

**Evaluation Report - Cheyenne High School
10th Grade Same-Sex Instruction**

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Evaluation Report- Cheyenne High School 10th Grade Same-Sex Instruction

Executive Summary

This report presents final findings regarding the evaluation of the effectiveness of single-sex instruction¹ (SSI) on achievement outcomes, instructional practices, teacher efficacy, and classroom behaviors at Cheyenne High School. Tenth graders grouped according to sex for Algebra and English instruction during the 2004-2005 school year were compared to 10th graders in a coeducational context at Cheyenne during the 2002-2003 school year. Student, teacher and classroom variables were assessed by comparison of course grades, standardized test scores, classroom observations, survey results, and teacher interviews.

The evaluation sought to answer six questions concerning SSI at Cheyenne, a co-educational, urban area high school with students primarily from disadvantaged populations:

1) Are achievement scores for students participating in SSI greater than for participants in traditional co-educational classroom instruction? 2) Is the frequency and specific types of disciplinary infractions more or less prevalent in SSI classrooms? 3) What is the influence of the teacher upon achievement in SSI when measured statistically? 4) What is the impact of SSI upon teacher efficacy and satisfaction? 5) What are the opinions of teachers and students participating in SSI? 6) Are engagement levels greater in SSI classrooms than in coeducational classes?

Differences in achievement, teacher influence and disciplinary referrals were measured quantitatively, comparing data between 10th grade SSI students in 2004-2005 and a matched sample 10th graders from Cheyenne in 2002-2003. To understand the culture and apply meaning to the experiences of SSI teachers and students, qualitative analysis was used. Surveys employing descriptive and factor analysis were used to assess student and teacher opinions. The variables of teacher practice; efficacy and cultural impact were assessed by observation and interview methodologies, as well as through survey analysis.

¹ CCSD administration typically refers to same-sex instruction as gender specific instruction, this report uses the terminology of same-sex instruction (SSI) which is the conventional terminology found in published literature.

Students in SSI instruction did **not** show significant differences in grades or standardized test scores compared to students in co-educational instruction. Secondary data analysis indicated achievement did not vary by either sex of student, or by subject of instruction. The role of teacher was shown to have a statistically significant influence on achievement in several cases. Analysis of student survey data revealed predominately negative perceptions towards SSI. Observational and interview data suggested SSI provided a supportive environment for females, inducing greater participation and academic risk-taking. Together, teacher experience and SSI teaching was related to greater teacher efficacy. Teacher effectiveness was indicated as the most important variable in predicting achievement outcomes of students regardless of educational context.

Evidence supporting the unilateral effectiveness of SSI to promote greater student achievement was **not** indicated in the current study. With limitations and qualifications, we concluded SSI might provide an instructional environment more conducive to female participation and academic risk-taking, provided teachers are experienced and properly trained. In summary, the benefits of SSI, based upon this evaluation, provide limited evidence that single-sex educational contexts alone are conducive to short-term learning gains.

Background and Purpose

Cheyenne High School, located at 3200 W. Alexander Road, Las Vegas, NV, is a four-year secondary school serving the Northeast region of the Clark County School District (CCSD). The student population of 2,856 is 37.5% White, 33.4% Black, 22.2% Hispanic and 6.2% Asian/Pacific Islander or American Indian/Alaskan natives (CCSD Accountability Report, 2004). Accountability statistics indicate a graduation rate of 64%, a dropout rate of 8%, an average daily attendance of 91.4% and an average class size of 30.5 students.

“Cheyenne High School has been classified as a school which did not demonstrate Adequate Yearly Progress (AYP) during the 2004-2005 school year. Classification as not demonstrating AYP is due to the school's not meeting 27 of the No Child Left Behind criteria in the areas of English language arts (ELA) and mathematics” (CCSD Accountability Report, 2004, p.3). As a mechanism to increase overall instructional effectiveness and promote enhanced achievement, former Principal, Dr. Ronan Matthew, in consultation with regional administrative staff, including current Principal Dr. Jeffrey Geihs elected to continue and expand same-sex instruction originally implemented during the 2002-2003 school year. The original program grouped ninth grade remedial students in Algebra and English classes

based upon sex. The program was expanded to include all students taking Algebra and English instruction in both the 9th and 10th grades during the 2004-2005 school year.

The purpose of this report is to document and compare differences between SSI and coeducational instruction as measured by achievement, frequency and type of disciplinary incidents, observed differences in instructional practice, self-reported teacher efficacy and student/teacher opinions. Same-sex instruction (SSI) is defined as the grouping of same sex students in a classroom with either a same sex or different sex teacher. The primary comparisons involved 10th grade students enrolled in Algebra and English classes and participating in SSI for two consecutive years; the treatment group. A similar group of students enrolled in coeducational instruction at Cheyenne in the 2002-2003 school year was used as the non-participating control group.

Research concerning the grouping of students based upon sex has resulted in ambiguous findings (Herr & Arms, 2004). Students instructed in SSI settings have shown greater academic gains when compared to students in co-educational instruction, but in most cases, the comparisons were between single-sex religious or affluent private schools and completely co-educational public schools (e.g., Bone, 1983; Finn, 1980; Marsh, 1989; Riordan, 1985; Steedman, 1983, 1984; Willis & Kenway, 1986). Although the use of SSI in private schools is related to achievement gains, research concerning the effects of SSI in less privileged populations and urban settings is scarce, in part because there are very few single-sex programs in public school (Campbell & Sanders, 2002; Herr & Arms; Mael, 1998).

Most SSI studies have been conducted in single-sex schools with demographically advantaged students. Drawing inferences with respect to achievement gains and school context from affluent populations to disadvantaged students is presumptuous and potentially skewed. The background variables associated with affluence such as parental support, supplementary instruction or use of computers at home may account for the gains, rather than the school setting. In addition, most studies have not made within-school comparisons, such as comparing achievement between SSI to a substantively similar population from the same school.

The current study is an exception. Few SSI evaluations have been conducted for at-risk populations in a predominately coeducational environment within the same school. The current evaluation was conducted at a four-year secondary school in the Clark County School District (CCSD), in Las Vegas, Nevada with a

predominantly at-risk student population. Evidence as to the benefits of same-sex instruction in this type of setting is scarce. Thus, exploration of the contextual factors and participant variables influencing the effectiveness of SSI is warranted.

This report is the second in a series of evaluations of SSI at Cheyenne High School. The previous study evaluated SSI in the 2003-2004 school year. Results of the prior evaluation indicated that SSI in Algebra was related to achievement differences. Though moderate achievement gains were found for English instruction, the results were not statistically significant. Instruction in either a SSI context or a coeducational context was not found to significantly influence absenteeism or number of disciplinary infractions. Survey and focus group results indicated that, while SSI was a moderately preferred instructional context for teachers, students only marginally endorsed it. The current study aimed to follow-up on the previous findings while implementing more research controls.

In summary, the main goal of the analyses reported here is to evaluate and compare achievement between students participating in SSI and demographically similar students participating in coeducational instruction. Secondary goals of the evaluation are to determine the relationships between student disciplinary actions based upon instructional context and the relationship between teacher efficacy and SSI. Lastly, a goal of the evaluation is to determine the opinions of both teachers and students concerning SSI.

Three stipulations are important to note. First, the effectiveness of instruction varies from classroom to classroom depending on the learning goals, instructional approach and capability of the individual teacher. Comparisons among classrooms should be interpreted with caution, and a causal conclusion among different teachers is unwarranted. Second, the equivalence of the groups participating in SSI and coeducational instruction was not measured at the onset of the evaluation. Observed differences may be a result of predetermined group differences, such as previous knowledge, parental guidance or socioeconomic status. Lastly, student achievement was measured by both grades and standardized test scores. Differences in grades may be a function of curriculum fluctuation, teacher philosophy or assessment criteria, and thus may not be a reflection of absolute achievement.

