability.

Parents have also developed an interest in single gender classes. An article in the New York Sun stated, "Parental interest in single sex options is demonstrated in the overwhelming number of applications received by the new side by side Brighter Choice Charter School For Girls and the Brighter Choice Charter School For Boys" ("Single Sex," 2002, p. 6).

As a result of The No Child Left Behind legislation, the federal government is making changes in the way Title IX is interpreted, which will allow schools to experiment

with single sex classes without the fear of a lawsuit (Sappenfield and McCarroll, 2007, p. 1). The NCLB helped fund these experiments by providing a three million dollar pot of money for which they can compete (Vlahos, 2002, p. 1; Fletcher, 2002, p. 1). This provision in NCLB was sponsored by Senators Hutchison, Clinton and Kennedy (Vlahos, 2002, p. 1; Schemo, 2002, p. 1; Kovner, 2002, p. 1).

Are single gender classes better than mixed gender classes at meeting the educational needs of all students? Do we change the classroom to fit the child or change the child to fit the classroom (Author Unknown)? Many questions exist about which arrangement is best suited to meet the needs of all students.

Statement of the Problem

Opinions vary among educators regarding the single gender learning environment. The purpose of this study was to analyze the opinions of educators across Kentucky regarding single gender classrooms in relation to academic performance, attendance, and behavior.

For education leaders attempting to change the format in a school, it is important to know how the

faculty and staff view the effectiveness of single gender classes. When leadership considers implementing new programs, it is important to collect information that may have a bearing on the success of the program. A survey of this type could be done prior to any attempts to implement a new program.

The concerns and attitudes of those involved will have a large impact on how well a program is accepted and how much effort is put into making the program succeed. A survey may illuminate areas of concern that should be addressed before attempting to implement this type of setting, which would improve the program's probability of success.

Subjects of Study

The target population of this study was educators currently employed in Kentucky and listed on the state of Kentucky global address book. The size of the population used in this survey was the 705 respondents.

Table 1

Demographic Data for the Participants of the Study

Respondents With Experience		Respondents With No Experience	
N = 227 (32%)		(Total N = 705)	
N = 478 (68%)			
Males	Females	Males	Females
57 (25.1%)	170 (74.9%)	118 (24.7%)	360 (75.3%)

There were a total of 705 surveys returned. Responses were from 57 males and 170 females with experience in single sex classes and 118 males and 360 females with no experience in single sex classes.

Research Questions and Hypotheses

The purpose of this study was to analyze the opinions of Kentucky educators regarding single gender organizational classrooms, in relation to academic performance, attendance, and behavior. Three research questions were answered and three hypotheses were tested.

The research questions to be answered for this study were:

1. Do educators with experience in single sex classes and educators with no experience in single sex classes both believe that single sex classes improve the academic performance of all students?
2. Do educators with experience in single sex classes and educators with no experience in single sex classes both believe that single sex classes improve the attendance of all students?
3. Do educators with experience in single sex classes and educators with no experience in single sex classes both believe that single sex classes improve the behavior of all students?

The research questions were addressed by testing three hypotheses:

Ho1: There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes of how gender grouping will effect the academic performance of all students.

Ho2: There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes of how gender grouping will effect the attendance of all students.

Ho3: There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes of how gender grouping will effect the behavior of all students.

Definition of Major Terms

The following definitions were used in this study and are given to provide clarity to the study.

1. ACLU - American Civil Liberties Union, (www.aclu.org/), a non-profit group established in 1920 to protect the rights of all Americans

2. ACT - American College Testing, Incorporation, (<http://www.act.org>), an independent, non-profit organization that provides testing services

3. AAUW - American Association of University Women, (<http://www.aauw.org/>), advances equity for women and girls

4. ERIC - Educational Resources Information Center, (<http://www.eric.ed.gov/>), provides free access to more than 1.2 million bibliographic records of journal articles and other education related materials

5. ETS - Educational Testing Service, (<http://www.ets.org>), non-profit organization that measures the educational and intellectual progress of children

6. IWITTS - Institute for Women in Trades, Technology & Science, (www.iwitts.com), provides the

tools to successfully Integrate women into male dominated careers

7. NAEP - National Assessment of Educational Progress, (<http://nces.ed.gov/>), assesses student academic ability in various subject areas

8. NASSPE - National Association for Single Sex Public Education, (<http://www.singlesexschools.org/>), provides information on single sex classrooms

9. NCLB - No Child Left Behind, Federal law passed in 2001, ensuring that no child is trapped in a failing school

10. NOW - National Organization of Women, (www.now.org), feminine advocacy group formed to take action to bring women into full participation in society - sharing equal rights, responsibilities and opportunities with men

