SINGLE-SEX SCHOOLS AND CLASSROOMS AS AN EFFECTIVE SCHOOL STRUCTURE THAT WILL PROMOTE AN EFFECTIVE LEARNING ENVIRONMENT, WITHOUT EXTERNAL YOUTH SUBCULTURE DISTRACTIONS.

By

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ABSTRACT

The focus of this literature review is to determine if single-sex classrooms are an effective systemic alternative to assist in meeting today’s educational challenges for students in today’s educational environment. Single-sex schools have been incorporated as the foundation of educational systems for hundreds of years. Many single-sex schools became coeducational schools during the 1970’s and 1980’s due to social and political pressures. Today’s educational environment has brought back a strong interest in single-sex schools and single-sex classes. There has been a push to pursue these systemic changes, along with governmental support that made changes to Title IX regulations that often brought challenges to equal rights groups. By separating boys and girls in the educational environment, single-sex classes eliminate some of today’s social distractions and social culture that takes away from the learning environment. Without the distractions of youth cultural pressures and stereotypes, single-sex classes will place a higher academic focus on the teaching and learning that is occurring in the classroom.
Chapter 1 Introduction

Statement of the Problem

Bath Community Schools is rural school district that is located six miles north of East Lansing, Michigan. Bath Community Schools has an enrollment of 1032 students and typically has three sections of classes at each grade level. The Bath School District is facing academic challenges due to a rapidly changing student population over the last three years. During this time frame, there has been a significant change in the socio-economic status of the district. In addition, the district is facing an increasingly transient, at-risk population of students, while trying to meet higher educational expectations.

Accountability and student performance expectations are at an all time high in the State of Michigan. Expectations set by Governor Rick Snyder of Michigan have raised the educational bar beyond those of No Child Left Behind. The State of Michigan raised cut scores on the Michigan Educational Assessment Program (MEAP) and the Michigan Merit Exam (MME) during the 2011-2012 school year. The result of this action has the number of students considered proficient in the areas tested dropping by 20-80% in every district across the state. Funding for school districts will likely be tied to student performance on the MEAP and MME in the coming years. Parents will begin to question further the quality of education their children are receiving in local public schools. In response to these challenges, Michigan educators are looking for ways to strengthen instruction, student performance, and instructional environments provided to students within our schools and school districts. Single-Sex Schools and Single-Sex Classrooms is an area many schools have considered trying to improve student performance. One of the main motivations behind Single-Sex Schools and Classrooms is the potential elimination of external youth cultural factors, such as “rating and dating” that can inhibit a
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healthy educational environment. Single-Sex schooling has a long history as a model in education in Northern Ireland, England, and United States (Lepore & Warren, 1997; Riordan, 1990; Sullivan, Joshi, & Leonard, 2010). Prior to the 1800’s, elementary public schools seemed to be mixed on location, but secondary schools were primarily single-sex schools. During the 1800’s, the United States had a significant shift to coeducational public schools primarily due to financial constraints of operating separate single-sex schools (Riordan, 1990). American private and Catholic schools remained primarily single-sex schools at the K-12 and Collegiate levels until the 1970’s and 1980’s. From 1966 to 1986, single sex colleges and universities dropped 19% from 25% to 6% single-sex colleges (Tyack & Hansot, 1990). Private single-sex high schools dropped significantly between 1963 and 1987. Boy’s schools dropped 26% from 37% to 11%. Girl’s schools dropped 12% from 24% to 12%. During this time period, coeducational schools doubled from 38% to 76% (Tyack & Hansot, 1990). This change occurred primarily due to fiscal reasons, not because of research that stated coeducational schools were better.

Educational leaders began establishing public single-sex inner city schools during the late 1980’s (U.S. Department of Education, 2008). Throughout the 1990’s, inner city public schools continued to try single-sex schools. Legal challenges and opposition groups forced efforts to stop these single-sex schools in several cities. These groups claimed Title IX violations as the basis their claims that single-sex schools were inappropriate for public education. Single-Sex Schools increased from 20 in 2003 to 80 in 2007 (U.S. Department of Education, 2008). This large increase occurred due to changes to Title IX regulations underneath President Bush’s lead in 2006. The amendments provided increased flexibility for school districts to implement public single-sex schools (U.S. Department of Education, 2008). Today’s public single-sex schools vary from schools that are completely separate to schools that share a facility where girls and
boys can mingle during non-instructional and extracurricular activities. Single-Sex Schooling has undergone significant research, scrutiny, and observation since the shift started in the 1970’s. Pros and Cons are constantly debated and contested by researchers and the public. The U.S. Department of Education conducted a systemic review in 2005, and in 2008. RMC Research Corporation contracted with United States Department of Education to conduct this descriptive study.

School districts across the state and country are looking for long term solutions to increase student performance. School systems, principals, and teachers are becoming more systemic in their practices than ever before. Therefore, school improvement initiatives must be evidence based and sustainable over a long period of time. In order for this to happen, initiatives must be organized, implemented, and systemic. Educational leaders, educators, parents, students, and community members must be involved and supportive of the initiative.