Research Questions

Six areas of inquiry and corresponding research questions were identified in consultation with former Principal Ronan Matthew during a meeting held on

October 12, 2004 and subsequent communications with Regional Superintendent Marsha Irvin on October 27, 2004.

Question 1: Are achievement gains for students participating in SSI greater than for participants in traditional coeducational instruction?

This question addressed the relationship between achievements of 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year as compared to a similar group of students participating in coeducational instruction during the 2002-2003 school year at Cheyenne. Achievement was determined based upon a numerical comparison of first and second semester composite grades attained in either Algebra and/or English classes. Additionally, analysis included comparison of the appropriate Iowa Test of Basic Skills (ITBS) data. The main purpose of this analysis was to summarize academic performance in each type of instructional context and examine the relationship in student performance *between* the two-targeted years. Differences between these groups could be due to instruction, or individual differences of the students.

Question 2: Are specific types of disciplinary infractions more or less prevalent in SSI classrooms?

This question investigated the number and type of disciplinary infractions of 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year as compared to a similar group of students participating in coeducational instruction during the 2004-2005 school year at Cheyenne. The main purpose of this analysis was to determine if a relationship existed between instructional context and the incidence of disciplinary infractions. A three-level coding process was used to categorize type of disciplinary infractions. Infractions related to attendance, tardiness or truancy were grouped into one category, non-violent behavioral incidents comprised a second category, and instances of substance abuse and violent behavior were included in the third, most severe, disciplinary category.

Question 3: What are the influences of the variables of teacher and sex of student upon achievement?

This question addressed the degree of influence of other relevant factors, in addition to instructional context, which may have an impact upon student achievement. Data related to this question was acquired by two methods. First,

question three analyzed quantitative data to determine what proportion of student achievement of 10th grade remedial students participating in SSI at Cheyenne High School during the 2004-2005 school year was attributed to SSI instruction, teacher performance and sex of student. Secondly, in-classroom observations identified if instructional technique, learning objectives or interactions with students are different between SSI and coeducational classrooms.

Question 4: What is the impact of SSI upon teacher efficacy and satisfaction?

This question described the degree of relationship between instructional context and teacher efficacy. Prior research has shown teacher efficacy is positively related to student achievement. A teacher efficacy survey was developed and administered on two occasions, initially in October 2004 and again in May 2005. Maximum likelihood factor analysis with varimax rotation was performed in order to identify underlying latent variables of the teacher survey. Descriptive results and selected comparisons are reported.

Question 5: What are the opinions of teachers and students participating in SSI?

This question addressed the subjective nature of participating in SSI. Survey results for both teachers and students were tabulated to assess degree of satisfaction, instructional implications and evaluation of the impact of SSI from personal perspectives. Additionally, in-person interviews were conducted with teacher participants to supplement survey data. Classroom observations were used as a qualitative measure. Descriptive results and selected comparisons are reported.

Question 6: Are engagement levels greater in SSI classrooms than in mixed-sex classes?

This question determined if the type, frequency, and nature of classroom practices used in SSI classrooms differ from those used in coeducational classes. Interviews and observations focused upon classroom behaviors, student/teacher interactions and patterns of participation. Interviews with teachers supplemented observational data. The purpose of this analysis is to provide additional information that may help CCSD determine the implications to students and teachers in the event SSI is expanded to other subjects within Cheyenne High School, or other schools within CCSD.

Methods and Procedures

The primary participants in the evaluation were 489 10th grade students enrolled in SSI at Cheyenne High School during the 2004-2005 school year. Students used in the achievement comparisons were those that participated in SSI for two consecutive years. Comparisons of this nature are designed to assess the cumulative effects of SSI. Therefore, only those student participating in SSI in both the 2003-2004 and the 2004-2005 school years are included in the quantitative achievement results. 814 SSI student participants completed the student survey designed to measure attitudes toward SSI. In addition, 86 teachers and three administrators participated in the teacher survey process, and a subset of eight SSI teachers participated in the interview discussions. Classroom observations consisted of 30 total classes on six different occasions. Teachers were eligible for observation provided they taught both an all-boys class *and* an all-girls class, as well as at least one co-educational class.

Data used in the evaluation was compiled using several methods:

1. Achievement data was supplied from two sources. School-based records from Cheyenne High School were used to evaluate composite first and second semester grades for 10th grade students participating in SSI instruction at Cheyenne High School during the 2004-2005 school year that also participated in SSI instruction during the 2003-2004 school year. Data supplied for this portion of the analysis included student ID, gender, and grades for students participating in 10th grade Algebra and English. Additional school-based records were used to code and quantify disciplinary infractions requiring central office referral. Similar data for the 10th graders from Cheyenne in 2002-2003, the comparison group, was obtained from the CCSD Central Information Services Department.

The CCSD Department of Testing supplied data used to compare ITBS scores for 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year that also participated in SSI instruction during the 2003-2004 school year. Identical data for 10th grade students participating in coeducational instruction at Cheyenne High School during the 2002-2003 school year was provided to use as the control group comparison.

2. A 16-item Likert scale student survey, designed by the lead researcher, to measure opinions of students and their assessment of learning outcomes was

distributed to a randomly selected group of SSI participants in attendance at Cheyenne High School during November 2004. A copy of the survey can be seen in [Appendix A](#).

3. A 17-item Likert survey, adapted from Hoy and Woolfolk (1990) was designed to measure the degree of teacher efficacy and SSI teaching effectiveness. Teachers voluntarily completed the survey. A copy of the survey can be seen in [Appendix B](#).
4. Classroom observations consisted of observation of 30 total classes on six different occasions. Teachers were eligible for observation provided they taught an all-boys class, an all-girls class, and a co-educational class. Two trained research observers conducted observations. A copy of the observation protocol can be found in [Appendix E](#).
5. Interviews were conducted with eight teachers and the school Principal. Teachers involved in the interview portion were selected on a convenience basis, however in order to be eligible for participation, teachers were required to have taught an all-boys class, an all-girls class, and a co-educational class in order for intra-contextual opinions to be evaluated. During the interviews, both researchers, one of whom questioned the participant while the other recorded participant responses, were present. A copy of the interview protocol can be found in [Appendix D](#).

Several aspects of data collection and analytic procedures should be noted:

1. Cheyenne High School and CCSD award course grades twice per school year. Each grade represents achievement for one semester or approximately 19 weeks. Grades are allocated on a “letter” basis ranging from “A” to “F”. In order to conduct a numerical analysis, composite annual grades were compiled and converted to numerical equivalents using the scale, A=4, B=3, C=2, D=1 and F=0.
2. Disciplinary results were categorized into three categories based upon severity of infraction. Category A (severity rating one) consisted of absence, tardies, dress code violations, missing detention, and truancy. Category B (severity rating two) was comprised of entering a closed campus, unacceptable school behavior, and verbal confrontations. Category C (severity rating three) included battery, fighting, harassment, substance possession or use, immoral conduct, insubordination, threats, vandalism or other acts of physical aggression. A composite disciplinary score for 10th

grade students participating in SSI at Cheyenne High School during the 2004-2005 and for the 10th grade students participating in coeducational instruction at Cheyenne High School during the 2002-2003 school year was calculated by multiplying the number of infractions per student in each category by the category severity weighting and creating a group sum. The sum was then divided by the number of students in the data set to produce a frequency/severity per student group.

Results

A number of different analyses were conducted. The general purpose and nature of the analysis procedure for each research question is described below. An attempt was made to reduce large amounts of data into concise summary tables. Complete data files and statistical analyses are available upon request.

Question 1 addressed the relationship between achievements of 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year compared to a similar group of students participating in coeducational instruction during the 2002-2003 school year at Cheyenne. Achievement was measured in two ways, by a comparison of semester grades and comparison of scores on the IBTS, a standardized, norm-referenced measure designed to assess basic knowledge of reading comprehension, vocabulary and math skills. Two-tailed t-tests were performed to determine if a significant difference in achievement existed between the student groups.

