

# Gender Differences in Participation and Achievement in the West African Senior School Certificate Examination (WASSCE) in Sierra Leone

Issa Fofana, Mohamed H. Keimbe, Issa B. Fofana

Department of Physics and Computer Science, Njala University, Freetown, Sierra Leone

issa\_fofana@hotmail.com

**Abstract:** This study investigated the differences in participation and achievement in the West African School Certificate examination in the first ten years of its inception for students attempting the examination in Sierra Leone. It is observed that the average female participation in the examination over the period is less than the 35% approximated in the 2004 Census data. The numbers for female participation were impressive in the first two years of the period but dropped slightly over the remaining parts. The western area, which hosts the political and commercial capital of the nation had the female participation slightly above the national level. It was observed that there is gender difference in participation in almost all the subjects offered in the examination. The female students were significantly more likely than their male counterparts to attempt the commercial subjects, whilst more male students offered the Science and Arts subjects. On the average over 65 percent of the students who obtained five credits and above, the basic criteria for admission into tertiary institution over the period in the examination were male. Performance for females is observed to be highest in the Western Region of the country, with an average of over 30% of the success rate. The male candidates performed better than their female counterparts in almost all the subjects offered in the examination. It is realised that both male and female students performed better in single sex schools than mixed schools and the male students tend to perform slightly better than their female counterparts in mixed schools.

*Index Terms*— Gender, Participation, Achievement, Examination (key words)

## I. INTRODUCTION

There has been a longstanding interest, concern and debate about gender differences in participation and achievement in schools in Sierra Leone. Since the end of the devastating civil war, the government along with its partners in education have been frantic in putting measures in place to address the perceived gender disparity in the education sector.

Across the globe various pressure groups, especially those of

Women's advocacy have been involved in campaigns claiming that girls are subjected to unfair educational systems. These campaigns have been somehow successful as various governments and institutions have developed programmes to address the issue.

The president of the Republic of Sierra Leone who also is the chancellor of the university of Sierra Leone made the following statement, as a definite consequence of the cries of the female advocacy groups: "Let me also at this juncture call upon parents, guardians and every Sierra Leonean to support the education of women. My government is giving scholarships to female students studying the sciences in our universities. We are expanding on our current initiatives to improve the enrolment and retention rates of girls in schools. We cannot build our families, our communities and this nation without promoting the education of women. Our collective survival and development warrants the education of women. We have no choice. We must do it." [1].

Despite these assurances by government, it still appears more need to be done to achieve this goal as seen by the African Development Bank. "Although the government has put in place many initiatives that have resulted in increased enrolment, completion and retention rates over the years, Sierra Leone has yet to achieve parity at even the primary-school level and it seems like a daunting task at other levels." [2]

Sam William Basse et al.[3] noted that "Nurture in Nigeria tends to favour male dominance over the feminine gender. Environmental provision for male students makes them fit and able to cope with tasks requiring high Intellectual challenge, computation and rigour." They also stated that "this phenomenon is further compounded in Africa where sex-stereotyping is so pervasive that from birth, society fixes gender roles and conditions males to play and act within the confines of intellectually and physically more challenging tasks like construction, moulding, football, palm-wine tapping, climbing, agriculture, fishing and the like. Women on the other hand, are 'sentenced' to the kitchen and related domestic chores, including child-rearing."

It is also reported that in Sierra Leone, "Those parents who send their children to school generally choose to educate their sons. With the result that historically few women have held positions of power in the country. Girls stay at home to do the

household chores, and frequently fall victim to teenage pregnancy due to forced sex. Among girls who do attend school, the drop-out rate is high, only a tiny minority make it to university.”[4] UNICEF also reports that “Girls access to education is improving in Sierra Leone. Parity is almost observed in primary school, but retention and completion of education remain a challenge with high dropout rate for girls and low enrolment in secondary school.” That same report further states that “Adolescent pregnancy, one of the highest in the world, remains a major concern. It is a reason behind the high dropout rates of girls in the secondary cycle. It is also a major contributing factor to high infant and maternal mortality.” [5] Gender differences in performance and participation in public examinations is reported to generate a lot of attention and anxiety amongst educational authorities. It is also said to have been reported in many countries across Europe, in the USA, Australia and New Zealand. [6]

