

Do Teachers' Qualifications and Experience Influence Academic Performance of Students in Basic Science in Junior Secondary Schools in Nigeria?

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Abstract

This study investigated the influence of teachers' qualification and experience on students' academic performance in basic science in junior secondary schools in Nigeria. The study was a descriptive survey type of research. Simple random sampling was used to select eight Junior Secondary Schools (J.S.S.) in Ogun East senatorial district of Ogun State. It included 18 basic science teachers and 540 junior secondary school students. The data were collected using a questionnaire and basic science achievement test. The data collected were analysed using descriptive statistics, one-way analysis of variance and Pearson Product-Moment Correlation. The findings of this study revealed that most of the basic science teachers at the J.S.S. level were not trained as basic science teachers; science teachers' qualifications influenced students' academic performance in basic science; basic science teachers' years of teaching experience did not have a positive correlation with students' academic performance in basic science.

Keywords: Qualification, academic performance, problem solving

Introduction

Education is perhaps the largest and most costly of all the National undertakings in Nigeria nowadays. This is not surprising, since there is a general agreement that education is the most valuable resource in any nation and that it is the foundation of a nation's economic, social and political strength. Education is the cornerstone of any nation and has remained for some time a big industry in Nigeria (Taiwo, 2018). In recent years, there has been growing awareness that advancement in education depends largely on the qualifications and ability of teachers (Adeogun, 2001). Teachers are the most important single factor in the success of an educational enterprise (Aaronson, Barrow & Sander, 2007; Harris & Sass, 2008; Rivkin, Hanushek and Kain, 2005). Teachers, therefore, have a vital role to play in the development of a nation, especially in upbringing leaders and intellectuals of tomorrow who will sustain the nation's development (Taiwo, 2018). If one seeks the explanation of the rise of any nation, one will have to turn to schools and examine the calibre of their teachers. Therefore, it is not surprising that both the developed and the developing nations of the world are today asking questions about their teachers, their relevance and adequacy of their preparations. There has been much concern expressed in recent years about the apparent fall in standard of education in Nigeria, most especially at the secondary school level (Olagoke, 2018). This perhaps explains why Nigerian Government has moved from one system of educational structure to another in search of excellence in its educational products (Duje, 2011). The main causes for this fall in standard of education, according to Olagoke (2018), are low teacher/pupils ratio caused by the geometric progression in students'

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population and lack of qualified teachers. This downward trend in Nigerian standard of education has become a thorn in the flesh for all science educators who sincerely want to see teachers as transforming elements and students as totally developed individuals capable of affecting technological change in society.

The first form of science a Nigerian child encounters in school is integrated science, at the junior secondary school level. This first form of science has changed to basic science due to educational reforms in Nigeria (FRN, 2007). The subject was introduced into the Nigerian secondary schools as a panacea for some of the problems bedeviling science especially at the junior level, most especially with the revised policy on education with emphasis on the acquisition of process skills (Bamidele and Adekola, 2017). The emphasis of the programme is on the development of the spirit of enquiry as opposed to rote learning, as well as the development of science process skills and scientific attitudes rather than accepting scientific facts as a dogma (Bamidele, 2014). According to the National Policy on Education (FGN, 2007), basic science is supposed to be presented in such a way that the child:

- I. Gains the concept of fundamental unity of science (Physics, Chemistry and Biology);
- II. Gains the communality of approach to problem-solving of scientific nature;
- III. Gains an understanding of the role and function of science in everyday life and the world in which he/she lives.

From the above, basic science serves as the gateway to the study of single science subjects, which provides a solid foundation for the learning of the specialized scientific discipline like physics, chemistry and biology. Hence, a child who is not well-grounded in basic science at the junior secondary school level may see the core science subjects as bitter pills to swallow. Thus, students' poor performance in basic science at the junior secondary school level may lead to many junior secondary school students developing a negative attitude towards core science subjects at the senior secondary school level, which in turn will affect students' admission into tertiary institutions to study science and science-related courses. One is compelled to ask the extent to which integrated science departments have contributed to this present concern about the general fall in the standard of education in Nigeria. Professional science educators and a few qualified basic science teachers have severely criticized the teaching of basic science as ineffective and often handled by inexperienced or, at worst, unqualified teachers (Odetoyinbo, 2004; Olarewaju, 1987; Oludipe, 1997). The concern for basic science teachers' qualifications makes it necessary for this study to look into the qualifications of teachers teaching basic science at the junior secondary school level.

