

Relationship Between Teacher Attributes and Academic Achievement of Senior Secondary School Students in North Central, Nigeria

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Abstract

This study investigated the relationship between teacher attributes and academic achievement of senior secondary school students in North Central, Nigeria. With the purpose of identifying the teachers' professional attributes and examines the relationships that academic achievement could have with variables such as teachers' pedagogical content knowledge, communication skills and classroom management skills. The study adopted a correlational research design to examine the relationship between variables. The population for the study was one hundred and eighty thousand, nine hundred and seventy-eight (180,978) SS II students in the North Central of Nigeria out of which 384 students were systematically selected for the study. Teacher Attributes Scale was used as research instrument. Statistical Package for Social Sciences (SPSS) was used to analyze the data at four different levels; simple percentages was used to analyze the respondents' demographic data, mean, standard deviation, scatterplot and One-way ANOVA were used to analyze the research questions, Multiple Linear Regression Analysis was used to test hypothesis 1 and 5, Person Product-Moment Correlation (PPMC) was used to test hypotheses 2 to 4 at 0.05 alpha level of significance. The results revealed both teacher-related attributes substantially predict students' academic achievement; having pedagogical content knowledge as a key positive predictor of academic achievement, and teachers' classroom management skills and communication skills have weak inverse relationships with students' academic achievement. Educational institutions should invest in comprehensive professional development programs that enhance teachers' pedagogical content knowledge, communication, and classroom management skills to collectively boost student performance.

INTRODUCTION

Attributes refer to the inherent qualities, characteristics, or properties that define an individual or object. In the context of teaching, attributes can include personal qualities, skills, and dispositions that influence a teacher's behavior and effectiveness. Teacher attributes refer to the personal and professional qualities that influence instructional effectiveness. These include pedagogical content knowledge, communication skills, classroom management, empathy, and professional ethics. According to Kyriacou (2009), teacher attributes encompass a range of personal qualities, including enthusiasm, empathy, and patience, which are essential for effective teaching and learning. Similarly, Hattie (2009) emphasizes the importance of teacher attributes such as passion, clarity, and feedback in promoting student achievement. In psychology, attributes are often referred to as personality traits or characteristics that

shape an individual's behavior and interactions. For example, conscientiousness, extraversion, and agreeableness are attributes that can influence a teacher's approach to teaching and student relationships (McCrae & Costa, 2008).

Teachers' professional attributes refer to the qualities, characteristics, and skills that effective teachers possess, enabling them to perform their roles successfully. These attributes can include pedagogical knowledge and skills, subject matter expertise, communication and interpersonal skills, classroom management and organization, adaptability and flexibility passion for teaching and learning, empathy and understanding, continuous learning and professional development.

All secondary school students deserve and wish to achieve academic success, but some teachers' attributes, such as pedagogical content knowledge, communication skills, and classroom management are inadequate, hindering students' academic progress. Many secondary school teachers lack essential skills, including effective communication, classroom management, and sound pedagogical content knowledge, and fail to provide constructive feedback that supports students' learning. Teachers' attributes, particularly pedagogical content knowledge, communication skills, and classroom management, may significantly influence students' academic achievement, engagement, motivation, and overall educational experiences. Teachers with strong pedagogical content knowledge, effective communication skills, and adept classroom management foster a supportive and constructive learning environment, promoting academic excellence. Conversely, teachers lacking these attributes may inadvertently create an environment conducive to disengagement, apathy, and diminished motivation. Therefore, investigating the relationship between teachers' attributes (pedagogical content knowledge, communication skills, and classroom management) and academic achievement among secondary school students in North Central Nigeria is crucial for improving educational outcomes.

