Environmental Research Journal 2 (4): 167-173, 2008
ISSN: 1994-5396


# The Influence of School-Sex on the Quality of Output from Secondary Schools in Ekiti State, Nigeria

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**Abstract:** This study investigated the influence of school-sex on the quality of output from secondary schools in Ekiti State, Nigeria. As a descriptive research, the study population comprised all the 141 secondary schools that presented students for the 2003 senior secondary certificate examinations in the State. Out of the population, a sample of 113 schools (80% of the population) was drawn through the process of stratified random sampling technique. The instrument used to collect data for the study was an inventory. Data were also collected on the performance of students in 5 core subjects in schools' curriculum namely English Language, Mathematics, Physics, Chemistry and Biology. The data collected were analysed through the use of percentages and the t-test. The findings show that quality of output from single-sex schools was better than the quality of output from mixed sex schools. Single-sex schools outperformed mixed sex chools in the examinations. The mean scores for students in single-sex schools were greater than those of mixed schools. Considering these findings, it was recommended that the State Government should establish more single-sex schools in the State when funds are available. Government should also create single-sex classes in mixed schools or convert some of the mixed schools especially in urban areas into single-sex schools.

**Key words:** Influence, school-sex, wuality of output, secondaty school, Nigeria

## INTRODUCTION

Various researchers have reported differences in the quality of output from secondary schools (Adeyemi, 1998; Ajayi, 2003). Their arguments were centred on differences in the level of output between single-sex schools and mixed schools. Some researchers found that single-sex schools outperformed mixed schools (Mok and Flynn, 1997; Bolaji, 2003). Others reported that boys from mixed schools outscored boys from single-sex schools (Nwezeh, 1989; Cairns, 1990). Min (1991) agreed with these findings and reported that single-sex schools significantly influenced the schooling experiences of students regardless of sex during their secondary school period while Parker and Rennie (1997) argued that the concept of single-sex classes in mixed schools has become accepted in many schools.

Over the years, research work has shown poor performance in Science by female single-sex schools (Burgess, 1990; William, 1998; Inyang, 1998; Bolaji, 2003). Burgess (1990) for instance, compared the performance of girls in girls' schools in Mathematics, with those in mixed schools and found that girls performed better in Mathematics in all-girls' schools than in mixed schools. He argued that girls' achievement, self-esteem and willingness to take an active role are being jeopardized in mixed schools. Marsh and Rowe (1996) supported this point and reported that because single-sex schools are more likely to be selective, their students are typically brighter.

Several studies have found that girls in single-sex schools have stronger preferences for Mathematics and Physics than their co-educational peers (Mallam, 1993; Brutsaert and Bracke, 1994; Harker and Nash, 1997). Mallam (1993) for instance, found that students in all-girls' Nigerian schools favoured Mathematics more than girls in co-educational schools, particularly when Mathematics was taught by female teachers. In a related study, Oyedeji (1996) found significant gender differences in Science and Mathematics in favour of boys. His findings were consistent with Okpala and Onocha's (1995) findings which indicated that Science subjects especially Physics and Chemistry are often thought to be for males' students. However, LePore and Warren (1997) using data from the National Educational Longitudinal Study found that boys in single-sex schools did not increase their test scores more than boys in co-educational schools while girls experienced no statistically significant effects on single-sex and mixed school enrolment in Science.

Lee and Lockhead (1990) examined 1,012 students in Ninth-grade Nigerian public schools and found no significant gender gap between Mathematics scores of boys' schools and girls' schools. They however found that girls in single-sex schools outperformed other girls in Mathematics after the study adjusted for substantial differences in students' background, school resources and teacher attitudes. Fagbemi (1996) reported that achievement motivation for females is lower than for males and this had serious implication for their education. Adesoji and Fasuyi (2001) designed a study to analyze the problem-solving difficulties of male and female students in single-sex and mixed schools in volumetric analysis and found that more girls than boys had difficulties in problem solving.

