

GENDER DIFFERENCES AS DETERMINANT OF ACADEMIC ACHIEVEMENTS IN SCIENCE BASED COURSES IN COLLEGE OF EDUCATION IKERE-EKITI, EKITI STATE, NIGERIA

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ABSTRACT

According to several measures, girls lag behind boys in science education. They also enroll in fewer terms, do not perform as well on tests, and demonstrate less interest in science and science related courses as they progress through school. The above formed the basis for this study which looked into gender differences as determinants of academic achievements in science based courses in colleges of education, Ikere-Ekiti, Ekiti State Nigeria. This study comprised of six integrated science combinations of part three students of school of science, College of Education, Ikere – Ekiti. Out of which two hundred and forty students were selected to form the subject of the study. The two instruments used for gathering information for the study were science achievement test and science attitudinal scale. The question raised was tested with the use of t-test analysis and it was concluded that there was significant difference in the achievements of male and female students when exposed to different activities while there was no significant difference in the achievements of male and female students when they are exposed to the same activity in science.

Keywords: *Gender differences, academic achievement, tertiary*

INTRODUCTION

The issue of gender equity in education has been the concern of highly placed educated women in the society for decades. Yet, the problem seems to continue regardless of several action plans by government in the past. What then is responsible for this inequity? Who and what does this affect and what can government do to reduce this inequity in schools and in systems, each of the issue and responsibilities of achieving gender equity in science and technology education in years to come.

In an international study, to find out what the pictures in the mind of upper school children about scientist are, or what he/she looks like and what he/she does. This study found out that the drawings by the children (both male and female) were mostly a white beard old man, with spectacle, wearing a lab coat and carrying a test tube, Whitelegg (1992). For girls in particular, these messages may be damaging especially when they are reinforced by a wide range of stereotyped image found in the media. However, the damaging image of scientific activity as male domain is not new over the recent years, and girls entering schools already carry quite a lot of

negative impression with them which influences their view of science, scientist and their engagement in science courses or subjects seems to be deteriorating as they go up the ladder. Most of the time, girls would have settled their mind that they don't belong in science courses by the virtue of their perspective based on the misrepresentations of scientist and their activities. It must be noted that to reduce gender inequity in schools as well as in the society, families have roles to play since it is the primary social institution of the child that the child first learn, what he knows from home; whether or not the view is stereotypical or a general circumstance. It is believed that in general, boys are socialized to be competitive, aggressive, team-oriented using a structure learning format and stronger discipline. The socialization of girls, however, is less formal and is primarily involved in more verbal interaction and social competence and confidence Edgar (1993).

The participation rate of girls in science and technology depends on the expectations that society has of its male and female. The objectives and organization of education, the images of science and technology present in the culture and the way these activities are pursued. With this in mind, educational institutions should establish a workable and affective program linking early primary, secondary and tertiary institutions to ensure that the success of girls in science and technology is achieved in the future. It really must be a combined effort between all educational facilities to allow for a smooth transition between stages of learning, so that consistency is not lost. Similarly, it is critical that educators feel empowered to make the necessary changes required to achieve gender equity in schools. Marsh (1994) outlines the "responsibilities of the schools and school systems to ensure the development and implementation of gender inclusive curriculum in all areas and to ensure appropriate professional development to support these activities.

No one disputes the claim that scientific knowledge and technological education are not uniformly available to the social sexes/groups in the world. In particular, it is generally recognized that girls and women have shown less interest in scientific and technological education. Most times they see sciences as a course or subject for males and men in particular. It has also been discovered in schools that girls seem not really showing interest in sciences which mostly resulted in low enrolment in science oriented courses. Also, most renowned scientists people have ever heard of are males such as Michael Faraday, Charles Darwin, Thomas Edison, Bill Gate and so on. Research has shown that boys performs better than girls in science and as well outnumber girls in science classes (Shakeshaft, 1995). Science still remain the pivot of national development and so for its efficiency, it should be a type of programme that accommodates boys and girls and so accessible and comprehensible for both sexes. Hence, this study focused on gender differences as determinants of academic achievements in science based courses in colleges of education, Ikere-Ekiti, Ekiti state, Nigeria. Based on the above, tentatively, there is no significant difference in the achievements of male and female students when they are exposed to the same science activity and when they are exposed to different

science activity. and attempts to provide answers to the following questions: The general purpose of this study is to determine the influence of gender on students' achievements in science based courses. Specifically, the study investigates the ratio of male students to female students in science based courses. It will also find out the influence of student's interest on their performance.