Educational reform is moving at an increased rate in today’s society, and it seems everyone has an idea or initiative. Our challenge as educators is to identify reforms that will make the greatest impact in a global economy. Our federal and state governments, led by President Obama and Governor Snyder respectively, have put an imperative focus on reforming our educational systems. Improving our schools has become a national and state priority. Every educator should be dedicated to ensuring every student grows academically and socially. Increased expectations and increased student needs are challenging every educator to work harder to ensure academic success for all students. Promoting academic and social growth in a global environment has become a significant challenge.

Today’s academic changes have been brought upon due to an economic downturn and our ever changing global economy. Today’s economic challenges require a society of people
who are well educated, team orientated, and adaptable to a quickly changing society. Our educational system has the responsibility to inspire students to achieve at higher levels than ever before. These changes are also leading us towards one global society. As a society, many of us are learning as we progress through life. Partnership For 21st Century Skills is an organization that has identified educational objectives to help the United States remain competitive in a global society. Partnership For 21st Century Skills (2009) identified the following as key skills:

- Thinking critically and making judgments
- Solving complex, multidisciplinary, open-ended problems
- Creativity and entrepreneurial thinking
- Communicating and collaborating
- Making innovative use of knowledge, information, and opportunities
- Taking charge of financial, health, and civic responsibilities

Reforms are needed to address the varying needs of students. We must address the demands from our parents, government, and communities to prepare and motivate today’s youth. Educators must look at all educational deficits and find solutions that will improve them. Single-Sex Classrooms and Single-Sex Schools have become popular reforms to consider in addressing our challenges. This type of reform needs to have a targeted plan, and an opportunity to create support from all parts of a school community. Systemic change and a successful initiative which addresses student academics and social needs cannot occur if the support is not in place from the school community.


**Research Question:**

To what extent are single-sex classrooms an effective educational model to promote a positive learning environment for students academically and socially?

To what extent are single-sex classrooms an effective educational model to promote increased academic gains?

**Definition of Terms:**

**Single-Sex or Single-Gender Schools:**

A Single-Sex or Single-Gender School has only male students or female students attending that school.

**Coeducational or Mixed-Sex Schools:**

Coeducational or Mixed-Sex Schools have male and female students attending the same school.

**Single-Sex Classroom:**

Single-Sex Classrooms have only male students or female students in attendance.

**Mixed-Sex Classroom:**

Mixed-Sex Classrooms have male and female students in attendance.
Chapter II Literature Review

Several studies have concluded that single-sex schools or single-sex classes have had a significant impact on student performance. The impact on students has been quantitative and qualitative ranging from increased student testing performance to how a student perceives themselves. A few other studies contradict these results, and conclude that there are no significant benefits to single-sex classes or single-sex schools. The ultimate goal of single-sex classes or single-sex schools is to increase student educational performance.

Benefits/Negatives to Single-Sex Classes/Schools

Riordan (1990) found that one of the primary reasons single-sex schools went away in the public sector was economics. As public education grew, especially in the United States, coeducational schools became the norm due to economic efficiency. Coeducational schools did not become the norm because they were found to be more beneficial educationally. Riordan’s literature review noted that single-sex schools create opportunities to encourage curriculum delivery to meet the needs of the student, improve teacher-student interactions, improve classroom order and control, and break down sex stereotypes. On the other hand, his review found that potential negatives include increased gender stereotyping, increased sex-stereotyped roles, potential inequalities in education, and potential obstruction of positive relationships amongst the sexes.

Two other studies conducted by Herr and Arms (2004) and Baker (2002) found the ability of teachers to be prepared to handle pedagogical skills needed to teach single-sex classes, and/or the ability to handle classes of all boys created significant challenges to incorporating successful single-sex schools and single-sex classrooms. In both of their studies, limited success
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by single-sex classes was determined to be caused by a lack of educational training and pedagogical skills in teaching a specific gender.

Single-Sex Classes/Schools Educational Research

Sullivan, Joshi, and Leonard (2009) reviewed single-sex school data from a longitudinal study conducted in England, Scotland, and Wales starting in the 1970’s. The National Child Development Study (NCDS) included children that were born during a single week in 1958 in England, Scotland, and Wales. The original sample included 17,414 children, although this study looked at 12,320 of these children as adults. The original sample was not clustered, and included children from a variety of backgrounds. Sullivan et al. (2009) reviewed academic and survey data that was taken when the cohort group was 16, 18, 33, and 42 years of age. Controls were used on family background characteristics as well as prior test courses when reviewing the data. During this time period, parents had little choice where to send their kids to school, what type of school, and single-sex schools were common and relatively wide spread. In fact, 25% of the cohort went to single-sex schools across a relatively evenly spread of four different types of British Schools.

