

IMPACT OF GENDER AND QUALIFICATION ON TEACHERS' EFFECTIVENESS IN TEACHING BASIC SCIENCE AND TECHNOLOGY IN PRIMARY SCHOOL IN FEDERAL CAPITAL TERRITORY, ABUJA

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ABSTRACT

The study assessed the impact of gender and qualification on teachers' effectiveness in teaching Basic Science and Technology in primary schools in Federal Capital Territory, Abuja. Two research questions and two null hypotheses guided the study. The study adopted expo -facto research design. The population of the study 9,193 Basic Science and Technology (BST) primary school teachers in FCT. A sample size of 1120 BST primary school teachers was drawn for the study using dual-stage sampling techniques. The instrument for data collection was an observation schedule titled: "Observational Schedule for Assessing Primary School Teachers' Acquisition of Required Skills for Effective Teaching of Basic Science and Technology (OSAP-TARSETBST)" developed by the researcher. Data collected were analyzed using mean and standard deviation to answer the research questions, while the hypotheses were tested using t-test statistic and Analysis of Variance (ANOVA) at 0.05 level of significance. The study among others revealed that both gender; and teachers' qualifications were statistically significant factors on the extent to which BST primary school teachers possess required skills for teaching Basic Science and Technology. Based on the findings of the study, the researcher concluded that primary school teachers exhibited the required skills for teaching BST to a great extent. However, they lack required skills such as ability to carry out experiments, interpret result of the experiment, improvisation by constructing things, grouping pupils to accomplish a given task and consideration for individual difference among pupils. It was therefore recommended among others that: In-service educational training, workshop and seminars should be develop to facilitate the acquisition these required skills they are lacking.

Introduction

Nigeria Educational system in has undergone different changes of which Universal Basic Education is one. The Universal Basic Education programme has been initiated into the Nigerian education system so as to provide functional and effective education for its citizenry and also as a way of eradicating illiteracy, ignorance and poverty among Nigerians (Yusuf & Ajere, 2009). Universal Basic Education Programme is an educational reform programme of the Federal Government of Nigeria introduced to serve as a catalyst for achieving free, compulsory and universal 9-year education for every Nigerian child of school age (Federal Republic of Nigeria, 2012; Damole, 2012). As a result, the existing curricula for primary and junior secondary schools were reviewed, restructured and re-aligned to fit into a 9-year Basic Education Programme (Obioma, 2007). Hence, the subjects offered at these levels of education are affected with some modifications. The Primary Science for 6 years primary education was restructured into Basic Science and Technology (BST) for lower basic level primary1-3 and

middle basic level (primary 4-6) and integrated science to Basic Science (BS) for upper basic level (JSS 1-3) (Adeniyi, 2007; & Damole, 2011).

Basic Science and Technology is one of the subjects for every Nigerian school child at the primary education level. It is a product of the restructuring and integration of four primary and junior secondary school curricula namely Basic Science, Basic Technology, Physical and Health Education and computer studies/Information technology communication (FME, 2012). FME outlined the objectives, as to develop interest in science and technology, acquire basic knowledge and skill in science and technology. Others are to apply scientific and technological knowledge and skills to meet contemporary societal needs, take advantage of the numerous career opportunities provided by science and technology, become prepared for further studies in science and technology, avoid drug abuse and related matters and safety and security consciousness. Basic Science and Technology is often referred to as a subject that offers students the onset and preliminary knowledge and training to acquire the necessary skills in applied science, technology, agricultural, industrial, commercial, economic development among others and to afford pupils with early basic scientific awareness to solve problems.

Basic science and technology is a very important subject that can promote national development. This is because no nation can develop without recording successes in science and technology. Many developed nations of the world such as America, Germany, France, among others, boast of several scientific inventions which make them to be rated as the world powers (Baiyelo 2015). For instance, Electricity, aircraft, telephone, television, computers and other form of machinery could not have been invented without basic science and technology. In this sense, modern gadgets in all aspect of human comfort are inventions of science and technology. This therefore implies that a nation that lacks the necessary basic science and technology will have to depend on other developed nations for the existence of its people. Such a nation cannot be said to be independent because it has to depend on the whim and caprices of other nation with the necessary basic science and technology. A nation without basic science and technology will experience difficulties in feeding its people because even agriculture requires the application of basic science and technology (Omatayo, Ihereme & Maduwesi, 2008). Thus, the importance of science and technology to national development cannot be underestimated.