11. SAT - Scholastic Aptitude Test, (<http://www.collegeboard.com>), non-profit association formed to assess the abilities of college bound students

12. Title IX: (<http://www.american.edu/>), Law passed in 1972 in order to abolish sex discrimination in

public schools

13. TLN: Teacher Leaders Network,
(<http://www.teacherleaders.org>), an internet
discussion group

Limitations

This applied project had these limitations:

1. Choice of respondents
2. Truthfulness of responses
3. Selection of questions
4. Return rate of questionnaires

CHAPTER TWO
REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to analyze the opinions of Kentucky educators regarding single gender organizational classrooms, in relation to academic performance, attendance, and behavior. A survey of this type could serve as an aide for educators as they collect information in any school considering the implementation of single gender classes. This information will better prepare educators to make the decisions necessary for successful implementation of single gender classes.

This review of literature will provide information that is pro and con concerning the single gender grouping of students. The review will discuss gaps that exist in academic achievement between male and female students. The review will explore the research on brain growth and development in males and females and how this may affect their learning. Also included is information on some of the single sex programs and how much success they have achieved.

Gaps in Achievement

By looking at the following test data, one can see that a need exists for a more effective method of educating our students. Males score higher in math and science, while girls score higher in reading and writing.

In Gurian and Stevens (2004) studies, they showed similar results as Salomone's (2006) research. Using data from the 2000 National Assessment of Educational Progress, Gurian and Stevens (2004) wrote "boys are one and one half years behind girls in reading and writing, while girls are now only negligibly behind boys in math and science" (p. 3-4). These statistics hold true around the world.

Being able to read well is necessary for students to do well in school and in life, and presently this is the area where the need for change is most evident, especially for boys. Girls have an advantage over boys early in life. They begin school with better verbal skills, which enables them to do better in subjects that require reading and writing skills (Salomone, 2006, p. 787).

This presents a problem for teachers trying to prepare a reading or writing lesson for a mixed classroom. It is very demanding for a teacher to prepare and present a lesson plan that will address so many different levels of ability and learning styles in one classroom.

The gap favoring girls in reading and writing continues to expand as students move from grade to grade, which is understandable, if you agree that the present classroom setup does not meet the individual learning style of each sex (Salomone, 2006, p. 788). "The average eleventh grade boy writes with the proficiency of the average eighth grade girl" (p. 787-788). The question is, "Would boys perform better in reading and writing in a single sex class?"

Educators must find ways to improve the performance of boys in reading and writing. When a boy is trying to write about a subject in which he has little interest, it becomes an ordeal for him. Teachers need to allow them more freedom to choose what they read and write about. They may only write a few sentences describing a flower,

but allow them to write about an enjoyable experience and they will fill pages.

Shoemaker attributes the difference in reading levels between boys and girls to social pressure (Abramson, 2001, p. 2). He seems to believe that the perception presented by the media does not encourage males to read. "It's how you promote reading in our society. Society doesn't offer examples of fathers reading to sons or any other type of male role models for reading. They're not seeing it on television and they're not hearing it at home. There's just a social expectation that boys are playing sports instead of reading, and we need to fix that" (p. 2). In a single gender classroom, where males see other males reading, reading becomes more acceptable. It becomes less of a stigma for them and they can read for pleasure and for educational purposes.

It seems that boys are still performing better than girls in math and science classes but the gap is decreasing. Some research seems to indicate that this is the result of developmental differences. "Boy brains seem to dedicate more area to activities involving movement and mechanical functioning. These qualities make learning

subjects like science and math easier for boys" (Gurian and Stevens, 2004, p. 3).

In general, girls are getting better grades, receiving more honors, and achieving higher levels of education than boys ("Leading the way," 2002, p. 1). As a result of the lower levels of achievement, more boys are being labeled with attention deficit disorder and hyperactivity disorder. More boys than girls are having discipline problems and are dropping out of school (p. 1). "One out of eleven American boys age 12 were prescribed medicine for attention deficit/hyperactivity disorder in 2003" (Montgomery, 2005, p. 1).

Other reports reveal similar results. The SBDM Guide Post cites that "boys outnumber girls in special education classes, dropouts, and retentions and boys have lower rates of college enrollment" ("Leading the way," 2002, p. 1). "Enrollments in higher education in the 1990's favored females by a ratio of 54 to 46, while as recently as 1980 the ratio was 50 to 50" (Riordan, 1999, p. 1).

For years, girls lagged behind boys in many academic areas and struggled to close the educational achievement

gap. As a result of advocacy groups bringing attention to this problem, girls have made very good gains in education. These groups managed to have the educational community place more emphasis on what girls need to achieve at high levels. Girls are now ahead of boys in many areas and are only slightly behind boys in math and science, traditionally strong areas for boys.

