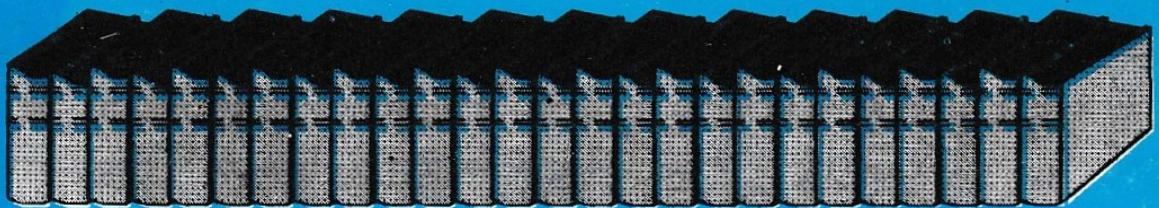
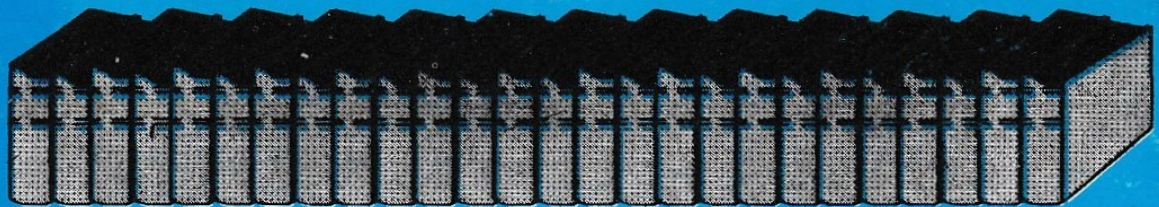
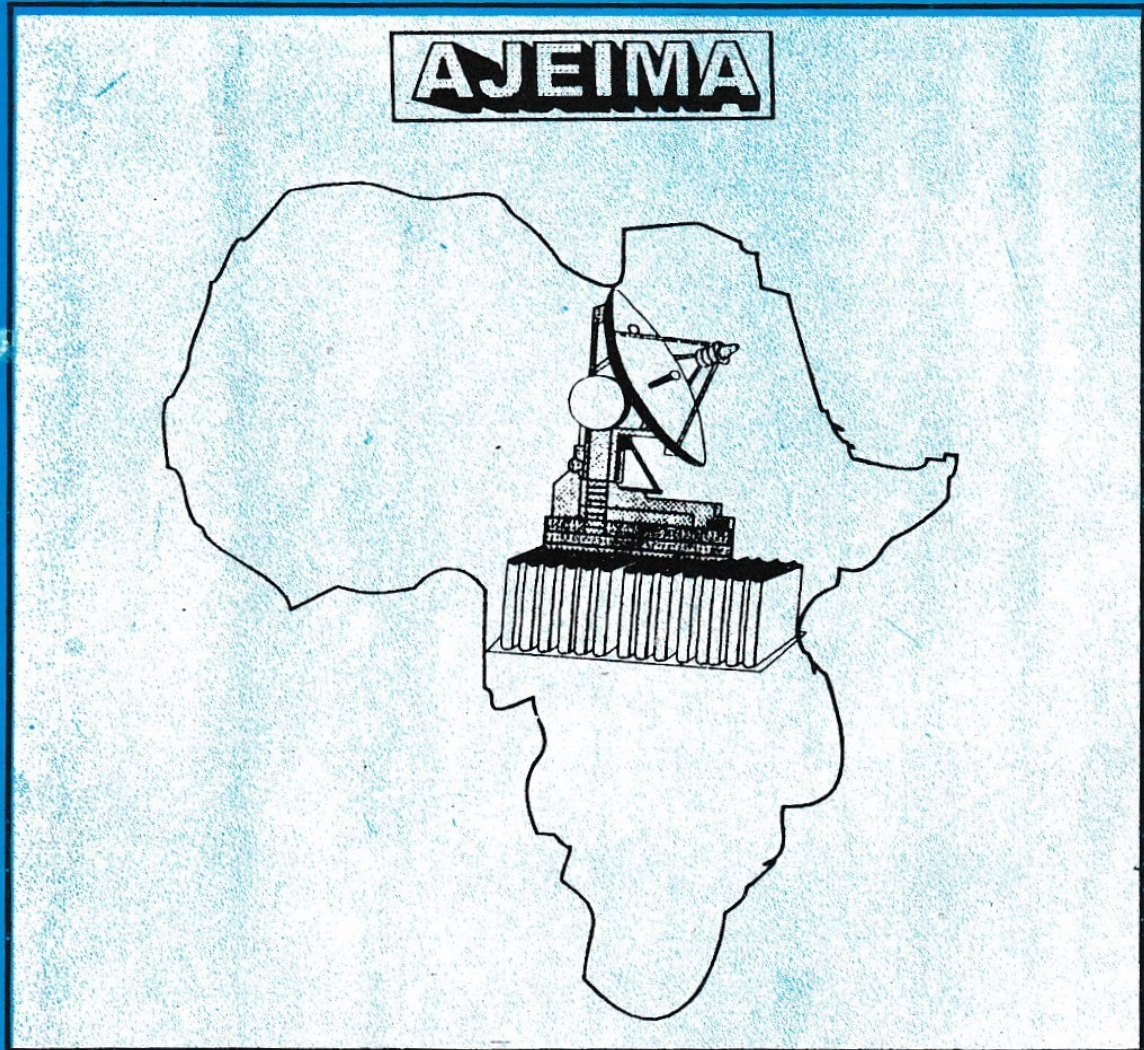