Grades comparison

Table 1. The mean score, standard deviation of grades, and statistical significance of grades achieved by each student group for both Algebra and English

| Student Group | Number of participants | Mean Grade | Std. Deviation | t value |
|----------------------|------------------------|------------|----------------|-------------------------------------|
| 2002-2003 Algebra I | 42 | 1.19 | 1.064 | $t_{(142)} = .530$, $p = .597$ |
| 2004-2005 Algebra I | 102 | 1.29 | 1.067 | |
| 2002-2003 Algebra IB | 106 | 1.41 | 1.140 | $t_{(174)} = -6.09$, $p < .001$ |
| 2004-2005 Algebra IB | 130 | .634 | 0.751 | |
| 2002-2003 English I | 13 | 1.11 | 1.080 | $t_{(26)} = 1.181$, $p = .248$ |
| 2004-2005 English I | 15 | 1.63 | 1.216 | |
| 2002-2003 English II | 373 | 2.08 | 1.126 | $t_{(704)} = 1.489$, $p = .137$ |
| 2004-2005 English II | 333 | 2.21 | 1.191 | |

Results from Table 1 indicate achievement as measured by semester grades of students participating in SSI in 2004-2005 was not significantly different than achievement of students in 2002-2003 for Algebra I. Significant results were observed for Algebra Ib, indicating that 10th grade students in the 2002-2003 cohort in coeducational instruction, the control group, achieved significantly higher composite grades than 10th grade students in SSI during the 2004-2005 school year.

Achievement in English, although greater on a mean basis, in favor of the 2004-2005 SSI group was not statistically significant for either English I, or English II classes. In both subjects, the difference in achievement observed might be attributable to the educational context, or the pre-existing individual differences of students, or other classroom factors not measured.

It should be noted that standard deviation values indicated a wide range of variability in grades. Large variability typically indicates heterogeneity of groups and may suggest that substantial pre-existing differences are possible. Based upon the lack of significant findings in favor of SSI, no additional analyses were performed.

Test score comparison

Test results from the ITBS were supplied by the CCSD Department of Testing. Scores on both the Reading and Math sections of the ITBS for 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year were compared to a similar group of students participating in coeducational instruction during the 2002-2003 school year at Cheyenne. Two-tailed t-tests were performed to determine if a significant difference in achievement existed between the student groups.

Table 2. The mean score, standard deviation, and statistical significance of *NRT Reading* test scores achieved by *each* student group.

| Student Group | Number of participants | Mean Score | Std. Deviation | t value |
|----------------|------------------------|------------|----------------|--------------------------------------|
| 2002-2003 ITBS | 347 | 245.06 | 27.064 | $t_{(685)} = -2.365$, $p = .018$ |
| 2004-2005 ITBS | 340 | 240.01 | 28.907 | |

Interpretation of results indicated that the 10th grade students during the 2002-2003 school year at Cheyenne, the control group, scored statistically significantly higher than 10th grade students participating in SSI at Cheyenne High School during the

2004-2005 school year. Based upon the significance of results a secondary analysis based upon the sex of the student was conducted.

Table 3. The mean score, standard deviation, and statistical significance of *NRT Reading* test scores achieved by *Boys*.

| Student Group | Number of participants | Mean Score | Std. Deviation | t value |
|----------------|------------------------|------------|----------------|-------------------------------------|
| 2002-2003 ITBS | 179 | 246.46 | 27.846 | $t_{(348)} = -2.235,$ $p = .026$ |
| 2004-2005 ITBS | 171 | 239.63 | 29.292 | |

Table 4. The mean score, standard deviation, and statistical significance of *NRT Reading* test scores achieved by *Girls*.

| Student Group | Number of participants | Mean Score | Std. Deviation | t value |
|----------------|------------------------|------------|----------------|-------------------------------------|
| 2002-2003 ITBS | 168 | 243.57 | 26.206 | $t_{(335)} = -1.064,$ $p = .288$ |
| 2004-2005 ITBS | 169 | 240.39 | 28.594 | |

The analysis of NRT Reading testing scores indicated significant differences for test achievement for boys in favor of the 2002-2003 10th graders at Cheyenne, the control group. No statistically significant differences were observed for girls on NRT scores.

NRT Math test scores were analyzed identically to NRT Reading test scores. The analysis was performed comparing 10th graders in the 2002-2003 group to the 2004-2005 group. The follow-up analysis consisted of comparison of boys and girls separately.

Table 5. The mean score, standard deviation, and statistical significance of *NRT Math* test scores achieved by *each* student group

| Student Group | Number of participants | Mean Score | Std. Deviation | t value |
|----------------|------------------------|------------|----------------|-------------------------------------|
| 2002-2003 ITBS | 338 | 248.23 | 28.362 | $t_{(685)} = -4.101,$ $p < .001$ |
| 2004-2005 ITBS | 329 | 239.17 | 28.677 | |

Interpretation of results indicated 10th grade students during the 2002-2003 school year at Cheyenne, the control group, scored statistically significantly higher on the Math portion of the ITBS than 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year, thus a follow-up analysis was conducted.

Table 6. The mean score, standard deviation, and statistical significance of *NRT Math* test scores achieved by *Boys*.

| Student Group | Number of participants | Mean Score | Std. Deviation | <i>t</i> value |
|----------------|------------------------|------------|----------------|--------------------------------------|
| 2002-2003 ITBS | 174 | 251.09 | 30.706 | $t_{(338)} = -2.743$, $p = .006$ |
| 2004-2005 ITBS | 166 | 242.05 | 29.972 | |

Table 7. The mean score, standard deviation, and statistical significance of *NRT Math* test scores achieved by *Girls*.

| Student Group | Number of participants | Mean Score | Std. Deviation | <i>t</i> value |
|----------------|------------------------|------------|----------------|--------------------------------------|
| 2002-2003 ITBS | 164 | 245.20 | 25.385 | $t_{(325)} = -3.088$, $p = .002$ |
| 2004-2005 ITBS | 163 | 236.24 | 27.073 | |

The analysis of ITBS Math testing scores indicated significant differences for test achievement for both girls and boys in favor of the 2002-2003 10th graders at Cheyenne, the control group.

In summary, the analysis of ITBS test scores indicates greater achievement in favor of 10th grade students during the 2002-2003 school year at Cheyenne, the control group, or no significant differences on test scores between groups. Results of this nature are either attributable to the educational context, or the pre-existing individual differences of students. It is also important to note that test administration during the 2002-2003 school year occurred during October of the school year, while test administration was conducted during February of the 2004-2005. Deferring test administration would typically result in higher test scores for the later group based upon cognitive development occurring over the course of the year. Observed results did not support this expectation.

Disciplinary Infractions

Question two investigated the frequency and type of disciplinary infractions of 10th grade students participating in SSI at Cheyenne High School during the 2004-2005 school year as compared to a similar group of students participating in coeducational instruction during the 2004-2005 school year at Cheyenne.

Disciplinary data was coded in three categories based upon severity of infraction and described completely on page 10. After clustering infractions into categories, the severity of infraction was multiplied by the frequency of infractions per student to arrive at an aggregate severity rating for each student group. A comparison between groups was then performed.

Table 8. The mean number of disciplinary infractions per student for SSI students in 2004-2005 and coeducational students in 2002-2003.

| Student Group | Number of participants | Frequency x severity cumulative total | Mean disciplinary infractions per student | <i>t</i> value |
|---------------|------------------------|---------------------------------------|---|--------------------------------------|
| 2002-2003 | 505 | 771 | 1.527 | $t_{(1480)} = -11.135$ $p < .001$ |
| 2004-2005 | 422 | 2123 | 4.182 | |

The analysis of two tailed t-tests with unequal variances assumed indicated a statistically significant difference between the combined severity/frequency score in favor of the 2002-2003 school year participants compared to the combined severity/frequency score for the 2004-2005 school year.