Basic Science and Technology has been defined by some researchers. According to Omiko (2016), Basic Science and Technology is an introductory course to the study of the sciences in senior secondary schools. It involves the study of elementary biology, anatomy, earth/solar system, ecology, genetics, chemistry, physics and engineering as a single science subject in the Junior Secondary school (Nwafor, 2012). This implies that, Basic Science and Technology is a subject that prepares the students for the study of core science subjects like Physics, Chemistry and Biology at the senior secondary school level. Basic science and technology offers the basic training in scientific skills required for human survival, societal transformation and sustainable development. Basic science and Technology has continually brought about positive changes in our society and the world as a whole. Indeed our everyday life appears to be controlled by science and technology. That is why today children require a wider scope of knowledge and competence to cope with the changes at a time when there are persistent

deficiencies in Nigerian educational system (Omatayo, Ihereme & Maduewesi, 2008; & Alaba, 2010).

In spite of the overwhelming importance of Basic Science and Technology and the laudable curriculum that has been designed for the subject at the basic education levels, the nature, practice and product of Basic Science and Technology education as reflected in pupils' academic achievement has continued to be discouraging (Omatayo, Ihereme & Maduewesi, 2008). According to Akpan (2012), the structures and appropriate activities that foster effective implementation of the curriculum are either inadequate or lacking in Nigerian schools. Furthermore, Afuwape and Oriola (2017) observed that among the myriad of challenges of Basic Science and Technology teaching in Nigeria are the issues of teacher quality and development, lack of enough specialist teachers; dearth of relevant support materials for teachers and inadequate supervision and mentoring of teachers. Consequently, the academic achievement of pupils in basic science and technology has been underwhelming. In the Federal Capital Territory (FCT), Abuja Nigeria for instance, evidence gathered on the academic achievement of pupils transiting to junior secondary school (JSS) shows that only 48%, 44%, 45%, 38% and 41% of the pupils passed well or had good results to be given admission into junior secondary schools and basic science was one of the subjects that recorded higher number of failures from 2013-2017 (Primary Education Board, Statistics Unit, FCT Abuja, 2017). The cause of this higher number of failures to the best of the researcher knowledge is yet to be figured out and the trend of below-average performance has become a serious issue for all stakeholders to ponder on.

Consequently, if the desired aim of a scientifically and technologically literate citizenry is to be achieved in Nigerian schools, then steps must be taken to arrest the undesirable situation. One important step to take can be to assess the standard of teaching of the subject which has to do with teachers' effectiveness in teaching Basic Science and Technology at the primary education level. This is because the primary education level lays the foundation for secondary and tertiary education. Therefore, for individual to be able to study any single or combined science subjects at the secondary school level and beyond successfully, such a person must have been well-grounded in Basic Science and Technology during primary school education.

Primary school education is the level of education recognised for developing in children literacy and numeracy skills (Nzeribe, 2004). It lays the foundation upon which other levels of education are built. Therefore, any inadequacy at this level may affect the successful completion or otherwise of the other levels of education. The Federal Republic of Nigeria in her National Policy on Education (FRN, 2004) indicated that primary education is the key to the success or failure of the educational system. The policy defined primary education as the education given in institutions for children aged 6-11 years plus. The policy also outlined the objectives of primary education as to: inculcate permanent literacy and numeracy and the ability to communicate effectively; lay a sound basis for scientific and reflective thinking; give citizenship education as a basis for effective participation in and contribute to the life of the society. Others are to mould the character and develop sound attitude and morals in the child; develop in the child the ability to adapt to the child's changing environment; give the child the opportunity for developing manipulative skills that will enable the child function effectively in the society within the limits of the child's capacity; and provide the child with basic tools for further educational advancement, including preparation for trades and crafts

of the locality (FRN, 2004: 14). In this study, Primary school education is define as the foundation level of education that develops in the children literacy and numeracy skills.