Single-sex schools outperformed coeducational schools on tests given to 16 year old girls 20% to 13% in 1974. Although there was no significant difference for boys at the age of 16, nor for boys and girls on tests given at the age of 18 in 1976. In addition, single-sex schools outperformed coeducational schools for boys (25% to 11%) and girls (21% to 7%) in educational attainment. It is noteworthy though, when controlling the various sectors, educational attainment between single-sex and coeducational schools were relatively even. There were significant differences in performance by boys and girls that went to single-sex schools when assessed in non-stereotypical subjects. For instance, boys that went to single-sex schools outperformed boys
that went to coeducational schools by 2.2 times on testing in English and foreign languages. Single-sex schooled girls outperformed coeducational girls by 1.6 times in math and science. They also found that women were more likely to attain careers in male dominated fields if they went to single-sex schools (Sullivan et al. 2009). Sullivan et al. (2009) concluded that while educational performance was higher for single-sex girls through the early high school years and that it appeared to have some benefits in breaking down stereotypes, they were not convinced that single-sex schools were the solution. Sullivan et al. (2009) suggested that the larger issues and challenges in education continue to revolve around social class and ethnicity. The study also suggests coeducational schools should put a larger focus on increasing success for boys and girls in breaking down stereotypical barriers, which will further break down one of the arguments for single-sex schools. Sullivan et al. (2009) also caution that one of the challenges currently in Britain is student populations in some coeducational schools of 70% boys. This has been created by the interest in single-sex schools by parents for girls, but not for boys.

One study took place on a school that was transitioned into a single-sex school due to years of poor achievement testing. Herrelko, Jeffries, and Robertson (2009) conducted a study on an urban elementary school that was being restructured in order to address student academic performance issues. Their study examined the impact of single gender mathematics classes on student achievement. In addition, their study evaluated preferences of teachers, students, and parents after a year of implementation. Five years of poor academic achievement was forcing this school to be reconstituted. The staff chose the model of single gender classes instead of being forced to transfer and rebuild the whole building staff. Enrollment at the school was voluntary, as parents chose whether to send their students to this school. The student population
of the school was 98% African-American and 2% Hispanic. The building was noted to be the poorest in the school district.

There were two sets of data collected for this study. First, student achievement data came from the Ohio Department of Education mathematics achievement test scores. Achievement tests reported to the school were identified by number in order to maintain anonymity. Scores and percentages for two years of data were compared, which gave a snapshot of student academic performance before and after the reorganization of the school. Secondly, surveys of teachers, students, and parents were conducted, along with conversations with teaching staff was recorded and compiled. Survey responses were reported in percentages of “Yes” and “No” answers (Herrelko et al., 2009).

Some of the important findings from this study include teacher, parent, and student perceptions of single gender classes. Single gender classes providing a positive impact on the student achievement was perceived by teachers (72%), parents of female students (54%), parents of male students (46%), male students (51%), and female students (78%). It is noteworthy that 14% and 16% of parents of female students and male students, respectively, had no opinion. Therefore, only 8% of female parents and 38% of male parents did not find single gender classrooms to have a positive impact. From the Ohio Department of Education testing, significant gains were found at Grades 3 and 4, while Grade 6 saw a drop. The following academic results were noted in the study: Grade 3 boys increased 37%, Grade 3 girls increased 39%, Grade 4 boys increased 16%, Grade 4 girls increased 29%, Grade 6 boys decreased 30%, and Grade 6 girls decreased 5%. The decreases to an extent can be attributed to the resistance of 6th graders to single gender classes. The boys indicated a 100% opposition to single gender classes, despite 51% of the boys recognizing the benefits (Herrelko et al., 2006). These findings
suggest the age level when a change from coeducational to single gender classes occurs can have a huge impact on the success of the students. The staff was encouraged by these results and continued on with this transition in subsequent school years. In addition, the study found that there was an increase in parental interest and involvement as a positive by product for this schools success (Herrelko et al., 2006).

Several studies have taken place in other countries around the world. Wills, Kilpatrick, and Hutton (2006) conducted a study on an Australian government primary school of 230 students and 11 teachers. The school was a mixed rural/urban community with a moderate socio-economic status. Participants included parents, students, and staff members. The group made observations of students and classes as part of their study.

Data collected for this study included information from five observations of students at the school. The observations were focused in on time on task, and the nature of interactions between students in the classroom, as well as on the playground. Perception surveys were given to parents, students, and staff members. Interviews were conducted with the principal, her deputy, and the teachers of the single gender classrooms. A template was used to store data from the observations of single-sex and coeducational classrooms until further analysis could be conducted. Wills et al. (2006) found that parents (27 of 32) felt single-sex schooling was more beneficial if they were given a choice. Parents noted that their students were motivated to go to school, pleased with their students achievements, and that their students were more engaged at school. Teachers found that student behavior was improved, male and female students became more confident and responsible, and that they felt like they could gear their instruction more towards the needs of the students. Students found that school was a happier place (Wills et al., 2006). These findings suggest there are significant benefits for both boys and girls in a single-
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sex classroom. Much of the success in this study is attributed to the abilities of the teachers that took on this assignment. The abilities of these teachers created an environment where girls became more self-assured and confident, while the boys became more self-disciplined and motivated to learn (Wills et al., 2006). These findings further indicate that single-sex classrooms can be highly effective when implemented with appropriate professional development and staffing.

Longitudinal studies of educational performance in the United States have been conducted several times over the last 50 years. Riordan (1990) received data from the Class of 1972 National Longitudinal Study (NLS), and the 1980 High School and Beyond (HSB) study. Both studies were conducted by the National Center for Education Statistics, and these studies randomly selected 22,652 students in 1972, and 58,270 students in 1980. Students selected in 1972 were seniors in high school, while 29,737 of the 1980 students were sophomores in high school with the remainder being seniors in high school. Students were selected from public, private, and church-related schools.