It should be noted that although the results for the mean disciplinary referrals per student was statistically significant under the current analysis, the result should be interpreted with caution. A change in school principal from one year to the next may result in a modification of disciplinary policy. While we interpret this finding to indicate the combined frequency and severity of disciplinary infractions is much greater for SSI students than their coeducational peers, however, we cannot attribute this difference to instructional context under the current circumstances.

Other variables

Question 3 addressed the degree of influence between various teacher and school variables upon achievement in SSI. A multiple regression analysis was used for this portion of the analysis. “Multiple regression is eminently suited for analyzing collective and separate effects of two or more independent variables on a dependant variable (Pedhazur, 1999, p.3). An analysis of this nature allows through predictive modeling to determine the unique contribution of the educational environment (SSI or co-educational), sex of student (male or female) and teacher.

In the current evaluation a multiple regression was performed for four dependant variables, Algebra I grades, Algebra IB grades, English I grades and English II grades. The independent variables of group (experimental or control), sex of student (male or female) and teacher (coded according to the number of teachers for the particular dependent variable) were included in the analysis. Coded vectors represented each independent variable. A summary of the results can be found in the Table 9 below.

Table 9. Multiple regression analysis, amount of variance contributed and statistically significance for four course grades.

| Dependant Variable | Independent Variable | Variance explained (%) | Statistical significance |
|---------------------------|-----------------------------|-------------------------------|---------------------------------|
| Algebra I grades | Teacher | 17.6 | $p < .025$ |
| Algebra I grades | Group | .3 | Not significant |
| Algebra I grades | Sex of student | .7 | Not significant |
| Algebra Ib grades | Teacher | 1.7 | Not significant |
| Algebra Ib grades | Group | 13.1 | $p < .001$ |
| Algebra Ib grades | Sex of student | 0 | Not significant |
| English I grades | Teacher | 43.0 | Not significant |
| English I grades | Group | 5.4 | Not significant |
| English I grades | Sex of student | 3.7 | Not significant |
| English II grades | Teacher | 12.9 | $p < .001$ |
| English II grades | Group | 1.3 | $p < .005$ |
| English II grades | Sex of student | 2.0 | $p < .001$ |

The results of the regression analysis indicate respectively the influence of the variable of teacher accounts for 17.6% of the differences in grades in Algebra I, 1.7% of the difference in Algebra Ib grades, 43% of the difference in English I grades, and 12.9% of the difference in English II grades above and beyond the variance contributed by other factors. The lack of significance of the finding for English I is based upon a very small sample (30) which would require even greater

differences to be considered significant. Overall, the variable of teacher explains more of the differences in student grades than any other variable.

The variable of group was only a significant predictor of Algebra Ib grades. This result may indicate the beneficial effects of SSI and the diminished importance of teachers. These findings may be attributable to the type of teacher, or other variables not considered in the current analysis. A sizable portion of variance in the current analysis remains unexplained.

The variable of sex accounts for significant differences in English II grades, but only adds 2.0% of unique variance to the predictive model. Similarly, the variable of Group accounts for significant differences in English II grades, however only contributes 1.3% unique variance in the model. In comparison to teacher, the influence of sex of student and instructional context has only a nominal impact upon student grades in the current analysis.

Teacher Efficacy

Question 4 addressed the influence of SSI upon teacher efficacy and teacher satisfaction within the SSI teaching environment. Teacher efficacy defined as, “The extent to which the teacher believes he or she has the capacity to affect student performance” (Tschannen-Moran, Hoy & Hoy, 1998, p. 202), has been found to have strong positive relationships with student achievement.

Previous research indicates greater teacher efficacy leads to greater effort and persistence on the part of the teachers when encountering instructional obstacles such as classroom disruptions or unmotivated students. Enhanced efficacy leads to better student performance, which in turn leads to greater efficacy perceptions on the part of teachers. The reverse is also supported by efficacy research. Lower efficacy leads to less effort by teachers and giving up easily, which leads to poor teaching outcomes, which then produce decreased efficacy (Tschannen-Moran et al., 1998).

To measure teacher efficacy a 17-item Likert survey adapted from Hoy and Woolfolk (1990) was administered. Eighty-six teachers completed dual administration of the survey, initially during the beginning of the school year on November 23, 2004 and at secondly during the conclusion of the school year on May 18, 2005. In addition to the survey questions, demographic information was collected including gender, teaching experience, educational level and type of class taught (SSI or coeducational).

Analysis of variance results indicated that more experienced SSI teachers ($M=10.67$, $SD=4.61$) had significantly higher teaching efficacy composite scores than those with less experience ($M= 7.40$, $SD=1.92$), $F_{(4, 27)} = 3.10$, $p=.03$. No other survey analyses reached significance. As the seniority of teachers increased, their feelings of efficacy increased.

Although teaching SSI classes and efficacy did not result in a statistically significant difference between groups, results approached statistical significance indicating that SSI teachers may possess a higher degree of efficacy. Efficacy may be a latent factor, which develops over time, and is not easily detected over short periods of assessment. Follow-up interviews with teachers lend support to this assumption. Teachers believe, if they are generally effective, then the SSI teaching environment increased their overall efficacy. Although overall effectiveness is a pre-requisite for effectiveness as a SSI instructor, SSI was described as providing an environment conducive to enhancing feelings of efficacy. One teacher described the overall SSI experience,

“I would like to think that my effectiveness as a teacher is the end result. Almost 90% of my (SSI) kids say thank you, I have learned a lot. I think I am better in SSI because I think I can handle the class better. I did not have any bias. Too many people look into the problem. Teachers are trying to find excuses as to why it will fail. Some people try to find excuses, some find solutions.”

Results did not conclude the SSI environment promoted efficacy, but SSI may leverage and cultivate teachers already confident in their abilities. The SSI classroom may be more conducive to promoting an environment of trust and respect. The barriers of coeducational classes which might result in embarrassment or concern about reactions are inhibited in SSI. One teacher revealed.

“They enjoy the way I come across to them they see how I respect them and they give that respect back. They trust me to share things, it (teaching) is on another level because of SSI. I am not embarrassed to address issues with them.”

For this teacher, comfort is directly related to the SSI instructional environment. SSI is conducive to productivity and effectiveness. The on-going assessment of

teacher efficacy is recommended as efficacy may be a variable that does not fully develop over a short period of time. Longitudinal analysis may provide additional information supporting the role of teacher efficacy in SSI.

Surveys and Interviews

Question Five addressed the subjective nature of participating in SSI. Two methods were used to assess subjective opinions, surveys and interviews. Student opinions were assessed solely by surveys. Teacher impressions of SSI were assessed by both surveys and interviews with results reported separately in Question Six below.

A survey was randomly distributed to SSI classrooms during November 2004. A total of 813 of 836 surveys returned were scored to complete the analysis. Twenty-three surveys were not scored due to obvious deficiencies, including choosing multiple responses for the same question, completing less than 50% of the items, circling the same response for every item, or defacing the survey instrument.

Descriptive frequencies, means and standard deviations were calculated on an item basis. Factor analysis was not completed as only descriptive comparisons are warranted for this research question. Items 3, 4, and 9 were reverse coded to create equivalent comparisons as the survey items were worded negatively.