Thus, the importance of primary education cannot be overemphasized. According to Akinbote, Odu-oluwu and lawal (2001), the period of primary education is crucial in the life of an individual in particular and the society in general. Therefore, the introduction of Basic Science and Technology at the primary education level exposes the pupils to logical thinking and scientific methods. This prepares the pupils for higher aspirations in the field of sciences and determines to a large extent, their likeness or otherwise for science and technology related courses or disciplines in further academic pursuits. However, the extent to which pupils achieve from the teaching and learning of Basic Science and Technology may depend largely on teachers' effectiveness in teaching the subject.

Teachers' effectiveness may tell a lot about how children develop in Basic Science and Technology. This is because no matter how laudable a curriculum is planned, its success will depend mainly on the characteristics of the teacher as they determine what happens during teaching and learning (Igbokwe, 2009). Kolawole (2011) asserted that for children to show interest or not, like or dislike any subject, it depends on the teachers and how effective the teachers are. Kolawole further explained that the implementation of any curriculum depends on the quality of teachers and their effectiveness in the teaching and learning process.

Teachers are instrumental in the curriculum implementation process. Ihebereme (2010) views teachers as trained individuals that translate educational objectives to the pupils through teaching and learning process. According to Ihebereme, the teacher is also expected to interpret the contents and learning experiences as stated in the curriculum. In this study, teachers can be viewed as individuals who are trained in the theory and practice of the teaching profession who has acquired the skills to be able to impart knowledge to the learners. High learning outcomes can be regarded as an indication of teachers' effectiveness.

Teachers' effectiveness is a recurrent concept in education literature. Teacher effectiveness, according to Altaf (2012) typically refers to a collection of characteristics, competencies and behaviours of teachers at all educational levels that enable learners or students to achieve desired learning outcomes, which may include the attainment of specific learning objectives as well as the broad goals. In the same vein, Prasad and Prasad (2005) views teachers' effectiveness as the attribute of teachers who possess the capacity or potential of having positive impact on students' learning, behaviour and attitudes. In line with Matter (2015), an effective teacher must possess the qualities of creating a learning environment and ability to successfully deliver instruction. For the purpose of this study, teacher effectiveness referrers to the ability of a teacher to possess requisite skills and apply such in achieving the objectives of teaching and learning. Given these definitions and explanations, teacher effectiveness has to do with the abilities and competencies exhibited by the teacher during teaching and learning in order to promote learning outcomes and consequently, achieve some predetermined objectives or goals. Effective teachers are those that possess the knowledge and skills needed to attain the goals and must be able to use that knowledge and those skills appropriately if these goals are to be achieved. According to Bern (2004), an effective teacher is one who adequately plan the lesson to deliver and who employs appropriate teaching

methods, strategies and skills in transmitting the right knowledge, skills and abilities to learners in expectation of higher learning outcomes.

In line with the parameter of an effective teacher, Kolawole, (2011) observed that many primary school teachers are still not adequately prepared to teach Basic Science and Technology. Studies also reported that poor preparation, inadequate trendy science material resources and equipment to enhance teaching, the use of inappropriate teaching methods, among others have resulted to poor achievement of the objectives of Basic Science and Technology (Oloube, 2005 & Ihebereme, 2010). Also, Agbayewo (2005) observed that the teaching of Basic Science and Technology, Mathematics and other science related subjects that require innovative techniques still tend to be traditional and devoid of some innovations. Agbayewo asserted that the much valued scientific attributes and skills can only be inculcated in the children if they are actively involved in exploring their environment. Adora (2003) adduced that the present weakness in Basic Science and Technology education in Nigeria seems to be related to, among others, unconducive learning environment, unmotivated teachers and inadequate teaching and learning materials as well as ineffectiveness in teaching the subject on the part of the primary school teachers. Consequently, to ensure full realization of the objectives of Basic Science and Technology at the primary school level, there may be need to periodically carry out proper assessment on teachers' effectiveness in teaching the subject. This is because such assessment may help to provide useful insights into the areas of strength and weaknesses in the teaching and learning of Basic Science and Technology. With the understanding of teachers as a strong factor in teaching and learning of Basic Science and Technology, the researcher is of the view that teachers' variables such as level of academic attainment or academic qualification and gender may affect learning outcome. For instance, Tella (2008) reported that teachers' educational qualification is another variable that is seen to affect learning outcomes. Nonetheless, this claims by Tella is faced with contradiction in findings therefore necessitates other research efforts in order to provide enough empirical evidence for drawing reasonable conclusion about these variables. For instance, among the variables, teachers' qualification has been adduced to have seriously influenced the teaching and learning process.