Recently, research is addressing the gender gap in technology. Dr. Donna Milgram, Founder and Executive Director of IWITTS, stated, "Significantly few computer science students are women and the gap is even more pronounced in programming and advanced courses" (Whittenburg, 2003, p. 1).

The report also stated, "One reason that women are less likely to take skills classes, has to do with the way the classes are taught. The classes do not include the kind of things that interest women. The research shows that young women are very interested in technology and its function, rather than in the machines themselves" (p. 2).

These studies present strong evidence that something in our present educational system must change to improve

the academic performance of our students. Single gender classes may provide an environment that would allow students to achieve at higher levels. Single gender classes may provide more opportunity for educators to meet the needs of each sex, by providing more individualized instruction.

Effect of Poor Academic Achievement on Society

With many boys doing poorly in the classroom and dropping out of school, the number of college-educated workers available will have an effect on the productivity of the work force (Conlin, 2003, p. 2). Companies will have to choose employees from a work force that has fewer skilled workers, resulting in less productivity. "When the economy reenergizes, a skills shortage in the United States could undermine employers' productivity and growth" (p. 2).

The lack of achievement by members of a society will have a negative effect on the prosperity of the whole country. Individuals that reach a level of education beyond high school contribute more monetarily to society (Conlin, 2003, p. 4). Figures from Northeastern University show that "the average college diploma holder

contributes four times more in net taxes over his career than a high school graduate. Meanwhile, the typical high school dropout will usually get forty thousand dollars more from the government than he pays in, a net drain on society" (p. 4). For the United States to compete in an ever-changing world, schools must graduate students that are capable of contributing to the prosperity of the country.

British educators have recognized the detrimental effects of a lack of education and have been searching to find successful classroom programs that prevent boys turning off to school by focusing on teaching techniques that keep their interest (Conlin, 2003, p. 3). "The sit still and learn teaching style is better tolerated by girls. Educators have not done enough to keep up with the recent findings in brain research about developmental differences" (p. 5).

Research in Single Gender Learning Patterns

Educators have debated the merits of single gender classrooms in their search to find the best environment for educating all students. There seems to be an increasing amount of research on single sex education

being done, which will benefit educators as they strive to provide classrooms that allow all students to achieve at high levels.

Research shows that there are recognizable physical differences between the brains of males and females (Sax, 2004, p. 2). "You cannot tell by looking at a child's brain whether that child is black, white, Asian or Hispanic. But you can tell whether the child is a boy or girl" (p. 2).

In Lonsdorf's studies, she was able to show that young male and female chimps learn in different ways. She concluded that the differences are genetically programmed and are similar to differences observed in young humans (Sax, 2004, p. 2). Educators must become familiar with these learning differences and tailor classroom instruction to the learning style of the student.

In a single sex school, teachers must consider learning differences between the genders when preparing lesson plans. The idea behind same sex classes is to provide more individualized instruction that is based upon what the research is telling us that works best for each gender.

Beaumont Middle School in Lexington, Kentucky, trains its teachers in male/female brain differences and teaches reading/writing, math, and science in separate-sex classrooms (Gurian and Stevens, 2004, p. 5). "After one year of this gender-specific experiment, girls' math and science scores and boys' Scholastic Reading Inventory (SRI) scores rose significantly" (p. 5).

The Michael Gurian Institute is located at the University of Missouri-Kansas City. Teachers from Missouri school districts are trained in how boys and girls learn differently.

After working with the Gurian Institute to train their teachers, some schools in Missouri enjoyed improvements in discipline and academics. "In the Hickman Mills School District in Kansas City, discipline problems were cut by thirty-five percent within six months. At the Edison Elementary school, they went from testing at the lowest levels to near the top. They outscored state data in every subject. There are now only two students out of four hundred who would require state mandated retesting. They also saw a drastic drop in discipline problems" (Gurian, 2001, p. 6-7).

Gurian (2001) provides a guide to how the male and female brains develop and learn. He presents techniques that teachers can use to meet the needs of each sex. In his book, *Boys and Girls Learn Differently*, he describes how brain based gender research indicates the need for changes in our schools. Gurian recommends that "schools use same sex classes, peer tutoring, year round schooling and even change the timing of the school day" (p. 6-7). Gurian believes that schools need more structure in the form of school uniforms or dress codes.

In Gurian's (2001) studies he tells us that brain development in girls is more advanced than boys in the parts of the brain that control speech. This means that most girls enter school with a higher level of verbal skills than boys. This gives girls an advantage in subjects that demand reading and writing skills (p. 26-27). To meet the needs of young students, educators need to consider these facts when organizing early childhood education classrooms. Lesson plans could allow girls to move at a faster pace in activities involving reading and writing.