Table 10. Responses by item, percent positive (indicating strongly agree or agree), mean response and standard deviations.

| Question | N | Percent Positive | Mean | Std. Deviation |
|---|-----|------------------|------|----------------|
| Item 1 - GSI provides an opportunity to learn more | 787 | 23.1 | 3.55 | 1.24 |
| Item 2 – I expect better grades in my gender specific classes | 788 | 28.6 | 3.39 | 1.32 |
| Item 3 – I learn less in classes that include both genders | 775 | 73.6 | 4.01 | 1.19 |
| Item 4 – Grouping students by gender has no influence on my success in school | 786 | 26.2 | 2.49 | 1.40 |
| Item 5 – I have more friends in my GSI classes | 784 | 25.3 | 3.45 | 1.32 |
| Item 6 – GSI classes are more fun | 774 | 16.0 | 3.87 | 1.25 |
| Item 7 – Students should be grouped by gender | 784 | 8.7 | 4.24 | 1.08 |
| Item 8 – I participate in lesson discussions more often in GSI | 786 | 19.3 | 3.68 | 1.25 |

| Question | N | Percent Positive | Mean | Std. Deviation |
|--|----------|-------------------------|-------------|-----------------------|
| Item 9 – GSI is boring | 789 | 29.8 | 2.68 | 1.42 |
| Item 10 – GSI allows me to concentrate more on the lesson | 791 | 19.5 | 3.66 | 1.22 |
| Item 11 – GSI is easier for teachers | 786 | 19.5 | 3.41 | 1.21 |
| Item 12 – I study more frequently for GSI classes | 785 | 12.0 | 3.97 | 1.11 |
| Item 13 – GSI eliminates disruptions in the classroom | 789 | 12.0 | 4.03 | 1.15 |
| Item 14 – My teachers enjoy GSI teaching | 785 | 15.7 | 3.34 | 1.10 |
| Item 15 – Teachers pay more attention to disruptive students | 787 | 40.5 | 2.88 | 1.36 |
| Item 16 – I prefer GSI | 791 | 10.6 | 4.13 | 1.18 |

The results from the survey indicated the majority of student opinions concerning same-sex instruction are negative. In 16 out of 16 questions, the least frequent responses from students were either “strongly agree” or “agree” concerning the positive nature and impact of SSI. Using a 5-point Likert scale (1-strongly agree-5-strongly disagree) the mean response for all questions was 3.78. When the mean response is higher, students have a more negative opinion of SSI. It is important to note the large standard deviation numbers for 16 out of the 16 questions. Large standard deviations indicate significant variability in the range of scores. Large variability in reported scores may be interpreted as meaning responses to SSI evoke either strong positive or negative opinions.

Table 11. Aggregate survey response.

| | Questions | Minimum | Maximum | Mean | Std. Deviation |
|--------------|-----------|---------|---------|------|----------------|
| Total survey | 16 | 2.49 | 4.24 | 3.78 | N/A |

A complete list of responses to each question and percentages of responses in each category can be found in [Appendix C](#). The most positive response by students was related to classroom discipline. Over forty percent of students strongly agreed or agreed to the question, “Teachers pay more attention to disruptive students”. The second most positive response was 28.5% of students indicated they agreed or strongly agreed with the statement, “I expect better grades in my gender specific classes, however 53% disagreed or strongly disagreed with the same statement, indicating learning may not be a function of same sex grouping in the views of students currently participating in SSI.

Most negative responses concerned the instructional aspects of SSI. 78.3% of students indicated disagreement with the statement, “Students should be grouped

by gender”. 72.7% of students indicated they disagreed or strongly disagreed with the statement, “I study more frequently for my gender specific classes”, Students apparently do not perceive SSI as conducive to enhancing the learning environment. Additionally, the perception of students concerning the influence of SSI upon classroom behaviors was not positive as 71.4% of respondents disagreed or strongly disagreed with the statement, “gender specific instruction eliminates disruptions in the classroom. Finally, and perhaps most importantly, over 71% of students disagreed or strongly disagreed to the question, “I prefer gender specific instruction”.

Classroom Practices

Question six addressed the type, frequency and nature of classroom practices used in SSI classrooms as contrasted to coeducational classes. Classroom observations and follow-up interviews were conducted only with teachers that taught all three types of classes, i.e., an all- girls class, an all-boys class and a co-educational class. Any teacher not currently teaching all three types of classes were excluded from this portion of the analysis. The purpose of the interviews and observations was to determine if behaviors, student/teacher interactions, and patterns of participation differ across educational context. Interviews with teachers were conducted to supplement observational data.

Observations and subsequent interviews resulted in three main assumptions concerning same-sex instruction:

1. Instructional practices vary by teacher, not by how students are grouped. Individual teachers were observed as being consistent across instructional contexts using the same style, structure and approach regardless of teaching same-sex or coeducational classes. Teachers seemed to follow the same lesson plans, hold students to similar disciplinary standards, and exemplified consistent communication patterns with students, regardless of the gender make-up of the classroom.

Interviews revealed several teachers concurred that instructional practices are stable across contexts. When asked directly if SSI lends itself to altering practices one teacher responded, “No, I would never teach differently, good teaching is good teaching. I do not have to alter my lesson. If there is an important point that I make with an all boys class, then I will discuss with the girls the next day. I don’t teach any differently based upon the kids.”

It appears if a teacher is effective in a coeducational environment, they will be effective in an SSI environment. Conversely, several teachers observed encountering classroom challenges, such as students talking out, in SSI were observed to have similar difficulties, regardless of the gender composition of the classroom.

2. The patterns of behaviors exhibited by students' changed, depending upon the gender composition of the classroom. Students appeared to be conscious of the gender make-up of the classroom and acted according to a prescribed set of mores and behaviors. This was particularly pronounced in the behavior of girls who were observed participating in more conversations and answering teacher questions regularly in SSI. The coeducational environment seemed to constrain female participation, while SSI did not provide a conversational barrier observed in a typical coeducational classroom.

In SSI classrooms, boys' maintained what has been reported as typical behavior patterns, such as dominating interactions with teachers (Parker & Rossie, 2002). It appeared that their dominant behavior had a compounding affect—perhaps because there was a 100% concentration of boys--and a struggle for supremacy ensued. In these classes, the researchers witnessed, and teachers confirmed, high levels of participation, aggression (including physical violence), rude behavior, and several students sleeping. One teacher indicated for SSI, "They know they are getting ready to be focused. That has been eliminated from the whole scene, it has been eliminated."

In mixed-sex algebra classes, the boys' behavior appeared to be more tempered, paralleling the scope of girls' involvement. Boys were not quite as boisterous, perhaps because there were fewer of them. Regardless, boys dominated the classroom culture and flow of the class. Girls participated much less and were often stifled or ignored when they tried to participate.

Teachers indicated inappropriate behaviors were more frequent in coeducational classes. One teacher exclaimed, "I have more problems in mixed gender than in other classes. If you try 100% a day, single gender will perform better than mixed gender."

However, SSI appeared to promote other issues not encountered in a coeducational context. A perceived downside of SSI is grouping boys together, one teacher indicated,

“The boys are totally homophobic. They do not want anyone to think that they are sitting too close to each other. There are comments constantly have to keep tamping down. That is the only gender issue that I see. Boys are rowdy, boys will boys. If it is coed, it might dilute the rowdiness.”

Teacher opinion about the types of behaviors in SSI may be based upon personal preference, however almost universally teachers think the behavior issues in SSI are different.

“They are different, but not any better or worse. Just a different thing, when they are together they are not as rude, they have got...especially boys when they are together they don't care...they fart and burp...when you talk to them about it and tell it's not appropriate they get it. You do not see me farting up here. They get it. It goes back to the relationship that you have with them, if you don't have that relationship it won't work.”

Observations and confirmations of this nature lead the research team to believe it is the ability of the teacher, not the classroom environment that prevails in deciphering learning and behavioral differences between SSI and co-educational classrooms.

3. SSI seems to provide a preferential learning environment for girls. Analysis of observations and interviews revealed girls' classes exhibited high levels of teamwork, camaraderie, enthusiasm, and academic risk-taking. Girls collaborated with each other, encouraged and congratulated one another, voiced excitement about content, and asked and answered questions more often. These findings support previous research concerning boys' domination of classroom dynamics inhibiting female expressiveness (Parker & Rossie, 2002; Streitmatter, 1997).

Teachers agreed the primary observable benefits of SSI are the cultivation of participation and involvement by females. One teacher told us,

“Girls have gone up to tell you the truth...got two girls classes and they far outweigh the boys in terms of achievement than boys. Girls are comfortable to ask questions and share and not feel stupid. I don't see difference with boys, I do with girls.”

