

Impact of chemistry teachers' qualification and years of experience on academic performance of secondary school chemistry students in Ogbia local government area Bayelsa state

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The purpose of the study was to examine impact of chemistry teachers' qualification and years of experience on academic performance of secondary school students in Ogbia Local Government Area in Bayelsa State. The study adopted an expo-facto survey research design. Two research questions were raised and answered. The population of the study was 35 secondary schools and 3,116 chemistry students in Ogbia Local Government Area, Bayelsa State. 184 students and 10 teachers were used as sample in the study. A teacher questionnaire titled, "Teachers' Qualification and Experience" was used for data collection and it was validated by two science education experts. There was no reliability since students' previous scores were used. Frequency, percentage and mean were used to answer the research questions. The findings showed that teachers' qualification and years of experience have a significant impact on students' academic achievement in senior secondary schools in Ogbia Local Government Area. Hence, teachers' qualification and years of experience are major determinants that affect students' performance in senior secondary schools in Ogbia Local Government Area. This implied that government should establish policies that increase the number of teachers with B.Ed in chemistry and schools should prioritize hiring teachers with appropriate qualifications and years of experience in chemistry education so as to enhance academic performance in chemistry.

Keywords: Teachers qualification, Teachers' experience, Academic achievement, Chemistry education, Teachers, Education.

1. Introduction

Science and technology serve as the fundamental pillars upon which sustainable development hinges (Cleopas, 2018). Every facet of human progress and society, spanning domains such as healthcare, agriculture, transportation, communication, banking, housing, trade, commerce, sports, tourism, and entertainment, is propelled by advancements in science and technology (Etebu & Amatari, 2020). It is widely acknowledged that no nation, state, or community can flourish and maintain competitiveness in the global arena without a robust foundation in the realm of science and technology (Ojebiyi & Sunday, 2014). In support to this, National Policy on Education, Federal Republic of Nigeria (2004) stated that government shall popularization of science to production of large number of scientists that will help in nation building. As a result of this, the government made provision for 60% science intake in admission as against 40% art and commercial intake in admission into higher institutions (Federal Republic of Nigeria, 2004).

Similarly, education plays a paramount role in shaping and molding individuals to function effectively within their surroundings (Boit, Njoki, & Chang'ach, 2012). United Nations Educational, Scientific and Cultural Organization (UNESCO) in Etebu and Amatari (2020) defines education as the comprehensive set of processes intended to cultivate human abilities and behaviors. It encompasses organized and continuous instruction designed to impart a combination of knowledge, skills, and values

essential for all aspects of life. As Wolfenson in [Etebu and Amatari \(2020\)](#) points out, education equips individuals with a set of skills that enhance their confidence and empower them to make decisions that pave the way for a prosperous future. Consequently, education serves as a conduit for achieving success in life and enables individuals to harness their skills constructively. Expanding on this notion, [Boit et al. \(2012\)](#) emphasized that education empowers citizens to reshape their society and eradicate inequality, fostering a more equitable and inclusive community. Harris and Sass in [Casian, Mugo, and Claire \(2021\)](#) opined that education is a bridge that connects people to better future and national development and improved students' academic performance depends on quality education in which teachers qualification is one of its wheel.

