



Impact of Teachers' Qualification and Years of Teaching Experience on Academic Performance of Chemistry Students in Colleges of Education, Kaduna State Nigeria

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ABSTRACT

This study examined Impact of Teachers' Qualification and Years of Teaching Experience on Academic Performance of Chemistry Students in Colleges of Education, Kaduna State Nigeria. Descriptive survey and ex-post factor research designs were used for the study. Two colleges of education from Kaduna state were used, with a population of 84 teachers of Chemistry and 1224 students offering Chemistry as a course in the two institutions. A sample of 40 teachers and 300 students were selected using simple random sampling technique. Two instruments, Teachers' Qualification and Experience on Chemistry Students Performance Questionnaire (TQECSPQ) and Students' past results of 2022 were used to collect data. The questionnaire was validated and reliability coefficient of 0.68 was established. One research objective with corresponding research question and null hypothesis was formulated, answered and tested at $p \leq 0.05$ level of significance. Data collected were analysed using frequency percentage and t - test statistics. Findings from the study revealed that: there is a significant difference in the academic performance of between Chemistry students taught by highly experienced and qualified Chemistry teachers and those taught by less experienced and qualified Chemistry teachers. Based on the findings, it is recommended that Chemistry teachers with higher educational qualifications and years of teaching experience should teach Chemistry students in colleges of education.

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INTRODUCTION

For any society to advance in science and technology, role of teachers must be given adequate consideration. This is because no nation can rise above the quality of its teachers. Teachers are the foundation to all professional careers, a tool towards building all professions, a root for national growth and development, a means for advancement in science and technology of every nation. Therefore, a teacher, according to Abubakar (2017) is a person who trains and instructs students in various fields by helping them to learn and grow in formal, informal or non-formal educational settings. Qualified teachers are trained personnel in area of

education and certified, who are responsible for impacting knowledge on learner through formal method of instruction (Ezeugbor, 2017). Garba (2018) viewed a qualified teacher as a person who has the minimum academic and professional qualifications to teach a specific level of education in a country. In Nigeria, the professional body responsible for certification of teachers is called Teachers Registration Council of Nigeria (TRCN) which recognized teacher as indispensable human resource in the school system, he is considered more important than laboratory facilities/materials and funding.

On account of the important roles teachers play in teaching and learning process,

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Educational law in Nigeria provides that; “no person shall teach in any school unless his name has been placed on the register of teachers...” As of now, one is legally recognized as a teacher if his name is in the register of the Teachers Registration Council and he ceases to be a teacher once his name is deleted from the register (TRCN, 2010). Teachers are very important factor in influencing students’ learning because they stand in the interface of knowledge transmission, values and skills in the learning process. If the teacher is ineffective, students under the teacher’s tutorship will achieve inadequate progress academically. This is regardless of how similar or different the students are in terms of individual potential in academic achievement (Kimani, Kara & Njagi, 2013).

Teachers’ years of teaching experience is another variable that determine effectiveness of teachers in teaching and learning process. Aina and Olanipekun (2015) sees teachers’ years of teaching experience as the number of years a teacher spent teaching students, conducting research on contemporary issues in education, attending conferences, workshops and seminars. As teachers grow professionally, they tend to develop skills, increase exposure and acquire training that help them to prepare and conduct effective teaching and create enabling environment for learning. A lot of studies conducted by Unanma, Abugu and Umeobike (2013), Mohammed and Yusuf (2015), Yunana, Mari and Lawal (2015), and Dada and Yusuf (2016) to determine the effect of teachers’ years of teaching experience on the academic performance of students showed a positive effect. In addition to enhancing academic performance of students an experienced teacher does, he also confer more benefit to their students’ success outside school, colleagues and to the school as a whole (Kini & Podolsky, 2016).