Academic achievement refers to the level of success or accomplishment that a student attains in their educational pursuits. It is typically measured by grades, test scores, and other indicators of academic performance. Academic achievement often determines future opportunities for students. Higher academic achievement opens doors to higher education, scholarships, and career prospects. It can also lead to greater financial stability and a wider range of choices in future. The academic achievements of the students are believed to be greatly influenced by teachers' attributes and causal attribution for their success or failure. Teachers' positive attributes toward teaching can increase students' motivation to learn and actively engage in the classroom. When a teacher has good communication skill, master his subject matter, good classroom management, and gives timely feedback, students may feel supported and value the teacher. They are more likely to be motivated to participate in class discussions, complete assignments, and strive for academic success. Therefore, teachers' pedagogical content knowledge, communication skill, and classroom management skill, may influence the amount of effort they put in their academic pursuit.

Gender differences may influence how teachers display instructional attributes and how students perceive and respond to them. Some studies suggest that male and female teachers may differ in their classroom management styles, communication patterns, and instructional delivery, which can shape students' engagement and achievement differently. Recent research has explored how gender differences in teacher attributes related to academic achievement. A study by Imran et al. (2024) examined gender differences in teachers' pedagogical practices and attitudes towards student learning in primary schools in Sargodha, Pakistan. The findings indicated no significant differences between male and female teachers in classroom management and attitudes

towards students' learning. However, the study emphasized the importance of training for single primary school teachers, regardless of gender, to enhance classroom management skills. In contrast, research analyzing data from the TIMSS 2019 study in Saudi Arabia found that gender differences in teachers' practices and attitudes could influence students' grades. The study suggested that these differences might contribute to the observed gender gaps in achievement outcomes between girls and boys.

Statement of the problem

The major problem that led to this study is the decline in academic performance of secondary school students and the suboptimal attributes of teachers toward their teaching profession. Therefore, exploring variables such as the relationships of teacher attributes (pedagogical content knowledge, communication skills and classroom management skills) can provide valuable information for educators to address these challenges and improve students' academic outcomes.

Relationship between teacher attributes and academic achievement

The relationship between teacher attributes and students' academic achievement has been a topic of interest for educators and researchers for decades. Teachers play a vital role in shaping students' learning experiences and outcomes. The quality of teaching has a significant impact on students' academic achievement, and teacher attributes are a crucial factor in determining the effectiveness of teaching. Research has consistently shown that teacher attributes, such as pedagogical content knowledge, communication skills, and classroom management skills, are strongly correlated with student academic achievement (Hattie, 2009; Marzano, 2007; Darling-Hammond, 2010). Teachers' pedagogical content knowledge has a significant relationship with students' academic performance in circle theorem (Suglo, Bornaa, & Iddrisu, et al, 2023). Pedagogical Content Knowledge and Subject Matter Content Knowledge facilitate teaching effectiveness and learning efficiency in the teaching of STEM subjects in the University of Technology (Mafa-Theledi, 2024). Effective communication skills enable teachers to convey complex concepts clearly, provide constructive feedback, and build strong relationships with students (Wiggins & McTighe, 2005). Chen and Lee (2017) investigated "The Relationship Between Teacher's Pedagogical Content Knowledge and Students' Science Achievement" and found a significant positive correlation between teachers' pedagogical content knowledge and students' science achievement. Pedagogical content knowledge (PCK) refers to the ability of teachers to transform subject matter into teachable content. In Nigeria, many teachers lack PCK, which hinders their ability to effectively teach and engage their students. A study by Adeyemi (2017) found that many Nigerian teachers lack the necessary PCK to teach mathematics and science effectively. Effective communication is critical for successful teaching and learning. However, many Nigerian teachers struggle with communication skills, which can lead to misunderstandings and miscommunication with students. A study by Ogunleye (2018) found that many Nigerian teachers have poor communication skills, which affects their ability to teach and engage their students. Classroom management refers to the ability of teachers to create and maintain a positive learning environment. In Nigeria, many teachers struggle with classroom management, which can lead to discipline problems and a lack of focus among students. A study by Akomolafe (2019) found that many Nigerian teachers lack the necessary skills to manage their classrooms effectively. Effective classroom management is critical for creating a positive learning environment. Goodson (2025) discussed the personal attributes and skills of effective teachers, noting that classroom management is a key component in ensuring student academic success.