Quality education therefore, is a cornerstone of societal development and progress, and the role of teachers is paramount in shaping the educational experience of students. Within the realm of science education, chemistry holds a significant position as a fundamental discipline that fosters critical thinking and problem-solving skills. [Uwaleke and Offiah \(2014\)](#) defines chemistry as the scientific study of the structure, composition and properties of substances. The competence and qualification of chemistry teachers play a pivotal role in shaping students' understanding, interest, and performance in this subject. Education systems around the world are under constant scrutiny to improve outcomes and teacher quality is consistently identified as a critical factor ([Etebu & Amatari, 2020](#)). The teachers are very important to growth and development of any nation because no nation can be higher than its educational system in which teachers are pivotal. Teachers from the kindergarten level to the highest level has a niche in the wellbeing of economy, health, power, transport, education, among others of any nation. It is crucial to note that teachers as implementers of educational decisions by the government contribute greatly to development and sustainability of any nation and should be treated with highest regards. One of the ways by which teachers are graded is through academic performance of students taught. Some persons blame teachers when academic performance is poor but when academic performance is good, most times, all credit goes to the students. Nevertheless, in both ways, many factors contribute to poor academic performance and good academic performance of students. Both teachers and students and even external forces play out in learning outcome. Some of the factors affecting academic performance of chemistry students include fear of science, anxiety, school environment, parents' attitude, students' attitude, teachers' attitude, lack of interest, socio-economic status, laboratory facilities, teacher qualifications, teacher experience, teaching methods, among others. The place of teachers cannot be overemphasized in teaching and learning. The teacher has a large percentage of role to play in the learning process of science. Studies hold it that even Artificial Intelligence (AI) with all its good and interesting characteristics cannot replace the role of teachers in teaching and learning process ([Cleopas, 2023](#)). Hence, it is expected that a teacher should be competent in his or her specialization. Darling-Hammond in [Ichaza and Omoregie \(2020\)](#) opined that teacher quality entails knowledge of subject matter, good communication skill, knowledge and ability to use a wide range of teaching methods and strategies that enhance students understanding and academic performance. Research hold it that teacher quality influences classroom situation and students' academic performance ([Etebu & Amatari, 2020](#)).

[Ichaza and Omoregie \(2020\)](#) defined a competent teacher as one who is qualified professionally and trained to teach in the school having acquired necessary and relevant skills and attitude and showing adequate skills in the teaching process. [Ivowi \(2016a\)](#) added resourcefulness, knowledge of subject matter, behaviour motivation, pedagogy, skill processes and evaluation as part of qualifications of a competent teacher. Also, [Akinbobola \(2006\)](#) supported that a competent teacher has a sound knowledge of subject matter, use a variety of methods of teaching, good language skills, attends workshops, seminars, conferences and have zeal and commitment for education to acquire knowledge, skills, attitude and in the process of teaching gained experiences on the job that will further improve his or her activities in the classroom. To this end, a competent teacher is a person who has a mastery of his or her subject matter and has ability to appropriately use a variety of teaching methods and instructional materials to transfer knowledge, skills, attitude and values to the learners. Teacher quality is an aspect

in which stakeholders need to pay attention to. As far back in the 70s, teacher quality has been in highest regards. No wonder quality of graduate and education was high. The studies of Ajayi, Hallak, Hanusek and Rivkin in Yusuf and Dada (2016) confirmed that quality of education in any nation hinge on quality, quantity and commitment of her teachers. In other words, no nation can rise above her education which depends on quality of her teachers among other factors. Elsbree in Casian et al. (2021) reported that qualification of teachers in the United State of America (USA) necessitated best education in order to meet the needs and aspiration of children and youth. Certification of teachers in USA is to ensure that teachers are qualified to teach in the public schools and on the long run academic performance of students is enhanced (Cremin and Lawrence in Casian et al. (2021)). In Africa, teacher qualification is a requirement and a guide in the teaching profession in order to acquire knowledge and skill relevant for teaching. Adeyemi in Casian et al. (2021) also revealed that in Kenya, qualification of teachers and experience have notable significant impact in learning outcomes.

Research by Hanushek (2011) posit that the consistently underscored robust connection between teacher qualifications and student academic performance. A study by Ichaza and Omoregie (2020) revealed that educators with advanced degrees and specialized training significantly enhance student achievement. Likewise, findings from a comprehensive analysis conducted by Etebu and Amatari (2020) affirmed that teachers possessing a substantial subject-area expertise contribute substantially to improved student learning outcomes.