Background to the Study

Universities and colleges, apart from supplying professional graduates, also supply our secondary schools with graduate teachers without professional teaching qualifications (Odetoyinbo, 2004; Olarewaju, 1987). While one may concede academic excellence in subject areas to this set of teachers, the other essential pre-requisite for teaching, that is professionalism, is still lacking. In this era of need for teachers who are capable of directing and facilitating the changes that modern education involves, the basic science teachers should combine academic excellence with professional competence to be effective. A teacher who has no relevant training and qualification may not have been exposed to methods that make the teaching/learning process interesting and successful. We may not understand the use of some complicated equipment for teaching/learning process, therefore may not be able to communicate abstract ideas and concepts effectively without them. This definitely decreases the rate at which students understand subject matter. Recruiting adequately-qualified basic science teachers needs particular attention. It is one thing to have a school staffed with teachers, while it is another thing to have qualified teachers. For teaching to be meaningful

and effective, there is a need for adequate supply of qualified teachers capable of transforming students. Without adequate supply of qualified basic science teachers to junior secondary schools, it will become difficult to attend to the academic needs of each of the students, especially where there is only one basic science teacher to three levels of classes of about ninety or more students at each level. When a teacher is unable to work as efficiently as he would have wanted to, there is a problem created in the teaching/learning process in which students are unable to perform maximally and may even feel they lack competence. Teachers also may become discouraged when students are not giving expected responses.

Literature Review

Merriam-Webster Dictionary defines 'qualification' as a special skill or type of experience or knowledge that makes someone suitable to do a particular job or activity (Aina, Olanipekun, & Garuba 2015). Therefore, teachers' qualification is a particular skill or type of experience or knowledge someone possesses to make him or her able to teach effectively. Teachers' qualifications could, consequently, mean all the skills a teacher is required to teach well. Such skills include formal education, experience, subject matter knowledge, pedagogy studies, duration of training, certificate/license and professional development (Zuzovsky, 2009). Someone might have a teaching certificate at hand but without adequate knowledge of subject matter, this individual has no teaching qualifications yet. Similarly, someone without proper knowledge of pedagogy or someone who spent few years in training (Darling-Hammond, Berry & Thoreson, 2001) without completing the required years does not possess teacher qualifications. Professional development and experience (Rice, 2003) also count for teachers' qualifications, as several studies have revealed (Helk, 2007). Qualification is one of the critical factors that drive students' academic performance (Hakielimu, 2011).

Eryilmaz and Laslan (1999) observed that one of the most important factors in the teaching process is teacher's qualification. The perspective of Ibrahim (2000) was that teachers' qualifications can go a long way to bring about students' higher academic achievement. Teachers' profession relates to competence in instruction and management of students and materials in the classroom (Hamilton-Ekeke, 2013). A qualified teacher is the one who holds a teaching certificate and/or is licensed by the state, owns at least a National Certificate in Education (NCE) and a bachelor's degree from a three- or four-year institution and is knowledgeable in his/her area of specialization (Musau & Abere, 2015). However, Darling-Hammond (1998) defines a well-qualified teacher just as one who was fully certified and held the equivalent of a major in the field being taught. Teachers' qualifications are more than just holding a certificate of any institution. Zuzovsky (2009) in her study ties teachers' qualifications to seven indicators that are:

- Teachers' formal education;
- Teachers' education in the subject matter of teaching (in-field preparation);
- Teacher education in pedagogical studies;
- Duration of the preparation period;
- Certification and licensing status;
- Years of experience;
- Preparation in professional development activities.