"Girls take in more sensory data and can hear better than boys, which can effect the seating arrangement in a room" (Gurian, 2002, p. 26-27). This may also mean that girls will not learn as well in a noisy classroom.

Boy brains are more advanced in the areas of the brain that deal with things like measuring, mechanical design, geography, and map reading (Gurian, 2001, p. 27). This kind of information can help schools to plan a schedule that is more appealing to the interests of its students. In mixed gender schools, these classes may be offered as electives.

Gurian (2001) also discusses other things that may affect a boy's ability to learn. "A boy who has had a crisis at home this morning may come to school with a higher stress hormone level than his sister, because he has held in the stress. He may be unable to learn for much of the morning. He is more likely to become physically aggressive or withdrawn" (pp. 31 and 32). Situations like this can be dealt with more effectively when teachers are better trained in gender behavior differences.

Two important environmental differences were discussed by Gurian and Ballew. The first, the use of space, is an important part of the learning process for boys. Boys need to occupy a lot of space when they organize their materials to work in class or to study (Hughes, 2006, p. 11). This may interfere with anyone working nearby. It is important for the teacher to take these things into consideration when they prepare lesson plans and seating charts. The teacher could provide additional space for boys that think they need it.

The second learning style is movement. Many boys seem unable to sit in one place for long periods of time. While this may bother other students and the teacher, it seems to help boys. "Movement seems to stimulate male brains and helps to manage impulsive behavior" (Hughes, 2006, p. 11). Classrooms and lesson plans designed to allow for movement may allow students to achieve at higher academic levels.

In Swartz and Hanson's (1992) research, they found that in classroom discussions "boys took three times as many turns speaking" (p. 1). In many cases the teacher thinks that the more the student participates orally in

class, the more intelligent the student is and that they are learning more than those who speak out less often. This oral participation by the boys also attracts more of the teacher's attention, leaving the girls largely ignored (p. 1). Teachers must insist on more participation from girls by calling on them during discussions.

The lack of attention and fewer opportunities to participate orally is counter-productive to the learning style of girls (Vail, 2002, p. 3). "Girls learn best while socially interacting and working in a collaborative setting. Girls benefit more from a collaborative setting in a single sex classroom" (p. 2). This would be valuable information for the staff of any school considering the use of single gender classes.

Single Gender Programs

Sax (2004) studies included Moten Elementary School in Washington, D.C., Thurgood Marshall Elementary School in Seattle and the Africentric School in Columbus. All were schools that achieved dramatic results after switching to a single sex format. "After one year, Moten's students were scoring among the top in the

district, with the second highest score in math and the sixth highest in reading" (p. 3). Sax (2004) and Miller (2002) showed that single sex schools will reduce the number of discipline problems. "Discipline referrals at Moten Elementary School were reduced by ninety nine percent after the switch" (Sax, 2004, p. 3).

At the Thurgood Marshall School in Seattle, principal Benjamin Wright decided to set up a pilot program in 2001, separating boys and girls in a few classrooms. The number of boys being suspended dropped and boys test scores increased (Miller, 2002, p. 1). "In the pilot program, seventy-three percent of the boys passed the state standards. The girls stayed steady with their test scores" (p. 1). In 2002, the entire school went to single sex classes with the exception of its programs for English learners and autistic children (p. 1).

At Hunt Elementary School, principal Tamela Barr divided the fifth and sixth grades into all boy and all girl classes. After the first six weeks, grades were up and a large number of students achieved academic honors (Burnett, 2007, p. 1). One teacher stated, "It's just

something about them being separate. We can get a lot more accomplished and the boys are so focused. They just come in ready to work" (p. 2).

However, the students seemed to have mixed feelings. Tatierra Givens and Miranda Ferguson both like not having boys in their classes and their grades have improved (P. 2). Boys did not like being separated from the girls. Robert Butler said, "It's alright, but my grades have remained the same as last year" (p. 2). Trezella Brown said, "He did not like being in an all boy class. His grades have also remained the same as last year. It is more fun with the girls in class" (p. 2).

These cases provide us with evidence that single gender classes can help students to perform better academically and reduce behavior problems. Educators considering the move to single gender classes must provide this information to their staff. Allowing staff members to visit schools with successful programs to observe and question teachers may convince staff members that the move would be beneficial.

Throughout Kentucky, experiments with single sex classes have been tried in an effort to determine the

best grouping for boys and girls. In some schools the format yielded impressive results, while others were less convincing.

