

## Nexus between Teacher's Communication Style and Students' Academic Performance in Chemistry

Hassan Kadiri<sup>1</sup>, Mariam Titilayo Na Allah<sup>2</sup>, David Akinjide Akintola<sup>3</sup>

<sup>1</sup> Kwara State College of Education Ilorin, <sup>2</sup>National Open University of Nigeria

\*kadirh011@gmail.com

### Abstract

*The study investigated how teacher's communication styles influence learning outcome in Chemistry. The study adopted a survey research method involving 120 participants randomly selected from secondary schools in South-West Nigeria. Two structured questionnaires were used to collect the data (TRFQS and TRFQT for Chemistry students and teachers respectively). Findings from the study revealed that learners' academic performance has no direct connection with teacher's writing and non-verbal style. However, result showed that teacher's speaking style has influence on learning outcome. The study has implication for school heads, teachers, curriculum planners and learners in their efforts towards enhancing learners' academic performance.*

**Keyword :** Communication styles, Learning outcomes, Chemistry education, Academic performance.



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### 1. INTRODUCTION

Nation's level of advancement in science and technology determines her level of development and influence in the global community. Thus, developed and underdeveloped nation is identified by her level of advancement in science and technology. A developed nation is recognized by her technological attainment through scientific applications (Omiko 2005; Azegba 2010). Scientific method is the systematic investigation of the nature and establishing reliable body of knowledge. It plays a crucial role in shaping human thinking, exploring, generating and applying knowledge about our environment (Aniodoh, 2012; Ivowi, 2003). Therefore, effective impart of scientific knowledge to learners is fundamental to attainment of a nation's development. Physics, Chemistry, Biology among others are the core science subjects that make up science education. This study focuses on chemistry as a subject taught in secondary schools. Ababio (2004) has defined chemistry as a branch of science that deals with the study of matter, its compositions, properties and reactions which helped in developing of modern technology through the application of its principles in modern invention. The focus on teaching and learning of Chemistry can be more valued when one realizes that the task of the subject is not narrow to the attainment of a body of information about nature. Rather, it encompasses the exploitation of such information in solving the various problems that confront mankind. In this regard, the use of appropriate instructional methods and provision of necessary materials for successful instruction and learning of Chemistry is inevitable in an effort towards achieving scientific and technological excellence (Azegba, 2010; Asiyai, 2005).

However, government has invested so much on science education but the outcome result on the learners' quality is not commensurate with government expenditure. Specifically, academic achievement of students in Chemistry has remained unimpressive in the recent, which needs urgent response from education stakeholders. There are many factors responsible for this unsatisfactory students' achievement as identified by previous researchers which include teachers, students, parents and environmental factors (Abadjo, 2004; Ibezim, 2018). Teachers are the most resourceful personnel in education system. Teachers play major roles in determining students' achievement (Ibukun 2009). The quality of education produced in a country speaks volumes about the availability and effective teaching to which learners are exposed. School teachers can be described as a major predictor of the quality education who predicts his learners' performance and success in

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examinations. They also play key roles in developing the system of education in a society (Aina, Ogundele & Olanipekun, 2013; Ojo, 2018).

Similarly, studies have shown that teacher related factors such as qualification, teaching experience, communication style and gender play significant role in improving students' academic achievement (Alafiatayo, Anyanwu & Salau, 2016; Ibukun, 2009; Ibezim, 2018). Studies revealed that qualified teachers are significantly influencing the students to achieve greatly in their academic pursuit. Teacher requires good knowledge of the subject matter through acquisition of necessary training. Therefore, it is essential for teachers to earn high qualifications for efficiency and effectiveness. Furthermore, teachers' exposure and mastery of the contents of the subject are distinctive ingredients for effective disposition of learning to the learners. Teachers' exposure to a certain experience increases their knowledge, skills, and productivity of teachers which facilitate students' skills, achievement and retentive capacity. Teaching experiences has direct relationship with teacher's ability to effectively plan the lesson, address students' individual differences and stimulate their inquiry (Etiubon & Benson, 2014; Okey, 2012).

More so, teacher's communication style is another factor that has significant influence on students' achievement. An individual teacher that are characterized by good communication skill should be able to present the subject matter with ease and become easier for students to assimilate since his presentation style and subject mastery distinguishes him, this promote success/achievement level in the classroom. (Omotoyinbo & Olaniyi, 2019). Elochukwu, (2001) find a significant relationship between teachers' communication style and learners' achievement in schools. However, Chemistry education aims at equipping learners with diverse basic scientific skills, competencies and creativity needed to provide opportunities for wealth creation. These aims will remain a mirage if teachers of chemistry do not have the pre-requisite qualification and experience needed for learners active involvement in teaching and learning activities to enhance their productivity.