Teachers' qualifications can be divided into two categories: personal qualities and certification. What qualifies someone to teach and that can influence students' academic performance are related to certain qualities teacher got in the classroom and

was certificated at a particular period of his or her lifetime. The personal qualities are changing continuously in his or her lifetime. Degree certificates, formal education, and in-field preparation are not throughout the life of a teacher. Once a teacher obtains them, it is over for his or her lifetime. Teaching strategies, experience, professional development, motivation, and interaction are personal to the individual teacher and keep changing during the teacher's life. A teacher who has a bad teaching strategy today may not have it later. A teacher's experience today will not remain the same in a year to come, so will professional development. A teacher who is poor in motivating and interacting with students today may not remain the same or learn how to do it.

Some studies found that teachers' experience and educational qualifications significantly influenced students' academic achievement (Ankomah, Koomson, Bosu & Oduro, 2005; Asikhia, 2010; Njeru and Orodho, 2003; Bamidele & Adekola, 2017; Clotfelter, Ladd & Vigdor, 2007; Kosgei, Mise, Odera & Ayugi, 2013; Musau & Migosi, 2015; Olaleye, 2011). When conducting research on factors contributing to underachievement of Zambian female students in O- Level physics examinations, Maguswi (2011) found that lack of qualified teachers of physics had a significant contribution. Moreover, a study conducted by Adaramola and Obomanu (2011) in Nigeria found that the lack of qualified teachers led to consistent poor performance of students in SMT subjects. However, studies held by other scholars found that teachers' professional qualifications and teaching experience are not significantly related to students' academic achievement (Buddin & Zamarro, 2009; Kimani, Kara & Njagi, 2013; Mbugua, Kibet, Muthaa and Reche, 2012; Musau and Abere, 2013; Rivkin et al., 2005). Akinsolu (2010) asserted that the availability of qualified teachers determined the performance of students in schools. On the contrary, Igwe (1990) investigated the influence of teacher's qualification in Kano county and reported that there is no significant relationship between teacher's qualification and student's performance. Huang and Moon (2009) state that teacher's qualification accounted for approximately 40 to 60 per cent of variance in the average of student's achievement in assessment. Seweje and Jegede (2005) noted that the ability of a teacher to teach is derived not only from one's academic background but is also based upon outstanding pedagogical skill acquired. Both Stronge, Ward, Tucker and Hindman (2007) and Kosgei, Mise, Odera & Ayugi (2013) asserted that there is a positive correlation between teachers' experience and students' academic achievement.

Statement of the Problem

Basic science is the sound basis for studying single science subjects (physics, chemistry and biology) at the senior secondary school level (S.S.S.). Students must obtain credit pass in basic science before they can offer the single science subjects at the S.S.S. level. However, students' failure rate in basic science at the junior secondary school level (J.S.S.) has been reducing the numbers of students eligible to study single science subjects at the S.S.S. level. Teacher characteristics have been identified to play a significant role in student's academic performance. It is hoped that if qualified teachers, who went through pedagogical training in basic science education, are the ones teaching the subject at the J.S.S. level, basic science would be an interesting subject to learn by students. Hence, this study examined the impact of teacher's qualifications on the academic performance of students in basic science in Ogun state, South-West Nigeria.

Objectives of the Study

The main objectives of this study were:

1. To examine the qualifications of teachers teaching basic science at the junior secondary school (J.S.S.) level.
2. To find out if the type of training basic science teachers received would affect effective teaching of integrated science.
3. To examine the years of teaching experience of basic science teachers.

4. To find out the academic achievement of students taught by qualified basic science teachers and those taught by less qualified basic science teachers.
5. To find out if there is a correlation between basic science teachers' years of teaching experience and students' academic achievement.

Hypotheses

The following hypotheses were formulated and tested:

H_{01} : There is no significant difference in the academic performance of J.S.S. students in basic science between those taught by unqualified basic science teachers and those taught by qualified basic science teachers.

H_{02} : There is no significant correlation between basic science teachers' years of teaching experience and students' academic performance in basic science.

Methodology

Research Design

This study is a descriptive survey type of research. It sought to find out the influence of teachers' qualifications and experience on students' academic performance in basic science and also sought to find out the degree of relationship between the independent variables (teachers' qualifications and experience) and the dependent variable (students' academic performance in basic science) at the J.S.S. level.