Considering other subjects in the schools' curriculum, some researchers have found that girls' schools often outscored boys' schools in English Language examinations (Min, 1991). Others have reported no school-sex differences in academic performance in English Language (Enyong, 1986). In another situation, Adeosun (2002) found no significant difference between the achievement mean scores of males and female students in each of the experimental and control groups in Social Studies. He however, found a significant difference in the retention mean scores between males and females in the control and experiment groups with females having higher mean scores.

Nwezeh (1989) conducted a study on 120 students (60 boys and 60 girls) randomly selected from final year students of a high school and found that there was no significant differences in the verbal and numerical aptitude tests examined on the students. In a similar study, Ajayi (2005) found a mean of 6.69 for mixed schools and a mean of 6.41 in single-sex schools. She found that the t-calculated (1.603) was less than the t-table (1.960) at 0.05 level of significance and then concluded that there was no significant difference in the academic performance of students from mixed and single-sex schools. In related study, Anaso and Anaso (2000) found that boys' schools performed better than girls' schools and that in co-educational schools, boys generally performed better than girls when teaching classes using the guided discovery method.

Sex differences in achievement have continued to be a matter of concern to educationists (Smith 1996; Bolaji, 1997, William, 1998; Adeyemo, 2005). Adeyemo (2005) for instance, examined whether any significant difference existed between single-sex and mixed schools in academic performance using experimental and control groups. He used the 2-way Analysis of Variance and the Analysis of Covariance (ANCOVA) to analyse his data and found no significant differences in the performance of single-sex and mixed schools on both the experiment and control groups. This finding was contrary to Bamisile's (2005) findings that indicated a significant difference between the academic performance of male and female students on the basis of school location.

Output in education represents the immediate results of the system's activities. The main outputs in education are expressed in terms of learning, that is, changes in the knowledge, skills and attitudes of individuals as a result of their experiences within the educational system (Akangbou, 1985; Blaug, 1994). Blaug (1994) for instance, outlined different concepts of evaluating output. According to him, these concepts include the number of students completing a course; the number of students completing a course of standard length and the number of students with given achievement test scores. As such, since the quality of output is determined by examination performance (Adeyemi, 1998), the senior secondary certificate examination is an instrument for evaluating the quality of output of secondary education in Nigeria.

The foregoing has shown a review of the findings of previous researchers on school-sex and the quality of output in schools. From the review, it seems that the quality of output is perhaps a function of school-sex. Considering this point, this study examined the infuence of school-sex on the quality of output from secondary schools in Ekiti State, Nigeria in a bid to determine whether or not there is any significant difference in the quality of output.

**Statement of the problem:** Several studies have given divergent findings on whether boys outperformed girls or vice-versa in public examinations (Oyedeji, 1995; Fagbemi, 1996; Adeosun, 2002). Their arguments seem to show that the quality of output from secondary schools varies between single-sex schools and mixed schools. Since single-sex and mixed schooling are the 2 modes of schooling in Nigeria, the problem of this study was to determine what influence school-sex had on the quality of output from secondary schools in Ekiti State, Nigeria. In examining this problem, the following research questions were raised.

**Research questions:**

- What is the performance level of students in the junior secondary certificate (JSC) and senior secondary certificate (SSC) examinations in Ekiti State, Nigeria?
- Is there any significant difference between the quality of output from single-sex secondary schools and the quality of output from mixed secondary schools in Ekiti State Nigeria?

## MATERIALS AND METHODS

As a descriptive survey (Gay, 1996), the population for this study comprised all the 141 secondary schools that presented candidates for the 2003 Senior Secondary Certificate (SSC) examinations in Ekiti State, Nigeria. This was made up of 61 urban schools (43%) and 80 rural schools (57%). Out of the population, a sample of 113 schools (80% of the population) was drawn through the process of stratified random sampling technique. The instrument used to collect data for the study was an inventory which requested for data on school-sex, enrolment figures, number of classes in each school and students' grades in 5 major subjects in schools' curriculum: English Language, Mathematics, Physics, Chemistry and Biology in the 2003 SSC examinations. The content validity of the instruments was determined by experts in Tests and Measurement who examined each item of the instrument to determine whether they actually measured what they were supposed to measure.