Chemistry Education is crucial in nurturing scientific literacy and promoting interest in STEM fields. A study by Ojelade and Aregbesola (2018) highlighted that students who receive quality chemistry education are more likely to pursue careers in science-related fields. Moreover, chemistry knowledge is essential for understanding real-world phenomena, making informed decisions, and addressing global challenges such as climate change and healthcare. Chemistry is about composition, properties and uses of matter (Ababio, 2010). Onwukwe (2011) opined that chemistry deals with characteristics, composition, chemical reactions and transformation of matter. Udosen (2015) asserted that chemistry has many subdivisions as against initial divisions into inorganic, organic, physical and analytical. Also, it relates with other sciences which have branches such as geology, biochemistry, chemical engineering, geo informatics, among others. Competent chemistry teachers can instill a sense of curiosity and enthusiasm in students, fostering a lifelong interest in science. Bayelsa State, located in the southern region of Nigeria, is no exception. According to a study published in chemistry education research and practice in 2020, limited resources, inadequate infrastructure, and a shortage of qualified teachers are common issues that can hinder effective chemistry education. A study by Jacob Kola Aina and Olanipekun (2015) found that teacher quality is a major concern in Nigerian schools, impacting student learning outcomes. Given the importance of chemistry education, addressing these challenges is critical for the future prospects of Bayelsa State's students. Numerous empirical studies have revealed the significance of teachers explaining noticeable variances in students' achievement (Hanushek, 2011) but studies on impact of teachers' qualification and experience on chemistry students' academic performance in Bayelsa State are insufficient. This study aims to investigate the impact of chemistry teachers' qualification and experience on academic performance of senior secondary school chemistry students in Bayelsa State.

1.1. Statement of the Problem

Nigeria, like many other developing nations has been facing challenges in its education system (Adesehinwa, 2013). The quality of chemistry education and its impact on the academic performance of secondary school students is a matter of concern (Ojelade & Aregbesola, 2018). The rate at which we do science today in Nigeria cannot get us to a level of being scientifically literate to compete healthily with other developed countries in the world. Chemistry holds a crucial position as a foundational subject within the broader spectrum of science education and qualifications of teachers are pivotal in shaping students' learning experiences and outcomes (Ojelade & Aregbesola, 2018). However, despite its significance, there exists a gap in understanding how qualifications of chemistry teachers affect

performance of students. Some of the factors contributing to poor performance in science subjects include diverse students in a class with varying ability levels, non-functional laboratories, complex biology syllabus (Obomanu & Akporehwe, 2011). Others include inadequate qualified teachers, corruption, inappropriate curriculum, parents' financial standing, inappropriate teaching methods, poor subject matter delivery, poor teaching quality, poor students' involvement, among others (Aina, 2013; Okenyi, 2013). These factors, in turn, may contribute to poor academic achievement in chemistry, which could have far-reaching implications on students' future educational and career prospects.

According to a report from West African Examination Council (2013) poor performance among secondary school students in chemistry has been prevalent in Nigeria and academic performance of secondary school chemistry students in Bayelsa State has seen a substantial decline over time. Also, the West African Examination Council (2017) revealed that only 30% of total number of students who registered had credit pass. And since 2018 till date, improvement in academic performance has been sluggish and unsatisfactory. Chemistry teachers have made great efforts to improve their teaching methods by using some varieties like demonstration, discussion, lecture, laboratory, inquiry, discovering, among others to teach chemistry in schools in order for students to have better understanding of concepts, ideas, laws, theorems and phenomena. Despite efforts to improving academic performance in chemistry, poor performance is still prevalent and it is a great concern to students, parents, teachers, stakeholders in education and a big threat to growth of science and technology in the nation. The quality of teachers in chemistry education has been identified as a potential factor leading to this decline (Aina in Etebu and Amatari (2020)). Achimugu (2016) also revealed that many chemistry teachers are faced with inadequate effort to carry out activities or lessons properly, probably due to insufficient time for chemistry lessons. There is little empirical evidence on the impact of chemistry teacher's qualifications and years of experience on academic performance. This study sought to bridge this gap by examining how chemistry teachers' qualifications and years of experience influence academic performance of senior secondary school students in the state.

2. Review of Related Literature

Abidoye and Bamuwagun (2022) investigated effect of chemistry teachers' gender and academic qualification on performance of students in senior secondary schools in Kwara State, Nigeria. A survey research design was used for the study. Questionnaire was used for data collection and one hundred and fifty-five teachers was sample size for the study. Three research questions and two hypotheses were used in the study. Percentage, t- test and Analysis of Variance (ANOVA) were used for data analysis. The findings revealed that there was a significant difference on students' academic performance based on teachers' qualification but there was no significant difference based on gender. This showed that gender difference does not affect academic performance in science.