Riordan (1990) randomly sampled Catholic school students from single-sex schools, mixed-sex schools, mostly white schools, and racially diverse schools. In analyzing the data, the author put in controls to ensure a comparison of relatively equivalent students. Controls for parental structures, race, sex, family size, location, and socioeconomic backgrounds were put into place. Cognitive tests designed by Educational Testing Service were evaluated. The regular (white) Catholic school sample and special minority school sample were evaluated separately.

Riordan (1990) found in his analysis that boys from mixed-sex white schools out performed single-sex white boy’s schools by a half-year of academic performance. On the other hand, single-sex girls schools out performed mixed-sex girls by a full academic year. In the
minority sample, both boys and girls from single-sex schools outperformed their mixed-sex school counterparts by almost a full academic year (Riordan, 1990). In evaluating longitudinal data from the NLS Class of 1972, Riordan (1990) noted that both boys and girls who went to single-sex schools outperformed mixed-sex schools. The study found that single-sex students outperformed mixed-sex students in educational achievement, as well as occupational achievement over the course of their lives. In addition, the study found girls who went to single-sex colleges and single-sex schools typically achieved higher occupational attainments, healthier marriages, stronger views towards equal sex roles, and they had higher self esteem. Riordan (1990) also noted that women who had at least two years of single-sex college obtained more educational and occupational prestige than comparable students who attended only mixed-sex colleges. The author concluded that single-sex schools appear to have a positive benefit for girls and boys in educational achievement (Riordan, 1990).

One trend in the United States is to create single-sex classes within coeducational schools. Streitmatter (2002) conducted a qualitative research design and data analysis over one school year to determine perceptions of students taking single-sex classes within a coeducational school. Students in this study attended an inner city school that had a 75% minority population, of which most were Latino-American. Students assigned to the single-sex class had failed the course at least once. Two students self-selected entry into the course. There was one all male section, one all female section, and seven mixed sections (Streitmatter, 2002).

Streitmatter (2002) conducted observations of student-student and student-teacher interactions in both single-sex classes as well as one of the mixed-sex classes. All three sections were taught by the same teacher. The bi-weekly observations focused on whether the students or teacher behaved differently according to the make-up of the class. In addition, the teacher was
interviewed at the beginning and end of the school year. Students were interviewed once at the end of the school year. Observation data was analyzed into general categories, while interview data was analyzed into broader categories around the student perceptions and attitudes towards math (Streitmatter, 2002).

Analysis of the results found that male and female students had some similar opinions, as well as differing opinions. Boys and girls agreed that more work was completed in single-sex classes, to feeling more comfortable to participate in class, and in being more confident in their abilities. Girls felt they grew more as a math student, while boys felt the single-sex classes made no difference. Girls expressed an interest in having more single-sex classes, on the other hand boys wanted to return to mixed-sex classes. Another qualitative difference found girls would be specific about male behaviors they found distracting in mixed-sex classes. Streitmatter (2002) concluded a need for single-sex class options for girls is important. Although, the author found the need for boys does not seem to be there, although it would still provide some positive effects (Streitmatter, 2002).

Single-sex and coeducational school data from the National Educational Longitudinal Study (NELS) was used for the basis of another study comparing single-sex and coeducational Catholic schools. Lepore and Warren (1997) reviewed data associated with single-sex and coeducational Catholic schools with fewer than 25% of their students on a vocational curricular program. The 836 student sample was in the 10th grade in 1990, the data used was collected from the student’s 10th and 12th grade school years. NELS of 1988 is a randomly selected sample of 25,000 students from public and private schools. Controls used for the study included academic testing, ethnicity, educational aspirations, and household data. Students analyzed at the 12th grade responded to all three surveys, didn’t drop out of school, and did not change
schools. Analysis provided two equivalent groups to compare for academic outcomes (Lepore & Warren, 1997).

Analysis of academic scores found little difference in academic achievement for the boys between the two types of schools. Lepore and Warren (1997) also found no statistical significance in academic performance for girls attending single-sex schools. Academic gains calculated for both boys and girls between the 8th and 12th grades were equivalent between all students among both types of schools. Lepore and Warren (1997) concluded significant evidence that single-sex Catholic school boys or girls learned more than coeducational Catholic boys or girls while analyzing data from NLS 1988 was not evident.

A reconstituted inner-city middle school became a public and large experiment on single-sex classes. Herr and Arms (2004) studied the reconstitution of Single Sex Academy from its’ inception in 1999. Single Sex Academy was a low performing inner-city school that served a low-income, minority population of 1100 students. In addition, Herr & Arms (2004) took into account the impact of high-stakes testing on the school, along with how multiple reforms derailed the single-sex experiment. Information for the study was gathered by teacher, student, and administrative interviews; classroom observations; student surveys; and document analysis. Each teacher’s female and male classes were observed from four to eight times over the course of two years. Teachers were interviewed two to four times, while students were interviewed once. Herr and Arms (2004) used a grounded approach to data analysis.

Through the analysis of observations and interviews, a common theme emerged. The constant focus on test preparation and increasing test scores dominated curriculum and instruction. Single Sex Academy was considered a success because of increased test scores that came from a constant focus on test preparation. Herr and Arms (2004) found a school that
qualitatively was in disarray. The constant focus and pressure on standardized tests took away from the potential pedagogical strategies that could be implemented for all boys or all girls’ instruction. When analyzing their observations into groups, all male classes typically were either ultra-controlled or out of control. Female classes, while improving academically, did not capture teachable moments and address gender specific pedagogy (Herr & Arms, 2004).

