A SURVEY OF GENDA DIFFERENCES IN PRIMARY SCHOOL PUPILS' PERFORMANCE IN BASIC SCIENCE AND TECHNOLOGY

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Abstract

The research was conducted at Demonstration Staff Primary School Federal College of Education (Technical) Bichi to explore the effect of gender differences in Basic Science examination mark scores among pupils in Primary 4. The study employs an ex-post factor research design. The population of the study involved all the primary 4 pupils in Bichi Education Zone. 52 pupils (30 male and 22 female) were randomly selected and their end of term examination result in Basic Science were used for the study. The result showed that there was significant difference in the academic performance of male and female pupils in Basic Science and Technology Concepts. It is recommended that the curricula should be equipped with teaching material and training policies that avoid gender stereo-typing.

Introduction

The purpose of the elementary (Primary) school is to introduce children to the skills, information, and attitudes necessary for proper adjustment to the community and society. Basically, the Subjects taught are Reading, Basic Science, writing, Spelling, Mathematics, Social Studies and Physical Education. In Most countries Basic Science Education is compulsory for all. In all nations of the world (Nigeria inclusive) science and Mathematics are given first attention due to numerous benefits from them (Ekeh, 2003). Despite the importance of Basic Science Education to the development of communities, the public outcry on the under-performance of students in the subject as well as low enrolment in the science subject disciplines, (Chemistry, physics, Biology) at the senior secondary level sends some signal that there is problem in the teaching and learning processes of Basic Science. The problem is more pronounced with the female students.

Poor performance of girl child could be as a result of gender disparity, the differences in performance can also be attributed to gender stereotyping which encourages boys more than girls to show interest in subject relevant and related to the roles expected of them in the society. Parents devote much of their time and resources on male child education than female, as women get married and stayed with their husband. It could be viewed broadly to include denial of access to education, early marriage, confinement to solitary living, subjugation by culture to accept choices forced on them, discrimination and harassment at work, political disenfranchisement from elective and political appointment and exposure to cruel mourning rites upon the death of their husband (Oniye, 2000).Despite the importance of science to human development, the preference and awareness of the pupils are predisposed by several limiting factors and conflict among which gender and science ability are the foremost aspect.

The major concern is to improve the academic performance of the pupils in science process skills that is applicable to the pupils' immediate environment. Educational system is disseminated with serious gender tribulations that need to be overcome. The culture regards male as superior which hinders full women participation to their potentials. This study surveys the gender differences in performance among Basic Science pupils.

Research question

Does gender difference influence performance in Basic science among primary school pupils in demonstration primary school?

Research Hypothesis

H₀: There is no significant difference in the academic performance of male and female pupils in Basic Science.

Methodology
The study was an ex-post factor design. The end of term results was used without manipulation. The data presented in this research were generated during teaching practice conducted at the Demonstration Staff School, Federal College of Education (Technical) Bichi which examined the effect of gender differences in relation to third term examination mark scores in Basic Science and Technology amongst the pupils in primary four. The study sample was made up to 58 pupils in intact classes comprising 24 girls 34 boys (see appendix for raw scores).

Proportionate sample the boys and girls were determined as follows;

Girls: $\frac{24 \times 52}{58} = \frac{1248}{58} = 21.52 \approx 22$

Boys: $\frac{34 \times 52}{58} = \frac{1768}{58} = 30.48 \approx 30$

Lottery method was used to draw a simple random sample in that event a set of 52 tickets each were assigned a number representing the pupils mark scores of 30 boys and 22 girls folded, thoroughly mixed up and drawn one by one. The serial number occurring on the tickets are considered as selected samples Table 1.

Instrumentation
Primary four third term Basic Science and technology examination questions; The Basic Science and Technology examination question was used to assess the pupil's performance which comprises of section A and section B with 20 items made from the following topic parts: classes of food , Food items and their functions, Measurement and weight, Physical and chemical change, Skeletal system.
Result
Research Question: Does gender differences influence performance in Basic science among primary school pupils?

To answer this research question, the mean and standard deviation of the male and female pupils were computed in table 1.

Table 1

Gender	N	$\bar{X}$	SD	Mean Diff
Male	30	64.37	18.47	
				5.68
Female	22	70.05	23.64	

From the table, the mean and standard deviation of the male and female students were 64.37; 18.47 and 70.05; 23.64 respectively. The mean difference was 5.68 which was relatively small. To confirm if the mean deviation was significant, the data was subjected to independent sample t-test at $p \leq 0.05$. The standard deviation was further subjected to Fisher formula for comparing sample standard deviations.

The results are presented in table 2.

Table 2: Statistics for the two independent selected samples

Variable	N	$\bar{X}$	$S.D$	$d.f$	t- cal.	P-value	Significant level
Female	22	70.05	23.64				n.s
				50	0.937	1.721	0.05
Male	30	64.37	18.47				ns

n.s = Not significant at P= 0.05

Discussion
From the result in table 2, $tC50 = 0.9371 > 0.05$ reveals that there was significance difference in the academic performance of the male and female pupils in Basic Science and Technology concepts. Hence the null hypothesis was rejected.

Performance of pupils in Primary four categorized by gender
The findings from the research revealed that the null hypothesis, Girls and boys are equally likely to score the same marks on Basic science ability indicated that there are significant differences in the mean scores. That is gender is determines the success or failure in Basic Science and Technology examination amongst the pupils. This result agrees with the findings of Kano (2004) that; gender does have effect on student's performance in science.

Conclusion
The results from the research shows that gender does have effect on pupil's performance in Basic Science and technology and concluded that there is significant difference between two values of Standard deviations. Hence the observed results are unlikely to occur just by chance. The confidence interval results are not significant. That is chance alone would rarely produce so extreme a result. The result from t- test indicated that the null hypothesis was rejected and accepts the alternative hypothesis. The data give evidence of girl/boys difference in mean Basic Science and Technology scores (t =0.937, df=21, P> 0.5) and concluded there is significant differences in the mean scores on basic science examination of the girls and boys. The confidence intervals for the difference between the two means, lies between - 6.49 and 17.85 which covers 0 value expresses that $H_0 : \mu_1 = \mu2$ cannot be rejected against the two sided alternative at the $\propto = 0.5$ level of significant and revealed that there are no innate biological or psychological reasons why girls should not do as well as boys if given the opportunity and if provided with adequate motivation.

Recommendations
Based with finding of the study the following recommendation are made

1. Performance in Basic science does not depend on gender. For this reason both girls and boys should be uniformly be optimistic to study sciences in the future.
2. Inspire parents and teachers to raise self-confidence and motivation among girls to pursue interests in science
3. The curricula should be equipped with teaching material and training policies that avoid gender stereo-typing, encourage balance in the gender composition of teachers and endorsement of female role models in professions typically dominated by men and Support research to further explore which factors shape gender differences in basic science study.

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APPENDIX

The data for girls are as follows:

18 24 38   20 48 53 58 67 67   73   75   77 93   94 97 57 72   73 75   75   90   94 97 97

The scores of the boys are shown below

14 32 35 36 38 44 48   37 50 72 49 57 60 57 63 57 63 61 62 70 72 71 67 74 72 74 62 77 81 85 77 96 97 91

Structure of questions

Section (A):The pupils were instructed to arrange the name of 10 common food items in a tabular form according to the work they do to the human body.
Section (B): Pupils were instructed to underline the correct answer. Every item was assigned a score of 3-marks respectively; accordingly the total score of 20-items was 60 marks.