It still remains a major issue in educational research. It has been focused on the under participation of girls and is still the case in many parts of the world, with Sierra Leone not an exception. It is however reported that in many other countries, boys are considered to be on the other side of the spectrum, disadvantaged in performance and participation. [7]

The main objective of this research was to investigate participation and performance patterns by gender in the West African Senior School Certificate Examination in Sierra Leone for the first ten years of this examination system (2000 – 2009)

The specific aims of the study were to examine:

- i) Gender differences in participation in the examination over the period.
- ii) Gender differences in achievement in the examination over the period.
- v) Gender difference in achievement in the examination in single-sex and co-educational schools

## II. METHODOLOGY

Data used in the study was provided by the national office of the West African Examination Council in Freetown, with the kind permission of the head of the office. Various statistical techniques were used in the analysis.

Microsoft Excel 2016 and IBM SPSS Statistics 23 were used in all statistical analyses.

Differences between proportions were tested for statistical significance using a chi-square test for independence. [8]

Effect sizes were calculated using the Practical Meta-Analysis Effect Size Calculator. [9]

## III. RESULTS AND ANALYSIS

The 2004 Census data for Sierra Leone approximates the enrolment at Senior Secondary School as 65,141 in 2003/04. Of this enrolment 22,483 (35%) are girls and 42,658 (65%) are boys [10].

It could be observed from figure 1 that the average female participation in the examination over the period is less than the 35% approximated in the 2004 Census data. The numbers for female participation were impressive in the first two years, of the period but dropped slightly over the remaining parts of the

period to about 30%.

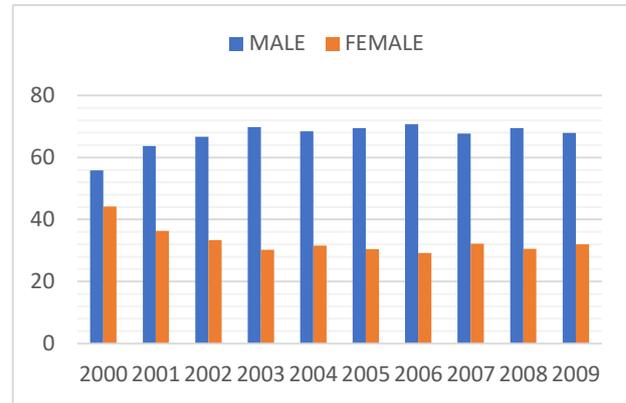


Figure 1: Percentage attempts by gender over the period

Sierra Leone is divided into four political and administrative regions, West, North, South and East respectively. Table 1, 2 and 3 shows the percentage of the students who attempted the examination over the period and in the various regions of the nation.

The western area, the political and commercial capital of the nation accounted for over 70% of participation in each in the first three years of the period.

Table 1 Percentage attempts by year and region

Year	West	South	North	East
2000	84.1	8.4	1.8	5.7
2001	77.9	12.9	3.3	5.8
2002	73.7	13.5	6.5	6.3
2003	65.7	15.8	10.6	7.9
2004	58.0	18.4	15.0	8.5
2005	55.2	17.7	17.4	9.6
2006	55.2	16.9	15.6	12.4
2007	53.0	16.5	17.4	13.1
2008	52.3	16.1	17.8	13.8
2009	50.4	16.0	18.3	15.3
<b>Average</b>	<b>62.6</b>	<b>15.2</b>	<b>12.4</b>	<b>9.8</b>

This period was at the height of the civil war which drove people out of their homes especially in areas outside the capital of the country. However, even in the latter parts of the period nearly 50% of those who attempted the examination did so in the western region.