Despite the academic gains shown at Single Sex Academy, the school short-circuited a potential reform that could truly benefit all students. Single Sex Academy offered a cheap substitute based upon achievement through skill and drill. Herr and Arms (2004) suggested that single-sex schools need to go beyond simplistic measures, and create an authentic opportunity to move towards gender equity.

Creating equity, gender-based instruction in math and science has often been a driving force in creating single-sex classes. Baker (2002) examined single-sex middle school classrooms that were offered in a low income, high minority school in Arizona. Parents were not given a choice on whether their students would be assigned to single-sex or coeducational classes. The majority of the students were Latino-American, and they were not native English speakers. The teachers were the drive behind the study, as they were interested in expanding female interest in math and science courses.

Baker (2002) conducted research in two single-sex math and science classrooms taught by two female teachers. A grounded theory approach was used to evaluate the data that was gathered throughout this study. Observations, classroom artifacts, grades, and interviews were the forms of data collected. Observations were analyzed for recurring themes such as pedagogy, student behavior, and task directions. Classroom artifacts such as assessments, work samples, and curriculum materials were analyzed by cognitive demand and structured. Grades were
assigned a number and analyzed three times a year to obtain a composite grade. Last, interviews of the teachers, students, and interns were recorded and analyzed for patterns and commonalities (Baker, 2002).

The findings of this study did not clearly indicate improved academic achievement for boys or girls. A limitation of this study was prior year grades were not released by the school district for comparison. The teachers did note that they did not see a difference in grades. Summarization of the observations and interviews yielded positive outcomes for girls and negative outcomes for boys. Girls benefited from feelings of empowerment, increased self-concepts, and better attitudes towards math and science. On the other hand, boys had a negative impact in those same areas, in addition to increased discipline problems (Baker, 2002).

Baker (2002) concluded that some of the hurdles in this study orientated around the teachers ability to connect with minority students with limited English speaking skills. While both attempted to strengthen their Spanish skills, language proved to be a barrier. In addition, he recommends any attempt at doing single-sex classes should be well planned, and incorporate appropriate pedagogical training with curricular revisions.

There have been significant efforts put into finding avenues to increase student achievement of inner-city minority students in recent years. Singh, Vaught, and Mitchell (1998) conducted a study on two single-sex classes and two coeducational classes. The students were drawn from classes located at two different schools in a low-socioeconomic community. There were two coeducational classes, one all male class, and one all female class. All students were characterized as average learners, age appropriate for their grade, and were given master teachers.
This qualitative study focused on two variables. Class organization and gender were the independent variables, while dependent variables were attendance and measures of achievement. Iowa Tests of Basic Skills in reading, math, science, and social studies were examined for educational performance. In addition, the researchers analyzed the student’s fourth and fifth grade final grades and daily attendance. Attendance rates for the fourth and fifth grade were determined. Analysis of Covariance methodology was used in determining the results (Singh et al., 1998).

Data analysis showed coeducational classes outperformed single-sex classes in all areas for boys and girls with the exception of female reading and math achievement. Single-sex girls out-performed coeducational girls in reading (38.60 to 36.12) and math (54.33 to 47.25). Coeducational classes especially outshined all boys (53.27 to 36.92) and all girls (53.46 to 39.66) in science achievement testing. Interestingly, single-sex course grades were slightly higher than coeducational grades for boys and girls. The only factor that was significantly in favor of single-sex classes was male attendance. Male absence rates in the coeducational setting was 13.39 compared to 5.77 in all boys classes (Singh et al., 1998).

From this study, Singh et al. (1998) concluded three things. First, there needs to be more research on single-sex classes to fully understand the educational and motivational effects. Second, their observations supported claims that single-sex female classes would benefit African-American girls. Last, educational research needs to focus on the actual practices in single-sex and coeducational classes serving African-American males.

Many supporters of single-sex education promote the ideas there is significant benefits for girls in math classes. Gilson (2002) studied female performance in single-gender and coeducational 8th grade math classes. The study focused on 467 8th grade girls from ten
independent all girl middle schools, and 208 8th grade girls from ten independent coeducational schools. The schools were randomly selected and scattered across large metropolitan areas in the United States. The schools have selective enrollment and serve middle to upper middle socioeconomic classes.

Sixty single-sex and sixty coeducational schools were randomly invited to participate in the study. Twenty schools agreed to share their test results, and nineteen of them also completed questionnaires used to gather information about the schools. Student questionnaires were incorporated to assess student attitudes towards math. Phone conversations with teachers and administrators were conducted. Comprehensive Test Program III test data was used from two testing cycles (Gilson, 2002). The author conducted a t test for independent samples on the assessments. In addition, effective size and regression analysis was conducted on school sector and attitudes. Analysis of surveys compared attitudes with student performance.

Gilson (2002) found there was no significant difference in student performance between single-sex and coeducational schools. Positive attitudes towards math were found in both settings, although coeducational students reported a slightly stronger sense of their ability in math, achievement, and interest.