Semi-structured interview was conducted with 20 principals of schools and 20 education officers in the State to elicit information from them on their views about the sex differences in the quality of output from single-sex and mixed schools. These principals and education officers were sampled randomly form the 141 principals and 232 education officers in the State. The responses of the interviewees were coded and analysed by counting. The proportion of the number of responses to each question was computed through the content analysis technique (Easterby *et al*., 1996) based on a maximum obtainable score of 100%.

### Data analysis

**Research question 1:** What is the performance level of students in the senior secondary certificate (SSC) examinations in Ekiti State, Nigeria?

Examining this question, the grades obtained by students in the senior secondary certificate (SSC) examinations in English Language, Mathematics, Physics, Chemistry and Biology in Ekiti State, Nigeria were collected from the State's Ministry of Education and analyzed with the use of percentages. The findings are indicated in Table 1.

As shown in Table 1, the students' level of performance was low in the 5 core subjects in the senior secondary certificate (JSC) examinations. There suggests that the State had recorded low-level performance of students in major subjects in secondary schools' curriculum for quite sometime. The analysis shows that the performance level was below 40% in each of the subjects.

Table 1: Students' performance in the SSC examinations in Ekiti State, Nigeria

| Years | English language (%) | Mathematics (%) | Physics (%) | Chemistry (%) | Biology (%) |
|---|---|---|---|---|---|
| 2001 | 5 | 12 | 11 | 25 | 16 |
| 2002 | 8 | 15 | 18 | 27 | 24 |
| 2003 | 8 | 16 | 17 | 25 | 26 |

Source: statistics division, ministry of education, Ado-Ekiti

**Research question 2:** Is there any significant difference between the quality of output from single-sex secondary schools and the quality of output from mixed secondary schools in Ekiti State Nigeria?

In examining this question, the following research hypothesis was raised.

**Ho:** There is no significant difference between the quality of output from single-sex secondary schools and the quality of output from mixed secondary schools in Ekiti State, Nigeria?

In testing this hypothesis, the t-test statistic was employed. The quality of output was measured by examination performance (Blaug, 1994). As such, data on the performance of students in single-sex and mixed schools were collected and transformed from discrete data to continuous data. The findings are indicated Table 2.

In Table 2, the calculated t (2.62) was greater than the t-table (2.00) in all the subjects. Hence, the null hypothesis was rejected. This shows that there was a significant difference in the quality of output from single-sex and mixed schools secondary in the State. The mean score for single-sex schools was 1.2 while the mean score for mixed schools was 0.81 indicating better quality of output from single-sex schools at the expense of mixed sex schools. Considering each of the core subjects in secondary schools curriculum, data on the quality of output from single-sex schools and mixed schools were also tested with the t-test statistic. The findings are shown in Table 3.

Table 3 shows that the calculated t was greater than the t-table in each of the subjects. Hence, the null hypothesis was rejected. This shows that there was a significant difference in the quality of output between single-sex and mixed secondary schools in the State.

### Analysis of the interviews

**Question 1:** What do you think about school-sex in relation to quality of output from single-sex and mixed secondary schools in Ekiti State?

In response to this question, 16 of the principals (80%) and 17 of the education officers (85%) were of the view that single-sex schools achieve better quality of output than mixed schools.