Teachers' qualification is characterized by the level of education attainment and certificate acquired by teachers that qualify them to teach at a given level of education. Abe and Adu (2013) and Wiki (2013) viewed teachers' qualification as a number of academic and professional certificates and or degrees that enables a person to become a registered teacher in primary or secondary school and even tertiary institution. A study by Adeyemi (2008) reported that higher teachers' qualification increases their awareness of diversifying search for new ideas, new commitments and new pedagogies that will facilitate teaching and learning. This implies that teachers' qualification may influence the teaching and learning of Basic Science and Technology in FCT, however, this remains a speculation and calls for empirical verification

Teachers' qualification has been viewed as the certificates or degrees obtained by teachers after undergoing necessary educational programmes and trainings to become teachers, probably the variations in the qualifications of primary school teachers may affect their effectiveness in teaching Basic Science and Technology. Moreover, in Nigeria, both teachers who are academically qualified and those that are professionally qualified are employed to teach at

the primary and post primary school levels (Ahiauzu & PrinceWill, 2011). Academically qualified teachers, according to Edu and Kalu (2012) are those who have academic training as a result of enrolment into educational institution and obtained qualifications such as HND, B.Sc, B.A. and M.A. among others while professionally qualified teachers are those who got professional training that gave them professional knowledge, skills, techniques, aptitudes as different from the general education. Such teachers certificates include TCII and NCE or and degrees like B.Ed., B.Sc. Ed, B.A. Ed, and M.Ed, among others. These differences in qualifications may likely influence the teaching of Basic Science and Technology positively or negatively. Thus, it becomes necessary in a study like this to find out the moderating influence of teachers' qualification on their effectiveness in teaching Basic Science and Technology at the primary school level. Teachers' qualification can be referred to as the highest certificate acquired by a teacher or the highest level of education attained by the teacher upon which he or she is employed to teach. Apart from teachers' qualification, another variable that may influence teachers' effectiveness is their gender.

Gender influence in teaching and learning has become a recurrent issue in education literature generally. The concept has been defined by researchers with slight variations. Okoh (2007) and Igboegwu and Okonkwo (2012) defined gender as a socially constructed definition of women and men. According to these authors, gender is defined in relations to the ways in which a culture or society defines rights, responsibilities and identities of men and women in relation to one another. Similarly, according to Yang (2010), gender refers to the social attributes and opportunities associated with being male and female and the relationships between women and men; girls and boys, as well as the relations between women and men. Therefor the researcher viewed gender as a cultural construct that distinguishes the roles, behaviour, mental and emotional characteristics between males and females as developed by a society. This implies that gender

These socially defined attributes that distinguishes the roles, behaviour and emotions of males and females may also influence teachers' activities in the classroom. A study by Akiri and Ugborugbo (2008) revealed that there was a significant relationship between teachers' gender and learning outcomes. Khurshid and Zahur (2013) revealed that female teachers were more effective in teaching than the male teachers. On the other hand, Dee (2007) examined whether teachers' gender affects students' outcome and found that teachers' gender was not a significant factor in this respect. Also, Awodun et.al, (2015) reported significant difference in the performance mean scores of boys taught by male and that of those taught by female Physics teachers. There is significant difference in the performance mean scores of girls taught by male and that of those taught by female teachers and there is significant difference in the performance mean scores of students taught by male and that of those taught by female Physics teachers.

This inconsistency in the findings raises questions about the state of affairs that currently exist on this issue, particularly the extent to which gender influences teachers' effectiveness in teaching Basic Science and Technology at the primary school level.

Literature has however, shown that most primary school teachers are not usually adequately prepared for teaching Basic Science and Technology despite all the effort and expenditure made by the government of Nigeria and other relevant stakeholders in the education sector

for proper implementation of school curriculum, the teaching of Basic Science and Technology in primary schools have not yield the expected result. This could be due to teachers' lack of the required skills or abilities for effective teaching of Basic Science and Technology at this level of education which can have negative effect on pupils' learning in the subject.