Gilson (2002) concluded that single-gender schools are not automatically better. Pedagogical skills and educational practices have a more important impact on student learning. The author advised to cure the disinterested attitudes of female students towards math, educational systems need to focus on educational pedagogies that will impact today’s female students (Gilson, 2002).
U.S. Department of Education Analysis

The United States Department of Education contracted with the RMC Corporation to research single-sex and coeducational schools during 2005 and 2008. The 2005 U.S. Department of Education report noted enough conclusive evidence to generalize findings in favor or against single-sex schools. Trends in the report seemed to support single-sex schools, although it was determined further studies needed to be conducted. The report also suggests further longitudinal studies focusing on single-sex schools and the success rates of their students needs to be conducted as well. The longitudinal studies should focus on job performance, leadership performance, performance in mixed-sex work environments, job involvement, and organizational commitment (U.S. Department of Education, 2005).

The 2008 U.S. Department of Education study included observations and surveys. These surveys were completed by teachers, parents, students, and administrators. RMC Corporation found through the surveys and observations an increase in positive interactions, decrease in disruptions, and a greater sense of community in single-sex schools in comparison to their coeducational counterparts. In addition, they found that academic effort and homework completion occurred at much higher rates in single-sex schools than coeducational schools (U.S. Department of Education, 2008). Some of the benefits found in the study included a greater sense of community and increased respect for teachers.

The benefits found below were observed, and data was collected through surveys that were given to teachers, students, parents, and administrators at Single-Sex Schools as well as Coeducational Schools. A compilation of the observations and surveys yielded the list of benefits to single-sex schools when being compared to similar coeducational schools. It is
noteworthy that several of the observed and surveyed benefits were found to only benefit female students.

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<tr>
<td>Increased Socio-Emotional Benefits</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Safer Behavior</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Increased Sensitivity to Gender Differences in Learning and Maturation</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Decreased Sexual Harassment and Violence</td>
<td>X</td>
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Observations, findings, and conclusions from the various studies researching the impact of single-sex schools and single-sex classrooms offers this as an option that could potentially have a huge systematic change to engage today’s students for academic success in 21st Century Skills and Outcomes. The studies demonstrate that there is a potential opportunity for public schools to create a different educational environment that could create academic gains while meeting the various needs of students. Single-sex classes are an initiative that has many conflicting studies that have shown positive educational gains, no significant educational benefit, or negative educational impact. It is evident that one of the key factors is professional development for teachers that prepares them for gender specific educational needs. In addition, the opportunity for a longitudinal study would truly benefit research on this topic.
Chapter III Synthesis of Research as it is Relative to the Problem

Research has shown a very conflicting picture of single-sex schools. Some studies have shown there is an educational and/or social benefit to having single sex schools for boys and girls (Herrelko, Jeffries, & Robertson, 2006; Riordan, 1990; Streitmatter, 2002; Sullivan, Joshi, & Leonard, 2009; Wills, Kilpatrick, & Hutton, 2006). Other studies have shown there is no educational benefit for students (Baker, 2002; Gilson, 2002; Lepore & Warren, 1997; Singh, Vaught, & Mitchell, 1998). Another contention of studies has shown no educational benefit or some educational benefit, while it had a negative impact on the social aspects of education. The primary goal of single-sex schools/classes includes the elimination of youth cultural values, sex bias, order and control issues, and stereotypes. It became very evident in the review of literature that any single-sex class or school experimentation should be more than just separation of the sexes. Single-sex classrooms have the opportunity to customize the learning experience for all students, specific to meeting the needs of a given gender. Teacher training and pedagogical preparation is often a factor left out when switching to gender based classes or schools. Without appropriate professional development and curricular changes specific to the gender being taught, the school and/or classes stand a high risk of being a failure. As educators, any initiative must prepare our teachers with the pedagogical skills to meet the needs of the students that are being taught. One of the greatest potential benefits of switching to single-sex classes or schools is having the opportunity to tailor the teaching and learning for that specific gender. Some of the most successful schools in the country belong to city school systems that have tailored their educational program to girls.

Mael (1998) found that research shows a role for single-sex schools. Although, much additional research is needed to clarify which individuals or target populations would gain most
from such schooling. He identified the following as reasons for coeducational schools vs.
reasons for single-sex schools.

<table>
<thead>
<tr>
<th>Coeducational vs. Single-Sex</th>
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<tbody>
<tr>
<td>1. Reflect real world social interactions</td>
<td>1. Increase academic climate</td>
</tr>
<tr>
<td>2. It is fairer, concern is female single-sex schools are not usually equal</td>
<td>2. Reduces rating and dating culture</td>
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<td>3. Without males, females have lower aspirations</td>
<td>3. Increase in leadership roles</td>
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<td>4. Does not improve male-female equity</td>
<td>4. Decrease male monopoly of class time</td>
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<td>5. Curtails male wild and antisocial behavior</td>
<td>5. Eliminates stereotypical views of subjects</td>
</tr>
<tr>
<td>6. Curtails male sexist attitudes</td>
<td>6. Increased self esteem</td>
</tr>
<tr>
<td>7. Not as expensive</td>
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</table>

In addition, two of the top performing urban schools in our country are single-sex schools. These schools are well-established, long lasting single-sex female schools. These schools are found in highly populated urban areas. Both schools are among the best schools found in their independent cities, along with one being nationally recognized. Salmone (2003) wrote about Philadelphia’s High School for Girls and Baltimore’s Western High School as two public single-sex female schools that have been in existence since the mid-1800. Girls High and Western High are among the top performing schools in our nation. A quick visit to Western High’s website displays their 2009 National Blue Ribbon School award. Western High shares an auditorium, pool, tennis courts, and courtyard with coeducational Polytechnic Institute. Students from both schools congregate in these areas before school, after school, and at lunch. Western High matches the highly regarded Polytechnic Institute academically on a yearly basis.