Population

The population for this study was the Junior Secondary School III students and their teachers in the fifty junior secondary public schools in the nine local government areas of Ogun East senatorial district, Ogun state, Nigeria.

Sample and Sampling Procedure

Simple random sampling technique was used to select eighteen out of the fifty junior secondary schools, i.e. two J.S.S. were randomly selected from the total number of J.S.S. in each of the nine local government areas. The researcher preferred simple random sampling because it gave equal chance for all junior secondary schools in the Ogun East senatorial district to be selected. Eighteen integrated science teachers, including 13 male and 5 female teachers, from the selected schools were purposively included in the study. This gave a total of 540 sampled students. The researcher targeted only the J.S.S. students because they had been through all the levels (forms one to three), and had adequate exposure to the contents of basic science.

Instrumentation

The study employed the following instruments:

1. **Basic Science Teacher's Questionnaire (BSTQ)**: The BSTQ was developed by the researcher to elicit responses from basic science teachers. The questionnaire sought demographic information such as sex, highest educational qualification, area of specialization and length of years in service.

2. **Basic Science Achievement Test (BSAT):** The BSAT was made up of 40 objective questions selected from the previous Junior Secondary Certificate Examination (JSCE) questions based on the topics treated during the study.

Validity and Reliability of the Instruments

The basic science multiple-choice performance test questions were selected from the previous Junior Secondary Certificate Examination (JSCE) questions. The JSCE questions are standardized in nature because they have been field-validated by experienced test and measurement experts in the state ministry of education. Moderating Committee edited and selected good items. Thereafter, the researcher subjected it to test-retest analysis of two weeks interval on a pilot sample of 30 basic science J.S.S. students to establish the reliability of the instrument. The reliability coefficient yielded 0.76 indicating that the instrument is reliable. Basic Science Teachers' Questionnaire (BSTQ) was meant to get responses from basic science teachers on their competencies to teach basic science effectively. There were two sections in the questionnaire; section A sought for demographic data of teachers (highest educational qualification, area of specialization and length of years in service); while section B contained six items, participants responded to each of the 6 statements by selecting one of the following responses: agree, disagree, undecided. The BSTQ was given to experts in the field of curriculum studies to establish the content and face validity. They read through and made necessary corrections which were then taken into consideration in re-working the questionnaire. The BSTQ was further subjected to a reliability test, using thirty students who did not participate in the study. Cronbach Alpha were computed to determine the reliabilities of scores obtained in this context. The BSTQ yielded an internal consistency reliability of 0.79

Procedure

There were three phases of data collection. These were the pretest – the first week, treatment – six weeks, and the post-test – the last of the eight weeks. Three periods of 40 minutes each were spent each week for the six weeks during the second term of 2017/2018 academic session. There was no alteration on the time-table allocated for basic science by the school, i.e. the periods were in line with the schools' time-tables. Before exposing the students to teaching, the BSAT was administered as pre-test. The achievement post-test was administered within the week after the completion of the treatment; this was to minimize the maturation effect, by giving the students the same forty-item multiple choice test that was used for the pretests. The BSTQ was administered to the basic science teachers immediately after the administration of the post-test to students.

Data Analysis

Data collected was analysed using descriptive statistics, One-way Analysis Of Variance (ANOVA) and Pearson Product-Moment Correlation. Computations for the afore-mentioned methods of data analysis were done using SPSS 16.00 Statistical Package.

Results

Table 1: Certificates and areas of specialization of basic science teachers

S/N	Certificate	Specialisation	Number	Percentage
1	B.Ed.	Int. Science	4	22.22

2	B.Ed.	Sciences	4	22.22
3	B.Sc.	Sciences	6	33.33
4	M.Sc.	Sciences	3	16.67
5	M.Ed.	Science	1	5.56
Total			18	100

Table 1 above reveals the certificates and areas of specialization of teachers teaching basic science at the sampled junior secondary schools.