Worthy of note is that, poor foundation in Basic Science and Technology at the primary school level of education will likely lead to failure or poor achievement of students in science subjects and disciplines at the secondary and tertiary levels of education. Hence, considering the critical role played by teachers in the teaching and learning of Basic Science and Technology at the primary school level, it becomes necessary to periodically conduct an assessment of teachers' effectiveness with emphasis on the extent they possess the required skill in teaching Basic Science and Technology, which is the essence of this research.

Statement of problem

Many developing nations, including Nigeria are expected to lay much emphasis in proper teaching and learning of Basic Science and Technology. However, despite the overwhelming importance of Basic Science and Technology and the laudable objectives of the subject as stated in the curriculum, some researchers have reported that the structures and appropriate activities that foster effective implementation of the curriculum are still either inadequate or lacking in Nigerian schools and this makes teaching of the subject to be poor and disappointing. Some literatures tend to show that most primary school teachers are usually not adequately prepared for teaching Basic Science and Technology. Some researchers have mentioned the myriad of challenges of Basic Science and Technology teaching in the country to include the issues of teacher quality and development, lack of enough specialist teachers, dearth of relevant support materials for teachers, inadequate supervision and inadequate mentoring of teachers. These have consequently affected the academic achievement of pupils in Basic Science and Technology particularly in FCT Abuja and this has become a serious issue to all relevant stakeholders. The question then is whether teachers are effective enough in teaching the subject. Many researchers have adduced that teachers' qualification and gender have high influence on the teaching of Basic Science and Technology whereas others reported in disagreement. This disagreement in findings calls for further research in order to generate more empirical evidences on this issue. The question then is; to what extent gender and qualification influence teachers-effectiveness in teaching Basic Science and Technology at the primary school level?

Purpose of the Study

The main purpose of the study is to determine the impact of gender and qualification on Basic Science and Technology teachers' effectiveness in teaching Basic Science and Technology in primary schools in FCT Abuja. Specifically, the study sought to determine the extent to which:

1. Primary school teachers possess the required skills for teaching Basic Science and Technology.
2. Primary school teachers possess the required skills for teaching Basic Science and Technology based on qualification.

Research questions

The following research questions guided the study:

1. What is the extent male and female primary school teachers possess the required skills for teaching Basic Science and Technology?
2. What is the extent primary school teachers possess the required skills for teaching Basic Science and Technology based on qualification?

Hypotheses

The following null hypotheses guided the study and were tested at 0.05 levels of significance:

- 1 **H0₁**: There is no significant difference in the extent male and female primary school teachers possess the required skills for teaching Basic Science and Technology.
- 2 **H0₂**: The extent primary school teachers possess the required skills for teaching Basic Science and Technology does not differ significantly based on teachers' qualification in FCT Abuja.

Method

The study adopted ex-post-facto research design. The population of the study comprised 9,193 (4439 male and 4754 female teachers) Universal Basic Education Commission (UBEC) schools teachers from 570 Universal Basic Education Commission (UBEC) schools in Federal Capital Territory of Nigeria (Planning and Research Department, Universal Basic Education Commission (UBEC), 2017). The sample size for the study comprised of 1120 public primary school teachers teaching Basic Science and Technology. Dual-stage sampling procedure was used to draw the teachers from the six Area Councils in Federal Capital Territory of Nigeria. This is because the population involved is large and it is spread over a wide geographical area.

In the first stage, the researcher employed proportionate random sampling techniques to draw 20% of the public primary schools in each of the six Area councils which amounted to 112 public primary schools from the list of the 570 Universal Basic Education Commission (UBEC) schools in FCT, Abuja. The use of 20% (percent) of the public primary school was based on the recommendation of Ali (2006), that when the population is large about 5 to 20% could be used for the study. Given that the number of the schools is moderately large, the researcher deemed it wise to use 20% of public primary schools in FCT for the study.

