

ANALYSIS OF MALE AND FEMALE STUDENTS ENROLMENT IN PHYSICS: A CASE STUDY OF COLLEGE OF EDUCATION, AZARE, BAUCHI STATE

By

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Abstract

Science and technology have been recognized as the bedrock for scientific and technological advancement of any nation. A neglect of the education of female who make up more than half of the population of Nigeria has serious implication to the growth and economic development of this nation. If Nigeria is to achieve technological advancement there is the urgent need to address female (gender) education. Thus this paper discusses the role of science and technology in general and in particular female in physics education. Enrolments in physics for the period of ten (10) academics years were studied. The number and trend of female enrolment were compared with that of their male counterparts. The results revealed that less than nine percent (9%) of female students that enrolled for physics within the period of study; an indication that female students are becoming endangered species in physics education. Recommendations were made to address the problems.

Introduction

The state of science and technology in the country is now a matter of great concern to all. This arises from increasing realization that Nigeria cannot develop as rapidly as aspires without creating a adequate pool of scientific and technological man power at all levels of her working population. More than 50% of the total populations in Nigeria are women (Tahir, 1998 and Awolola, 2001). Thus, the role of women as partners in progress toward the realization of the most needed economic and technological advancement cannot be put aside. Studies have however shown that women have low representation in occupation related to science in general and physics in particular. (Ayeni and Idris, 2001, Aguakagua, 1995 and Aliyu, 2000).

It is important to note that the number of female students who proceed beyond secondary education level in Nigeria are less than 30% (Lawal, 2001). Out of this, the number that pursue studies in science and technology related courses are even lower (Ochor,1996). Many of them no longer study science and science related courses. The few that do scored lower than their male counterparts

(Eya and Mgbob, 1996). There is no doubt that the participation of women in science is very vital for the development of Nigeria, for the country and its citizens have a lot to gain from producing larger number of female scientists and technologists.

The role of physics in the quest for technological advancement is very critical because it is applied in all facets of life: medicine, industry, agriculture, telecommunication, and so on. Presently the position of women in physics is a reflection of their position in the society as a whole.

Gonzuk and Chogok, (2001) also reported from their classroom experience that generally, both boys and girls find physics difficult but girls are more discouraged by the difficulty and encouraged by success than their male counterpart. A survey of physics teachers available in Katagun local government area of Bauchi state conducted by the author in 2005, revealed that nine(9) physics teachers (three(3) B.Sc and six(6) NCE holders) serve the ten (10) secondary schools available. Of these nine physics teachers none was a female. The implications of this are the absence of a model for female students and a possible perception of physics as a male world where women are not welcomed in physics. The limited number of girls studying physics in secondary schools and tertiary institutions an indication that we lack qualified female physics teachers in our schools and are likely to continue in the same trend for a long time to come.

Purpose of the Study

The purpose of the study is to:

- (i) Identify the factors that affect the choice of physics as a course of study among the female.
- (ii) To measure the degree of female enrolment into physics
- (iii) To find a proper solution to all the above.

Statement of the Problem

The following problem informed the need to embark on this study.
Persistent low enrolment in physics by the female students over the years.

Research Questions

- (i) Why do we have a low enrolment in physics course?
- (ii) What is the level of female students' enrolment in physics?

Significance of the Study

This study has the following benefits.

- (i) it will identify the problems causing the low enrolment in physics among the female students.
- (ii) it will indicate the area of difficulty faced by the students offering physics as a course.

- (i) the research may point out the need for a revision of teaching methods.

Materials and Method

Sample: College of Education Azare in Bauchi State was used as a case study.

Population and Instrumentation

Matriculation list covering a period of ten (10) academic years (1997/1998-2006/2007) for NCE were collected from the records office of the college. Admissions (227 students) into the physics department were sorted out according to sex: from the records the total female student admission into the physics department were estimated.