Table 2: Basic science teachers' years of teaching experience

Teachers	Qualification	Years of experience
A	B.Ed. (Int. Science)	5
B	B.Ed. (Physics)	8
C	B.Ed. (Int. Science)	20
D	B.Ed. (Chemistry)	12
E	B.Sc. (Physics)	5
F	B.Ed. (Int. Science)	10
G	B.Sc. (Biochemistry)	5
H	B.Ed. (Biology)	20
I	B.Sc. (Biology)	5
J	B.Ed. (Int. Science)	15
K	B.Sc. (Chemistry)	15
L	M.Sc. (Biochemistry)	6

M	B.Sc. (Biochemistry)	15
N	B.Ed. (Biology)	22
O	M.Ed. (Biology)	20
P	B.Sc. (Chemistry)	15
Q	M.Sc. (Biology)	12
R	M.Sc. (Biology)	15

Table 2 above reveals the sampled teachers' qualifications with their corresponding years of teaching experience. The lowest year of teaching experience was five years, while the highest was twenty-two years.

Table 3: Basic science teachers' responses to questions on basic science teaching competency

Items	Agree	Disagree	Undecided
You are aware of the objectives of teaching basic science.	04(22.22)	14(77.78)	-
You are aware of the philosophy of teaching basic science.	04(22.22)	14(77.78)	-
You are aware of the methods of teaching basic science.	04(22.22)	14(77.78)	-
You are aware of the evaluation methods of basic science.	09(50)	09(50)	-
You are aware of the improvisation techniques in basic science	09(50)	09(50)	-
You have attended seminar, workshop or in-service training on basic science before	-	18(100)	-
You can teach all the topics in basic science	04(22.22)	14(77.78)	-

Numbers in brackets are in percentages.

Table 3 above reveals basic science teachers' responses to various questions on their competencies to teach basic science.

Table 4: Descriptive analysis of students' mean scores in line with teachers' qualifications

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
					B.EdInt.Sc	120		
B.EdScience	120	19.08	1.373	.125	18.83	19.32	12	20
B.Sc	180	10.84	1.094	.082	10.68	11.00	1	12
M.Sc.	90	10.82	.842	.089	10.65	11.00	10	12
M.EdScience	30	18.70	1.643	.300	18.09	19.31	15	20
Total	540	17.59	8.109	.349	16.90	18.27	1	38

In table 4 above it is revealed that students taught by the qualified basic science teachers had the highest mean score (31.02) and standard deviation (2.253), followed by those taught by professional teachers (B.Ed. Science and M.Ed. Science) who were not trained as basic science teachers, with mean scores of (19.08) & (18.70) and standard deviations (1.373) & (1.643) respectively. The lowest mean scores and standard deviation were ascribed to students taught by the untrained teachers/unqualified basic science teachers (B.Sc. and M.Sc.) with mean scores of (10.84) & (10.82) and standard deviation (1.094) & (.842) respectively.

Table 5: ONE-WAY ANOVA of students’ mean scores according to basic science teachers’ qualifications.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34260.834	4	8565.209	3.870	.000
Within Groups	1184.075	535	2.213		
Total	35444.909	539			

p significant at < 0.05.

Ho: There is no significant difference in the academic performance of J.S.S. students in basic science between those taught by unqualified basic science teachers and those taught by qualified basic science teachers.

Table 5 reveals that there is a significant difference in the mean scores of students taught by qualified basic science teachers and those taught by unqualified basic science teachers ($F_{(4, 535)} = .000$, statistically significant). Hence, hypothesis 1 is not accepted.

Table 6: Descriptive analysis of students’ mean scores in line with teachers’ experience

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
5Years	80	17.72	8.702	.973	15.79	19.66	10	35
6Years	63	18.49	9.546	1.203	16.09	20.90	2	33
8Years	75	19.13	8.899	1.028	17.09	21.18	10	33
10Years	68	16.85	7.827	.949	14.96	18.75	10	37
12Years	68	17.99	7.544	.915	16.16	19.81	11	37
15Years	67	17.54	7.987	.976	15.59	19.49	10	37

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
5Years	80	17.72	8.702	.973	15.79	19.66	10	35
20Years	60	17.22	7.069	.913	15.39	19.04	10	32
22Years	59	15.15	5.765	.751	13.65	16.65	10	30
Total	540	17.57	8.074	.347	16.89	18.25	2	37

Table 6 above reveals that basic science teachers' years of teaching experience did not correlate with students' academic performance. Interestingly, basic science teachers with 5, 6 and 8 years teaching experience respectively had slightly higher mean scores and standard deviations scores than the basic science teachers with 10-22 years teaching experience.