Educators from elite independent boys’ schools consider single-sex schooling as a better option to accommodate slower maturation rates, shorter attention spans, and higher energy levels found in boys (Salmone, 2003). Coupled with the benefit of removing stigmas around foreign
languages, English, and the arts, these educators consider single-sex schools as an exceptional educational benefit for students.

There needs to be more research done in the realm of single-sex education. There is some very valid research that points to the benefits of single-sex classes and single-sex schools. There are some unanswered questions. Can single-sex schooling truly be better for all students? Single-sex schooling has had some documented success with the affluent population. There also have been some issues with single-sex schools or classes addressing only one sex with a school or district population. This has created some significant issues for the coeducational schools or classes within the same school or district, as one school or set of classes become overloaded with one gender which creates a coeducational imbalance. This is a population that also has great success in coeducational schools as well. Mixed results with suburban and urban schools. As a district that serves a wide range of socio-economic and socio-emotional students, would there be an advantage to establishing single-sex classes? In addition, would it be cost effective for a district our size to explore single-sex classes? A longitudinal study and a commitment to single-sex classes over a period of time would be needed to answer these questions. A significant amount of professional development and training would be needed to prepare staff for the challenges involved in single-sex classes.
Chapter IV Recommendations and Conclusion

Recommendation:

Bath Community Schools currently is facing academic challenges it has not seen before. The district is facing a drastically increasing at-risk population, transient population, and higher expectations. These changes bring to the forefront a reason to evaluate their systems and how they will conduct their educational systems to best serve their students. Single-sex schools and/or single-sex classrooms are options Bath Community Schools are exploring. Bath Community Schools will evaluate the pros and cons to single-sex educational delivery, the costs involved in setting up a single-sex educational system, and whether it is the right fit for our educational community and community as a whole. Mael (1998) pointed out that a predominance of research supports single-sex schooling, and that it should be an option if not the norm. Riordan (2002) suggested that single-sex schools promote a pro-academic parent/student choice that eliminates youth cultural values. These values are often leading to anti-educational attitudes that farther disadvantage struggling students. The 2005 and 2008 U.S. Department of Education studies both show evidence that single-sex schools are a viable option to building academic success. Our federal government changed Title IX laws to accommodate such changes. The partnership for 21st Century Skills emphasizes the need and urgency for our educational system to respond quickly to our changing society and global economy. If schools doubt change, our country and our kids stand to lose and fall behind. Other nations are catching up and taking advantage of new opportunities. It is the duty of today’s educators to prepare students for a competitive, high-paced society. Educators will need to prepare students to become collaborative, creative, decisive, and multidisciplinary problem solvers.
Why should Bath Community Schools consider?

The educational environment in Bath Community Schools could offer a blended coeducational/single-sex class environment that could capitalize on the strengths of both systems. Despite the overall mixed reviews on single-sex education, there has been research that has shown educational benefit for students in single-sex classes. This evidence has been taken in recent years. Bath Community Schools offers a unique opportunity, with appropriate preparation of staff, to conduct a pure educational investigation on the educational benefit of single-sex classes. In order to do this, the Bath Community and Bath School system will need to be engaged into an educational and parental dialogue. This dialogue will require further research, school visitations, and evaluation of how single-sex classes could impact education at Bath Community Schools. From this dialogue, the Bath Community Schools family will determine if single-sex classes would create a unique learning opportunity, educational culture, and parental choice for students.

Implementation proposal for Fall 2012.

In order to effectively implement this type of systemic change at Bath Community schools, the idea of single-sex classes will have to undergo three phases. These three phases will include a series of steps to investigate the potential value of single-sex classes and determine if board, staff, and parents believe single-sex classes are appropriate for Bath Community Schools. The three phases will occur over a nine month period in hope of preparing a plan for implementation during the summer of 2013. Prior to starting the three phases, further investigation and preparation will need to be conducted to determine whether this is an appropriate educational change to pursue for Bath Community Schools. There is research that
would support pursuing this, but there is also enough uncertainty to dissuade this pursuit. The phases below would offer the structure needed to pursue this systemic change.

