

COMPARATIVE STUDIES OF TRENDS IN GENDER ENROLMENT IN STM EDUCATION AT TERTIARY LEVEL: A CASE STUDY OF FEDERAL COLLEGE OF EDUCATION, KANO

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Abstract

Students' enrolments in STM education over a period of 30 years were studied. The number of gender enrolment in the first 5 years (1993 - 1998) and the second 5 years (1999 -2004) were sorted out. While the % of gender enrolment stood at 64% to 36% in favour of males in the first 5 years, it is 67% to 33% in the second 5 years also in favour of males. The statistics also shows an upward trend in the enrolment figure in the second 5 years even-though there is no impressive correlation in gender enrolment when rank correlation of the enrolment figures were computed. Possible factors responsible for these trends were highlighted and recommendations were made.

Introduction

Over the years, importance of STM education all over the world generally and in particular for our national growth has been stressed. The issue of female participation in Science and Technology in particular has generated so much interest, leading to involvement of numerous organizations both Governmental and Non-Governmental, Professional Subject Associations such as Science Teachers' Association of Nigeria (STAN), Nigeria Association of Technology Teachers (NATT), Mathematical Association of Nigeria (MAN), Chemical Society of Nigeria (CSN) and some educational organs of the United Nation Organization (UNO).

Between 1977 and 1985, the U.N. adopted various resolutions to ensure equal opportunities for men and women. In 1982, there was a UNESCO conference in Harare, which called for setting up of structures in Africa at the national level to develop, absorb, and use Science and Technology and distribute developmental tools among various groups of people. This called for continuous promotion of STM education at both formal and informal levels.

It is obvious that the awakening interest to have women particularly to participate more in STM education is a global issue (Okooboh *et al*, 2001). In the highly industrialized world where tradition and customs hold less sway on the people, the problem of inadequate number of women in science and technology is much less. The reverse seems to be the case in most developing countries of which Nigeria is one. However, the facts from all empirical researches is that women are underrepresented in all occupations dealing with Sciences, Mathematics or Engineering (Schwedes 2001). In Nigeria, the ratio of the population of men to that of women were about the same (1991 census). The roles of both genders as partners in progress towards the realization of the most needed economic and technological advancement cannot be put aside.

In the last decade a number of policy measures have been adopted by the authorities of Federal College of Education, Kano in order to address the problem of under participation of females in STM education within its catchments area. Such measure include:

1. The introduction of the Pre-NCE and Remedial Programmes in 1995.
2. Concession in terms of admission requirements into Pre-NCE programmes involving STM education.
3. Preparation of the College calendar in such a way that unsuccessful candidates into the university are given a chance in the STM education.
4. Career guidance and counseling freely offered by the college to encourage participation in STM education.
5. Seminars and workshops organized at school level by governmental and non-governmental organizations, professional subject associations to encourage active participation in STM education at tertiary institutions,

What impact has these policy measures had on the enrolment of females in STM education within the decade? How does a change in college administration affect these policies as reflected in enrolment figures in the two separate periods? The results of this study will go a long way to reveal the effectiveness or otherwise of these policy measures. Information obtained from these data will serve as a guide to the college administration and other similar institutions that might wish to adopt similar strategies.

Methodology

Matriculation lists covering a period of 10 academic sessions 1993/1994 - 2003/2004 were collected from the record office of F.C.E., Kano. Enrolments into the various departments under the School of Sciences were sorted out according to sessions. From these data, total numbers of male and female enrolments for two separate periods (1995 -1999) and (2000 - 2004) were estimated. Rank correlation of the figures of gender enrolment over the two periods were computed using Pearson's Correlation Coefficient V which is given as:

$$N_{XY} - \frac{N_X N_Y}{N}$$

$$\sqrt{\left\{ \frac{N_X^2 - (N_X)^2}{N} \right\} \left\{ \frac{N_Y^2 - (N_Y)^2}{N} \right\}}$$

The following assumptions were made on the computed values the correlation (Kurian, 1983).

Correlation coefficient value from	0.00 to 0.20 means negligible correlation.
	0.20 to 0.40 means low correlation
	0.40 to 0.60 means moderate correlation
	0.60 to 0.80 means substantial correlation
	0.80 means substantial correlation

Results and Discussion

STM Education is highly connected with the pace of development of any nation. It is used as indices for the potential for development (Williams, 1996). Participation of both genders in national development is very important for development will proceed rapidly if all nations' human resources are tapped in the development process.