Ichaza and Omoregie (2020) examined influence of teachers' qualifications on academic performance of secondary school students in Delta State. A descriptive survey design used for the study. The sample was three hundred and sixty-four students, teachers and principals. Questionnaire and achievement test were used for data collection for the study. Pearson Product Moment Correlation (PPMC) and t-test statistics were used for data analysis. The results showed that significant difference exist between teacher qualifications and students' academic performance in senior school. Students taught by experienced teachers performed better than those taught by inexperienced teachers. Also, students taught by qualified teachers had better academic performance than those taught by unqualified teachers. These showed that teacher quality is very important as regards its significant impact on students' academic performance.

Abidoye and Ogunlowo (2012) examined influence of biology teachers on academic performance of students in senior secondary schools in south west geopolitical zones, Nigeria. A descriptive survey research design was employed. One hundred and two students and two hundred and four biology teachers from south west zone was the sample size. Frequency, percentage and t-test were used to analyze data in the study. The results revealed that biology teachers influence students' academic

performance. Also, there was no significant difference in gender and years of experience in academic performance of students.

Aina (2013) examined subject area specialization combination correlation in colleges of education: effect on students' achievement in physics. Descriptive survey design was used in the study. The population was students from four colleges of education. T-test statistics was used for data analysis and findings revealed that there was a significant variance in academic achievement of physics students based on subject combination. Also, academic performance of students who combines physics with mathematics was higher than those who combined physics with chemistry. Physics and mathematics positively correlate in nature makes it easier for students to perform better in both. Also, understanding mathematics help the student to understand physics and vice visa.

Yusuf and Dada (2016) investigated impact of teachers' qualification and experience on performance of students in colleges of education in Kaduna State, Nigeria. 20 teachers and one hundred students were randomly selected from two colleges of education as sample for the study. Questionnaire and students test scores were used to collect data for the study and frequency, percentage and t-test were used for data analysis. The result reported that there is a significant variance in the performance of students taught English by professional and experienced teachers. They further recommended that unprofessional teachers should upgrade themselves with Post Graduate Diploma in Education (PGDE) and other higher degrees in order to enhance academic performance of students.

Oludipe and Oludipe (2021) investigated do teachers' qualification and experience influence academic performance of students in basic science in junior secondary school in Nigeria? A descriptive survey research design was used in the study. The sample was made up of five hundred and forty students and 18 basic science teachers. A questionnaire and basic science achievement test were used for data collection. Descriptive research statistics, one way Analysis of Variance (ANOVA) and Pearson Product Moment Correlation (PPMC) were used for data analysis. The result revealed that majority of the basic science teachers were not adequately trained and qualified and also basic science teachers' years of experience was not significant to students' academic performance in science. This implied that teachers' qualification in science influence science students' academic performance. This result also implied that teachers' years of experience does not influence science students' academic performance.

Casian et al. (2021) examined impact of teachers' qualification on students' academic performance in public secondary schools in Rwanda. Correlational research design was employed. The sample size was one hundred and twenty-one students. Interview and questionnaire were used for data collection and Pearson Product Moment Correlation (PPMC) was used for data analysis. Findings revealed that there was a positive correlation between teachers' qualification and students' academic performance. This showed that students taught by qualified teachers do better than those taught by unqualified teachers.

Okose and Obiunu (2024) investigated Influence of teachers' years of teaching experience and qualification on students' academic performance in basic education certificate examination in Delta State. The study employe an ex-post facto research design. The sample size was ninety junior secondary school III basic science teachers and one thousand eight hundred students who sat for basic science examination in 2021/2022 academic session. Mean, standard deviation and t-test analysis were used to answer and test the hypotheses. Findings revealed that teachers' qualification and years of experience have significant implication on students' academic performance in Basic Education Certificate Examination.

3. Purpose of the Study

The purposes of the study are

1. To examine the impact of chemistry teachers' qualifications on academic performance of senior secondary school chemistry students in Bayelsa State.
2. To examine the impact of chemistry teachers' years of experience on academic performance of senior secondary school chemistry students in Bayelsa State.