The Kentucky Teacher magazine reports that "a one semester experiment with separate classes for boys and girls got such positive results that educators at Paducah Middle School, in Paducah, Kentucky, have decided to expand the concept to include all students in grades 6 and 7" (Rains, 2002, p. 11). In the beginning, girls and boys were separated into two 6th grade classes and the results were improved grades, better behavior and positive comments from those involved. "After nine weeks, sixty-four percent of the boys had better grades in math and science. Ninety-four percent of the girls improved in science and seventy-eight percent improved in math" (p. 11).

Candy Varble, a social studies teacher, and Cathy Manning, a mathematics teacher, agree that, "Behavior improved along with grades. The girls have quit all of that note passing. And the boys don't have to act up to try to impress the girls" (p. 11).

The students, who still see opposite sex classmates in classes such as band or art and during lunch, say they like the girls only and boys only classes for their core subjects. "It was distracting to be in class with a boy that you kind of liked," said Melissa Knight (Rains, 2002, p. 11). Classmate Sashay Gillespie said "Her grades went from a C grade to a B" (P. 11). Similarly, boys said they are better students without the distraction of girls. "I can concentrate and ask more questions," said Logan Henry (p. 11).

Is the single sex classroom the best setting? Since so few public single sex schools exist, it is hard to come by studies that adequately judge their impact. Many believe that evidence of the success of single gender schools already exists. "If private single sex schools and colleges in America such as Wellesley and Smith have thrived for generations, why should not the same be true for public schools" (Sappenfield and McCarroll, 2002, p. 2)?

Arguments Against Single Gender Programs

Educator opinion of the effectiveness of single sex classes varies from person to person. Up to this point,

performance and for all their responsibilities (Swartz, 2001, p. 3).

The ACLU and NOW also reason that single sex classes have a detrimental impact on the social growth of each sex. The American Civil Liberties Union and the National Organization of Women (Hughes, 2006) each argue that coeducation is better for boys and girls because it allows them to develop interpersonal skills so they can interact with each other. Some worry that without the collegial relationships boys and girls form in school, they will not develop into men and women who understand and respect one another (p. 8). The president for the National Organization for Women's New York chapter, Matthea Marquart, said, "She felt the schools diverted attention from real gender inequities because single sex schools served such few students" (Kovner, 2002, p. 2).

The New York ACLU disputes the effectiveness of the Young Women's Leadership School in Albany. "We are not satisfied that in order for those students to get a good education, they have to be separated by gender" (Fletcher, 2002, p. 1). The ACLU believes that the school

meets all of the criteria that are necessary for success in a single gender or mixed gender school (p. 2).

The American Civil Liberties Union opposes a plan by the Jefferson County Public Schools in Louisville, Kentucky, to create the state's first all boy and all girl public schools. "The district's plan does not address the area's underlying problems of poverty and would reinforce gender stereotypes" ("ACLU Objects To," 2005, p. 1). Beth Wilson, director of the ACLU in Kentucky, said, "The district's plan fails to guarantee that a student could transfer to a coed school, which raises constitutional questions" (p. 1).

In 1998, the American Association of University Women Education Foundation released a report, which disputed the reports of successful single sex classes and schools (Standen, 2007, p. 48). The AAUW researchers insisted that outside factors could be making the difference. "Smaller class sizes, a focus on academics and students making the choice themselves to attend single sex schools were cited as possible factors in the success of students. By selecting single sex schools,

students are making a pro academic choice" (Schevitz, 1998, p. 1).

The AAUW report is based on the work of sixteen researchers who shared their findings on single sex education at a round table in November. The research included studies from public schools overseas and Catholic schools in the United States, because of the small number of single sex public schools in this country (Schevitz, 1998, p. 1). Nancy Zirkin of the AAUW said, "It is not the single sex schools per se that make boys and girls succeed, but all the same elements that make boys and girls succeed in schools where they are together, like a sense of community, good discipline, and adequate resources" (Schemo, 2002, p. A26).

Conclusion

Research by Gurian (2001) tells us that the physical development of the male and female brain is different. Gurian and Stevens (2004) reported improvements in academics and behavior in experiments in Kentucky and Missouri after the staff in these schools received training in gender specific learning differences.

Whether students are taught in a coeducational or single gender classroom, educators must buy into the school of thought that learning differences do exist between the sexes. Caplice (1994) says it best, "You have to get away from the notion that if you put everyone in a bowl and mix it up, everybody gets the same and everybody's going to benefit from that experience - that's not necessarily true in education" (p. 1).

CHAPTER THREE
DESIGN AND METHODOLOGY

Design

The research design was descriptive. The purpose of the study was to analyze the opinions of Kentucky educators regarding single gender classrooms in relation to academic performance, attendance, and behavior. The study attempted to determine if there was a difference of opinion between educators with experience in single gender classrooms and educators with no experience of the effectiveness of this type of format.