Academic qualification of Teachers, years of teaching experience, number of seminars, conferences and workshops they have attended, make them versatile and expose them to a better approach in teaching and learning process which in the long run enhance academic performance of students (Akiri, 2013; Van der

Bergh & Roos, 2014; Firestone, 2014; Mohammed & Yusuf, 2015; Yunana, Mari & Lawal, 2015; Dada & Yusuf 2016; Abubakar, 2017; Samuel, Okonkwo & Egolum 2022). Unanma, Abugu and Umeobike (2013) examined relationship between teacher’s academic qualifications and academic achievement of Senior Secondary School Students in Chemistry findings revealed that students thought by highly qualified with higher number of years in teaching experience performed better. Also Yunana, Mari and Lawal, (2015) examined the impact of teachers’ years of teaching experience and qualification on Chemistry students’ academic performance in secondary schools, Kaduna state Nigeria, findings revealed a positive impact. It is on this basis that the researchers deem it necessary to find out the impact of teachers’ qualification and years of teaching experience on academic performance of chemistry students in colleges of education, Kaduna state Nigeria”.

Chemistry has been identified as an important science subject and its importance in scientific and technological development of any nation (FGN, 2013). Achimugu, (2016), defined chemistry as a branch of science that studies the properties of matter in terms of compositions, structures, transformations, interactions and energy implications of chemical changes. It is recognised as one of the major natural science subject and other science-related courses in Nigerian educational system (Osokoya, 2017). It is a pre-requisite subject for offering most science-oriented courses in the tertiary institutions and this calls for the need in teaching it effectively (Kyado, Achor, & Adah, 2021).

Teaching and learning of Chemistry at tertiary institution revolves around the intricate interplay of passionate experienced teachers, willing and serious students, deployment of appropriate pedagogy, requisite facilities as well as a most enabling ambience for the actualization of a pre-determined learning outcomes (Adesoji & Olatunbosun, 2008; Emendu & Okoye, 2015; Khan, 2016; Abubakar, 2016 and Osokoya, 2017). As important as chemistry is in the development of science and technology in Nigeria, and effort have been made by researchers/chemistry teachers to

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enhance students' academic performance in chemistry at tertiary institution, a lot of factors hinders the smooth teaching and Chemistry at colleges of education leading to dwindling performance of students in colleges of education. These factors includes: large class size, inadequate laboratory facilities, lack of proper guidance, family background, Under staffing, inadequate teaching and learning materials, poor funding, lack of motivation, poor background knowledge of Chemistry from senior secondary school, Mushtaq & Shabana, 2012, Mbugua, et'al, 2012, Kimani, et'al 2013, Ikechukwu & Akeem, 2015, Eberly, 2015, Abanikanda, 2016)). All these factors affecting student's performance in Chemistry are grouped into five (5) major factors by Abubakar, (2017) they are: Students' factors, Teacher's factors, Lack of Science equipment and facilities, Environmental factors, and Governmental factors. This study therefore, determined "the impact of teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education, Kaduna state Nigeria".

Colleges of Education are tertiary institutions or teacher training colleges primarily engaged in teaching and conducting researches on the needs of pre-school, compulsory or post compulsory levels of education and training. They provide full-time courses of teaching, instruction and training in technology, applied science, humanity and carry out researches in the development and adaptation of teaching techniques (Aina & Olanipekun, 2015). Colleges of education offer a minimum teaching qualification in Nigeria, the Nigeria Certificate in Education (NCE). All NCE awarding Institutions are regulated by National Commission for Colleges of Education (NCCE), an agency of Federal Ministry of Education in Nigeria (FGN, 2013). This study used students in colleges of education to determined "*the impact of teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education, Kaduna state Nigeria*".

Objective of the Study

The Objective of the study is to:

- i. determine the impact of teachers' qualification and years of teaching experience on academic performance of Chemistry students in colleges of education, Kaduna State Nigeria

Research Question

What is the impact of teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education, Kaduna State Nigeria?

Null Hypothesis:

H0₁: There is no significant difference between teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education Kaduna State Nigeria.

METHODOLOGY

The study employs descriptive survey and ex-post factor research design where questionnaire and previous student' results was used. The study analysed 2023 end of semester examination result of NCE II chemistry students' result, in order to determine the impact of teachers' years of teaching qualification and experience on academic performance of student in colleges of education in Kaduna State, Nigeria.

Two colleges of education from Kaduna state was used, with a population of 84 teachers teaching Chemistry and 1224 students offering Chemistry as a course in the two institutions. A sample of 40 Chemistry teachers and 300 Chemistry students were selected using simple random sampling technique. Two instruments; (questionnaire and student' previous semester result) Teachers' Qualification and Experience on Chemistry Students Performance Questionnaire (TQECSPQ) and Students' past Semesters results were used to collect data. The questionnaire was validated by expert in Science Education followed by pilot test. Result from pilot test was analysed and obtained a reliability coefficient of 0.68 using Pearson Product Moment Correlation Coefficients. Data collected were subjected to statistical analysis, the research question was answered using frequency count



and percentage, while the null hypothesis stated was tested using t - test statistics at 0.05 level of significance.