Ho₂: There is no significant correlation between basic science teachers' years of teaching experience and students' academic performance in basic science.

Table 7: Pearson correlation between teachers' years of teaching experience and students' academic performance

		score	experience
score	Pearson Correlation	1	-.089*
	Sig. (2-tailed)		.039
	N	540	540
experience	Pearson Correlation	-.089*	1
	Sig. (2-tailed)	.039	
	N	540	540

*. Correlation is significant at the 0.05 level (2-tailed).

To examine the relationship between basic science teachers' years of teaching experience and students' academic performance, Pearson Product-Moment Correlation was used. According to the result in table 7, basic science teachers' years of teaching experience and students' academic performance were not significantly correlated, $-.089(538) = .039, p > 0.05$. According to the finding, there was no positive interaction between basic science teachers' years of teaching experience and students' academic performance. Hypothesis 2 is accepted.

Discussion

Table 1 reveals that basic science teachers at the sampled J.S.S. level were mostly holders of Bachelor degrees in education and sciences, and Master's degrees in education and sciences. Nine of the eighteen basic science teachers were professional teachers, i.e. they underwent pedagogical training as teachers; nine were not professional teachers. In all the eighteen schools in the study only four out of the eighteen teachers were trained as basic science teachers. Four of the remaining fourteen teachers had their bachelor degrees in education in biology, chemistry and physics respectively; six had their bachelor degrees in sciences - biology, chemistry, physics, and biochemistry; three had their Master's degrees in biology and chemistry; while one had her Master's degree in science education (biology). This points to the fact that there is shortage of trained basic science teachers in the sampled schools, and by extension across the junior secondary schools in Ogun state.

Table 2 revealed that the lowest number of basic science teachers' work experience was five years, while the highest was twenty-two years. A teacher's years of experience is one of the teachers' qualification indicators that is believed to be a significant determinant of students' academic performance. However, there is the need for caution in Nigeria about experience. Many teachers may have been in the teaching profession for over twenty years without having properly developed himself or herself for years. This category of teachers may not be able to cope with the new trends in education. The subject curriculum is changing almost every year as the whole world is changing. The years of work experience of an unqualified basic science teacher do not necessarily increase their qualification.

Table 3 revealed that competencies of basic science teachers in teaching basic science are affected by their certificates and the type of training they have received. A teacher who was not trained specifically as a basic science teacher would surely be unaware of the objectives, philosophy and methods of teaching basic science. Hence, such teachers will not be competent to teach basic science effectively. That was why only the four trained basic science teachers agreed that they were aware of the objectives, philosophy and methods of teaching basic science; while the remaining fourteen teachers, including the five professional teachers, disagreed. Talking about the awareness of evaluation methods and improvisation techniques in basics science, all the nine professional teachers agreed that they were aware of the evaluation methods and improvisation techniques in basic science; while the remaining nine non-professional teachers disagreed. This is not surprising because all science teachers were offered the same courses on the evaluation and improvisation techniques in sciences during their course of studies. A teacher who did not offer courses in evaluation and improvisation techniques, like the nine non-professional basic science teachers under study, would surely be unaware of how to handle evaluation and improvisation in basic science. Interestingly, the qualified basic science teachers, the trained teachers and the untrained teachers all disagreed that they had attended seminars, workshops or in-service training to update their knowledge and competencies on basic science. Attending seminars, workshops or in-service training is professional development which develops an individual skill, knowledge, expertise and other characteristics as a teacher (OECD, 2009). It is a conscious and systematic step to ensure teachers' upgrading and continuous self-improvement (Oluremi, 2013). Professional development is critical to the retention and improvement of any teacher in the classroom (American Association of Physics Teachers, 2009). Hence, the responses of the sampled basic science teachers not having attended any professional development programs are not encouraging at all. This will surely have a negative effect on students' academic performance, since professional development is related positively to students' achievement. Expectedly, only the four trained basic science teachers agreed that they could teach all the topics in basic science, while the remaining fourteen teachers (trained

and untrained) disagreed that they could teach all the topics in basic science. Basic science comprises earth science, space science, life science, etc. Hence, any teacher who was not trained specifically as a basic science teacher would not be able to handle basic science contents. That is why in most junior secondary schools, where there are shortage of qualified basic science teachers, most of the basic science topics in the schemes of works outside the areas of specialisation of this set of unqualified teachers are not always covered. This has been having a negative effect on the teaching and learning of basic science at the J.S.S. level.