The female participation in the western region stayed close to 60% even in the last year of the period as seen in table. This is above that estimated for in the analytical report on population projection by Statistics Sierra Leone for children at senior secondary school level in the 2004 population and housing survey.<sup>10</sup> The northern region recorded female participation below 10% on average through the period, even though, the population projection shows that about 30% of children in this age group are resident there. This region is known for its strong traditional tendencies with many parents not allowing their girl child to go to school and forcing them into early marriage.

Table 2: Percentage attempts by year and region – Male

Year	West	South	North	East
2000	80.1	9.7	2.5	7.7
2001	74.3	13.7	4.4	7.6
2002	70.4	14.3	7.6	7.7
2003	61.9	17.2	11.9	8.9
2004	53.2	20.4	16.9	9.6
2005	51.2	19.4	18.6	10.8
2006	51.1	17.4	17.8	13.7
2007	50.5	17.2	19.6	12.6
2008	48.3	16.4	20.2	15.1
2009	46.3	16.2	20.2	17.3
<b>Average</b>	<b>58.7</b>	<b>16.2</b>	<b>14.0</b>	<b>11.1</b>

Table 3: Percentage attempts by year and region - Female

Year	West	South	North	East
2000	89.2	6.8	1.0	3.1
2001	84.4	11.5	1.3	2.7
2002	80.3	12.0	4.3	3.5
2003	74.6	12.5	7.5	5.5
2004	68.5	14.3	11.0	6.2
2005	64.4	14.0	14.7	6.9
2006	65.0	15.6	10.3	9.2
2007	58.3	14.9	12.6	14.1
2008	61.5	15.5	12.3	10.7
2009	59.3	15.7	14.1	10.9
<b>Average</b>	<b>70.5</b>	<b>13.3</b>	<b>8.9</b>	<b>7.3</b>

Preference for subjects offered by students attempting the examination is given a serious consideration in this work, as it may indicate the future educational and career directions of either gender.

Most of the subjects offered at WASSCE were considered in the analysis, except for those that were predominantly offered by either male or female students with a close to 100% domi-

nation in participation by either sex. These subjects include electronics, metal works, applied electricity, building and technical drawing for male students, clothing and textile, type writing, visual arts, shorthand and secretariat for female students.

Table 4 gives the proportion of male and female students who attempted the examination in the various subjects offered. The table shows that there is gender difference in participation in almost all the subjects offered. The female students were significantly more likely than their male counterparts to attempt Business Methods, Commerce, Financial Accounting, Cost Accounting, Economics, Literature – in – English, Home Management and Management in Living (all  $p < .0001$ ) and slightly more likely to attempt Biology ( $p > .005$ ). The male students were significantly more likely than the females to attempt Christian Religious Knowledge, Geography, Government, History, Engineering science, Further Mathematics, Agricultural Science, Chemistry, Science Core and Physics (all  $p < .0001$ ) and slightly more likely to attempt Health Science ( $p > .09$ ).

For subjects in which male students dominated, the effect sizes ranged from .06 to .77 and for those subjects where female students attempted most, d ranged from .19 to .69

Table 4: Percentage attempt of male and female candidates who attempted the examination

Subject	Male (19875)	Female (9364)	p	d
Business Methods	26.5	50.1	<.0001	0.4591
Commerce	14.1	21.9	<.0001	0.1971
Financial Accounting	34.2	52.7	<.0001	0.3588
Cost Accounting	29.7	43.8	<.0001	0.2804
Christian Religious Knowledge	23.9	21	<.0001	0.0639
Economics	68.2	79.3	<.0001	0.2300
Geography	35.8	20.9	<.0001	0.3036
Government	42.2	28.8	<.0001	0.2608
History	47.7	33.6	<.0001	0.2683
Literature – in – English	66.7	77.7	<.0001	0.2247
Engineering Science	2.0	0.3	<.0001	0.1242
Chemistry	22.4	17	<.0001	0.1236
Further Mathematics	11.1	5.3	<.0001	0.1879
Agricultural Science	96.3	71.5	<.0001	0.7753
Biology	74.3	75.8	>.005	0.0329
Health Science	25.6	24.7	>.09	0.0199
Science(Core)	7.4	3.7	<.0001	0.1441
Physics	19.3	11.7	<.0001	0.1899
Home Management	8.5	17.6	<.0001	0.6919
Management in Living	1.3	13.5	<.0001	0.5335