At the second stage, the researcher used disproportionate random sampling technique to draw 10 public primary school teachers teaching Basic Science and Technology from each of the 112 public primary schools sampled from the six Area Councils of FCT which amounted to the sample size 1120 public primary schools teachers used for the study. The sampling techniques were deemed appropriate to ensure probability sampling and also to ensure manageable sample size given the method deemed appropriate for data collection for the study. The instrument for data collection for the study was an observational Schedule titled: "Observational Schedule for Assessing Primary School Teachers' Acquisition of Required Skills for Effective Teaching of Basic Science and Technology (OSAP-TARSETBST)" developed by the researcher. OSAP-TARSETBST consisted of two parts; A and B. Part A sought for demographic information of the teachers, while part B contained 10 items modelled on a four point rating scale ranging from VGE- Very Great Extent = 4 points, GE-Great Extent = 3 points, LE-Low Extent = 2 points to VLE-Very Low Extent =1 point; to elicit information on primary school teachers possess required skills required for effective teaching of Basic

Science and Technology. The instrument was face validated by four experts: two in educational foundations, and two measurement and evaluation experts, all from University of Abuja. These experts were requested to look at the instrument in terms of suitability of the instrument and the items in line with the purpose of the study, research questions and null hypotheses. The useful suggestions made by the validators were used in the correction and production of the final instrument (OSAP-TARSETBST). Twenty copies of the final instrument were used to collect data from 20 primary school teachers in FCT who are not part of the sample of the study, to ascertain the reliability of the instrument reliability. Data collected were analysed using Cronbach Alpha statistical method and a coefficient of 0.83 was obtained.

Twenty (20) research assistants consisting of Ph.D. students of University of Abuja, were employed and trained for four days on how to use the observational schedule to rate the Basic Science and Technology teachers. The research assistants were sent in pairs to each of the sampled primary schools in the six Area Councils of FCT upon prior notification of the school in writing. To eliminate rating error due to subjectivity, the two research assistants were made to simultaneously rate a teacher while teaching, the two independent rating scores of the two assistants were compared per item and the average recorded for the teacher on the item.

Data collection lasted for six weeks, one week for each area council. Data collected were analyzed using mean and standard deviation, t- test and Analysis of variance (ANOVA) at 0.05 level of significance. All computations were made using Statistical Package for Social Science (SPSS) to ensure accuracy of result. To answer the research questions, the result was interpreted using limit of real numbers: where a mean score of 1.00 - 1.49 was regarded as Very Little Extent; 1.50 – 2.49 as little extent; 2.50 – 3.49 as Great extent, while 3.50 – 4.00 as Very Great Extent. In testing the null hypotheses, the following decision rules were used: (i) When the associated probability value obtained is less than 0.05 (that is, $P < 0.05$) the null hypothesis was rejected and (ii) When the associated probability value obtained is greater than 0.05 (that is, $P > 0.05$) the null hypothesis was not rejected.

Research Question 1: What is the extent to which male and female primary school teachers possess the required skills for teaching Basic Science and Technology in FCT Abuja?

Table 1: Mean Ratings of Respondents on the extent to which Male and Female Primary School Teachers Possess the Required Skills for Teaching Basic Science and Technology in FCT

S/ N	Items	Male N = 538		Female N = 582		Total		
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	DEC
1	Subject mastery skill	3.29	0.83	2.69	0.86	2.98	0.90	GE
2	Observational skill	2.50	0.50	2.30	0.78	2.39	0.66	LE
3	Questioning ability	3.09	0.99	2.57	0.90	2.82	0.98	GE
4	Communication skills	2.75	0.69	3.08	0.51	2.92	0.62	GE
5	Ability to give feedback to learners	3.27	0.82	2.79	0.77	3.02	0.83	GE
6	Ability to carry out experiments	1.84	0.87	2.02	0.95	1.93	0.91	LE

7	Ability to interpret results of experiments	1.96	0.90	1.99	0.91	1.98	0.91	LE
8	Ability to classify things	2.29	0.54	3.22	0.63	2.77	0.75	GE
9	Ability to organize things	3.06	0.88	3.06	0.86	3.06	0.87	GE
10	Ability to improvise by constructing things	2.34	0.74	2.24	0.84	2.29	0.79	LE
Cluster Mean		2.64	0.25	2.60	0.28	2.62	0.26	GE