Literature Review

Various factors have been identified from studies to explain this poor enrolment in physics, among these as identified by sharifat, 2002 was;

- (i) Lack of qualify teacher to teach the subject physics at the secondary schools level.
 - (ii) Poor method of teaching used by the teachers teaching the subject at the secondary schools level.
 - (iii) Lack of practical equipment affect the performance of students in physics in our secondary schools and this lead to low enrolment of students especially female in physics at the NCE level.
- Amadu, (2001) also identified in his work that;
- (i) lack of mathematical skills affect their enrolment in physics.
 - (ii) The abstract nature of physics leads to poor performance of students in the subject at the secondary schools which have negative effects in their enrolment at the NCE level.

Another factor identified by Gozale and Chogok, (2001) is lack of female physics teacher to teach physics at the secondary school level. If at the secondary school level, there are role model teachers of physics, which the female students can emulate, this would have attracted them toward the subject, but since the entire teacher teaching physics were all male, the female students might perceive physics as a male subject.

Analysis and Discussions

TABLE I: MALE AND FEMALE STUDENTS ADMISSION INTO PHYSICS DEPARTMENT ACCORDING TO SEX AT COLLEGE OF EDUCATION, AZARE

YEAR	MALE	MALE%	FEMALE	FEMALE%	TOTAL
1997/1998	15	100	-	-	15
1998/1999	13	100	-	-	13
1999/2000	18	100	-	-	18
2000/2001	19	100	-	-	19
2001/2002	11	100	-	-	11
2002/2003	24	88.89	3	11.11	27
2003/2004	28	93.33	2	6.67	30
2004/2005	24	100	-	00	24
2005/2006	21	91.3	2	8.70	23
2006/2007	38	80.85	9	19.15	47
TOTAL	211	92.95	16	7.05	227

Source: Record Office College of Education: Azare

From table I above, in 1997/1998 academics session, 15 were admitted into the department of physics, out of these numbers, no single female student was offered admission. Likewise in 1998/1999 academic session, 13 students were admitted into the department of physics, but all were males. In 1999/2000 academic session, eighteen (18) students were admitted into the department of physics, but were males. Likewise in 2000/2001 and 2001/2002 academic session, the admission into the department were nineteen (19) and eighteen (18) respectively, and all were males. In 2002/2003 the total admission into the department was twenty-seven (27) out of which only three (3) were females and rest twenty four were male. In the year 2003/2004 academic year a total of thirty (30) students were offered admission into physics department, out which two (2) were females and rest twenty eight were males.

The 2004/2005 academic session was another year without a single female student being admitted into the department. The total number of student's admission was twenty four and all were males. In the year 2005/2006, students admission into the department was twenty three (23) and out of this number only two (2) were females while the reaming twenty one (21) were males. During the year 2006/2007 academic year, there was an improvement in the number of female students being admitted into the department. The total admission was forty-seven (47) out of which nine (9) were females and the rest were males. The percentage admission increased from 8.9% to 19.15% in favor of females during the 2006/2007 academic year with nine (9) admissions.

TABLE II: MALE AND FEMALE STUDENTS ENROLMENT ACCORDING TO SEX AND LEVEL INTO PHYSICS DEPARTMENT AT COLLEGE OF EDUCATION AZARE

YEAR	100 LEVEL MALE	100 LEVEL FEMALE	200 LEVEL MALE	200 LEVEL FEMALE	300 LEVEL MALE	300 LEVEL FEMALE	TOTAL MALE	TOTAL MALE%	TOTAL FEMALE	TOTAL FEMALE %	TOTAL STUDENTS
1997/1998	5	-	4	-	7	1	16	94.12	1	5.88	17
1998/1999	6	-	5	-	4	-	15	100	00	00	15
1999/2000	7	-	6	-	5	-	18	100	00	00	18
2000/2001	8	-	7	-	6	-	21	100	00	00	21
2001/2002	11	-	8	-	7	-	26	100	00	00	26
2002/2003	21	3	11	-	8	-	40	93.02	3	6.98	43
2003/2004	26	2	21	3	11	-	58	92.06	5	7.94	63
2004/2005	20	-	26	2	21	3	67	93.06	5	6.94	72
2005/2006	18	-	20	-	26	2	64	96.97	2	3.03	66
2006/2007	34	7	18	-	20	-	72	91.14	7	8.86	79
TOTAL	156	12	126	5	115	6	397	94.52	23	5.48	420

Source: School of Science Examination Results (Academic Board).