3.1. Research Questions

1. What impact does teachers' educational qualification have on means of academic performance of secondary school chemistry students in Ogbia Local Government Area, Bayelsa State?
2. What impact does teachers' years of experience in teaching have on means of academic performance of secondary school chemistry students in Ogbia Local Government Area, Bayelsa State?

4. Methodology

Expo-facto research design method was used in the study. This was because collection of previous data for analysis from a sample considered to be true representative of the entire population of the study was utilized. Two research purposes, two research questions and two research hypotheses were used in the study.

4.1. Population

The population of the study was 35 Chemistry teachers and 3,116 Senior Secondary Two (SS2) science students totaling 3151 adopted from the 35 schools in Ogbia Local Government, Bayelsa State.

4.2. Sampling Technique

Ten schools were randomly selected within Ogbia Local Government Area, Bayelsa State. The sample size of One Hundred and Eight Four (184) students and 10 teachers were purposively sampled randomly from the population sample of both students and teachers among Senior Secondary Schools in Ogbia Local Government Area, Bayelsa State. This sample size is to be a representation of the population.

4.3. Instrumentation of Data Collection

The instrument used for the study was questionnaire and the previous scores of SS2 chemistry students in 2022/2023 session. The questionnaire was titled Teachers' Qualification and Experience (TQAE). The questionnaire was carefully selected and prepared for only the teachers since the students know little or nothing about their teachers' educational qualification and years of experience. The questionnaire contained three sections. Section A, contained information on the Bio-data of teachers. Section B contained information on the TEACHERS' QUALIFICATION IN CHEMISTRY (TQC) and Section C contained information on the YEARS OF TEACHERS' EXPERIENCE (YTE). Then previous scores of SS2 chemistry students' of 2022/2023 session were collected for the data analysis. The instrument was subjected to face validity and there was no reliability of it because students' previous scores were used.

4.4. Administration of the Instrument

The researcher, through the support of the research assistant, distributed and administered the instruments to the respondents. This was preceded by the training the research assistants to gain their support. Then the researcher collected the previous scores of 2022/2023 SS2 chemistry students.

4.5. Data Analysis

Data were analyzed using frequency, percentage and mean.

Research Question 1: What impact does teachers' educational qualification have on mean academic performance of secondary school chemistry students in Ogbia Local Government Area, Bayelsa state?

Table 1.
Qualification of chemistry teachers in the sampled schools

Name of school	Academic qualification	Teaching experience
School A	B. Sc. (Ed) chemistry	9
School B	NCE (Chemistry), B. Sc. (Ed) chemistry	12
School C	B. Sc. (Ed) chemistry	8
School D	B. Sc. Chemistry	5
School E	B. Sc. (Ed) Chemistry, PGDE	7
School F	B. Sc. (Ed) Chemistry	4
School G	B. Sc (Ed) Chemistry	9
School H	B. Sc Chemistry	11
School I	B. Sc Chemistry	5
School J	B. Sc (Ed) Chemistry	13

5. Results

Table 1 revealed that students taught in School A with teacher educational qualification of B. Sc (Ed) Chemistry had 9 years teaching experience, students taught in School B with teacher educational qualification of N. C. E Chemistry and B. Sc (Ed) Chemistry had 12 years teaching experience, students taught in School C with teacher educational qualification of B. Sc (Ed) Chemistry had 8 years teaching experience, students taught in School D with teacher educational qualification of B. Sc Chemistry had 5 years teaching experience, students taught by School E with teacher educational qualification of B. Sc (Ed) Chemistry and Post Graduate Diploma in Education (PGDE) had 7 years teaching experience, students taught by School F with teacher educational qualification of B. Sc (Ed) Chemistry had 4 years teaching experience, students taught by School G with teacher educational qualification of B. Sc (Ed) Chemistry had 9 years teaching experience, students taught by School H with teacher educational qualification of B. Sc Chemistry had 11 years teaching experience, students taught by School I with teacher educational qualification of B. Sc Chemistry had 5 years teaching experience, students taught by School J with teacher educational qualification of B. Sc (Ed) Chemistry had 13 years teaching experience.

Table 2.

Mean scores on the impact of teachers' educational qualification and academic performance of students in senior secondary school represented as (A-J).