Therefore, intention of this research is to examine these teachers related factors influence on chemistry students' academic achievement. Chemistry students in secondary schools are experiencing deficiency and poor academic performance due to low input by the teachers, lack of appropriate teaching methodologies and inexperience of chemistry teachers in our classrooms (Ogunniyi, 2015). Also, the present state of Chemistry learning in South- West, Nigeria shows that some secondary school chemistry teachers are unprofessional, which leads to poor students' performance in chemistry. (Ojo, 2018; Aina et al., 2013). To eliminate the poor academic performance of chemistry students in senior secondary schools, the major causes of failure need to be traced to all variables involved in learning and teaching of chemistry. This study therefore aims at investigating the influence of teachers' academic qualification, experience, communication styles and gender on students' academic achievement in chemistry in South- West, Nigeria.

Main aim of this study is to investigate the teachers related factors influence on senior secondary school chemistry students' academic achievement in South-West, Nigeria. Specifically, the study intends to:

1. examine the teachers' qualification influence on chemistry students' academic achievement in secondary school.
2. assess teachers' experience influence on chemistry students' academic achievement in secondary school.
3. determine the influence of teachers' communication style on chemistry students' academic achievement in secondary school.

Investigate teachers' gender influence on chemistry students' academic achievement in secondary school.

## 2. METHOD

**Design:** The study adopted descriptive research plan specifically a survey type. The design is considered fit for the study because it is the best method that can be used for collecting data which will be used for decision making. It is also an efficient method for gathering descriptive information based on characteristics of population and the current practice and conditions. The study has students' academic achievement as dependent variable while teacher's qualification, teaching experience, communication style and gender are the independent variables.

**Population:** The population will consist of all science students and teachers in Nigeria. While the target population will comprise all senior secondary 2 (SS 2) chemistry students and their teachers in South West, Nigeria. **Sample and sampling:** Krejcie and Morgan (1970) sample size table would be used to establish the sample of the study.

**Instrumentation:** Data would be collected with the use of two structured questionnaires; TRFQS for Chemistry students and TRFQT for Chemistry teachers to be designed by the researcher. Validity of the instruments would be determined by three experts in chemistry. Reliability of the instruments would be ascertain using Cronbach Alpha statistical tool.

**Procedure:** Researchers would seek the consent of the respondents and ensure that none of the questionnaire items are offensive. Thereafter, the researchers would obtain Ethical Certificate. Questionnaires would be administered by the researchers with the help of research assistants. **Data Analysis:** Descriptive and inferential statistical tools would be employed to analyze the data..

## 3. RESULT

The results of analysis of data collected are presented in the following tables. The first table presents demographic characteristics of the respondents (gender, educational qualifications, and teaching experience) using percentage scores. The last six tables contain information on teacher's related factors and students' academic performance.

**Table 1.** Demographic Characteristics of the Respondents

Variable		N	Percentage
Teacher Gender	Male	75	62.50
	Female	45	37.50
	<b>Total</b>	<b>120</b>	<b>100</b>
Teacher Qualification	M. Ed Chemistry	4	3.30
	B.Sc Ed Chemistry	63	52.50
	B.Sc Chemistry/PGDE	5	4.20
	B.Sc Chemistry	8	6.70
	NCE Chemistry	38	31.70
	Others	2	1.70
	<b>Total</b>	<b>120</b>	<b>100</b>
Teacher Experience	Less than 5 years	10	8.30
	5 – 10 years	20	16.70
	11 – 15 years	56	46.70
	Above 15 years	34	28.30
	<b>Total</b>	<b>120</b>	<b>100</b>

Table 1 shows that 62.50% of the respondents are male while 37.50% are female. Also, 60% of the respondents have the required qualifications for teaching Chemistry at senior secondary school level. From this analysis, it is evident that majority of the sampled teachers have enough year of teaching experience which enable them to supply adequate and required information.

**Table 2.** Chi-Square Computation on Teacher's Speaking Style and Students' Performance

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	58.983	1	0.000		
Continuity Correction	32.420	1	0.000		
Likelihood Ratio	14.799	1	0.000		
Fisher's Exact Test				0.001	0.001
Linear-by-Linear Association	58.492	1	0.000		
N of Valid Cases	120				

Table 2 shows that the  $X^2$  calculated value is 58.983 while p value is 0.001 at a 0.05 level of significance, thus,  $p < 0.05$ . this implies that the relationship is not statistically significant. Therefore, research hypothesis that there is no significant relationship between teacher's speaking style and students' performance is rejected.