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FEMALE STUDENTS PARTICIPATION IN SCHOOL SCIENCE: AKWA IBOM STATE EXPERIENCE

BY

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Abstract

This study aimed at investigating females' participation in science using Akwa Ibom State Senior Science Schools as reference point. These schools were chosen because they provide the highest concentration of science students in the State. Analyses of data generated in the study show that females still lag behind their male counterparts with respect to their participation in science in all the years (1991 – 1996) considered. This was found to be similar to situations in most states of the federation. It was recommended that some forms of incentives be given to girls currently enrolled in science. This is capable of motivating others to participate.

INTRODUCTION

As different from the traditional society where women were associated almost irrevocably with menial and household duties such as sewing, farming, house keeping, child-bearing, among others, modern women now aspire to become engineers, scientists, to fly airplanes, thus aiming to compete favourable with their men counterparts. In spite of the modern development, unfortunately, the gap between male and female students with respect to career

choice is still palpably wide. This is probably because men traditionally have been seen as the representative of families in the community and the world of work, while women have been considered the nurturers of family, attending to its members physically and emotionally (Parsons and Balea, 1995).

Azikiwe (1993) is of the view that gender is obvious from birth and those children get socialized early into appropriate sex typed occupations. This early socialization does influence career choice of female children. According to Tucker and Asser (1989), girls predominantly are pruned to choosing to be secretaries, teachers and nurses. Yet Onyeisi (1990) as quoted by Anyeze (1996) asserts that the few female pilots, lawyers, doctors, engineers, scientists we have today are found to be as good as males. In a similar way males are found also to be excellent secretaries, teachers, nurses and even cooks.

This shows that the fact of choosing to be nurses, teachers, among others, does not suggest that females are mentally inferior to males (Nwachukwu, 1982; Daramola, 1983; and Onwioduokit, 1996). Several factors contribute to the reluctance of female students in choosing science and science – related disciplines. These include cultural influence, parent's expectation, peer-group influence, religious influence, among others, the strongest factors being perhaps, culture and religion.

Nigerian society is still superstitious. Unfortunately most cultural beliefs are based on superstition. Some of these beliefs forbid girls from choosing certain careers. Religion has a parallel influence especially in the northern parts of the country where women are expected to stay behind closed doors (Purdah).

In recent times, there has been a lot of emphasis on ways of encouraging female students in making career in science. As cited by Onwioduokit (1996), bodies such as Girls and Science and Technology (GASAT), Girls in Science and Technology (GIST) in England, Women in Science Enquiry Network (WISENET) based in Australia, and the Nigerian Association of Women in Science, Technology and Mathematics (NAWSTEM), have done much in attempt to change the image of the girl child in the society.