Table 1: Enrolment in STM Education, F.C.E., Kano. (1994 – 1998)

Sessions	Biology	Chemistry	Int. Science	Mathematics	P. H. E.	Physics
	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F
1994/95	26 14 40 65 35	15 07 22 68 32	30 14 44 68 32	28 10 38 74 26	27 03 30 90 10	11 03 14 79 21
1995/96	23 12 35 66 34	13 10 23 57 43	58 19 77 75 25	21 09 30 70 30	31 03 34 91 09	13 02 15 87 13
1996/97	22 24 46 48 52	15 19 34 44 56	10 16 26 38 62	21 09 30 70 30	31 4 35 89 11	17 07 24 71 29
1997/98	58 39 97 60 40	37 28 65 57 43	26 11 37 70 30	33 18 51 65 35	11 09 20 80 20	08 05 13 61 39
1998/99	36 45 81 44 56	25 34 59 42 58	09 14 23 39 61	34 15 49 69 31	28 08 36 78 22	13 07 20 65 35
TOTAL	165 134 229 55 45	105 98 203 52 48	133 74 207 64 36	137 61 198 69 31	128 27 155 83 17	62 24 86 76 24

Sources: Academic Record Office, F.C.E., Kano.

Table 2: Enrolment in STM Education, F.C.E., Kano. (2000 – 2004)

Sessions	Biology	Chemistry	Computer Edu.	Int. Science	Mathematics	P.H.E.	Physics
	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F	N N N % % M F T M F
1999/2000	25 28 53 47 53	26 14 40 65 35	27 01 28 96 04	13 09 22 59 41	69 13 82 84 16	41 03 44 93 07	27 07 34 79 21
2000/2001	59 53 112 53 57	58 39 97 60 40	29 07 36 81 19	18 09 27 67 32	76 13 89 85 15	42 04 46 91 09	20 10 30 67 33
2001/2002	105 46 151 69 31	72 28 100 72 28	26 05 31 84 16	39 16 55 71 29	69 27 96 72 28	60 03 63 95 05	20 16 36 56 44
2002/2003	85 40 125 68 32	31 31 62 50 50	08 05 13 62 38	18 39 57 32 68	32 19 51 63 37	33 02 35 94 06	21 08 29 72 28
2003/2004	87 135 222 39 61	49 47 96 51 49	31 04 35 89 11	51 30 81 63 37	76 21 97 78 22	32 10 42 76 24	27 10 37 73 27
TOTAL	361 302 663 54 46	236 159 395 60 40	121 22 143 85 15	139 103 242 57 43	332 93 415 78 22	208 22 230 90 10	115 51 166 69 31

Sources: Academic Record Office, F.C.E., Kano.

Table 3: Correlation of Enrolment of Genders in STM Education, F.C.E., Kano.

Session	Biology	Chemistry	Computer	Int. Science	Maths	P.H.E	Physics
1994-1999	0.71	0.75	-	0.54	0.68	0.58	0.12
2000-2004	0.38	0.43	0.01	0.31	0.09	0.40	0.51

From above data, total enrolment in STM education stood at 1148 for the period 1994 -1999 leaving the male % enrolment at 64% and that of female at 36%. For the period 2000 - 2004, total enrolment stood at 2254 with male having 67% of this figure as against 33% for the female. Further, a careful study of the enrolment figure in Table 1 shows that enrolments for males were consistently higher than those of females in Mathematics, P.H.E., and Physics whereas female enrolment compared favorably with male enrolment in Biology, Chemistry, and Integrated Science and even recorded higher % in 2 out of the 5 sessions. On the other hand, in Table 2 there is a general increase in the genders participation in STM education. However, the gender enrolment figures show a negligible to moderate correlation as against the first period studied where a substantial correlation

is recorded in enrolment figure in some STM education. The low enrolment figure of females in P.H.E. might be connected with cultural background of the catchments area of the people studying in F.C.E., Kano while female's low enrolment in Mathematics and Physics may follow the general low pattern of females studying in these subjects (Okoooh *et al*, 2001).

Although there is no clearly defined pattern of increase in female enrolment, the policies introduced by the college can be said to have had some impact. The problem may have to do with the issue of implementation since the coming of the second administration clearly resulted in increased enrolment of both sexes particularly the females.

Recommendations

Governmental organizations such as National Mathematical Centre, Nigerian Educational Research and Development Council and Science and Technology based Professional Subject Associations to survey research practices that affect participation in STM education.

Educational Trust Fund (E.T.F.) should be geared towards procuring and rehabilitation of infrastructure that will aid STM education.

Encouraging active participation in the practical works and reducing emphasis on written examination.

Organized private sector and well-placed Nigerians should supplement government effort of cash reward granted students that excel in their various courses in Colleges of Education.

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