When probed about the reasons for female intellectual prosperity teachers indicated the separation from the boys is the important factor. A teacher stated, “It helps the girls, I do think teenage girls perform better being isolated and not being bothered. Girls achieve better across the board.”

The SSI classroom fosters participation by both boys and girls for those that either know the answers or are interested in learning. The social factors, which inhibit participation in a coeducational environment, are diminished in SSI. According to one teacher, coeducational classes encourage a culture of anti-intellectualism. “Smarter ones are stunned into silence, teased about being smart, and eventually give up and start getting bad grades. Some of best students fail because they think if they do well they will be teased.”

In regular classes, girls showing enthusiasm are stigmatized, as intelligence is apparently not perceived as a quality of attractiveness to the teenage boy. Herr and Arms (2004) proclaimed the absence of a coeducational environment enables, “the girls...to either not worry about being too smart or not worry about being too dumb” (p. 547). Therefore providing a SSI environment where there are no social consequences for involvement should result in more participation and eventual achievement gains.

One teacher described the transformation witnessed over the course of the semester,

“Girls benefit most. They are shy at beginning, but come out and benefit most. Girls almost always do better. About 10 percent better than boys. It is my opinion...I believe the girls volunteer more to answer questions, I feel they are freer.” Boys will volunteer anything, anytime”

Almost unanimously, teachers believed the SSI environment was best for girls and helpful for boys, only to a lesser extent.

The issue of how students are grouped is the basis for the current evaluation. An important factor that may enhance SSI was expressed by teachers, and confirmed by the researchers, is the role of grouping by ability level. Jeffery Geihs, Principal of Cheyenne High School indicated ability grouping was eliminated at the start of the 2004-2005 school year. The elimination of ability grouping can potentially confound results related to SSI. Several teachers indicated that their overall effectiveness is inhibited as a result of the diverse ability grouping of student.

One teacher remarked, “Brought down by the mixed skills, so I’m not sure whether it is gender specific or mixed. I think it is mixed skills. Another commented,

“Personally, my opinion is that we need to actually determine that there are more variables than just gender. I would much rather have classes of boys and girls that are on the same level. Give me eight girls out of a class and seven from boys from other and will be three chapters further than I am. Mixed grouping is a big problem.”

In 2003-2004, students were grouped according to prior achievement levels. Reflecting upon the elimination of ability grouping in 2004-2005, another teacher commented,

“I am equally as effective as teacher, but discipline becomes a bigger issue. Girls are very chatty, boys violent, and acting out. Not quite as much talking in coeducational. My opinion from last year to this year...Now I don’t think it (SSI) is working, because of grouping and having too many students coming in without skills and that confounds discussion in an all boys class. I liked it better, more manageable, last year, at least I had time. Not so much catching up to do, like now.

In summary, with regard to the observational and interview portion of the evaluation, we interpret these discussion points to mean:

1. Teachers enjoy the SSI teaching experience. They feel in greater control, anticipate fewer disciplinary issues and believe SSI is a better instructional context than coeducational classrooms. However, teaching in an exclusive SSI environment appears undesirable, as the challenge of classroom management is formidable. Variables such as effectiveness are strongly related to teacher efficacy. If teachers believe an instructional context is preferential, the implicit ramification may lead to long-term teacher effectiveness and satisfaction.
2. The behaviors of students in SSI classrooms are different than coeducational classrooms. SSI is more conducive to cultivating an anti-intellectual climate, which promotes participation, especially for girls. Girls do not feel inhibited about participating and are more will to engage in academic risk-taking (Parker & Rossie, 2002). The culture of the SSI classroom de-emphasizes adolescent heterosexual interaction and dispels the focus upon egocentric socialization associated with the typical developing teenager. A

diminished focus on interpersonal communication provides an enhanced opportunity to focus upon learning.

3. The variable of teacher effectiveness supersedes the importance of the classroom environment. Teachers believe, and observations confirm, teacher effectiveness is not context dependant. Good teachers thrive regardless if the classroom is coeducational, or SSI.

Conclusions

The present analyses lead to several general conclusions regarding relationships between SSI and the variables investigated. Interpretations are summarized below:

1. The majority of the quantitive analyses of grades and standardized test scores indicated 10th grade control group students in coeducational instructional classes in the 2002-2003 year outperformed 10th grade experimental group classes in SSI during 2004-2005. The finding that coeducational instruction appeared to be the more effective instructional condition implies grouping students according to sex does not, by itself, result in achievement gains. Superior achievement in coeducational classes may be a result of educational context; achievement differences or other variables not measured in the current study. Specifically concerning achievement, it is not known if prior individual differences may have accounted for differences.

A more reliable analysis would have investigated the difference in test scores by the same students over a period of time, referred to as growth scores. Score comparisons over the course of time control for individual differences and permit a more equitable assessment of educational context.

2. Significant differences were not observed in favor of SSI for the number and severity of disciplinary incidents. Data analysis indicated the absolute number of central office disciplinary referrals (763) in the 2004-2005 school year were 21% greater than during the 2002-2003 year (630) despite the absolute number of students being 20% less than during 2002-2003. This finding may be interpreted as result of a differences concerning how inappropriate student behavior is regarded. Current administration appears to take a more aggressive approach to controlling student behavior. Interview data confirmed that SSI classes are “rowdier” and may be instrumental in subsequent disciplinary referrals.

3. The regression analysis indicated that the variables of group and teacher contributed unique variance towards the student achievement measure of grades. Two factors may be influencing the predictive effectiveness of the regression model. First, use of grades as a measure of achievement is contingent upon multiple variables, including course requirements, curriculum difficulty, teacher style and assessment criteria. Vast differences across classes taught by different teachers are possible and grades can be an imprecise measure of achievement.

Secondly, inconsistency between the amount of variance explained and the degree of significance between subjects may be a result of either differences in teacher effectiveness across subjects, or an indication of the variable nature of topic complexity. Conclusive attribution of the role of teacher related to achievement requires longitudinal comparison, as well as holding the teacher variable constant across different subjects.

4. Qualitative data analysis indicated teacher efficacy and educational context may be related, however quantitative data did not result in consilience of the efficacy finding. A more instrumental factor in the current study was teacher experience. As the longevity of teachers increased, a higher degree of self-efficacy was reported. The experience factor supported other qualitative findings indicating the importance of teacher. One teacher commented, “I think I am better in SSI because I think I can handle the class better” another stated, “good teaching is good teaching”. Apparently, if teachers have confidence in their ability, which in the current study was related to experience, they believe they are instrumental in influencing student achievement, regardless of the educational context.

Additionally, efficacy may be a latent factor, which develops over time, and is not easily detected over short periods of assessment. Follow-up measurement over a period of successive years may support efficacy findings typical to other studies.

5. Preference towards SSI by students was decisively negative. Supporting this contention were student responses to the survey instrument. In 9 out of 16 questions, asking about the positive aspects of SSI, the most common response was “strongly disagree”. Students indicated that SSI does not facilitate an educational context conducive to individual

achievement. For all questions, the majority of students indicated that SSI is less preferable than coeducational instruction.

The most negative responses concerned the socialization aspects of SSI. 66 percent of students indicated that SSI classes are not more fun, while 71 percent of students disagreed that SSI decreased disciplinary issues. Furthermore, over 70% of students responded disagree or strongly disagree to the question, "I prefer gender specific instruction".

Teachers, although positive in their responses, do not unilaterally support the continuance of SSI. This lack of absolute support may be substantiated by issues associated with effective SSI such as lack of training, no teacher choice in choosing SSI or coeducational classes, and lack of extra preparation time for demanding SSI populations.

6. Perhaps the most important finding from the current evaluation is the positive contribution of SSI upon girls. Females showed higher academic achievement in SSI algebra classes; they showed social and attitudinal advantages as well. Specifically, girls, grouped by sex, engaged in more academic risk-taking and participated more than girls in coeducational algebra settings.