The West Africa Senior School Certificate Examination is considered as the most popular determinant of access to higher education and, at times, to the place of work. It is also considered as a public measure of learners' performance, the quality of teaching and learning, and how well the entire educational system is doing. It is therefore essential to critically look at the performance of our children in this all-important examination system.

WAEC reports the results of WASSCE in the range A1(Excellent) to F9 (Fail). The number grades 1 – 9 have been the generally accepted interpretations of the results with the grades 1 – 6 usually referred to as credit passes and are mostly used for admission into tertiary institutions.

In this work, the grades 1 to 6 are considered as pass grades for the subjects attempted. Also, students with passes in five subjects and above are considered to have gained a pass in the examination as it is the basic requirement for entry into tertiary institutions.

Figure 2 shows the proportions of male and female students who passed five subjects and above in the examination. The years 2002 and 2003 shows that over 80 percent of those that obtained five credits and above in the examination were male, while the performance of the female students showed its highest values in 2007 and 2008 with over 30 percent pass rate. On the average over 65 percent of the male students obtained five credits and above over the period in the examination.

Figure 3 shows the performance rate for each sex as a proportion of the number of that sex that attempted the examination. It could be observed that in the years 2007 and 2008 a higher proportion of the female students who obtained five credits than their male counterparts

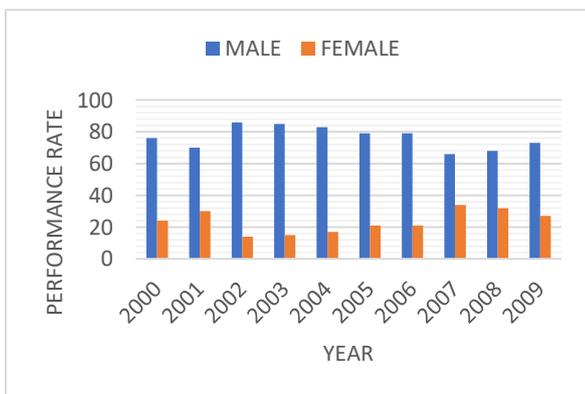


Figure 2: Percentage number of Students obtaining five credit passes and above by sex

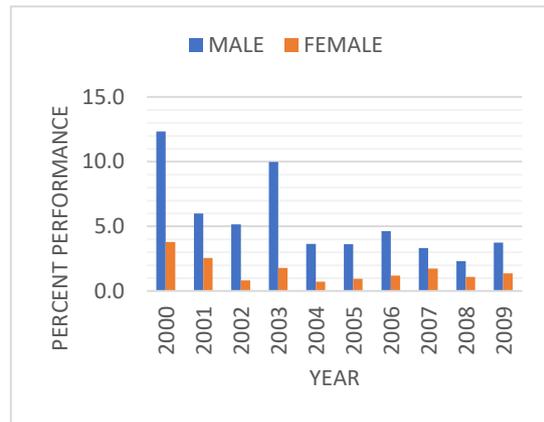


Figure 3 The performance rate for each sex as a proportion of the number of that sex that attempted the examination.

Table 5 shows the average performance rate in the various subjects attempted in the examination by sex. As seen in the table, the male candidates performed better than their female counterparts in almost all the subjects. The male advantage in the various subjects were statistically significant in the following subjects (Mathematics, Biology, Agricultural Science, History, Government, Geography, Economics, Cost Accounting, Financial Accounting, Commerce and Business with all  $p < 0.001$ ) and slightly significant for (Science (Core), Health Science, with  $p < .3$ ). The size effects for these subjects are in the range of .05 to .2.

