

Influence of Teachers' Characteristics on Effective Teaching and Learning of Chemistry in Public Senior Secondary Schools in Etche Local Government Area, Rivers State, Nigeria

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ABSTRACT

The study examined the influence of teachers' character Influence of teachers' characteristics on effective teaching and learning of chemistry in public secondary schools in Etche local government area, Rivers State, Nigeria. This study adopted a descriptive research survey design. The population of teachers in this local government area was 285 out of which 27 constitutes chemistry teacher and hence this sample size was used for the study as a census. These responded to a researcher self-constructed questionnaire consisting of 12 items on qualification, years of experience and commitment of the teachers using four Likert point scale of SA = Strongly Agree 4, A = Agree 3, D = Disagree 2, SD = Strongly Disagree 1. This scale together with a 2.5 criterion was used to answer the three research questions stated and reliability index 0.76 was reached using Cronbach's Alpha. The findings revealed that all three variables (qualification, experience and commitment) influence teachers' effectiveness of teaching and learning in chemistry particularly in public senior secondary schools in Etche local government area in Rivers State, Nigeria. It was therefore recommended among others that government should be ensured that whenever employment exercise is conducted, only those with teaching qualification should be considered no matter the cost.

Keywords: Teachers' Characteristics, Teaching, Learning, Chemistry, Qualification, Years of Experience, Commitment

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INTRODUCTION

Science is a special discipline that is concern with discovery of natural phenomena and how substances within the universe interact between and among themselves. These peculiar characteristics have made it relevant for science educationists to apply special ways through which knowledge about the universe is sought. Hence, the objective of teaching science is mainly for the learner to gain knowledge about the universe, acquire relevant skills and develop attitudes worthy of a scientist so to be equipped to solve problems of the inhabitants both

living things and non-living things found within the universe. Chemistry is the branch of science that deals with the properties, composition, structure, reactions, syntheses and uses of matter. The various branches of Chemistry include: Biochemistry, Geochemistry, Organic chemistry, Physical chemistry, Industrial chemistry, chemistry of earth and space, inorganic chemistry, and medical chemistry. Chemistry is one of the science subjects taught in secondary schools and in the university in most parts of the world. In most cases, nations all over

the world, the common aim of learning chemistry is to find solutions to the peculiar needs of the society. According to Igwe (2015), the objectives of secondary school chemistry curriculum in Nigeria as stated in the senior secondary school syllabus are as follows: to ease upcoming change in the use of scientific concepts and techniques gained through integrated science (now basic science) with chemistry; to provide fundamental knowledge in chemistry concepts and principles through careful selection of contents and properly guided successions; to show inter-connections between chemistry and other science subjects; to show chemistry and its nexus with the industry, everyday life, hazards and benefits, and; to provide students not continuing their education to higher school level with adequate foundation for other future careers. These objectives are geared towards meeting the needs of the individual and that of the society at large.

The importance of the science of chemistry to national development is overwhelming. The teaching of chemistry helps to impart scientific knowledge and arouse science-oriented attitude and scientific skills in learners. These attributes when channeled through useful activities result into development of the individual, the society and generally improved standard of living of the citizenry (Igwe, 2015). Going by the provisions of the national policy on education in Nigeria, science education should imbibe in the learner, well defined qualities and values such as the spirit of inquiry, creativity, objectivity, logical reasoning, curiosity and others alike. And this is why everyone who is ready to gain knowledge needs to go through the educational channel to succeed and of which the teachers have very vital roles to play. The foregoing reasons are why the teachers' characteristics are crucial to teaching and learning of chemistry.

Teaching to a great extent is a wholesome and crucial process and it is usually very important that those who engage in it should know the reason why they are doing so by having knowledge of the context and what sense we are using the word "Teaching" when it is being used. According to Ekanem and Ekanem (2019), teaching is perceived as an act that has to do with describing the various parts of the body that are in operating during the movements of the body. The teaching exercise entails movements such as talking, writing, stretching, pacing, gesture, and sitting amongst others which can only be done by a trained, qualified, and professional teacher. It is worth noting that teaching is intended to help the learner to realize how he could use his full potential to invent things and achieve greater height. Hence, any trace of an element that identifies that the teacher is not able to or does not possess the ability to carry out the act of teaching, will definitely cause the whole system to crumble and will frustrate achieving the aim of teaching-learning process and the entire educational process. Therefore teaching should be done consciously, wholesomely, intentionally and passionately by a matured, experienced and superior