Table 2: T -test on students' overall performance in SSC examinations

| Schools | N | Mean | SD | df | Calculated t-value | Table t-value |
|---|---|---|---|---|---|---|
| Single-sex | 08 | 1.2 | 0.67 | 111 | 2.62 | 2.00 |
| Mixed | 105 | 0.81 | 0.79 | | | |

$p < 0.05$

Table 3: T- test on students' performance in SSC examinations on subject basis

| Schools | N | Subjects | Mean | SD | df | Calculated t-value | Table t-value |
|---|---|---|---|---|---|---|---|
| Single-sex | 08 | English | 0.23 | 0.13 | 111 | 2.39 | 2.00 |
| Mixed | 105 | English | 0.14 | 0.16 | | | |
| Single-sex | 08 | Math | 0.26 | 0.14 | 111 | 2.21 | 2.00 |
| Mixed | 105 | Math | 0.12 | 0.15 | | | |
| Single-sex | 08 | Physics | 0.20 | 0.17 | 111 | 2.43 | 2.00 |
| Mixed | 105 | Physics | 0.11 | 0.17 | | | |
| Single-sex | 08 | Chemistry | 0.27 | 0.20 | 111 | 2.57 | 2.00 |
| Mixed | 105 | Chemistry | 0.14 | 0.15 | | | |
| Single-sex | 08 | Biology | 0.28 | 0.21 | 111 | 2.74 | 2.00 |
| Mixed | 105 | Biology | 0.18 | 0.17 | | | |

$p<0.05$

**Question 2:** What do you think about the social interaction and development in the schools?

Responding to this question, 15 of the principals (75%) and 17 of the education officers (85%) reported that single-sex schooling does not allow boys and girls to develop together in social harmony with home. They reported that single-sex schools allow for better social interaction among students, as they would not be detracted by the presence of students of the opposite sex.

**Question 3:** Is the appropriate to have boys and girls being taught together in the same class?

The principals and the education officers disagreed in their response to this question. Fifteen of the principals (75%) felt that there is nothing wrong in having boys and girls being taught together in the same class while 18 of the education officers (90%) were of the opinion that boys and girls should be separated into mixed sex classes.

**Question 4:** What do you think about the attitude of boys and girls to certain subjects being taught in schools?

In response to this question, the views of the principals and education officers were in marked disagreement with one another. Seventeen of the principals (85%) had the opinion that girls' attitude to certain subjects such as Mathematics tend to be jeopardized in mixed-sex classes. This, according to them is due to the shyness on the part of many girls to exhibit their intellectual ability in some subjects such as Science and Mathematics in mixed-sex schools unlike in single-sex schools where they do not have their male counterparts to compete with. Contrary to this view, 18 of the education officers (90%) were of the opinion that girls tend to develop a positive attitude to their studies when they have their male counterpart in their midst to study and compete with. Hence, they tend to show positive attitude to many subjects.

**Question 5:** What do you think about discipline and moral values in mixed schools?

In response to this question, 16 of the principals (80%) were of the view that mixed-sex schooling allows for indiscipline and moral decadence as many of the students are in the habit of forming bad groups to perpetrate truancy, acts of indiscipline and immoral behaviours. Although, all the education officers (100%) were of the opinion that such acts of indiscipline and moral decadence could be found in single-sex schools, nineteen of them (95%) claimed that indiscipline and moral decadence are terribly reduced in single-sex schools.

**Question 6:** What do you think about the self-esteem of students in single-sex and mixed schools?

Answering the question, all the principals and education officers agreed that students' self esteem is more enhanced in single-sex schools than in mixed schools. They were of the opinion that girls tend to excel more in single-sex schools than in mixed schools.

**Question 7:** What suggestions do you think can bring about better quality of output in single-sex and mixed schools in the State?

Responding to this question, all the principals and 15 of the education officers (75%) were of the opinion that since there was an influx of students into secondary schools in the State, mixed sex schools should be allowed to remain to cater for the large population of the students. However, 17 of the principals (85%) and 18 of the education officers (90%) were of the view that single-sex classes should be created in mixed schools to allow boys and girls to develop their intellectual skills separately. All the principals and education officers agreed that when funds are available, government should establish more single-sex schools in every local government headquarters in the State.