METHODOLOGY

A quasi experimental research type was adopted for the study. The population of the study was made up of six integrated science combinations of part three students' in the school of science, college of education, Ikere – Ekiti. The combinations are:

1. Biology/Integrated Science
2. Chemistry/Integrated Science
3. Computer/Integrated Science
4. Geography/Integrated Science
5. Integrated Science/Mathematics
6. Integrated Science/Physics

In all, two hundred and forty students were selected from the combinations through stratified random sampling technique. Allocation of male and female students to science activities followed random process. Each Could there be any significant difference in the achievements of male and female students when they are exposed to the same science activity and when they are exposed to different science activity group was identified with.

A – Male only

B – Female only

C – Male and female

These were also categorized as X and Y, while A, B is the X group and C, is the Y group. Science Achievement Test (SAT) and Science Attitudinal Scale (SAS) was the instruments used for data collection. The SAT was a 25 – items instrument used to assess the level of acquisition of concepts in tertiary science by the students. It was a multiple choice test with two alternatives that is, Yes or No one correct and the other detractor while the SAS was also a 25 - items instrument used to determine the interest of students to science subjects. Questions were raised in line with the purpose of this study with which it was required to (1) Agreed (2) Strongly agreed (3) Undecided, (4) Disagreed (5) Strongly disagreed. The instruments were validated and its reliability determined before it was used to collect the data used for the study. The administration and collection of all the necessary information were done during the normal class hours. One statistical procedure was employed to analyze the data. This was T-test analysis to determine the comparative nature of the effect of treatments.

RESULTS AND DISCUSSION

Table 1: Comparison of the means of the male and female students in SAT of group X in pretest.

| Treatment group | Subject | MScores | S.D | t-value |
|-----------------|---------|---------|------|---------|
| Male only | 120 | 9.6 | 5.43 | 0.4618 |
| Female only | 120 | 9.3 | 4.60 | |

Source: Field work 2010. At 0.05 level of significance, $df\ 238, t_c = 0.4618 < t_t = 1.645$

The result revealed that there is a significant difference in the background knowledge of the students. The mean scores of the two groups in post – test were also subjected to t-test analysis. The result is shown on table 2

Table 2: Comparison of the means of the male and female students in SAT group X in post – test.

| Treatment group | Subjects | Mean scores | S.D | t-value |
|-----------------|----------|-------------|------|---------|
| Male only | 120 | 14.30 | 2.45 | 62.58 |
| Female only | 120 | 9.70 | 1.68 | |

Source: Field work 2010 At 0.05 level of significance, $df\ 238, t_c = 62.58 > t_t = 1.645$

The result yielded significant difference in the achievement of the two groups in post-test, which showed that there was significant difference in the achievements of male and female students when they are exposed to different science activities.

Table 3: Descriptive independent group t – test comparing the mean scores of male and female students of group Y in SAT

| Sex | N | Xx | SD | Pretest | | | Post test | | | |
|-----|----|------|------|---------|------|------|-----------|-----|------|------|
| | | | | df | Tv | Tc | SD | df | Tv | Tc |
| M | 80 | 2.95 | 1.22 | 118 | 1.28 | 1.98 | 17.49 | 118 | 2.89 | 1.98 |
| F | 40 | 2.66 | 1.03 | | | | 16.70 | | | |

<0.01

The table above showed the result of an independent group t-test performed to compare the mean scores of male students (17.49) with that of female students (16.70 in the SAT) , this was not statistically significant, $t(118) = 1.47, P < 0.01$, indicating that there was significant difference between post – test mean scores of male and female students in SAT, hence, it showed that there was no significant difference in the achievement of male and female students when they were exposed to the same science activity. The results showed that male students alone in a group science activity performed better than their female counterparts and also discovered that there were no visible difference between the achievement of male and female students within the same group in science activity. It agrees with Shakeshaft (1995) that boys performed better than girls in science and as such outnumbered girls in science classes. This however does not overrule the fact that the problem of women in the present day society is caused by majority of our forefathers who saw nothing good in the education of their female children.

The result is clear that male students seem to be independent, team oriented self sufficient in their learning of science against the humiliation and harassment faced by their female counterparts in learning of science, negative expectations,

general views of women roles held by the traditional society, about housewife and motherhood as confirmed by Duyilemi (1996). Also, it is in support of Murphy (1996) who pointed out that gender difference in science is in favour of boys mainly and as such attributed this phenomenon to factors such as interaction frequency, time of exposure, curriculum contents and process of socialization which is in line with Dimitrov (1999) who was of the opinion that gender differences still existed within science classroom even though science is for everyone in a modern society.

CONCLUSION

The findings revealed that there was significant difference in the achievements of male and female students when exposed to different science activity. It also revealed that there was no significant difference in the achievement of male and female students when they are exposed to the same science activity. The study established that gender sensitive learning will aid effective science learning and the results are pointers directly and indirectly to area which have to be addressed in order to enhance the learning achievements of students in science if the government and other stakeholders in education industry could improve on the achievements of students through a gender sensitive learning. It is most likely that the nation will experience a turn around in scientific literacy as well as the economy.

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