In spite of all these attempts, it is doubtful whether there is a full participation of female students in science with particular reference to Akwa Ibom State. Hence the need for this study.

Purpose of the Study

Considering the attempts so far made to popularize science among female students in Akwa Ibom State, this study aims at investigating the extent of participation of female students in school science vis-à-vis their male counterparts. This invariable will show the extent to which the attempts to popularize science has been effective among the females.

Research Questions:

The study seeks to provide answers to the following research questions:

1. To what extent is the female students' participation in school science different from the participation of their male counterparts?
2. What has been the trend of female students' participation in school science?
3. Which year has the female students' participation in school science been the highest and which year has it been the lowest?

Research Hypotheses:

Based on the research questions the following hypotheses were tested in the study:

H_{0.1} There is no statistically significant difference between female and male students' enrolment in secondary school science subjects in (a) 1991 (b) 1992 (c) 1993 (d) 1994 (e) 1995 (f) 1996.

Research Method:

There are three categories of secondary schools in Akwa Ibom State in terms of ownership. These are government owned, community and private schools. Among the government owned schools are schools specially meant for the teaching and learning of science and are tagged "Senior Science Schools". There are five (5) of such schools in the State. Although students in other schools also offer Science, the highest concentration of science students

is seen in the science schools. In fact, all students in senior science schools were chosen for this study.

The study was also delimited to six (6) academic years (1991 – 1996) as well as the enrolment in the external Senior Secondary Certificate (SSC) Examinations in the years considered. This is because participation in science cannot be regarded as being meaningful if the candidate is not enrolled for an external examination.

All senior secondary 3 students that enrolled in the three fundamental science subjects – Physics, Chemistry and Biology in the senior science schools in the state from 1991 - 1996 formed the sample for the study. The admission lists for the years considered formed the instrument of the study.

This was equivalent to the enrolment list for SSC Examination as all students registered for science in SSCE.

Analysis and Results:

The data generated in the student were analysed as follows:

Table I: X² Analysis of the Enrolment of Science Students in Senior Secondary Certificate Examination (SSCE) in 1991

| School Location | | Enrolment | | C/o Enrolment | | L. Total X ² | Decision at P< .05 |
|-----------------|----------------|-----------|--------|---------------|--------|-------------------------|--------------------|
| | | Male | Female | Male | Female | | |
| Ibahachi | f _o | 24 | 10 | 71 | 29 | 34 | 5.76* |
| | f _e | 17 | 17 | | | | |
| Ndon Eyo | f _o | 50 | 18 | 74 | 26 | 68 | 15.06* |
| | f _e | 34 | 34 | | | | |
| Ididep | f _o | 70 | 15 | 82 | 18 | 85 | 35.59* |
| | f _e | 42.5 | 42.5 | | | | |
| Abak | f _o | 82 | 50 | 62 | 38 | 132 | 7.76* |
| | f _e | 66 | 66 | | | | |
| Oron | f _o | 100 | 22 | 82 | 26 | 122 | 49.87* |
| | f _e | 61 | 61 | | | | |

*Significant at P< .05

Critical X² value 3.84

It is shown on Table 1 above that there exists a significant difference between the enrolment of male and female students in science in all the five senior science schools in 1991.

Table 2: X^2 Analysis of the enrolment of Science Students in SSCE in 1992

| School Location | | Enrolment | | C/o Enrolment | | Total X2 At P< .05 | Decision |
|-----------------|-------|-----------|--------|---------------|--------|-----------------------|----------|
| | | Male | Female | Male | Female | | |
| Ibahachi | f_o | 50 | 14 | 78 | 22 | 64 | 20.25 * |
| | f_e | 32 | 32 | | | | |
| Ndon Eyo | f_o | 51 | 19 | 72 | 27 | 71 | 15.34 * |
| | F_e | 35.5 | 35.5 | | | | |
| Ididep | f_o | 36 | 15 | 71 | 29 | 52 | 9.31 * |
| | F_e | 25 | 26 | | | | |
| Abak | f_o | 150 | 14 | 91 | 09 | 164 | 112.78 * |
| | f_e | 82 | 82 | | | | |
| Oron | f_o | 80 | 27 | 75 | 25 | 107 | 26.25 * |
| | f_e | 53.5 | 53.5 | | | | |

- Significant at P< .05

Critical X^2 value = 3.84

As shown in Table 2 above, there exists a significant difference between male and female students' enrolment in science in the year 1992, considering all science schools in Akwa Ibom State.