Girls collaborated with each other, encouraged and congratulated one another, voiced excitement about content, and asked and answered questions more often. These findings support previous research concerning boys' domination of classroom dynamics inhibiting female expressiveness (Parker & Rossie, 2002; Streitmatter, 1997).

Recommendations

Several recommendations seem reasonable in light of the results of these analyses. We summarize these below.

1. Using grades as a primary measure of student achievement raises several concerns. Grades may be a consistent but arbitrary reflection of curriculum content, accurate assessment and teacher discretion. Different teachers can exhibit a tremendous amount of flexibility as to how grades are calculated and the relative importance of different subject matter.

A more precise measure of student performance that eliminates teacher bias as well as controls for the previous knowledge of a student is growth scores. Growth scores establish a baseline of performance and then time-based comparisons are made to the baseline. Analysis of growth trajectories neutralizes the impact of prior student knowledge that can have an inordinate influence on single-year grades. In the current study it is not known if grades received were based upon teacher discretion, student knowledge or the educational context. Future analysis should be of a longitudinal nature, using growth scores as a more effective barometer of student achievement while concurrently diffusing the emphasis of background knowledge.

2. Several confounds may exist in the current analysis. First, the evaluation did not control for previous background experience of students when making comparisons between groups. A pre-test should be considered to determine the amount of subject knowledge each student possessed before the implementation of SSI. Additionally, no controls were in place to account for parental support, hours of study by students, or other student/teacher variables. Previous research confirms these factors individually or collectively can influence achievement outcomes (Herr & Arms, 2004, Mael, 1998).

Thirdly, the grouping of students may have a huge influence on the quantitative variables measured in this study. During instruction, teachers seemed very challenged in trying to help student's with broad ability ranges assimilate subject content. Similarly, a wide range of engagement was observed from the student population. Maladaptive behaviors observed included disinterest, boredom, uncertainty and restlessness. Classroom chatter confirmed many students were confused about subject content.

These observations may be a result of the complexities of grouping multi-level students together, studying the same curriculum. Future analysis may wish to control for ability grouping as this factor may potentially confound the achievement differences associated with SSI. Lastly, controls for variations in curriculum across classrooms may provide the opportunity to generate more reliable, plausible causal generalizations based upon instructional context, and not other factors mentioned.

3. Integrity of comparison can be enhanced by a within school control group. The current study employed a comparison group that received complimentary instruction in 2002-2003. It is feasible the unique nature of

students, prior knowledge, or previous teachers were instrumental in the observed group differences. Only two out of 20 SSI teachers instructing the 2004-2005 cohort also taught the 2002-2003 control group. If at all possible, the variable of teacher should be held constant. Regression results indicated the influence of teacher could significantly alter achievement outcomes. By controlling for the influence of teacher the relevance of grades can be further supported. Ideally, future research should assign the same teachers to both coeducational, and SSI classrooms to promote more relevant comparisons.

4. Disciplinary standardization across classrooms and groups was not assured in the current study. Teachers, administrators and the severity of disciplinary policies can change over time. The perception of a seemingly minor infraction by one teacher, at one time, can elicit a much different response by another teacher, at a different time. On multiple occasions, the research team observed inconsistency in response to similar student behaviors. The variability in disciplinary referrals may have been disproportionately influenced by individual interpretation, rather than by the nature of the incident. Future studies should provide specific behavioral examples in each disciplinary category and should be communicated to all teachers. Multiple assessments of behavioral incidents can be incorporated to ensure inter-rater reliability of disciplinary referrals.
5. Teachers requested, and observation supported, the need for more specific training on how to manage and instruct same-sex classrooms. Interviews indicated that specific training in regards to the issues associated with SSI had not been conducted. The nuances of instructing, managing and enhancing learning in unorthodox educational settings should be conducted according to the experience of the teacher population. Unanimously teachers interviewed were in support of training specifically targeted towards the classroom management of students grouped according to gender. One teacher commented,

“I recommend more teacher training in how to deal with different classroom management issues and cultural differences, especially with the boys. Personally, I like to teach all females. But I would like to learn how to better communicate with and be more effective with the boys.”

The issues encountered in SSI environments, such as the rowdier behavior of boys, are different than traditional co-educational instruction. Future in-service training for teachers should include a component based upon the techniques of effective instruction in non-traditional teaching environments.

6. The results of this evaluation reflect the current educational environment only at Cheyenne High School. Generalizing these results to other schools should be done cautiously. Future attempts to evaluate the replication of this instructional format in other educational settings should include controls for school level variables such as experience of teacher, student SES, school size, class size, and community support. Additionally, the ability to generalize results should include a method to account for both the short-term and long-term impact of SSI. It is possible that the achievement benefits of SSI may not be readily observable over the course of two school years. A longitudinal study, which follows an SSI cohort over a period of years, may reveal more findings that are conclusive.
7. Lastly, SSI may affect many other variables. The current evaluation has focused almost exclusively on short-term measures of student performance. It is feasible that SSI may have other more important implications. Future efforts should address the ancillary consequences of SSI. Specifically, from a student perspective, what is the relationship of SSI to subsequent career choice and attitude towards school and administrators? Does SSI influence remedial students the same as mainstream or gifted individuals? From a teacher perspective, how does SSI influence teacher retention and performance assessment? Answers to these questions will provide additional information as to the overall merits of SSI and information useful in the decision making process of extending or contracting the use of same sex education within CCSD.

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Appendix A - Student Survey

Gender (circle one): Male Female

How many subjects do you have with gender specific instruction? One or Two

If taking only one subject, indicate which subject: Algebra English

If taking Algebra, indicate anticipated grade (circle one) A B C D F

If taking English, indicate anticipated grade (circle one) A B C D F

Participation in this survey is strictly voluntary. By completing, you give your consent to include your answers in the overall interpretation of the survey results.

This survey measures your beliefs and opinions about gender specific instruction. There are no correct or wrong answers. Please indicate the degree in which you agree or disagree with each item below by circling the number corresponding to your selection. Please answer every item, and use the following scale to select your answers:

(1) Strongly agree-SA (2) Agree-A (3) Undecided/Not sure-U
(4) Disagree-D (5) Strongly Disagree-SD

SA A U D SD

| | | | | | |
|--|---|---|---|---|---|
| 1. Gender specific instruction provides an opportunity to learn more..... | 1 | 2 | 3 | 4 | 5 |
| 2. I expect better grades in my gender specific classes..... | 1 | 2 | 3 | 4 | 5 |
| 3. I learn less in classes that include both genders..... | 1 | 2 | 3 | 4 | 5 |
| 4. Grouping students by gender has no influence on my success in school..... | 1 | 2 | 3 | 4 | 5 |
| 5. I have more friends in my gender specific classes..... | 1 | 2 | 3 | 4 | 5 |
| 6. Gender specific classes are more fun..... | 1 | 2 | 3 | 4 | 5 |
| 7. Students should be grouped by gender..... | 1 | 2 | 3 | 4 | 5 |
| 8. I participate in lesson discussions more often in gender specific classrooms..... | 1 | 2 | 3 | 4 | 5 |

(1) Strongly agree-SA

(2) Agree-A

(3) Undecided/Not sure-U

(4) Disagree-D

(5) Strongly Disagree-SD

| | SA | A | U | D | SD |
|---|----|---|---|---|----|
| 9. Gender specific instruction is boring..... | 1 | 2 | 3 | 4 | 5 |
| 10. Gender specific instruction allows me to concentrate more on the lesson | 1 | 2 | 3 | 4 | 5 |
| 11. Gender specific instruction is easier for teachers..... | 1 | 2 | 3 | 4 | 5 |
| 12. I study more frequently for my gender specific classes..... | 1 | 2 | 3 | 4 | 5 |
| 13. Gender specific instruction eliminates disruptions in the classroom..... | 1 | 2 | 3 | 4 | 5 |
| 14. My teachers enjoy gender specific teaching..... | 1 | 2 | 3 | 4 | 5 |
| 15. Teachers pay more attention to disruptive students..... | 1 | 2 | 3 | 4 | 5 |
| 16. I prefer gender specific instruction | 1 | 2 | 3 | 4 | 5 |

Appendix B – Teacher Survey**Teacher Opinion Survey**

A number of statements about organizations, people, and teaching are presented below. The purpose is to gather information regarding the actual attitudes of educators concerning these statements. There are no correct or incorrect answers. We are interested only in your frank opinions. Your responses will remain confidential.