Despite the importance of teacher attributes, many schools struggle to attract and retain high-quality teachers. In developing countries, the shortage of qualified teachers is particularly acute, exacerbating the challenges of providing quality education (UNESCO, 2019). The World Bank estimates that 130 million children in low-income countries are not learning basic skills, largely due to inadequate teaching (World Bank, 2018). In Nigeria particularly the north central, the education system faces similar challenges. The Nigeria Education Policy emphasizes the need for improving teacher quality to enhance student learning outcomes. However, there is limited research on the relationship between teacher attributes and student academic achievement in Nigeria specifically the north central. This study aims to investigate the relationship between teacher attributes and academic achievement of senior secondary school students in the North Central of Nigeria. It specifically seeks to examine the impact of pedagogical content knowledge, communication skills, and classroom management skills on student academic achievement. Pedagogical Content Knowledge (PCK): Refers to the knowledge of teaching methods, strategies, and techniques. Teachers with strong PCK can effectively convey complex concepts in a way that is understandable to students. Communication Skills: Effective communication skills enable teachers to clearly explain concepts, engage students in learning activities, and foster positive relationships in the classroom. Classroom Management Skills: Teachers with strong classroom management skills can create a conducive learning environment by establishing clear expectations, managing student behavior effectively, and promoting positive interactions among students.

The main purpose of this study is to investigate the relationship between teacher attributes and academic achievement of senior secondary school students in the North Central of Nigeria. The study was guided with the following research question:

1. What are the professional attributes of senior secondary school teachers in the North Central of Nigeria?
2. What is the relationship between teachers' pedagogical content knowledge and academic achievement of senior secondary school students in the North Central of Nigeria?
3. What is the relationship between teachers' communication skills and academic achievement of senior secondary school students in the North Central of Nigeria?
4. What is the relationship between teachers' classroom management and academic achievement of senior secondary school students in the North Central of Nigeria?
5. Does gender have relationship with teacher attributes and students' academic achievement?

Hypotheses

- Ho₁: There is no significant relationship between teachers' professional attributes and students' academic achievement in the North Central of Nigeria.
- Ho₂: There is no significant relationship between teachers' pedagogical content knowledge and students' academic achievement in the North Central of Nigeria.
- Ho₃: There is no significant relationship between teachers' communication skills and students' academic achievement in the North Central of Nigeria.
- Ho₄: There is no significant relationship between teachers' classroom management and students' academic achievement in the North Central of Nigeria.
- Ho₅: There are no significant relationships between teachers' professional attributes and academic achievement of male and female students in the North Central of Nigeria.

Theoretical Framework

This study is grounded in the Social Cognitive Theory (Bandura, 1986) and the Self-Determination Theory (SDT) by Edward Deci and Richard Ryan in the 1980s. The Social Cognitive Theory posits that learning is influenced by teacher attributes, such as PCK, communication skills, and classroom management skills. The Self-Determination Theory (SDT) suggests that teacher attributes, is motivated by three innate psychological needs: autonomy, competence, and relatedness to impact student academic achievement.

1. PCK and Students' Academic Achievement: Teachers with strong PCK are more effective in promoting student learning. And teachers who provide autonomy support to their students are more likely to promote intrinsic motivation and engagement, which can lead to improved academic achievement.
2. Communication Skills and Students' Academic Achievement: Effective communication enhances student understanding and engagement. Also, teachers who help their students develop a sense of competence are more likely to promote intrinsic motivation and engagement, which can lead to improved academic achievement.
3. Classroom Management Skills and Students' Academic Achievement: Well-managed classrooms facilitate student learning. And teachers who build positive relationships with their students are more likely to promote intrinsic motivation and engagement, which can lead to improved academic achievement.

