GENDER AND ACADEMIC PERFORMANCE OF COLLEGE PHYSICS STUDENTS: A CASE STUDY OF DEPARTMENT OF PHYSICS/COMPUTER SCIENCE EDUCATION, FEDERAL COLLEGE OF EDUCATION (TECHNICAL) OMOKU, NIGERIA

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ABSTRACT

This paper focused on gender enrolment gap and academic performance of college Physics students. A sample of eighteen female and eighteen male students were purposively selected as sample from the department of Physics/Computer science education of Federal college of Education (Technical), Omoku in Rivers state in the 2007/2008 academic session. The cumulative grade point average (CGPA) of the sample was analysed using mean, standard deviation and percentages. Four hypotheses formulated were tested using t-test. It was revealed that there was no statistical significant difference in academic performance between female and male students. Based on this, it was recommended that teachers in the department of Physics/Computer should still improve on their pedagogy skills so as to be able to impact on the students, stressing the importance of Physics in Technology, giving them the necessary motivation to learn especially in their introductory courses.

Key words: Gender, enrolment gap, academic performance.

INTRODUCTION

The increasing agitation for the rights of women over the year worldwide and indeed in Nigeria have led to studies on gender related issues. Observations and studies of scholars have revealed female is greatly marginalised in the world, Nigeria not an exception (Welch Deal, 2003; Okoye &Okafor, 2004; Agbakwuru &Okafor, 2008). Bassow, Udoh and Popoola cited in Adeosun (2008) noted that One of the areas of life which have been affected by gender difference is the field of science, precisely that of academic performance of students.

Physics is a discipline that has been plagued by many problems such as declining popularity and low enrolment especially in institutions of higher learning, poor academic performance in both external and internal examination and gender differences noticed in such performances. Gender roles affect familiarity with academic content, career aspirations ,attitude towards subjects, teachers expectation and preferred approaches and these in turn affect academic performance(Equal opportunities commission, 2001). Studies have revealed that in Sciences and Mathematics ,male students performed significantly better than female (Adeosun, 2008).Equally, some studies have found significant difference in academic in performance in Science and Mathematics between Male and female (Hazari ,Sadler and Tai, 2008).

However, Hazari et al (2008) argued that if females are well prepared ,feel confident and do well in introductory Physics ,they may be inclined to study Physics further. Halloun and Hestenes (1985) submitted that the primary objective of introductory Physics instruction should be to facilitate a transformation in the students' mode of thinking from the initial common sense knowledge state to the final Newtonian knowledge state of a Physicist. So, the controversy could therefore be said to continue as to which of the gender have a better academic performance in Physics. This paper

therefore assessed the gender difference in academic performance of Physics students of Federal College of Education (Technical), Omoku, Rivers.

The attrition of female studying Physics after high school is a growing concern to the Science Education community (Hazari, Sadler and Tai, 2008). The following questions were addressed in this study: does enrolment gap exists and is there a gendered achievement in favour of college Physics female students? If so, is the difference significant? This research was carried out to give a description of academic performance of females as compared to males in the Physics/Computer Science Education department of Federal College of Education (Technical), Omoku, Rivers state in the 2007/2008 academic session. The following hypotheses were formulated for the study.

Ho1: There is no significant difference in the academic performance of female and male NCE I Physics students of F.C.E. (Tech.), Omoku in 2007/2008 session

Ho2: There is no significant difference in the academic performance of female and male NCE II Physics students of F.C.E. (Tech.), Omoku in 2007/2008 session

Ho3: There is no significant difference in the academic performance of female and male NCE III Physics students of F.C.E. (Tech.), Omoku in 2007/2008 session

Ho4: There is no significant difference in the academic performance of female and male Physics students of F.C.E. (Tech.), Omoku in 2007/2008 session

Findings from this study will be useful to educational policy makers as it will reveal the state of Science education in the area of Physics as regards enrolment and gendered result of academic performance. This will in turn enable the Government to direct her effort towards the sustaining of students interest and eventually the growth and the development of Science and technology in Nigeria.

METHODOLOGY

The population of the study comprised all students of the department of Physics/Computer Science education of Federal College of Education (Tech.), Omoku in Rivers state. The study focused on all students in the 2007/2008 academic session .The session had eighteen (18) females and eighteen (18) males. The thirty-six (36) students constituted the sample for the study. All students of Physics department of F.C.E.(Tech.),Omoku combine with Computer as their second teaching subject.

Each student takes Physics, Computer, Education and general education courses. The total grade point of all scores of each student were divided by total units taken to give each students cumulative grade point average CGPA. The CGPA result of each student for NCE I, II and III levels were obtained from the department of Physics/Computer Science Education. The CGPA of the students were analysed using mean, standard deviation and percentages. T-test was used to test the hypotheses ($P > 0.05$) at two-tailed for each of the levels and for the whole session.

RESULTS AND DISCUSSION

Table 1: Total class enrolment of students in Physics/Computer Department of F.C.E. (T), Omoku between 2004-2008

Year	Total	Female	%	Male	%
2004	8	6	75	2	25
2005	13	9	69.2	4	30.8
2006	6	2	33	4	67
2007	17	5	29.1	12	70.9
2008	40	19	47.5	21	52.5
Total	84	41	48.8	43	51.2

Source: Fieldwork, 2008

Table 1 revealed how female students have shown interest in studying Physics for a period of five years from 2004-2008. The year 2008 recorded the highest enrolment of forty which also had the highest number of female students of nineteen. For the five years examined, forty one females enrolled in Physics department a little behind male students who were forty three.