person if it should result into gain in the intended knowledge, acquisition of relevant skills and change in attitude in the right direction. By this it means teaching flows from a mature, experience and superior person to an immature, inexperience person or even a novice with the intention that the later will learn or gain knowledge on what the learner is taught on the grounds that what the learner is taught and who teaches does it to the learner's advantage. Even though it is a common saying that the learner does not come to school a blank slate, the teacher is believed to have gained certain expert knowledge, ideas, skills and experiences on the particular concept or subject and so in a better position to impart that knowledge to his learner. Based on the ongoing, the success of the learner in this act of teaching is greatly measured by the effective teaching of the teacher. Ibrahim (2019) opined that, teacher factor such as qualification, gender, years of experience and exposure to teaching principles speaks a lot about teacher's teaching effectiveness which further expresses itself in the academic performance of the students. It is probably for this reason that it is asserted that "No education can rise above the quality of its teachers; the implication being that teachers' vital roles in the preparation of students to succeed in their present and future academic, career endeavors to make a livelihood and their ability to make useful decisions in the society and therefore these roles can be underpin. Similarly, Agbatogun (2010) pointed out that the roles of the teacher in the teaching-learning process are as important as they are numerous and cannot be taken for granted. This is because the educational sectors in all ramifications is useful to directs what is to be practiced in the classroom to ensure that students are equipped and able to apply what is taught in school especially in the science of chemistry to solving problems in everyday-life. Having this in mind, the teacher has to be effective in rendering his services such effectiveness that are determined by his exposure to the subject content, years of experience on the job etc. so as to maximally equip his learner to be able to in turn effectively play his own roles. Adeogun (2015) opined that, the quality of any educational system depends on the quality of its teaching staff of which the teacher trained is equally certified to do the job he knows how to do best, and that a school without such capable persons may not be able to achieve the goals and objectives of the educational system. The author added that teachers are the major indicator and determinants of quality education. Highly professional teachers who are dedicated, passionate, willing and committed are needed in the educational system such attribute that are able to verge the link between what the teachers know and what they teach. Thus, the ability to teach effectively depends on teachers' attributes including his knowledge in the content and the ability to use it for the benefits of the learner. Because it is not acceptable that a teacher would claim to have knowledge about a thing that he cannot dispense to his le-

anner. Knowing that teachers are known to have a remarkable influence on the academic success of students, they such crucial roles that determine the success of the entire educational system because they are highly responsible for interpreting educational policies and principles into practical actions during interaction with students.

Teaching and learning depend mainly on teachers whose characteristics are very influential in what will become the outcome of the whole system, no wonder an effective teacher was figured as one who yields better performance results in the course of his teaching duties (Agharuwhe, 2013). Moreover, the effect of teacher effectiveness on student learning results as reflected in the academic success of students has been the subject of numerous researches (Adu & Olatundum, 2007). One study suggests that effective teaching is an important predictor of the performance of students and that his means training the teacher on the pedagogical approaches. Therefore effective teachers are those who produce students with higher academic skills. It is an acceptable fact that the teacher is the most important factor in the educational process and that teachers are instrumental to the success of any educational program embarked upon by any government. This is because, apart from being at the implementation level of any educational policy, the success of any educational program also greatly depends on teachers' dedication and commitment to work (Adeniji, 2019).

Adeogun (2015) opined that the quality of any educational system depends on the quality of its teaching staff and that without quality teachers; a school may not be able to achieve its goals and objectives. Moreover, Usman (2018) posited that good teacher's characteristic is responsible for effective teaching among the teachers. Usman maintained that students taught by more qualified and more experienced teachers in terms of knowledge of the subject matter perform better than those taught by less qualified and less experienced teachers. From the above background, it is evident that the teacher is one key overriding factor for the effective teaching and learning of chemistry in secondary schools.

Statement of problem

Successful management and realization of objectives of teaching to a large extent can be attributed to many factors. Of these factors, teachers' availability as well as their effectiveness plays a very critical role. However, despite the important role of teachers in the teaching learning process, there have been poor performances of students in their internal and external examinations (Essien, 2016). Chemistry being the core science subject that is offered has been seen to have been faced with the challenges faced by other subjects in terms of poor performance of students (Essien, 2016).

The fact that students' academic performance in chemistry at the secondary school level has remained a dismal failure is no longer new. Several researchers have reported a continuous decline in the performance of Nigerian students in chemistry, as well as, data from various external examination bodies such as the West African Examination Council (WAEC) and the National Examination Council (NECO) have shown a consistent trend of poor performance of students in chemistry (Igwe, 2015).

These poor performances among students have caused serious concern among teachers, parents, government, educational administrators and even students themselves. The parents and teachers have blamed the students for not reading. Owing to that fact, "no education can rise above the level of its teachers; the researcher was triggered to examine the influence of teachers' characteristics on effective teaching and learning of chemistry in senior secondary schools in Etche local government area of Rivers state.