Phase 1: Introduction to Board of Education and District Leadership Team

I. Board Workshop in December 2012
   a. Review district testing data (MEAP, MME, DIBELS, AIMS)
   b. Review districts’ changing population
   c. Open discussion regarding single-sex classes
   d. Discuss pros and cons with district leadership regarding single-sex classes
   e. Discuss the mixed results found in current educational research
   f. Why should we consider single-sex classes at Bath?
      1. Unique opportunity because of our size
      2. Additional parental choice
      3. Engage our community in an educational conversation

II. District Leadership Team in January 2012
   a. Review district testing data (MEAP, MME, DIBELS, AIMS)
   b. Review districts’ changing population
   c. Open discussion regarding single-sex classes
   d. Discuss pros and cons with district leadership regarding single-sex classes
   e. DLT will read research regarding single-sex classes
      1. 21st Century Skills
      2. Research Articles regarding single-sex classes
      3. Professional development needed to implement

III. Visit a school with single-sex classes
a. Members of administration, board, and DLT

IV. District Leadership Team formulates a recommendation to pursue or not

*Phase 2: Community Conversations and District Capacity*

I. Staff Capacity

a. Breakdown staff by qualifications, management skills, and talents

b. Identify professional development needs

c. Parent meetings and surveys to gauge parental interest

*Phase 3: Single-Sex Classroom Implementation*

I. Preparation for implementation

a. Aligning Summer/Fall 2013 professional development

   1. Needs assessment from Phase 2

b. Identify staff to implement single-sex classes

   1. Gauge interest

   2. Inventory from Phase 2

   3. Assignment to classes

c. Identify and assign students to go into single-sex classes

   1. Parent survey interest

   2. Procedures for selection

d. Work with parents in preparation for the school year

   1. Parent/Staff meetings

   2. Assist parents in preparing students
Areas for Further Research

Research design

There have been many studies done on single-sex schools and single-sex classes over the last 30 years. Bath Community Schools provides a unique opportunity, if the board of education, administration, staff, and community decide that single-sex classes would offer an educational opportunity and parental choice that would benefit students. The educational environment in Bath Community Schools could offer a blended coeducational/single-sex class environment that could capitalize on the strengths of both systems. This is primarily because of our size as a district, and the potential to have a control group with two variable groups. In addition, students would all remain in their current educational setting, with the same teachers.

The participants would initially be middle school and possibly elementary school participants. Participants would be randomly assigned into one of three sections. Section 1 would be coeducational. Section 2 would be all boys. Section 3 would be all girls. Student backgrounds should vary from all socio-economic status, as well as those from all achievement levels.

Data collection

Data collection will be from observations, surveys, assessments, and documentation from every day classroom settings. Data collection will start in Fall and would continue throughout the school year. This study will have the potential to occur over multiple years and cohort groups.

Quantitative data will include the use of MEAP, AIMS, DIBELS, disciplinary records, and other district common assessments. Bath Community Schools will be in the process of developing common assessments in social studies and science in the coming year to go along
with our mathematics and reading assessments. The district will need to work on a systemic way
to warehouse data so it can be completely evaluated.

Student surveys will be conducted twice a year to garner student perception and attitudes
regarding single-sex and coeducational experiences. Parental and teacher surveys will be given
as well to determine their perceptions of the single-sex and coeducational experiences.

Survey’s coupled with academic growth data will create the opportunity to gauge a full
array of quantitative data for evaluation. This amount of data to along with three test subgroups
will potentially create an optimum opportunity to evaluate single-sex vs. coeducational classes.
There is also the potential to carry out this research longitudinally over several years.

**Ethical considerations**

Ethics are an important part of any research project. It is important to gain the support of
all parties involved. In this case, parents, students, and staff members would need to be on board
in order to ensure the quality of data. Consent will be garnered through the phases put into place
to make this systemic change. Parents will also understand the scope of the study and the
information that will be gathered during the study. Secondly, all participants will have their
personal information protected. Third, students will be identified by identification numbers in
order to keep their personal experiences and data protected. Last, knowledge of each participant
outside of school is vital. External factors can greatly impact student growth and this
information must be noted as well.

**Data analysis**

Data analysis is a very complex and important piece of any research project. Careful
analysis will result in a greater understanding of what the data is telling you. Data analysis can
make or break a research projects validity and usefulness. It is significantly important to take in
all factors that can affect the data positively or negatively. It is important to remember to have consistency in how surveys are given, so external factors do not skew the data.

Collection of data is just as vital. Processes must be consistent and organized. It is important to be embedded into the study, and to continually analyze the data and how it is collected. Maintaining the quality of your data, keeping it organized, and controlling your data maximizes your ability to analyze effectively both qualitative and quantitative data.

Summary and Conclusion

State and federal governments have continued to raise the bar on education and make it a significant part of their political agendas. Educators are continually challenged to assess what they are doing. We have to assess our systems and be accountable for our individual and district performance. Great educational teams continue to review and look at research-based practices and alternative avenues to increase student success. With these increased demands, educators cannot be afraid to reform their systems. Educational systems must maximize student potential and emphasize the 21st Century skills that today’s students need to succeed. As our population continues to change and become more diverse, we are responsible to find ways to become more effective.

Single-sex classes are a reform that has the potential to benefit today’s students. With appropriate professional development and training, educators can change their current systems into a system that would remove some of the focus away from the social distractions that can occur in the classroom. The research shows there can be a significant educational benefit for students in single-sex classrooms, especially for female students. To reach this benefit, schools must be proactive in preparation to make this educational shift. The preparation would include appropriate curricular planning coupled with professional development that emphasizes gender
based pedagogical skills. With this appropriate training, single-sex education can be equally
good for males. Systems that are struggling with youth cultural values, rating and dating, and
stereotypes should seriously consider single-sex classes as an educational alternative to increase
student performance. In today’s schools, if appropriate planning occurs with appropriate
professional development, single-sex classes are an affordable solution that can greatly impact
student growth.
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