Empirical Studies

The study of Khan, Khan, Zia-Ul-Islam, & Khan (2017), Communication Skills of a Teacher and Its Role in the Development of the Students' Academic Success, was carried out in Pakistan concluded that teacher communication skills have significant role in the academic achievement of the students. Odumosu & Olisama (2018) paper, titled "teachers' content and pedagogical content knowledge on students' achievement in algebra", carried out in Lagos, revealed that students were not equally affected by TPK in algebraic achievement test and that gender has no significant effect on students' achievement in algebra after exposure to teachers' content and pedagogic knowledge. A study of Dauda, Mustapha, & Mohammed (2022), titled "Relationship between Teachers' Attributes and Students' Academic Performance in Public Senior Secondary Schools in Maiduguri, Metropolis, Borno State, Nigeria." the findings revealed that there was a significant positive relationship between teachers' qualification and students' academic performance in Public Senior Secondary Schools in Maiduguri Metropolis, Borno State, Nigeria. Another finding revealed that there was a significant positive relationship between teachers' experiences and students' academic performance in Public Senior Secondary Schools in Maiduguri Metropolis, Borno State, Nigeria. Based on the findings the study concluded that teachers' attributes affect the students' academic performance positively. Gidado, Apeh, & Uben (2023), carried out a study titled "teachers, professional attitudes and academic achievement public senior secondary school students in the federal capital territory Abuja, Nigeria". The findings revealed that there was significant relationship between teachers' professional attitudes and students' academic achievement. Marife & Yango (2023), carried out a study titled "Teachers' Pedagogical Competence, Classroom Management Skills, and Students' Academic Achievement Among Selected Public City Schools Division in the Province of Laguna. The revealed a significant relationship between the teachers' level of pedagogical competence and students' academic achievement, and revealed that there is no significant relationship between the teachers' level of classroom management skills and students' academic achievement. Tariq & Ullah (2024) study, "Impact of Teachers' Communication Skills

on Academic Achievement of Students at Secondary School Level" in Pakistan, results of the regression test showed a positive but insignificant impact of teachers' communication skills on the academic achievement of students at the secondary school level. The findings of the study were that teachers use speaking and writing skills better than listening and body language skills, and the impact of teachers' communication skills on the academic achievement of students was positive but low and insignificant.

Methodology

This study adopted a correlational research design to examine the relationship between teacher attributes and students' academic achievement. The population of the study comprised all the twenty-four Federal Government Secondary Schools (also known as Unity Schools Federal Government Colleges) in the North-Central of Nigeria, which involved the total number of one hundred and eighty thousand, nine hundred and seventy-eight (180,978) in the North Central of Nigeria. The sample size was three hundred and eighty-four (384) SS II students, which was systematically obtained from the eleven (11) federal government secondary schools stratifically selected. Thile sample size was determined using Research Advisors (2006) sample size table for determining sample size from a given population. Teachers' attributes scale was used for data collection. Teachers' attributes scale was a self-constructed instrument designed by the researcher through the knowledge gained from the literature reviewed and You and Your School Questionnaire. It was designed to measure the teachers' professional attributes. There are sixteen (16) items in the scale which required students to indicate their level of agreement by ticking on a four-point scale either All teachers, most teachers, some teachers, or hardly any teacher. In the scale a high score denotes positive teachers' professional attributes of teaching while a low score denotes negative attributes of teaching. The instrument was validated through face validity, it was validated by experts in Educational Psychology, Department of Educational Foundations, at the University of Abuja. The reliability of the instrument was established through a pilot test and Cronbach Alpha Coefficient method with a reliability index of 0.82. Out of the 384 questionnaires distributed to the respondents, three hundred and eighty two(382) were retrieved, coded and faded in SPSS Version 20, analysed using descriptive and inferential statistics. Simple percentages was used to analysed the respondents' demographic data, mean scores, standard deviation, scatterplot and Analysis of Variance (ANOVA) were used to answer research questions. Multiple Linear Regression Analysis (MLRA) was used to test hypothesis 1 and 5, Pearson Product Moment Correlation Coefficient (PPMCC) statistics was used to test hypothesis 2 to 4 at 0.05 alpha level of significant.