**Table 3.** Chi-Square Computation on Teacher's Writing Style and Students' Performance

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.900	1	0.015		
Continuity Correction	2.680	1	0.102		
Likelihood Ratio	3.748	1	0.053		
Fisher's Exact Test				0.066	0.066
Linear-by-Linear Association	5.851	1	0.016		
N of Valid Cases	120				

Table 3 reveals that the  $X^2$  calculated value is 5.900 while p value is 0.066 at a 0.05 level of significance. This shows that  $p > 0.05$  which indicates that the relationship is statistically significant. So, research hypothesis that there is no significant relationship between teacher's writing style and students' performance is not rejected.

**Table 4.** Chi-Square Computation on Teacher's Non-verbal Style and Students' Performance

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	0.929	1	0.335		
Continuity Correction	0.094	1	0.759		
Likelihood Ratio	1.651	1	0.199		
Fisher's Exact Test				1.000	0.440
Linear-by-Linear Association	0.921	1	0.337		
N of Valid Cases	120				

Table 4 shows that the p value is 0.440 at a 0.05 level of significance, thus,  $p > 0.05$ . this implies that the relationship is statistically significant. Therefore, research hypothesis that there is no significant relationship between teacher's non-verbal style and students' performance is not rejected.

**Table 5.** Chi-Square Computation on Teacher's Qualification and Students' Performance

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.692	5	0.012
Likelihood Ratio	5.906	5	0.316
Linear-by-Linear Association	0.037	1	0.847
N of Valid Cases	120		

From the table 5, the  $X^2$  calculated value is 14.692, the degree of freedom is 5 at a 0.05 level of significance, and the table value is 0.012. Since the calculated value of 14.692 is greater than the table value of 0.012, the research hypothesis that there is no significant relationship between the teacher's qualification and students' performance is rejected.

**Table 6.** Chi-Square Computation on Teacher's Experience and Students' Performance

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.730	3	0.630
Likelihood Ratio	2.605	3	0.457
Linear-by-Linear Association	1.590	1	0.207
N of Valid Cases	120		

Table 6 shows that the  $X^2$  calculated value is 1.730, the degree of freedom is 3 at a 0.05 level of significance, and the table value is 0.630. Because the calculated value of 1.730 is greater than the table value of 0.630, the research hypothesis that there is no significant relationship between the teacher's experience and students' performance is rejected.

#### 4. DISCUSSION

Based on data analyzed, research hypothesis which states that there is no significant relationship between teacher's speaking style and students' performance was rejected. Because the p value is less than the level of significance. This means that there is relationship between teacher's speaking style and students' performance. This is in line with the findings of Obilor (2019) and Omotoyinbo and Olaniyi (2019) who opined that teacher's effective communication influenced students' academic performance. However, the research hypothesis which states that there is no significant relationship between teacher's writing style and students' performance was not rejected. This implies that teacher's writing style does not influence students' learning outcome. Though, teacher's writing should be legible and clear, the writing style adopted by a teacher has no significant relationship with students' academic performance. Likewise, the hypothesis which states that there is no relationship between teacher' non-verbal style and students' performance was not rejected based on data collected and analyzed. This is because the p value is greater than the level of significance. This means that teacher's non-verbal communication style has no relationship with learners' academic achievement.

Furthermore, the research hypothesis which states that there is no significant relationship between teacher's qualification and students' performance was rejected by the respondents. This implies that the relationship between teacher's qualification and students' performance is statistically significant. This is in agreement with the findings of Adebayo (2012) who found a significant relationship between teacher's qualification and learning outcome. This shows that acquiring the right training and qualification enhance effective

teaching and learning outcome. However, this contradicts the findings of Kosgei (2013) and Ujulu et al. (2019) who revealed that teacher's qualification has no influence on students' academic achievement.

Similarly, analysis of data revealed that respondents rejected the research hypothesis which states that there is no significant relationship between teacher's experience and students' performance. Because the p value is less than the level of significance. This means that students' performance has significant relationship with teacher's experience. This is in consonant with the findings of Commey-Ras (2003) and Ujulu (2019) who found a statistically significant relationship between teacher's experience and students' performance. Thus, teacher's teaching experience enhances students' understanding and improves academic gain.

## **5. CONCLUSION**

This study investigated the nexus between teacher's communication style and students' academic performance in Chemistry. The variables examined were teacher's speaking style, writing style, non-verbal style, qualification and experience. The study revealed that Chemistry students' academic performance is influenced by teacher's speaking style, qualification and teaching experience. However, teacher's writing and non-verbal style has no significant relationship with students' learning outcome.

Based on the findings, the following recommendations were made: Teachers should be encouraged to acquire communication skills and relevant qualifications through training and re-training. Also, government should motivate the teachers by prioritizing their welfare. Additionally, it is important to note that the study was limited to five secondary schools and 150 participants due to financial and time constraints. Therefore, additional efforts should be made to examine other teacher related factors that influence students academic performance that were not addressed in this study.

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