Aim and Objectives of Study

The aim of this study is to examine the influence of teachers' characteristics on effective teaching and learning of chemistry in senior secondary schools in Etche Local Government Area. Specifically, this study seeks to;

1. Examine the influence of teachers' qualification on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area.
2. Examine the influence of teachers' Experience on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area.
3. Examine the influence of teachers' commitment on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area

Research Questions

The following research questions will be answered to aid this study;

1. What is the influence of teachers' qualification on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area?
2. What is the influence of teachers' Experience on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area?
3. What is the influence of teachers' commitment on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area?

METHODOLOGY

The study examined the influence of teachers' character Influence of teachers' characteristics on effective teaching and learning of chemistry in public secondary schools in

Etche local government area, Rivers State, Nigeria. This study adopted a descriptive research survey design. The choice of this research design is considered appropriate because of its advantages of identifying attributes of a large population from a group of individuals. According to survey research design is ---The population of this study consists of principals, teachers and students in Etche local government area of Rivers state. According to statistical data from Rivers State Universal Basic Education Board, there are two hundred and eighty-five (285) teachers from 13 public schools in Etche local government and one thousand nine hundred fifty (1,950) students from thirteen (13) different secondary schools in the Etche Local Government Area of Rivers State made up the study's population. The sample size of the study was 27 chemistry teachers in 13 public senior secondary schools in Etche local government. Which is the same as the population size, census method was adopted to arrive at the sample size. This is because the entire population was small and accessible. The various schools were visited personally by the researcher during the regular period to distribute and collect the questionnaire for five consecutive weeks to ensure that fully completed copies were collection for this research. The instrument was a well-constructed questionnaire titled 'influence of teachers' characteristics on teaching and learning of chemistry in Senior secondary schools (ITCTL)' carefully designed to elicit responses from respondents. The questionnaire which constitutes the major instrument for data collection was divided into two parts which are sections A and B. Section A contains personal information of the respondents. Section B formed the main body of the questionnaire. This section contains questions using a four (4) point scale instrument through which the opinions of the respondents were expressed. Their responses was measured by means of a four-category rating system; SA = Strongly Agree 4, A = Agree 3, D = Disagree 2, SD = Strongly Disagree 1. Furthermore, the criterion was put as 2.5 such that any value below this value was regarded as disagree and above this value accepted as agree for the overall results

RESULTS

This (Table 1) indicates that 1 respondent representing 3.7% of the participants have lower degree and 26 respondents representing (97.3%) hold Bachelor degree. The implication is that, 97.3% of chemistry teachers for the research have high school certificate. However, all the chemistry teachers in the schools covered were qualified teachers.

Table 1: Educational Qualification of respondents

Educational Qualification	Frequency	Percentage
NCE/Diploma in education	1	3.7%
Bachelor degree in Education and above	26	96.3%
Total	27	100%

Research Question 1: What is the influence of teachers' qualification on teaching and learning of chemistry in Etche local government area?

(Table 2) above reveals that the items (1, 2, 3, and 4) having mean (3.74, 3.52, 3.44 and 3.53) all agree that teachers' qualification influences teaching and learning of chemistry in Etche Local Government Area. This is also indicated in the grand mean (3.53) all of which are above the criterion mean of 2.5.

Research Question 2: What is the influence of teachers' experience on teaching and learning of chemistry in Etche local government area?

Table 3 above reveals that the items (5, 6, 7, and 8) having mean (3.85, 3.70, 3.33 and 3.26) all agree that teachers' experience influences teaching and learning of chemistry in Etche local government area. This is also indicated in the grand mean (3.54) all of which are above the criterion mean of 2.5.

Research Question 3: What is the influence of teachers' commitment on teaching and learning of chemistry in Etche local government area?

Table 4 above reveals that the items (9, 10, 11, and 12) having mean (3.78, 3.78, 3.78 and 3.88) all agree that teachers' commitment influences teaching and learning of chemistry in Etche local government area. This is also indicated in the grand mean (3.81) all of which are above the criterion mean of 2.5.

DISCUSSION

The findings on Table 2 reveals that most respondents agreed that their qualification influences their ability to use innovative teaching methods in the classroom, their qualification influences their ability to engage students and maintain interest in chemistry lessons, also their qualification influence the quality of laboratory experiments and practical demonstrations in chemistry and their qualification influences their ability to integrate modern technology into chemistry lessons. The grand mean of 3.53 indicates on the impact of teachers' qualification on teaching and learning of chemistry in senior secondary schools in Etche Local Government. Huang and Moon (2019) in their study documented that teacher qualification accounted for up to 60 percent of the students' academic achievement.