Instrumentation

The data collection instrument for this study was a survey composed of twenty-two Likert type statements designed to reflect the respondent's attitude toward the effectiveness of single sex classes. The Likert scale typically provides five choices, allowing the individual to express different degrees of agreement or disagreement (Sax, G., 1989, p. 491).

The statements in the survey were designed to produce a response reflecting how the respondent rates the effectiveness of gender grouping on student academic

performance, attendance, and behavior. Responses to the survey statements were entered into a spreadsheet for comparison.

The chi square test was used to determine if the null hypotheses were true. By comparing what you expect to observe with what you actually do observe, it is possible to determine whether differences between the two are significant (Mertler & Charles, 2005, p. 362).

Procedure

The goal of the study was to gain a better understanding of the opinion of educators in relation to the ability of single gender classrooms to improve the academic performance, attendance, and behavior of all students. A comparison of opinions was made between educators that have experience in single gender classes and educators with no experience in single gender classes.

A survey was developed that sought the opinion of educators in the state of Kentucky. No previous research regarding educator opinion of single gender classrooms was found. A study of this kind may be useful as an aide for education leaders in evaluating teacher attitude

toward single gender classrooms. Teacher attitude will have a great impact on the success of any new program. A survey of this type may be done prior to any attempts to implement single gender classes.

The survey was e-mailed to educators listed on the Kentucky state global address book along with a brief explanation of the purpose of the survey (See Appendix A and B). All responses received for each survey statement were entered in a data sheet to enable summarization and analysis of the data.

Data Analysis

The total number of respondents was 705. Respondents were divided into two groups, educators with experience in single gender classes and educators with no experience. For each survey statement, respondents had five choices for expressing degrees of agreement or disagreement: strongly agree, agree, no opinion, disagree, and strongly disagree. For analysis, the responses were combined into three categories: agree, no opinion, and disagree. The total in each category were translated into percentage of total responses. Summarized demographics of respondents were divided into three

categories: academic performance, attendance, and behavior.

The data were analyzed to test the null hypotheses and to answer the research questions. The chi square test was computed to examine each hypothesis.

Chi square procedures are used when participants are of a nominal nature. Nominal variable responses do not indicate an amount, but the category that a participant falls into, such as when one answers yes, no, or maybe to a question (Heiman, 2001, p. 589).

If the null hypothesis is true, the observed frequency should equal the expected frequency. The greater the difference between the observed frequency and the expected frequency, the less likely it is that the difference is due to sampling error. Therefore, the less likely it is that the hypothesis is true, and less likely that the sample represents an equal distribution of frequencies (Heiman, 2001, p. 593).

The tabulated chi square value for each hypothesis must be determined. To begin, one must calculate the degrees of freedom. The term "degrees of freedom" is used to describe the number of values in the final calculation of

a statistic that are free to vary. For chi square calculations, the degrees of freedom are equal to $(r-1)(c-1)$, where r is the number of rows and c is the number of columns (Michael, 2008, p. 5). In this case, $r = 2$ (educators with experience and educators with no experience) and $c = 3$ (agree, no opinion, and disagree). So, $df = (2-1)(3-1) = 2$.

Before testing the null hypothesis, the researcher must decide how much risk of making an incorrect decision is acceptable. In most discussions of chi square computation, five chances out of one hundred seem to be acceptable. This value is known as the "significance level," or "alpha" (Michael, 2008, p. 5). So $\alpha = 0.05$.

The chi square value can be obtained by looking in the chi square table where the row for two degrees of freedom and the column for 0.05 significance level intersect. This tabled chi square value is 5.99. When the calculated chi square value reaches this point, it is in the region of rejection for the hypothesis (Heiman, 2001, p. 593). When a calculated chi square value is in the range of 0-5.99, the null hypothesis is supported. The margin of error is within this range.

CHAPTER FOUR
ANALYSIS OF DATA

Results

It needs to be pointed out that respondents to the survey did not always reply to every statement in the survey. Some statements were left blank. To investigate research question one, the survey asked educators to respond to the statement, "Academically, single gender classes outperform mixed gender classes."

Research Question 1: Do educators with experience in single sex classes and educators with no experience in single sex classes both believe that single sex classes improve the academic performance of students?

Table 2: Academics

Total N = 680					
	SA	A	NO	D	SD
Educators W/Exper.	34 (15%)	76 (34%)	71 (32%)	35 (16%)	7 (3%)
	(110) 49%	(71) 32%	(42) 19%		
Educators W/No Exp.	32 (7%)	129 (28%)	224 (49%)	59 (13%)	13 (3%)
	(161) 35%	(224) 49%	(72) 16%		

SA - Strongly Agree, A - Agree, NO - No Opinion
D - Disagree SD - Strongly Disagree

Table 2 shows a total of 680 responses. The number of responses from those with experience in single gender classes was 223. The number of responses from those with no experience in single gender classes was 457.

