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Influence of Gender Stereotyping on Achievement in basic Science among Upper basic School Students

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Abstract- The study examined the influence of gender stereotyping on achievement in Basic Science among Upper Basic Education School (UBES) students in Toto LGA, Nasarawa State, Nigeria. The study was a descriptive survey design. The population of the study consisted of all the public upper basic III students. The study employed a sample size of 300 students drawn from the population using simple random sampling. A researcher designed questionnaire titled "Gender Based Questionnaire on Students' Achievement in Basic Science" (GBQSABS) was used for data collection. Data was analysed employing descriptive statistics to answer the research question while, Chi Square statistics was used to test the research hypothesis at alpha = 0.05.The finding of the study show that gender stereotyping has no significant influence on students' achievement in Basic Science.

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I. Introduction

The influence of gender stereotyping in Basic Science education is an important issue especially, in creating awareness in its field of study. Basic Science education is a predominant cancer in the fabrics of students' achievement in the subject where there exists significant gender stereotyping (Umar & Samuel, 2018). Researches on gender stereotyping in Basic Science education have provided report indicating that there are no longer gender differences in the cognitive and psychomotor domains of students (Ola, Richter & Kotowska, 2014; Jusruk & Kalipeni, 2012 and Patten & Parker, 2012) though, others indicate that male students show higher achievement than their female counterparts (Oscar, Luis & Miguel, 2018 and Oludipe, 2012). Certain careers have been traditionally associated as males' domain, while others are associated as female's domain. For instance, careers in medicine, military or engineering are male dominated, while nursing, secretariat studies and home science are regarded the preserves of female (Danjuma, Onimode, & Ochedikwu, 2015 and Egbochuku, 2008).

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Researches also show that parents play significant roles in gender stereotyping of their children through socialization processes of the different roles they assign to their male and female children (Vleuten, Jaspers, Maas &Lippe, 2016 and Fausto-Sterling, 2012). For instance, boys are assigned to attend to the farm, cut overgrown weeds around their compounds and replace depleted tyres of their parents' vehicles, while girls would help in cooking and rearing their younger siblings (Fausto-Sterling, 2012). These gender stereotyping are gradually transferred to the school environment where students choose subjects in line with their gendered aspirations. Gender stereotyping therefore, impacts on students' achievements in Basic Science. A research by Umar and Samuel (2018) shows that there is no significant gender stereotyping influence on students' achievement in Basic Science. Similarly, earlier studies by Tayo-Olujubutu (2014), KorirandLaigong(2014) showed that gender did not influence achievement in the subject thus, suggesting that the more exposed the students are to the subject, the better their performances.

Achievement is the action of accomplishing an academic task successfully. Its purpose is to find out the cognatic position of a student at a given moment (Akani, 2017). The process has to do with testing the knowledge acquired by the student which helps the teacher and the student to evaluate and predict the degree of learning attained. It is useful in testing the retention of information and skill. It is also a determinant of the efficacy and efficiency of a given instruction (Kabutu, Oloyede & Bandele, 2015).

World globalization and urbanization have brought about transformation in science, technology, social, cultural and economic challenges to humanity in particular and nations, like Nigeria, in general to the extent that such transformations especially, in education have targeted human capital development as their specific goals (Umar & Samuel, 2018; Ifechukwu, 2013).

In Nigeria, for instance, the National Economic Empowerment and Development Strategy (NEEDS) identifies the country's economic achievement through transformation and sustenance of the educational processes which spurs individuals through technological development (Samuel 2017). In line with challenges posed by the transformation, the

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government instituted two major curriculum reforms that gave birth to the Basic Education Platform (Umar & Samuel, 2018;Igbokwe, 2015). Thus, a 9-year Basic Education Curriculum (BEC) of 2008 to 2014 and a Revised 9-year Basic Education Curriculum of 2014 to date were restructured and integrated to fit the educational challenges at the Basic School levels. The exercise was aimed at encouraging innovative teaching and learning as well as promoting holistic approach to science education.

In order to further address the challenges, the National Education Research and Development Council (NERDC) has produced teachers' guides for all the core subjects and the elective ones. This was aimed at ensuring effective implementation. Similarly, series of national workshops using interactive and variety-based methods were organized to train teachers in the operations of the teachers' guide for effective delivery of the Basic Science Curriculum (Obioma, 2011 & NERDC, 2013). The distribution of subjects in accordance with the BEC curriculum is in Table 1.