Name of school	Academic qualification	Mean
A	NCE (chemistry) and B. Sc. (Ed) chemistry	50.10
B	B. Sc. (Ed) Chemistry	23.25
C	B. Sc. (Ed) chemistry	62.96
D	B. Sc. chemistry	62.44
E	B. Sc. (Ed) chemistry	63.55
F	B. Sc. (Ed) chemistry	53.60
G	B. Sc. (Ed) chemistry	50.99
H	B. Sc. chemistry	43.05
I	B. Sc. chemistry	47.36
J	B. Sc. (Ed) chemistry	44.50

Table 2 revealed that students taught in School A with teacher educational qualification of B. Sc (Ed) Chemistry had a mean score of 50.10, students taught in School B with teacher educational qualification of N. C. E Chemistry and B. Sc (Ed) Chemistry had a mean score of 23.25, students taught in School C with teacher educational qualification of B. Sc (Ed) Chemistry had a mean score of 62.96, students taught in School D with teacher educational qualification of B. Sc Chemistry had a mean score

of 62.44, students taught in School E with teacher educational qualification of B. Sc (Ed) Chemistry and PGDE had a mean score of 63.55, students taught in School F with teacher educational qualification of B. Sc (Ed) Chemistry had a mean score of 53.60, students taught in School G with teacher educational qualification of B. Sc (Ed) Chemistry had a mean score of 50.99, students taught in School H with teacher educational qualification of B. Sc Chemistry has a mean score of 43.05, students taught in School I with teacher educational qualification of B. Sc Chemistry had a mean score of 47.36, students taught in School J with teacher educational qualification of B. Sc (Ed) Chemistry had a mean score of 44.50.

Research Question 2: What impact does teacher's qualification and years of experience have on academic performance of secondary school chemistry students' in Bayelsa State?

Table 3.

Mean scores on impact of teachers' qualification and years of experience on academic performance of students in senior secondary school represented as (A-J).

Name of school	Academic qualification	Teaching experience
A	B. Sc. (Ed) chemistry	9
B	NCE (chemistry) B. Sc. (Ed) chemistry	12
C	B. Sc. (Ed) chemistry	8
D	B. Sc. chemistry	5
E	B. Sc. (Ed) chemistry,	7
F	B. Sc. (Ed) chemistry	4
G	B. Sc (Ed) chemistry	9
H	B. Sc chemistry	11
I	B. Sc chemistry	5
J	B. Sc (Ed) chemistry	13

Table 3 revealed that students taught in School A with teacher educational qualification of B. Sc (Ed) Chemistry and teaching experience of 9 years had a mean score of 50.10, students taught in School B with teacher educational qualification of N. C. E Chemistry and B. Sc (Ed) Chemistry and teaching experience of 12 years had a mean score of 23.25, students taught in School C with teacher educational qualification of B. Sc (Ed) Chemistry and teaching experience of 8 years had a mean score of 62.96, students taught in School D with teacher educational qualification of B. Sc Chemistry and teaching experience of 5 years has a mean score of 62.44, students taught by School E with teacher educational qualification of B. Sc (Ed) Chemistry and PGDE and teaching experience of 7 years has a mean score of 63.55, students taught by School F with teacher educational qualification of B. Sc (Ed) Chemistry and teaching experience of 4 years has a mean score of 53.60, students taught by School G with teacher educational qualification of B. Sc (Ed) Chemistry and teaching experience of 9 years has a mean score of 50.99, students taught by School H with teacher educational qualification of B. Sc Chemistry and teaching experience of 11 years has a mean score of 43.05, students taught by School I with teacher educational qualification of B. Sc Chemistry and teaching experience of 5 years has a mean score of 47.36, students taught by School J with teacher educational qualification of B. Sc (Ed) Chemistry and teaching experience of 13 years has a mean score of 44.50.