A total of forty-nine percent of respondents with experience were in agreement that single gender classes will outperform mixed gender classes academically. A total of thirty-five percent with no experience agreed. There was a fourteen percent difference between the two groups.

To examine the null hypothesis, "There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes of how gender grouping will affect the academic performance of students," the chi square test was computed. A chi square value of 18.51 was obtained for null hypothesis one.

This calculated value (18.51) exceeds the tabled value of 5.99. A calculated chi square value of 5.99 or larger is sufficient to reject the null hypothesis.

The answer to research question one is that a larger number of educators with experience believe that single gender classes will improve the academic performance of all students. The results indicate that educators with no experience may be in need of more awareness regarding the possible benefits of single gender classes and their effect on student academics. Until they have better knowledge, successful implementation may be in jeopardy.

Table 3: Chi Square Calculations for Academic Data

	Agree	No Opinion	Disagree
Educators With Exp.	$\chi^2 = 5.02$	$\chi^2 = 6.85$	$\chi^2 = 0.57$
Educators With No Exp.	$\chi^2 = 2.45$	$\chi^2 = 3.34$	$\chi^2 = 0.28$

$\chi^2(2, N=680)=18.51, p<0.05$

Other statements in the survey show that approximately half of the respondents with experience believe that girls in single sex classes perform better in math and science (51% to 45%). Respondents with experience also believe more strongly that boys are more

successful in reading and English in single sex classes (47% to 37%).

To investigate research question two, the survey asked educators to respond to the statement "Single gender classes have better attendance than mixed gender classes." Responses are reported in table 4.

Research Question 2: Do educators with experience in single sex classes and educators with no experience in single sex classes both believe that single sex classes improve the attendance of students?

Table 4: Attendance

Total N = 679					
	SA	A	NO	D	SD
Educators W/Exp.	27 (13%)	38 (18%)	112 (51%)	38 (18%)	6 (3%)
	(65) 31%	(112) 51%	(44) 21%		
Educators W/No Exp.	11 (3%)	48 (11%)	315 (69%)	66 (15%)	18 (4%)
	(59) 14%	(315) 69%	(84) 19%		

SA - Strongly Agree A - Agree NO - No Opinion
D - Disagree SD - Strongly Disagree

Table 4 shows a total of 679 responses. The number of responses from those with experience in single gender

classes was 221. The number of responses from those with no experience in single gender classes was 458.

A total of thirty-one percent of respondents with experience were in agreement that single gender classes would have better attendance than mixed gender classes. A total of fourteen percent with no experience agreed. There was a seventeen percent difference between the two groups.

To examine the null hypothesis, "There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes regarding the effect gender grouping has on the attendance of students," the chi square test was computed. The resulting chi square value of 30.26 was obtained for hypothesis two. This calculated value is extremely large. Although a large number of respondents had no opinion, the statistical analysis indicates the null hypothesis for question two is rejected because it has greatly exceeded the point of rejection (5.99).

The answer to research question two is that a larger number of educators with experience believe that single

gender classes will improve student attendance. The number of respondents that had no opinion was large, indicating that they have little information on this topic. The percentage of those in each group that agreed was low, indicating that both groups will need to learn more about the effect of this type of grouping on attendance.

Table 5: Chi Square Calculations for Attendance Data

	Agree	No Opinion	Disagree
Educators With Exp.	$X^2 = 15.04$	$X^2 = 5.24$	$X^2 = 0.13$
Educators With No Exp.	$X^2 = 7.26$	$X^2 = 2.53$	$X^2 = 0.06$
$X^2 (2, N=679)=30.26, p<0.05$			

To investigate research question three, the survey asked educators to respond to the statement "There are fewer discipline problems in mixed gender classes." Responses are reported in table 6.

Research Question 3: Do educators with experience in single sex classes and educators with no experience in

single sex classes both believe that single sex classes improve the behavior of students?

Table 6: Behavior

Total N = 687					
	SA	A	NO	D	SD
Educators W/Exp.	8 (4%)	32 (14%)	55 (25%)	92 (41%)	37 (17%)
	(40) 18%		(55) 25%	(129) 58%	
Educators W/No Exp.	10 (2%)	58 (13%)	205 (44%)	154 (33%)	36 (8%)
	(68) 15%		(205) 44%	(190) 41%	

SA - Strongly Agree, A - Agree, NO - No Opinion
D - Disagree SD - Strongly Disagree

Table 6 shows the distribution of responses. The number of responses from those with experience in single gender classes is 224. The number of responses from those with no experience in single gender classes is 463.