Table 3: X² Analysis of the Enrolment of Science students in SSCE in 1993

| School Location | | Enrolment | | C/o Enrolment | | Total | X ² | Decision At P< .05 |
|-----------------|----------------|-----------|--------|---------------|--------|-------|----------------|--------------------|
| | | Male | Female | Male | Female | | | |
| Ibahachi | f _o | 55 | 10 | 85 | 15 | 65 | 31.15 | * |
| | f _e | 32.5 | 32.5 | | | | | |
| Ndon Eyo | f _o | 15 | 04 | 79 | 21 | 19 | 6.37 | * |
| | f _e | 9.5 | 9.5 | | | | | |
| Ididep | f _o | 40 | 17 | 70 | 30 | 57 | 9.29 | * |
| | F _e | 28.5 | 28.5 | | | | | |
| Abak | f _o | 150 | 59 | 72 | 28 | 209 | 39.62 | * |
| | f _e | 104.5 | 104.5 | | | | | |
| Oron | f _o | 50 | 09 | 85 | 15 | 59 | 28.49 | * |
| | f _e | 29.5 | 29.5 | | | | | |

- Significant at P< .05

Critical X² value = 3.84

The table above shows that in 1993, the enrolment of male and female students in science differs significantly in all the schools considered in the study.

Table 4: X² Analysis of Enrolment of Science Students in SSCE in 1994

| School Location | | Enrolment | | C/o Enrolment | | Total | X ² | Decision |
|-----------------|----------------|-----------|--------|---------------|--------|-------|----------------|-----------|
| School Location | | Male | Female | Male | Female | | | at P< .05 |
| Ibahachi | f _o | 40 | 14 | 74 | 26 | 54 | 12.52 | * |
| | f _e | 27 | 27 | | | | | |
| Ndon Eyo | f _o | 60 | 12 | 83 | 27 | 72 | 32.00 | * |
| | f _e | 37 | 36 | | | | | |
| Ididep | f _o | 69 | 24 | 74 | 26 | 93 | 21.77 | * |
| | f _e | 46.5 | 46.5 | | | | | |
| Abak | f _o | 101 | 59 | 63 | 37 | 160 | 11.03 | * |
| | f _e | 80 | 80 | | | | | |
| Oron | f _o | 81 | 10 | 89 | 11 | 91 | 55.40 | * |
| | f _e | 45.5 | 45.5 | | | | | |

- Significant at P< .05

Critical X² value = 3.84

Table 4 above shows a significant difference in the enrolment of male and female students who participated in science in 1994 in the schools considered in the study.

Table 5: X² Analysis of Enrolment of Science Students in SSCE in 1995

| School Location | | Enrolment | | C/o Enrolment | | Total | X ² At P< .05 | Decision |
|-----------------|----------------|-----------|--------|---------------|--------|-------|-----------------------------|----------|
| | | Male | Female | Male | Female | | | |
| Ibahachi | f _o | 13 | 05 | 72 | 28 | 18 | 3.56 | * |
| | f _e | 09 | 09 | | | | | |
| Ndon Eyo | f _o | 60 | 13 | 82 | 18 | 73 | 30.26 | * |
| | f _e | 36.5 | 36.5 | | | | | |
| Ididep | f _o | 71 | 18 | 80 | 20 | 89 | 31.56 | * |
| | f _e | 44.5 | 44.5 | | | | | |
| Abak | f _o | 100 | 63 | 61 | 39 | 163 | 8.40 | * |
| | F _e | 81.5 | 81.5 | | | | | |
| Oron | f _o | 39 | 10 | 80 | 20 | 49 | 17.16 | * |
| | f _e | 24.5 | 24.5 | | | | | |

- Significant at P< .05

Critical X² value = 3.84

Similar to other years considered earlier, Table 5 shows that the enrolment of male and female students in science differs significantly in 1995.