Key: GE = Great Extent, LE = Little Extent

The result of the study as presented in table 1 shows the mean ratings and standard deviations of respondents on the extent to which male and female primary school teachers possess the required skills for teaching Basic Science and Technology in FCT. The result of the study showed the mean ratings for items 1 – 5, and 9 for male respondents as 3.29, 2.50, 3.09, 2.75, 3.27 and 3.06. These mean ratings are within the range of 2.50-3.49 set as criterion for Great Extent. This implies that the male teachers possess the required skills for teaching Basic Science and Technology in FCT to a great extent, these skills are Subject mastery skill, Observational skill, Questioning ability, Communication skills, Ability to give feedback to learners and Ability to organize things. However, the male teachers possess the following skills to a low extent. These include; Ability to carry out experiments, Ability to interpret results of experiments, Ability to classify things and Ability to improvise by constructing things. This is so because the mean ratings are within the range of 1.50-2.49 set as criterion for low extent. The result of the study also showed that the female respondents had mean ratings for items 1, 3-5 and 8-9 as 2.69, 2.57, 3.08, 2.79, 3.22 and 3.06. This means that the female teachers possess the following skills to a great extent. These skills are; subject mastery skill, questioning ability, communication skills, ability to give feedback to learners, ability to classify things and ability to organize things. Furthermore, the cluster mean of 2.62 with a standard deviation of 0.26 showed that male and female primary school teachers possess the required skills for teaching Basic Science and Technology to a great extent.

Research Question 2: What is the extent to which primary school teachers possess the required skills for teaching Basic Science and Technology based on qualification in FCT Abuja?

Table 2: Mean Ratings of Respondents on the extent to which Primary School Teachers Possess the required Skills for Teaching Basic Science and Technology in FCT based on Qualification.

S/ N	Items	NCE N = 380		First Degree N = 625		M.Sc & Above N = 115		Total		DEC
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
1	Subject mastery skill	2.55	0.48	2.57	0.84	3.05	1.01	2.73	0.90	GE
2	Observational skill	2.48	0.50	2.45	0.64	1.73	0.88	2.39	0.66	LE
3	Questioning ability	3.21	0.97	2.58	0.90	2.85	0.99	2.82	0.98	GE
4	Communication skills	2.63	0.68	3.04	0.49	3.23	0.75	2.92	0.62	GE

5	Ability to give feedback to learners	3.37	0.77	2.77	0.78	3.24	0.76	3.02	0.83	GE
6	Ability to carry out experiments	1.71	0.85	2.08	0.92	1.88	0.92	1.93	0.91	LE
7	Ability to interpret results of experiments	1.83	0.89	2.08	0.91	1.90	0.90	1.98	0.91	LE
8	Ability to classify things	2.19	0.39	3.04	0.70	3.25	0.73	2.77	0.75	GE
9	Ability to organize things	3.09	0.96	3.13	0.74	2.57	1.09	3.06	0.87	GE
10	Ability to improvise by constructing things	2.26	0.74	2.40	0.79	1.77	0.76	2.29	0.79	LE
Cluster Mean		2.53	0.25	2.61	0.26	2.55	0.31	2.62	0.26	GE

Key: GE = Great Extent, LE = Little Extent

The result of the study as presented in table 2 showed the mean ratings and standard deviations of respondents on the extent to which primary school teachers possess the required skills for teaching Basic Science and Technology based on qualification. The result of the study showed the total mean ratings for items 1, 2-5, 8 and 9 are 2.73, 2.82, 2.92, 3.02, 2.77 and 3.06 with standard deviations of 0.90, 0.98, 0.62, 0.83, 0.75 and 0.87 respectively. These mean ratings are within the range of 2.50 – 3.49 set as criterion for Great Extent. These imply that based on qualification, the teachers possess the following skills to a great extent, these include subject mastery skill, questioning ability, communication skills, ability to give feedback to learners, ability to classify things and ability to organize things. However, the result of the study also showed that items 2, 6, 7 and 10 had total mean within the range of 1.50-2.49 set as criterion for low extent implying that the teachers, based on qualification possess the following skills to a low extent, these include; observational skill, ability to carry out experiments, ability to interpret results of experiments and ability to improvise by constructing things. Furthermore, the cluster mean of 2.62 with a standard deviation of 0.26 showed that based on qualification, the primary school teachers possess the required skills for teaching Basic Science and Technology to a great extent.

Hypothesis One: There is no significant difference on the extent to which male and female primary school teachers possess the required skills for teaching Basic Science and Technology in FCT Abuja.

Table 3: t-test Analysis of the Significant Difference on the extent to which Male and Female Primary School Teachers Possess the required Skills for Teaching Basic Science and Technology in FCT.