Research Question: What is the impact of teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education Kaduna State Nigeria?

RESULTS

Table 1: Percentage of male and female Chemistry Teachers in the two Colleges

College	Number of teachers Males	% of male teachers	Number of teachers Females	% of female teachers	Total number of teachers	Percentage
A	12	60	8	40	20	100%
B	14	70	6	30	20	100%
Total	26	65	14	35	40	100%

Result in Table 1 revealed that majority of teachers 26(65%) teaching Chemistry in the two

Colleges of Education are males while 14(35%) are females.

Table 2: Qualification of Chemistry teachers in the two Colleges

Teachers Qualification	Number of teachers in College A	% of teachers	Number of teachers in College B	%of teachers	Total number of teachers	Percentage
PhD	6	30	7	35	13	32.5%
MSc/MSc (ed)	12	60	10	50	22	55%
BSc/BSc (ed)	2	10	3	15	5	12.5%
Total	20	100	20	100	40	100%

Result in Table 2 revealed that majority of teachers 22 (55%) have masters and 13 (32.5%) have PhD degrees with relevant teaching qualification in the two Colleges of Education used

for the study. Only 5 (12.5%) teachers have first degree with teaching qualification.

Table 3: Chemistry Teachers' years of Teaching Experience in the two Colleges

Teachers Years of Experience	Number of teachers in College A	% of teachers	Number of teachers in College A	% of teachers	Total number of teachers	percentage
1-5 years	2	10	3	15	5	12.5%
6-10 years	4	20	7	35	11	27.5%
11 and above	14	70	10	50	24	60%
Total	20	100	20	100	40	100%

Result in Table 3 revealed that majority of teachers 24 (60%) have more than 11 years teaching experience. A reasonable number 35

(27.5%) have 6 – 10 years teaching experience. Only 5 (12%) have 1 – 5 years teaching experience.

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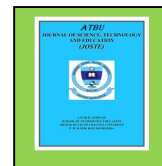


Table 4: Teachers' Participation in Workshop, Seminars and Conference

Type of Training received	Number of teachers in College A	% of teachers	Number of teachers in College A	% of teachers	Total number of teachers	percentage
Workshops	2	10	3	15	5	12.5%
Seminars	2	10	1	5	3	7.5%
Conferences	4	20	3	15	7	17.5%
All of the above	12	60	13	65	25	62.5%
Total	20	100	20	100	40	100%

Result in Table 4 revealed that majority of teachers 25 (62.5%) attended workshops, seminars and conferences only few teachers have

not attended workshops and seminars and conferences.

Table 5: Chemistry Teachers' Rating of Students' Performance in Chemistry

Teachers' Rating	Number of teachers in College A	% of teachers	Number of teachers in College A	% of teachers	Total number of teachers	percentage
Poor	0	0	0	0	0	0%
Good	15	75	12	60	27	67.5%
Very good	5	25	8	40	13	32.5%
Total	20	100	20	100	40	100%

Result in Table 5 revealed teachers' rating of their students' academic performance in Chemistry in the two colleges used for the study. Majority of teachers 27 (67.5%) rated their students good. Few teachers 13 (32.5%) rated them very good while none of the teachers in the two Colleges rated their students as poor.

Testing the Null Hypothesis

There is no significant difference between teachers' qualification and years of teaching experience on academic performance of chemistry students in colleges of education Kaduna State Nigeria. The stated hypothesis was tested using t-test statistics at 0.05 level of significance.

Table 6: t-test Analysis of Students' performance taught by Chemistry Teachers with MSc, MSc(ed) and PhD

Qualification	N	Mean	Std. Dev.	Df	t	P	Remark
MSc/MSc (ed)	150	11.90	3.42	298	2.17	0.03	S
PhD	150	12.87	3.27				

Significant at $P < 0.05$ level of significance

Result in Table 6 revealed that significant difference exist between students taught by teachers with higher qualification than those taught by teachers with lower qualification. This is because the calculated p value of 0.03 is found to be lower than the alpha value of 0.05.