6. Discussion of Findings

Teachers' educational qualification is very important in teaching and learning process. Educational qualification in education is required to teach any subject in the secondary schools in Nigeria. This is in order to acquire necessary and relevant knowledge, skills, attitude including teaching methodologies to teach effectively. From research question 1, the findings of this study revealed that chemistry teachers in Ogbia Local Government Area had required educational qualifications to teach chemistry and students' academic achievement in chemistry subject was independent of the teachers' experience. This finding is in line with the views held by [Aina, Olanipekun, and Garuba \(2015\)](#) and [Aina and Olanipekun](#)

(2015) who opined that there is significant positive correlation between teachers' educational qualifications and their students' academic achievement. This is in line with the work of Casian et al. (2021) "impact of teachers' qualification on students' academic performance in public secondary schools in Rwanda". Teachers with advanced degrees and specialized training produce students with higher test scores and deeper conceptual understanding. Abidoeye and Bamuwagun (2022) in their work on effect of chemistry teachers' gender and academic qualification on performance of students in senior secondary schools in Kwara State, Nigeria, confirmed that there is a significant influence of teachers' qualification on students' academic performance in chemistry education. This is supported by Ichaza and Omoregie (2020) in their study on influence of teachers' qualifications on academic performance of secondary school students in Delta State. They reported that students taught by qualified teachers did better than students taught by unqualified teachers. This is to buttress the fact that there is a relationship between chemistry teachers' qualification and students' academic performance. Etebu and Amatari (2020) in their study, confirmed that teachers with higher educational qualification made higher inputs on academic performance of students. Also, Abidoeye and Ogunlowo (2012) in their study on influence of biology teachers' characteristics on academic performance of students in senior secondary schools in south west geopolitical zones, Nigeria, supported this study. Their result showed that there is a link between teachers' characteristics in which teacher qualification is one, and students' academic performance in science.

From research question 2, the findings of this study revealed that chemistry teachers in Ogbia Local Government had required educational qualifications and years of experience in teaching chemistry and students mean scores range from 23.25 - 63.55. And the percentage pass of students ranging from 38.10 - 84.62. The findings are in line with the view held by several researchers who believed that students taught by teachers with more experience tend to do better in performance than those taught by teachers with lower teaching experience, due to acquisition of skills to teach well overtime (Ojelade & Aregbesola, 2018; Okose & Obiunu, 2024). In support of this assertion, Abimbola and Abidoeye (2013) and Awodi (2014) in their works revealed that qualification and experience influence academic performance of students in science. This is perhaps because overtime, teachers tend to master their subject matter, acquire skills for classroom control which help to solve heterogenous students' challenges in the classroom (Etebu & Amatari, 2020). Adeyemi (2010) who investigated the relationship between the qualifications and experience of chemistry teachers and achievement of their students showed that the students taught by teachers with higher qualifications and experience had significantly higher scores in chemistry. This is in contrast with Etebu and Amatari (2020) in their study impact of teachers' educational qualification on senior secondary students' academic achievement in Biology in Bayelsa State. They opined that students' academic achievement is not dependent on teaching experience because there was no significant difference in students' performance in biology when taught by qualified teachers with higher experience when result was analyzed statistically. Also, Abidoeye and Ogunlowo (2012) in their work on influence of biology teachers' on academic performance of students in senior secondary schools in south west geopolitical zones, Nigeria, reported that students' academic performance is not dependent on teacher gender or year of experiences. This is in line with work of Oludipe and Oludipe (2021) who investigated, do teachers' qualifications and experience influence academic performance of students in basic science in junior secondary school in Nigeria?

7. Conclusion

The study revealed that students' academic performance is linked with teachers' qualifications and experiences. This is to emphasize that importance should be placed on teacher qualifications and experiences in teaching and learning process. Teaching qualification exposes the teachers to mastery of the subject matter, acquisition of relevant skills and attitude and teaching methodologies that help to simplify concepts and ideas in teaching. In addition, teaching experiences enable the teachers with techniques learnt on and in the job to handle different cases in the classroom. It has been noted that teachers' qualification and experiences in teaching have positive impact on chemistry students' academic

performance. Hence, appropriate teaching qualification and experiences should not be compromised when recruiting teachers into the secondary schools.

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Institutional Review Board Statement:

The Ethical Committee of the Federal University, Otuoke, Nigeria has granted approval for this study (Ref. No. FOU/SC.EDU/ETH/24/02).

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Competing Interests:

The authors declare that they have no competing interests.

Authors' Contributions:

Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.

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