Table 1: Structure of Upper Basic Basic Education Curriculum

Upper Basic Education Curriculum (Basic 7-9)		
S/N	Core compulsory subjects	Elective subjects
1	English Language	Agriculture
2	One Major Nigerian Language(Hausa, Igbo or Yoruba)	Home Economics
3	Mathematics	Arabic Language
4	Basic Science	Business Studies
5	Social Studies	
6	Civic Education	
7	Cultural & Creative Arts	
8	Christian /Islamic Religious Studies	
9	Physical and Health Education (PHE)	
10	Basic Technology	
11	Computer Studies/ICT	

Source: National Educational and Research Development Council (NERDC), Nigeria (2008).

Basic Science is the first form of science a student encounters at the secondary school level; hence, it prepares students at the Basic School levels for the study of core science subjects at the Senior Secondary school level (Bukunola & Odowu, 2012). This implies that for a student to study single science subjects at the Senior Secondary school level successfully, such a student must be well grounded in Basic Science at the basic school level (Samuel, 2017).Despite the importance of Basic Science in the country's quest for technological advancement, there has been seeming ineffectiveness in the teaching and learning of the subjects which in turn is strongly affecting the attainment of the country's laudable objectives and goals to developing a scientific and technologically literate citizenry.

From the foregoing, Nigeria as a developing nation is in dire need of scientifically and technologically literate citizenry to be able to catapult her to the level of developed nations and to address the aspiration of the country to be among the first twenty economically developed countries in the world by the year 2020 (Achimugu, 2016).

The aim of this study was to examine the influence of gender stereotyping on Basic Science achievement among upper basic III students. Specifically, the study explored the influence of gender stereotyping on the achievement of the students in Basic Science.

a) Research Question

What is the influence of gender stereotyping on students' achievement in Basic Science?

b) Research Hypothesis

Gender stereotyping has no significant influence on students' achievement in Basic Science.

II. Methodology

Descriptive survey design was employed for the study. The population for the study comprised all public Upper Basic III students in Toto Local Government Area of Nasarawa State, Nigeria. The sample was made up of 300 students drawn from the 16 public UBES in the area using simple random sampling techniques. Out of the 16 schools, 5 were randomly selected from where the 300 students were sample using purposive sampling. The researcher developed as instrument titled "Gender Based Questionnaire on Students' Achievement in Basic Science" (GBQSABS) for data collection. The instrument comprised Sections A to E where, section A elicited personal data from the respondents while, Sections B to E were made up of Likert-type 40-items with options A–D that tested the students' knowledge and application of selected topics in Basic Science.

The instrument was validated by experts in Test and Measurement from the Nasarawa State University, Keffi, Nigeria and wastrial tested on a representative sample which did not participate in thefinal study. Cronbach's Coefficient Alpha was used to determine the reliability of SPSAQ and the reliability coefficient was found to be 0.83suggesting that the items had internal consistency levels and were reliable for the study descriptive statistics was used to answer the research

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question while Chi Square statistics was used to test the research hypothesis at alpha = 0.05.

Finding

Research Question: What is the effect of gender stereotyping on students' achievement in Basic Science?

The result to answer the research question is presented in Table 2.

Table 2: Mean and Standard Deviation (SD) of the Influence of Gender on Students' Achievement

Subject	Male		Female	
	Mean	SD	Mean	SD
Basic Science (First test)	3.24	0.68	3.24	0.720
Basic Science (Second test)	3.00	0.90	3.22	0.750
Average mean	3.12		3.23	

The results on Table 2 show the mean responses on the two tests and academic achievement of the students. The male and female students agreed with all the items with average mean scores of 3.12 and 3.23 respectively, for male and female students.

Table 3: Test of hypothesis using Chi-Square

Variable	N	Mean	SD	Df	X^2-cal	X^2-crit	Level of Sig.	Remark
1st test	150	3.22	0.97	12	2.7	21.03	0.05	Accept
2nd test	150	1.38	0.35					

The results on Table 3 reveal that theX^2-crit (21.03) exceedsX^2-cal (2.7) at degree of freedom (12) with alpha = 0.05. Hence, the null hypothesis was accepted, implying that gender stereotyping has no significant influence on students' achievement in Basic Science.

The result of research question one indicates that there is no significant relationship between gender stereotyping and academic achievement of students in Basic Science. This may be a result of insufficient facilities for teaching and learning which has affected the extent of students' achievement. This finding agreed with the view of (Umar & Samuel, 2018; Faisal, Shinwari & Hussain, 2017; Ogbianigene, 2014 and Kola, 2013). Thus, for the educational system to acquire the expected goals and objectives there is need for sufficient provision of the necessary facilities that will enhance effective teaching and learning among the students.

III. Conclusion and Recommendations

Based on the finding, it is concluded that gender stereotyping does not influence students' achievement in Basic Science. It is therefore, recommended that gender stereotyping should be provided for adequate teaching and learning processes/procedures. More so, it should be provided to students by helping them to generate independent learning for sustainability irrespective of gender stereotyping socialisation.

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