Table 5: Performance rates in the various subjects attempted in the examination by sex

Subject	Male	Female	p	d
Business Methods	18.8	15.2	<.0001	0.094
Commerce	12.1	6	<.0001	0.2074
Financial Accounting	19.4	13.9	<.0001	0.1463
Cost Accounting	32.8	25.9	<.0001	0.1475
Christian Religious Knowledge	8.6	12.4	0.061	0.1167
Economics	3.6	2.5	<.0001	0.0573
Geography	8.9	4	<.0001	0.1519
Government	45.9	34.7	<.0001	0.1946
History	42	31.2	<.0001	0.1936
Literature	5.3	5.9	0.087	0.0239
Further Mathematics	5.1	4.1	0.336	0.0371
Agricultural Science	15.7	8	<.0001	0.197
Biology	3.2	1.8	<.0001	0.074
Chemistry	3.2	2.9	0.662	0.3614
Health Science	8.9	8.1	0.22	0.0285
Science (Core)	44	40.7	0.26	0.053
Physics	6.5	6	0.553	0.0178
Engineering Science	17.2	11.1	0.441	0.078
Tech. Drawing	32.6	33.3	0.978	0.0047
Home Management	17.1	20.8	0.278	0.0513

Management in Living	2.7	6.6	0.013	0.1299
English Language	18.6	18.5	0.794	0.0015
Mathematics	3.9	1.8	<0.0001	0.0566

Table 5 shows the number of students who obtained five credits and above in the examination in single sex schools and mixed schools. It is seen that both male and female students perform better in single sex schools than mixed schools and the male students perform better than their female counterparts in mixed schools.

Table 5: Performance trends among Male(M) and Female(F) students in single sex and Mixed schools

Year	Male only	Female only	Mixed	
	M	F	M	F
2000	23.5	10.2	21.3	6.5
2001	10.3	10.6	9.5	1.3
2002	11.7	4.2	4.4	0.9
2003	20.4	10.7	9.8	2.8
2004	8.5	5.7	3.9	0.6
2005	5.6	5.5	4.1	1.5
2006	8.2	7.6	5.3	2.4
2007	6.3	8.2	4.2	4.0
2008	5.7	9.8	2.3	1.4
2009	6.8	11.3	5.0	2.9
Average	10.7	6.4	7.0	2.3

#### IV. SUMMARY

The study analysed the Gender differences in participation and performance in the West African Senior Secondary Certificate Examination for students attempting the examination in Sierra Leone in the period 2000 – 2009. The study analysed data for all the students who attempted the examination in the country by schools, by sex, by subjects attempted. their performances generally and in subjects attempted and the regions where the students attempted the examination.

The findings of the study revealed that:

1. Only about 30% on average of those who attempted the examination are females.
  2. The Western region, the political and economic capital of the nation accounted for about 63% of all the students who attempted the examination, about 58% of the male students and over 70% of the female students.
  3. The female students were significantly more likely than their male counterparts to attempt the commercial subjects and the male students more likely to attempt the science and arts subjects than their female counterparts.
- science and arts subjects than their female counterparts.

4. The male candidates performed better than their female counterparts in almost all the subjects attempted

5. It is seen that both male and female students performed better in single sex schools than mixed schools and the male students performed better than their female counterparts in mixed schools.

#### V. CONCLUSIONS

It is observed from the findings that the improvement in the enrolment and retention of girls in schools advocated for is still far from reality. The figures show that there may be slight improvements in participation and performance in the examination by girls, but there is no pattern to show that there are clear signs for girls to be at par with their male counterparts in the near future.

#### VI. RECOMMENDATION

It will be required that government and its partners in advocacy for improvements in the education of the girl child to ensure that parents are forced to send the girl child to school and also put measures in place to enforce and monitor the progress of the children through the schooling system. The provision of scholarships and other incentives might also help.

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