The students' mean academic performance are 11.90 and 12.87 for students taught by teachers with MSc/MSc(ed) and PhD respectively. This shows that students taught by teachers with higher qualification performed significantly better hence the null hypothesis was rejected.

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Table 7: t-test Analysis of Chemistry Teachers' Years of Teaching Experience and Students' Performance

Teachers, Years of Experience	N	Mean	Std. Dev	Df	t	P	Remark
Students taught by teachers with 1- 10 years of experience	150	11.87	3.21				
Students taught by teachers with 11- and above years of experience	150	12.91	3.37	298	2.12	0.01	S

Significant at $P < 0.05$ level of significance

Result in Table 7 revealed that significant difference exist between students taught by teachers who had higher years of experience than those taught by teachers with lower years of experience. This is because the calculated p value of 0.01 is found to be lower than the alpha value of 0.05. The students' mean

academic performance are 11.87 and 12.91 for students taught by teachers with 1-10 and 11 and above years of teaching experience respectively. This shows that students taught by teachers with higher number of years of experience performed significantly better hence the null hypothesis was rejected.

Table 8: t-test Analysis of Students' performance taught by Male and Female Chemistry Teachers

Qualification	N	Mean	Std. Dev.	Df	t	P	Remark
Male	150	12.32	3.31				
Female	150	12.81	3.27	298	1.24	0.23	N.S

Significant at $P < 0.05$ level of significance

Result in Table 8 revealed that there is no significant difference between students taught by male and female Chemistry teachers. This is because the calculated p value of 0.23 is higher than the 0.05 alpha level of significance, hence the null hypothesis is retained.

The findings also corroborates with that of Samuel, Okonkwo and Egolum (2022) which revealed that teaching qualification is a significant factor in predicting chemistry teachers' pedagogical content knowledge in chemistry.

Result from the study also showed that students taught by teachers having 11 years and above teaching experience performed better than those taught by teachers with 1- 10 years of teaching experience. This implies that the higher the teachers' years of experience the higher the students' academic performance. Findings from this study is in line with that of Unanma, Abugu and Umeobike (2013), Van der Bergh and Roos, (2014), Firestone (2014) Mohammed and Yusuf (2015), Yunana, Mari and Lawal (2015), Dada and Yusuf (2016) and Kini and Podolsky (2016) who revealed that teachers that have been teaching a particular subject for several years tend to performed better than novice teachers.

More so, the study was able to discover that there is no significant difference in the academic performance of Chemistry students

DISCUSSION OF THE FINDINGS

Findings of this study has revealed that as the educational qualification of Chemistry teachers increases, the academic performance of the students also increases. This implies that the academic qualification of Chemistry teachers influence the academic performance of students in colleges of education. This is in line with the findings Akiri (2013), Unanma, Abugu and Umeobike (2013), Van der Bergh and Roos, (2014), Firestone (2014) Mohammed and Yusuf (2015), Yunana, Mari and Lawal (2015) Dada and Yusuf 2016; Abubakar, (2017). Unanma, Abugu and Umeobike (2013) who found out that teachers' qualification contributed to the improvement of students' academic performance.

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taught by male and female Chemistry teachers this is in agreement with findings by Yunana, Mari and Lawal (2015), and Dada and Yusuf (2016) whose findings shows similar academic performance of students taught by male and female teachers.

CONCLUSION

Based on the results obtained, the following conclusions are deduced:

1. Academic performance of Chemistry students is enhanced when they are taught by Chemistry teachers with high academic qualification.
2. Teachers that have been teaching Chemistry for a long period of time have positive influence on the academic performance of chemistry teachers.
3. Teachers' gender has no influence on the academic performance of Chemistry students.

RECOMMENDATIONS

The following recommendations are made based on the findings of the study:

1. In-service training should be provided for teachers to acquire higher qualifications on how to use effective instructional strategies to enhance students' academic performance.
2. Highly experienced teachers who have many years of teaching experience should be assign to teach Chemistry students at colleges of education.
3. There should be no gender bias in recruiting Chemistry teachers in colleges of education as gender has no effect on students' academic performance.

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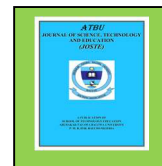
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