The results in tables 4 and 5 revealed that there was a significant difference in students' academic performance in basic science between the students taught by the qualified basic science teachers and those taught by the unqualified basic science teachers. This finding is in line with the findings of Adaramola and Obomanu, 2011; Akinsolu, 2010; Ankomah et al., 2005; Asikhia, 2010; Bamidele and Adekola, 2017; Clotfelter et al., 2007; Kosgei et al., 2013; Njeru and Orodho, 2003; Maguswi, 2011; Musau & Migosi, 2015; Olaleye, 2011. They all found in their studies that educational qualifications of teachers significantly influenced students' academic achievement and that students taught by qualified teachers performed better in achievement tests than students taught by unqualified teachers. However, this finding contradicts the findings of Buddin and Zamorro, 2009; Igwe, 1990; Kimani et al., 2013; Mbugua et al., 2012; Musau et al., 2013; Rivkin et al., 2005. They all found that teachers' professional qualifications were not significantly related to students' academic achievement. They were of the opinion that educational qualifications of teachers did not significantly influence students' academic achievement.

The results in tables 6 and 7 indicate that there was no positive interaction between basic science teachers' years of teaching experience and students' academic performance in basic science. This finding is in line with the findings of Buddin and Zamorro, 2009; Kimani et al., 2013; Mbugua et al., 2012; Musau et al., 2013; and Rivkin et al., 2005; they all asserted that teachers' years of teaching experiences were not significantly related to students' academic achievement. This is an interesting finding because it is believed that many teachers may have been in the teaching profession for over twenty years without having properly developed themselves for years. This category of teachers may not be able to cope with the new trends in education. The subject curriculum is changing almost every year as the whole world is changing due to technology changes. However, this finding contradicts the findings of Adaramola et al., 2011; Agharuwhe, 2013; Ankomah et al., 2005; Asikhia, 2010; Bamidele and Adekola, 2017; Clotfelter et al., 2007; Kosgei et al., 2013; Maguswi, 2011; Njeru and Orodho, 2003; Musau & Migosi, 2015; Olaleye, 2011; Stroge et al., 2007; They all found that teachers' years of teaching experiences were significantly related to students' academic achievement. This is a pointer to the fact that teachers with more years of teaching experiences will always draw from their wealth of experience to solve many of the students' learning problems.

Conclusion

This study examined the impact of basic science teacher's qualification on students' academic performance in basic science. Given the findings of this study, it can be concluded that basic science teacher's academic qualifications positively affect student's academic performance in basic science. This implies that basic science can only be taught effectively by a professionally trained teacher, who had acquired pedagogical skills in teaching in basic science. The study also revealed that teacher's years of teaching experience did not play a significant role in teaching/learning process. These are remarkable results, they call for further studies with wider samples within Nigeria and cross-cultural studies across the world. Results of such studies will make it possible for a more generalised picture to be established.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Many of untrained basic science teachers should be sent for in-service training, seminars and workshops to update their knowledge competence on the teaching of basic science.
2. All the science education students, at both colleges of education and university levels, should be offered basic science as a minor teaching subject in their first and second years respectively.
3. Basic science education programmes (in-service and pre-service) should include the following drills on:
 - the content of basic science
 - appropriate use of language of instruction
 - the application of methods of teaching
 - improvisation techniques
 - course evaluation techniques.

Implication

This study has important contributions and high implications for the educational practices in Nigeria. This study revealed that teachers' qualifications have a serious implication on students' academic performance. Hence, a qualified teacher is crucial in any educational system and that is why it is expedient to make sure that every teacher is academically and professionally qualified.

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