A total of eighteen percent of respondents with experience were in agreement that there are fewer discipline problems in mixed gender classes. A total of fifteen percent of respondents with no experience were in agreement. There was a three percent variance between the two groups. Fifty-eight percent of educators with

experience and forty-one percent with no experience disagreed with the statement, resulting in a seventeen percent difference.

To examine the hypothesis, "There is no significant difference in the opinion of educators with experience in single sex classes and educators with no experience in single sex classes, of how gender grouping will affect the behavior of students," the chi square test was computed. A chi square value of 25.40 was obtained for hypothesis three.

This calculated value is extremely large; indicating the null hypothesis for question three is rejected because it has greatly exceeded the point of rejection (5.99). The answer to research question three is found in the number of educators that disagree with the survey statement.

A larger number of educators with experience disagree that mixed gender classes have fewer discipline problems. The results indicate that educators do not believe that behavior will be better in mixed gender classes. The data provides evidence that both groups

believe that single gender classes may have a positive impact in this area.

Table 7: Chi Square Calculations for Behavior Data

	Agree	No Opinion	Disagree
Educators With Exp.	$X^2 = 0.65$	$X^2 = 10.46$	$X^2 = 6.00$
Educators With No Exp.	$X^2 = 0.32$	$X^2 = 5.06$	$X^2 = 2.91$

$X^2(2, N=687)=25.40, p<0.05$

Forty-eight percent of respondents with experience agreed that there are fewer behavior problems in all boy classes. Twenty-three percent of educators with no experience agreed. There was a twenty-five percent variance between the two groups.

Other data obtained from the survey showed that when male students are taught by a male teacher, forty-eight percent of educators with experience and forty-two percent with no experience agreed that there are fewer discipline problems. There was only a six percent difference between the two groups.

On the other hand, only six percent of educators with experience and three percent with no experience agreed that male students have fewer discipline problems when taught by a female teacher. There was only a three percent difference between the two groups.

Fifty-seven percent of educators with experience and thirty-nine percent of educators with no experience believe that all girl classes have fewer discipline problems. There was an eighteen percent difference between the two groups.

Respondents with experience in single sex classes were evenly divided on their preference toward working with mixed gender classes, thirty-four percent agreed, thirty percent had no opinion, and thirty-six percent disagreed. Respondents with no experience in single sex classes seemed to have a slight preference for working with mixed gender classes with forty-seven percent marking "agree," forty percent had no opinion and fourteen percent disagreed.

Thirty-four percent of respondents with experience answered that they would prefer to work with an all girl class, thirty percent had no opinion, and thirty-six

percent disagreed. Respondents with no experience marked the no opinion column at a higher rate (44%). Only twenty percent of educators with no experience agreed and thirty-six percent disagreed.

Respondents with experience were evenly divided on working with all boy classes. Thirty-four percent of respondents agreed, thirty-two percent had no opinion, and thirty-four percent disagreed. Only sixteen percent of educators with no experience were in favor of working with all boy classes, forty-five percent had no opinion and forty percent disagreed.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

The results of the survey indicate that educators with experience have a slightly higher opinion of the positive effects of single sex classes. In response to the statement about working with single gender classes, neither group was overwhelmingly in favor of this type of classroom arrangement. This would indicate that there is enough doubt to threaten the success of any efforts to begin using single sex classes.

The one statement that scored high with both educators with experience in single gender classes and educators with no experience is that boys and girls have different learning styles. This provides evidence that both groups of educators may be willing to experiment with instructional strategies designed to meet the learning needs of each gender.

A study of Michael Gurian's research in how the brains of boys and girls develop will provide valuable information for a staff considering the change to single sex classes. A trip to the Michael Gurian Institute may provide the training needed for a successful transition.

Conclusion

Before attempting to implement single gender classes, a survey of this type may need to be given to the staff. This would provide administration with valuable information that may need to be considered.

As is reported in the survey, educators believe there are situations where single sex classes result in a better academic outcome for both boys and girls. Educators need to develop goals based on what has been learned about gender learning patterns. Study the programs that have had success with this type of format and present the facts to the staff. The findings will provide useful information for educators in addressing the needs of both boys and girls as they progress through school.

Educators, parents, and community need to work together to ensure the best education for all students. Schools need to make the changes necessary to ensure that both genders are in an environment most compatible to their learning style. Educators must eliminate factors that cause either gender to be short changed in the educational setting.

Once the program has been implemented, conduct a review and survey periodically to determine effectiveness and teacher attitude. Educators must continue to research the possibilities to determine the best setting for both boys and girls.

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