Table 3 shows that item 4-8 have a mean score that are above the decision rule of 2.5 which was regarded as acceptable limit as indicated by the researcher. Respondents agreed that their years of experience influence their teaching effectiveness, their experience enables them to explain complex topics better than less

Table 2: Influence of teachers' qualification on teaching and learning chemistry

Item	N	Mean	SD	Decision
My qualification influences my ability to use innovative teaching method in the classroom.	27	3.74	.656	Agree
My qualification influences my ability to engage students and maintain interest in chemistry lessons	27	3.52	.509	Agree
My qualification influences the quality of laboratory experiments and practical demonstrations in chemistry	27	3.44	.506	Agree
My qualification influences my ability to integrate modern technology into chemistry lessons	27	3.41	.501	Agree
Grand mean		3.53		Agree

Table 3: Influence of teachers' experience on teaching and learning chemistry

Item	N	Mean	SD	Decision
My number of years of teaching experience influences my teaching effectiveness	27	3.85	.362	Agree
My experience influences me to explain complex topics better than less experienced ones	27	3.70	.465	Agree
My experience helps me to adapt modern teaching methods to accommodate different learning styles	27	3.33	.555	Agree
My experience influences my ability to connect chemistry concepts to real-world applications	27	3.26	.944	Agree
Grand mean		3.54		Agree

Table 4: Influence of teachers' commitment on teaching and learning chemistry

Item	N	Mean	SD	Decision
My commitment to lesson planning enhances my engagement in the classroom.	27	3.78	.641	Agree
My passion for the subject contribute to students motivation to learn chemistry	27	3.78	.424	Agree
My willingness to provide extra help reflect their commitment to students success in chemistry	27	3.78	.641	Agree
My dedication to engaging students make chemistry more interesting and easier to understand	27	3.88	.326	Agree
Grand mean		3.81		Agree

experienced ones, also their experience helps them to adapt modern teaching methods to accommodate different learning styles, and their experience influences their ability to connect chemistry concepts to real-world applications. The cluster mean of 3.54 was also found to be above the cut-off point of 2.50. This implies on the impact of teachers' Experience on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area. These finding is in line with the study of Omotayo (2014) who revealed that teachers' qualification and years of teaching experience have significant influence on the teaching and learning process. Though in some cases, years of experience had been reported as having small effect in influencing teaching learning process, when compared with other factors such as teacher knowledge on subject matters and academic qualification (Agbatogun, 2010). While in this study it is experience in term of number of years of service (3.54) that is slightly higher than qualification (3.53) attributing to experience as having greater influence than qualification on students' academic performance. Table 4 outcome reveals that respondent agreed that commitment to lesson planning enhances teachers' engagement and participation in class, that is, their passion for the subject contribute to students motivation to learn chemistry, also their willingness to

provide extra help reflect their commitment to students success in chemistry and their dedication to engaging students make chemistry more interesting and easier to understand. The grand mean of 3.81 was also found to be above the cut-off point of 2.50. This implies on the impact of teachers' commitment on teaching and learning of chemistry in senior secondary schools in Etche Local Government Area. Altun (2017) in his study reported that teachers' commitment has effect on students' better achievement.

Conclusion

Based on the results of the finding, it can be concludes that qualification impacts ability to use innovative teaching methods in the classroom, qualification affects ability to engage students and maintain interest in chemistry lessons, also qualification influence the quality of laboratory experiments and practical demonstrations in chemistry and qualification impacts ability to integrate modern technology into chemistry lessons.

Also, it can be concluded that years of experience influence teaching effectiveness, experience enables students to explain complex topics better than less experienced ones, also experience help in adapting to

modern teaching methods to accommodate different learning styles. Commitment to lesson planning enhances students' engagement and participation in class, their passion for the subject contributes to students' motivation to learn chemistry. Lastly, dedication to engaging students make chemistry more interesting and easier to understand is the impact of teachers' commitment on teaching and learning of chemistry.

Recommendations

The following recommendations were raised in the course of the study.

It should be ensured that whenever employment exercise is conducted, only those with teaching qualification should be considered no matter the cost. If peradventure there are any teachers particularly in the government schools that have not yet obtain training in education, in-service training and refresher courses should be organized periodically that will help to sharpen such teachers to equip them for effectiveness in the job.

Government should consider giving very good retired teachers' contract appointment to serve longer in the secondary schools if they are in good health since years of experience of the teacher is vital in the teaching and learning.

Serving teachers especially in the public schools should be properly motivated for better commitment and effectiveness in service delivery.

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