Table 6: X^2 Analysis of Enrolment of Science Students in SSCE in 1996

| School Location | | Enrolment | | C/o Enrolment | | Total | X^2 | Decision At $P < .05$ |
|-----------------|-------|-----------|--------|---------------|--------|-------|-------|--------------------------|
| | | Male | Female | Male | Female | | | |
| Ibahachi | f_o | 45 | 06 | 88 | 18 | 51 | 29.82 | * |
| | f_e | 25.5 | 25.5 | | | | | |
| Ndon Eyo | f_o | 43 | 20 | 68 | 32 | 63 | 8.40 | * |
| | f_e | 31.5 | 31.5 | | | | | |
| Ididep | f_o | 50 | 14 | 78 | 22 | 64 | 20.25 | * |
| | F_e | 32 | 32 | | | | | |
| Abak | f_o | 150 | 45 | 77 | 23 | 195 | 56.54 | * |
| | F_e | 97.5 | 97.5 | | | | | |
| Oron | f_o | 29 | 07 | 81 | 19 | 37 | 14.30 | * |
| | f_e | 18.5 | 18.5 | | | | | |

- Significant at $P < .05$

Critical X^2 value = 3.84

The enrolment of male and female students in SSCE in 1996 as it depicts their participation in science differs significantly, as shown in Table 6 above.

Table 7: Mean enrolment of male and female students in Science from 1991 – 1996 in Akwa Ibom State Senior Science Schools

| Year | Enrolment | | Total | Ratio of Male to Female (approx.) |
|------|-----------|--------|-------|-----------------------------------|
| | Male | Female | | |
| 1991 | 326 | 115 | 441 | 3:1 |
| 1992 | 369 | 89 | 458 | 4:1 |
| 1993 | 310 | 99 | 409 | 3:1 |
| 1994 | 351 | 119 | 470 | 3:1 |
| 1995 | 283 | 109 | 392 | 2:1 |
| 1996 | 318 | 92 | 410 | 3:1 |

Table 7 above shows 1995 as the year that the participation of female students was closest to their male counterparts. However, this improvement was not sustained.

In order to present a good picture of the enrolment, a graphical representation is shown as below:

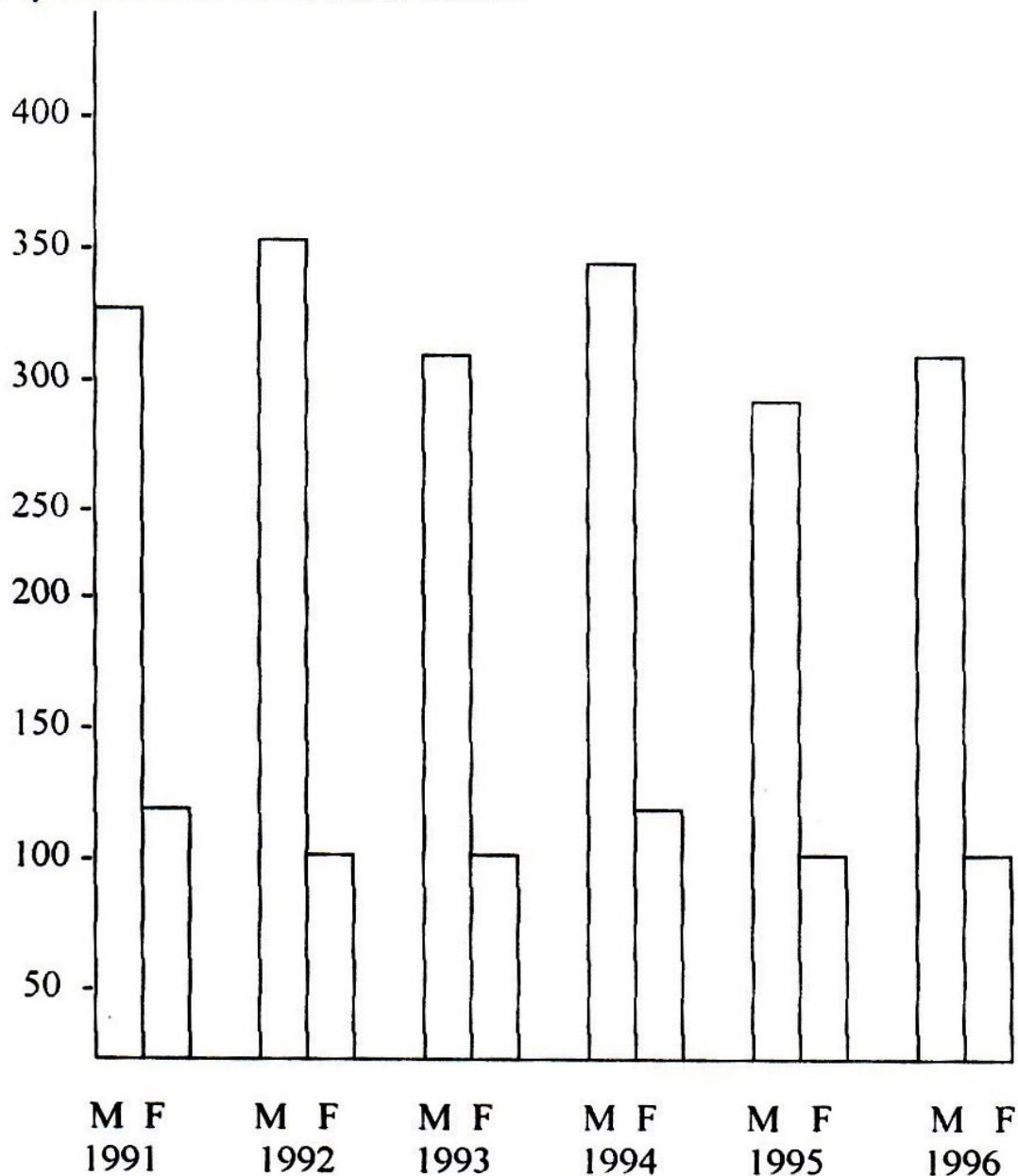


Figure 1: Graphical representation of enrolment

It is seen from the figure above that the highest enrolment (119) of the female students in science during the period reviewed was in 1994. The lowest (89) occurred in 1992. This gives the growth rate of female students per year vis-a-vis 14 male students per year. It is also seen that the growth in enrolment for both male and female is not consistent.

Discussion of Results:

Analyses of data for all the years considered show a consistent poor enrolment of female students in science compared to their male counterparts. This situation was found to be similar in all the senior science schools considered in the study. The finding confirms the outcome of some previous studies (Nuhu, 1996; Nworgu, 1996). As noted by UNDP Human Development Reports (1992), gender disparity remains very wide in education and wider still in sciences. This situation is not peculiar to Akwa Ibom State. Studies in other states – Yobe State (Idris and Olaosebikan, 1996), Cross River State (Madu, 1996), Kaduna State (Nworgu, 1996) and Gombe (Sallisu, 1996) among others have similar results.

The consistent poor enrolment of female students in science suggests that the on-going crusade on females' participation in science is yet to make a significant impact. Another disturbing face discovered in the study is that besides having a poor enrolment, there has not been an appreciable improvement over the years considered. This perhaps can be attributed to an unrelentless influence of culture and the society (Amiola and Sule, 1996).

Conclusion and Recommendation

The study has shown that the experience in Akwa Ibom State Science Schools is not different from what is happening in most states of the Federation. Females still lag greatly behind their male counterparts with respect of their participation in science/

It is therefore recommended that efforts be intensified in popularizing science among girls. Moreover some forms of incentives should be given to female students who are currently enrolled in science. This may take the forms of scholarship award, book grant, among other. All science oriented Women Association should evolve ways of encouraging girls to fully participate in science.

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