Gender	N	Mean	SD	Df	t- cal	Sign	Dec
Male	538	2.64	0.25	1118	2.63	0.00*	Significant (reject H ₀)
Female	582	2.60	0.28				

Key: N=Number of test respondent, = Mean score, sign= Significant value, * Significant at 0.05.

The finding of the study as presented in table 3 showed the t-test analysis of the significant difference on the extent to which male and female primary school teachers possess the

required skills for teaching Basic Science and Technology in FCT. Result showed that a cluster t-value of 2.63 with a degree of freedom of 1118 and a significant value of 0.00 were obtained. Since the significant value of 0.00 is less than 0.05 set as level of significance, this means that the null hypothesis which stated that there is no significant difference on the extent to which male and female primary school teachers possess the required skills for teaching Basic Science and Technology is rejected. Inference drawn therefore is that there was a significant difference on the extent to which male and female primary school teachers possess the required skills for teaching Basic Science and Technology in FCT.

Hypothesis Two: The extent to which primary school teachers possess the required skills for teaching Basic Science and Technology does not differ significantly based on teachers' qualification in FCT Abuja.

Table 4: ANOVA of the Significant Difference between the Mean Ratings of Respondents on the extent to which Primary School Teachers Possess the required Skills for Teaching Basic Science and Technology based on Qualification in FCT.

	Sum of Squares	Df	Mean Square	F	Sig.	Dec.
Between Groups	0.791	2	0.396	5.536	0.00	S
Within Groups	79.813	1117	0.071			
Total	80.604	1119				

S = Significance

The finding of the study as presented in table 12 showed the ANOVA of the significant difference between the mean ratings of respondents on the extent to which primary school teachers possess the required skills for teaching basic science and technology based on qualification. Result showed that an f-ratio of 5.53 and a significant value of 0.00 were obtained. Since the significant value of 0.00 is less than 0.05 set as level of significance, this means the null hypothesis which stated that the extent to which primary school teachers possess the required skills for teaching Basic Science and Technology does not differ significantly based on teachers' qualification is rejected. Inference drawn therefore is that there was a significant difference between the mean ratings of respondents on the extent to which primary school teachers possess the required skills for teaching basic science and technology based on qualification.

Discussion of findings

The findings of the study showed that both male and female primary school teachers possess the required skills for teaching Basic Science and Technology to a great extent. These skills include: subject mastery skill, questioning ability, communication skills, ability to give feedback to learners, ability to classify things and ability to organize things. However, observational skill, ability to carry out experiments, ability to interpret results of experiments and ability to improvise by constructing things were possess in low extent. This implies that both male and female primary school teachers possess the required skills for teaching Basic Science and Technology to a great extent in the Federal Capital Territory (FCT) Abuja to a great extent This could be due to the fact that the teachers underwent academic training and obtained the requisite qualifications for teaching at the primary school level of education in Nigeria.

It further revealed that there was a statistically significant difference in the extent male and female primary school teachers possess the required skills for teaching Basic Science and technology. And the teachers' qualification is also a significant factor. This finding is somewhat in line with the findings by Awodun, Oni, and Oyeniyi, (2015) that found out that there was a significant difference between the performances means scores of students taught by male and female Physics teachers. This could be that there were differences in the skills possessed by male and female teachers for teaching the subject, which in can in turn reflect on students' performance. However, with the common belief that males are more likely to perform well in science- oriented subjects than their female counterparts, it may be possible to have differences between the skills possessed by males and females for teaching Basic Science and Technology which could be the reason for the finding of this study.

Conclusion

Based on the findings, it was concluded that though teachers exhibited effectiveness in teaching Basic Science and technology in Federal Capital Territory Abuja. However, teachers are not effective in the following areas: ability to carry out experiments, interpret result of the experiment, improvisation by constructing things, grouping pupils to accomplish a given task and consideration for individual difference among pupils.

Recommendations

The following recommendations were made according to the findings of the study. Federal and State Ministries of Education should ensure the following:

1. Basic Science and Technology primary school teacher should be exposed to subject mastery skill, questioning ability, communication skills, ability to give feedback to learners, ability to classify things, ability to organize things, observational skill, ability to carry out experiments, ability to interpret results of experiments and ability to improvise by constructing things that are required for teaching Basic Science and Technology for effective teaching and learning of the subject.
2. That Basic Science and Technology teachers should be facilitated through in-service educational activities, workshop and seminars to develop these required skills.

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