## RESULTS AND DISCUSSION

In the foregoing, the influence of school-sex on the quality of output from secondary schools in Ekiti State, Nigeria was examined. The findings showed differences in the quality of output from single-sex schools and mixed schools thereby agreeing with the findings of previous researchers (Colley, Comber and Hargreaves, 1994; Fagbemi, 1996; Granleese and Joseph, 1999). The finding indicating that single-sex schools outperformed the mixed

schools in the senior secondary certificate examinations was consistent with the findings made by Bolaji (1997) who found sex differences in performance between male and female students in single-sex and mixed schools in favour of single-sex schools. The findings also agreed with the findings made by earlier researchers (William, 1998; Inyang, 1998; Nwagbo, 1999; Bamisile, 2005) who found that students from mixed schools scored significantly lower on the average in the senior secondary certificate examinations than their counterparts in single-sex schools. Moreover, the findings were consistent with the findings made by Marsh and Rowe (1996) who gave support for single-sex schools especially for girls and reported that single-sex schools significantly influenced the schooling experiences of students regardless of sex.

The findings of this study agreed with those of Burgess *et al*. (2003) who found that the gap in the quality of output was primarily due to performance differentials in English, with boys and girls obtaining similar results in Mathematics and Science. This study also found that the gender gap was not related to whether a school performs well or not nor whether it is effective or not. Instead, there is evidence that the gender gap is rooted in different rates of cognitive maturation between boys and girls. The findings were also consistent with those of other researchers (Alloway *et al*., 2002; Ajayi, 2005) who reported that the interest in single-sex education has been re-invigorated by the educational reform movement and by scepticism about whether the coeducational environment fosters equitable treatment of boys and girls. The findings in respect of the attitude of students in single sex vis-à-vis mixed schools agreed with those of previous researchers (Mallam, 1993; Fagbemi, 1996; Adesoji and Fasuyi, 2001).

The interviewees' responses tend to buttress the findings of the study. The findings that students in single-sex classes show more positive attitude to their studies than students in mixed sex classes were consistent with Parker and Rennie (1997) who reported that the concept of single-sex classes in mixed schools has become accepted in many schools. The findings that students' self esteem is more enhanced in single-sex schools than in mixed schools tend to agree with Ajayi's (2005) findings indicating that children attending single-sex schools had higher levels of academic self-esteem than those attending mixed schools.

One might, however, be tempted to ask what were in the single-sex schools that made them to have better quality of output than mixed schools? In response to this question, it is pertinent to note the views made by Burgess (1990), Inyang (1998) and Ezendu (2000) that mixed schooling creates some problems for girls as girls' achievement, self-esteem and willingness to take an active role are being jeopardized in mixed schools. They therefore, found that single-sex schools are more beneficial for girls and reported in their studies that students performed better in single-sex schools than in mixed schools. The findings were however, in contrast with the findings made by some researchers (Nwezeh, 1989; Adeosun, 2002; Adeyemo, 2005;) who found no significant difference in the quality of output from single-sex and mixed sex schools.

## CONCLUSION

Based on the findings of this study, it was concluded that school-sex has a considerable influence on the quality of output from secondary schools in Ekiti State, Nigeria. The findings have therefore, led the researcher to conclude that the quality of output from secondary schools in the State is a function of school-sex. The single-sex schools were almost the best secondary schools in the State in terms of the quality of output. This shows that school-sex is a critical variable in determining the quality of output from secondary schools.

## RECOMMENDATIONS

Considering the findings of this study, it was recommended that the Ekiti State Government should establish more single-sex schools in the State when funds are available. At least, one single-sex school should be established in each of the 16 local government headquarters in the State. Alternatively, the government could convert some of the mixed schools especially in urban areas into single-sex schools or create single-sex classes in mixed schools to enhance better quality of output.

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