Gender (circle one) Male Female

Total years of teaching experience _____

I taught gender specific classes in the 2004-2005 school year: YES NO

Total years of teaching experience at current location _____

Highest educational level attained (indicate degree) _____

INSTRUCTIONS: Please indicate your personal opinion about each statement by circling the appropriate response at the right of each statement.

1=Strongly Agree 2=Moderately Agree 3=Moderately Disagree 4=Strongly Disagree

| | | | | |
|--|---|---|---|---|
| 1. When a student does better than usual, many times it is because I exerted a little extra effort..... | 1 | 2 | 3 | 4 |
| 2. The amount a student can learn is primarily related to family support..... | 1 | 2 | 3 | 4 |
| 3. If students are not disciplined at home, they are not likely to accept any discipline in school..... | 1 | 2 | 3 | 4 |
| 4. I have enough training to deal with almost any learning problem..... | 1 | 2 | 3 | 4 |
| 5. When a student gets a better grade than he/she usually gets, it is because I found better ways of teaching that student..... | 1 | 2 | 3 | 4 |
| 6. A teacher is very limited in what he/she can achieve because a student's home environment has a greater influence on his/her achievement..... | 1 | 2 | 3 | 4 |
| 7. When the grades of my students improve, it is because I found approaches that are more effective..... | 1 | 2 | 3 | 4 |
| 8. If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching the concept..... | 1 | 2 | 3 | 4 |
| 9. If parents spent more time helping students with homework, I could accomplish better results in the classroom..... | 1 | 2 | 3 | 4 |
| 10. If I really try hard, I can get through to even the most difficult or unmotivated students..... | 1 | 2 | 3 | 4 |

Appendix B - Teacher Opinion Survey

1=Strongly Agree 2=Moderately Agree 3=Moderately Disagree 4=Strongly Disagree

| | | | | |
|--|---|---|---|---|
| 11. If a student's forgets a previous lesson, I would know how to increase his/her retention in the next lesson..... | 1 | 2 | 3 | 4 |
| 12. Good teaching can overcome the influences of a student's home experiences..... | 1 | 2 | 3 | 4 |
| 13. If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him/her quickly..... | 1 | 2 | 3 | 4 |
| 14. Teachers are not a very powerful influence on student achievement when all factors are considered..... | 1 | 2 | 3 | 4 |
| 15. Even a teacher with good teaching abilities may not reach many students..... | 1 | 2 | 3 | 4 |
| 16. When it comes right down to it, a teacher really cannot change a student's motivation since motivation depends on the student..... | 1 | 2 | 3 | 4 |
| 17. My teacher training program and/or experience has given me the necessary skills to be an effective teacher..... | 1 | 2 | 3 | 4 |

Appendix C - Student survey percentage of responses in each category

Yellow indicates most frequent response

(1) Strongly Disagree (2) Disagree (3) Undecided (4) Agree (5) Strongly Agree

| | SA | A | U | D | SD |
|--|------|------|------|------|------|
| 1. Gender specific instruction provided an opportunity to learn more..... | 6.0 | 17.2 | 23.0 | 23.6 | 30.2 |
| 2. I expect better grades in my gender specific classes..... | 11.0 | 17.5 | 18.4 | 27.7 | 25.4 |
| 3. I learn less in classes that include both genders..... | 5.0 | 9.2 | 12.3 | 27.0 | 46.6 |
| 4. Grouping students by gender has no influence on my success in school..... | 33.6 | 22.8 | 17.4 | 13.1 | 13.1 |
| 5. I have more friends in my gender specific classes..... | 11.5 | 13.8 | 19.5 | 28.8 | 26.4 |
| 6. Gender specific classes are more fun..... | 7.0 | 9.0 | 17.2 | 23.1 | 43.7 |
| 7. Students should be grouped by gender..... | 3.3 | 5.4 | 13.3 | 19.9 | 58.2 |
| 8. I participate more often in lesson discussions in gender specific classrooms..... | 7.4 | 12.0 | 19.2 | 27.7 | 33.7 |
| 9. Gender specific instruction is boring..... | 29.8 | 17.2 | 23.2 | 14.8 | 15.0 |
| 10. Gender specific instruction allows me to concentrate more on the lesson | 6.4 | 13.0 | 19.7 | 29.8 | 31.0 |
| 11. Gender specific instruction is easier for the teachers..... | 7.6 | 11.8 | 38.8 | 15.3 | 26.5 |
| 12. I study more frequently for my gender specific classes..... | 4.1 | 7.9 | 15.5 | 32.4 | 40.1 |
| 13. Gender specific instruction eliminates disruptions in the classroom..... | 4.1 | 8.0 | 16.9 | 23.3 | 47.8 |
| 14. My teachers enjoy gender specific training..... | 6.1 | 9.6 | 50.3 | 12.4 | 21.7 |
| 15. Teachers pay more attention to disruptive students..... | 20.2 | 20.3 | 29.0 | 12.2 | 18.3 |
| 16. I prefer gender specific instruction.... | 4.9 | 5.7 | 17.7 | 15.3 | 56.4 |

Appendix D - teacher interview questions

1. What were your expectations before you started teaching gender specific (GSI) classes?
2. Are there any differences in your method of instruction when teaching same sex students?
3. How does your approach to teaching influence student achievement?
4. Are behaviors in the classroom different with homogeneous gender groupings?
5. What is the impact, if any, of gender specific instruction on how you assess your effectiveness as a teacher (efficacy)?
6. How does gender specific instruction change student achievement? (What are your perceptions of student achievement as a result of the program?)
7. Would you recommend GSI to other subjects, students and locations?
8. What factors, if any, would confound the effects of GSI as ?
9. What other changes, if any, took place as a result of the program?
10. Would you change any of the mechanics and structure of the GSI program?

Appendix E – Observation protocol

Cheyenne High School Gender Specific Instruction Observation worksheet

Teacher: _____

Observation Date: _____

Subject: _____

Class Period: _____

Instruction type: Gender specific Co-educational (circle one) Gender: Male Female Mixed (circle one)

Instructional variables (indicate examples)

1. Teacher begins on time, if no, why not?
2. What was the purpose of this lesson?
3. Teacher focuses on lesson content?

Instructional techniques:

Provide examples

| | |
|------------------------|--|
| Small group discussion | |
| Cooperative group work | |
| Individual seatwork | |
| Open-ended inquiry | |
| Hands-on activities | |
| Lecture or recitation | |
| Drill and practice | |
| Reading textbook | |

Instructional techniques:

| | Provide examples |
|-------------------------------------|-------------------------|
| Teacher demonstration | |
| Data collection and/or manipulation | |

Student variables

Provide examples

| | |
|---|--|
| Attentiveness | |
| Behavior | |
| Describe student participation | |
| Ask teachers questions | |
| Responds when called upon | |
| Performs classroom responsibilities | |
| Describe student interaction with teacher | |
| Inappropriate conduct | |

Teacher variables

Provide examples

| | |
|---|--|
| References to same sex instruction | |
| Uses examples that are gender based | |
| Uses appropriate classroom management techniques | |
| Varies instructional technique | |
| Explains activity-Gives concise, sequential directions | |
| Circulates among students/student groups asking questions | |
| Emphasizes relations to real life | |

Materials Used

Provide examples

| | |
|--|--|
| Printed reading materials (books, articles, stories, etc.) | |
| Computer or computer technology | |
| Overhead projector, LCD projector | |
| Chalkboard, white board, chart tablet | |
| Videos, films, music | |