Table 2: Mean rating, standard deviation and t-analysis of NCE I students.

Gender	N	Mean	Std	df	t-cal	t-crit	Ho
Female	9	1.89	0.32	19	-0.44	1.72	Accept
Male	12	2.08	1.44				

Source: Fieldwork, 2008

The result on table 1 shows that t-calculated -0.44 is lesser than t-critical value of 1.72. So, the null hypothesis which states that there is no significant difference in the academic performance of female and male NCE I Physics students of Federal College Education (Technical), Omoku in 2007/2008 session was accepted.

Table 3: Mean rating, standard deviation and t-analysis of NCE II students.

Gender	N	Mean	Std	df	tcal	t crit	Ho
Female	4	2.85	0.71	5	-0.95	2.0	Accept
Male	3	3.45	0.90				

Source: Fieldwork, 2008

On table 3 it was observed that hypothesis 2 which states that there is no significant difference in the academic performance of female and male NCE II Physics studentsof FederalCollege Education (Technical), Omoku in 2007/2008 session was accepted indicating that there is no significant difference in the academic performance of female and male NCE II Physics students.

Table 4: Mean rating, standard deviation and t-analysis of NCE III students.

Gender	N	Mean	Std	df	t cal	t crit	Ho
Female	5	2.06	0.38	6	-6.06	1.94	Accept
Male	3	3.77	0.39				

Source: Fieldwork 2008

Result on table 4 revealed that the null hypothesis which states that there is no significant difference in the academic performance of female and male NCE III Physics students of FederalCollege Education (Technical), Omoku in 2007/2008 sessionwas accepted. Hence, gender is insignificant in the academic performance of NCE III students.

Table 5: Mean rating, standard deviation and t-analysis of Physics students in the 2007/08 Session.

Gender	N	Mean	Std	df	t-cal	t-crit	Ho
Female	18	2.15	0.90	34	-3.20	1.69	Accept
Male	18	2.59	1.29				

Source: Fieldwork, 2008

Table 5 summarised the academic performance of all students in Physics /Computer Science Education. The t-calculated value of -3.20 is lesser then critical value of 1.69 thus falling within the acceptance region of the hypothesis that there is no significant difference in the academic performance of female and male Physics students of FederalCollege Education (Technical), Omoku in 2007/2008 session.

Table 6: Rate of Pass of Physics students in the 2007/2008 session.

Year	Gender	N/P	Total CGPA	% Pass
I	Female	1	17	40.5
	Male	2	24.95	59.5
II	Female	-	11.41	52.4
	Male	-	10.35	47.6
III	Female	-	10.3	47.7
	Male	-	11.3	52.3
Total	Female	1	38.71	45.4
	Male	2	46.6	54.6

*Probation = CGPA < 1. N/B: N/P = Number on Probation

Table 6 summarises the rate of pass of female and male students at each of the levels NCEI, II, III and for all students in the department in 2007/08 session. The male students in Year I and III had higher total Cummulative Grade Point Average (CGPA) of 24.95 and 11.3 respectively ending up with an overall CGPA OF 46.6 for the session. The female trailed behind with a total CGPA of 38.71.

Following the National Commission for Colleges of Education minimum standard, Year 1 students took nine Physics, eight computer courses and fourteen education and general education courses. Year 2 took eight Physics, nine computer and eleven education and general education courses. Year 3 students took five Physics, nine computer and ten education and general education courses with their project EDU 323 and teaching practise. In Year 1, only one female had a CGPA of 0.98 while two males had 0.67 and 0.64 putting them on probation. The three students had to repeat Year1. Across the three academic levels, no significant gender difference resulted from the t anlaysis.

Equally, in the whole department, no significant gender difference in academic performance existed between the sexes evident on table 5. Similar study by Abubakar and Eze (2010) revealed no significant gender difference in the academic

performance of Mathematics students of FederalCollege Education (Technical), Omoku in the 2007/2008 session, however, the females performed better.

CONCLUSION AND RECOMMENDATIONS

This study sought to give an overview of female Physics students academic performance of F.C.E.(Tech.),Omoku in the 2007/2008 session. It revealed that female students interest have only slightly improved over the years between 2004 and 2008.They only bridged the enrolment gap but they still trail behind the males. The females ended up with a 45.4 % pass while males had 54.6 %. Etuk (cited in Agbakwuru and Okafor 2008) however pointed out that in a society where roles have shackled women to the floor thereby preventing them from participating optimally at every level of the society's life and leadership, such can at best function at half steam rather than at full capacity.

In view of the above findings, it is recommended that female students should not have a discipline-specific gender bias because Potvin et al (2009) advocated that such a bias may negatively impact and contribute to the loss of females in Sciences, Technology, and Engineering and Mathematics field. They should see the employment -inducing status of college Physics, now that teachers at the Universal Basic education level are being provided with incentives NCE graduates are trained for. The teachers in the department of Physics/Computer should still improve on their pedagogy skills so as to be able to impact on the students, stressing the importance of Physics in Technology, giving them the necessary motivation to learn especially in their introductory courses. Increased sensitization of the public especially parent/guardian on the need to encourage their children/wards in education especially the girl-child. All existing laws against women and girl-child should be upheld and women organisation should be given the required power and support on their campaigns in empowering women.

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