Table II above shows the enrolment into physics department at college of education Azare, between 1997/1998-2006/2007. The results were sorted out according to level and sex. From the records, the total female student's enrolments in each level each year into the department of physics were estimated.

In the year 1997/19998 there was only five (5) students enrolled into 100 levels and all were male. In 200 level, four (4) students registered and were also males while in 300 level eight (8) students registered out of which only one (1) student was a female.

During the 1998/1999, academic year six (6) students enrolled into physics department at 100 levels and in 200 level five (5) students enrolled while in 300 level four (4) students enrolled. None of the levels had female enrolment.

From the table, it shows that this issue of no female enrolments into physics department trend on until 2002/2003 academic year when we have three (3) students enrolled into the department in 100 level, while 200 level and 300 level have no female enrolment.

In the 2003/2004 academic year the total enrolment into the department was sixty three for all the levels but only five (5) were females, the rest were males that enrolled into the department. The year that followed, 2004/2005, had no female students' enrolment into 100 level of the department of physics. There

were a total of seventy two (72) students enrolled into the department but for that year, only five (5) were females, two (2) in 200 levels and three (3) in 300 levels.

In the academic year 2005/2006, a total of sixty six (66) students enrolled into the department; out of which only two (2) were females and the rest were males. During the 2006/2007 academic year, there was a little improvement in the enrolment of female students into the department of physics. Seven (7) female students enrolled into 100 level and two (2) in 200 level, making a total of nine (9) female students that enrolled into the department of physics.

Studying tables I and II above, one will see that in both, the female enrolment was very low compared to that of the male. Table I clearly show that female students were not given enough admission opportunity into physics department, since admission table (i.e. table I) shows that each year the number of female admission is very low when compared with their male counterpart. This contributes to their low enrolment in the subject. In summary the following summaries the factors that contribute to the persistence low enrolment of female students in physics over the years.

- (I) Lack of dedicated and competent teacher whose presence and teaching methods could have attracted more girls.
- (II) Lack of a role model female teacher of physics in our secondary schools to prove to the female students that physics is not a male subject only.
- (III) Male to female admission ratio which is always higher in favour of male students.

Implications of low enrolment of female students for teaching of Physics in Nigerian Schools

The preceding facts no doubt, established the fact of low enrolment of females in physics. The low enrolment has definitely given birth to meager number of available NCE female physics teaches.

Another serious implication borne out of the low enrolment is the overloading of the very few available female physics teachers. In our secondary schools, it is not strange again to see a physics teacher engaged in the teaching of either chemistry or mathematics or integrated science without an increase in such teachers' take-home-remuneration. When such teachers eventually find a better alternative that puts less demand on them they quickly grasp it. This leads to brain-drain in physics education.

Again, there is also that implication of losing women who could be better advocates for aids in physics before the educational authorities. In our society to face reality, women are better attended to than men. So women could be better advocates for the promotion of physics education before government or any concerned body for request for teaching aids or other assistance in the

teaching field or for help for the association –Science Teachers Association of Nigeria. Women, by nature are more accommodating, ready to listen to student's problems and complaints, tender-hearted and sympathetic than men. These attributes are needed in the teaching of physics.

Conclusion and Recommendations

The research revealed that there is gender disparity in the enrolment of students into physics at the College of Education Azare. Males are far more in number than their female counterparts.

Based on these findings the following recommendations were made.

- (1) Scholarship should be provided for girls who shows potential interest in science discipline especially physics
- (2) Effort should be made by the Nigerian government in general and Bauchi State in particular to improve teaching of physics at the secondary schools level, equipping the laboratories and providing teachers on the job training, to encourage them on the job.
- (3) As much as possible only professionally trained physics teachers should be made to teach physics, not just teachers who studied related courses.

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