Result

Research Question One: What are the professional attributes of senior secondary school teachers in the North Central of Nigeria?

Table 1: The professional attributes of senior secondary school teachers in the North Central of Nigeria.

N = 382

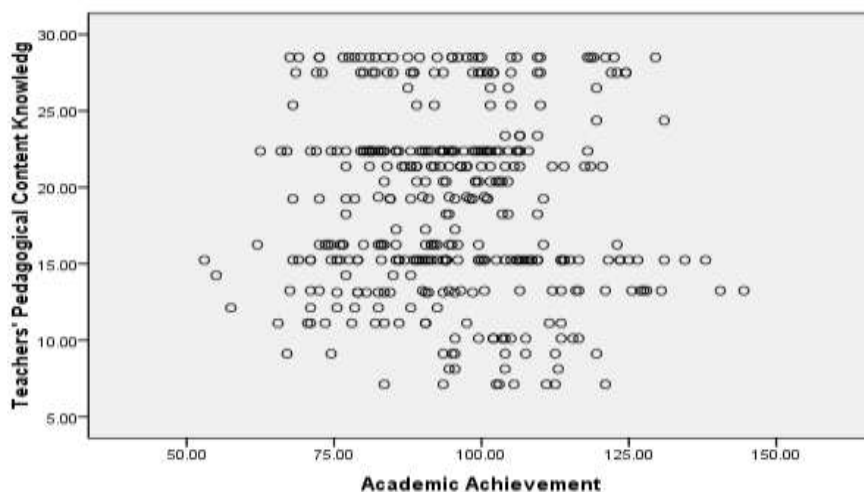
S/No.	Items	Std.		Decision
		Mean	Dev.	
1.	My teacher demonstrates a strong understanding of the subject matter which makes me more interested in learning	2.67	0.84	Agree

2.	I have confidence in my teachers' ability to explain complex topics in a way that I can understand.	2.78	0.78	Agree
3.	The teacher always encourages us to ask questions and seek clarification when we don't understand something	3.17	0.85	Agree
4.	Our teacher uses different teaching methods well to meet the needs of different learners in the class.	2.58	0.94	Agree
5.	My teacher provides examples and real-world applications that help understand abstract concepts.	2.59	0.85	Agree
6.	Our teacher often uses varieties of instructional materials and resources to support our learning.	2.22	0.88	Disagree
7.	The teacher demonstrates enthusiasm for the subject matter, which positively impacts my engagement and interest in learning.	2.51	0.90	Agree
8.	My teacher often provides constructive feedback and encouragement to help students improve their communication skills	2.48	0.96	Disagree
9.	The teacher communicates clearly and understandable.	2.94	0.81	Agree
10.	The teachers often use verbal and non-verbal cues to engage students and maintain their attention during lesson	2.81	0.85	Agree
11.	My teacher is approachable; he helps and gives me clear explanation whenever I ask questions.	2.83	1.00	Agree
12.	My teacher often encourages open and respectful communication in the classroom	2.90	0.94	Agree
13.	My teacher always handles disruptions or conflicts in the classroom in a calm and fair manner	2.92	0.98	Agree
14.	My teacher constantly organizes classroom activities and a stress-free learning environment	2.48	0.97	Disagree
15.	My teacher always enforces classroom rules and consequences for misbehavior	3.04	0.99	Agree
16.	I feel safe and inclusive in our classroom environment because of my teacher's attitude.	2.57	1.08	Agree
Sectional Mean/Std. Dev.		2.72	0.91	Agree

As shown in table 1, the professional attributes of senior secondary school teachers in the North Central of Nigeria were presented. The sectional mean of 2.72 shows that respondents in the study area agreed with the items on professional attributes of senior secondary school teachers in the North Central of Nigeria. This implying that the respondents accepted that some of the teachers in the North central of Nigeria has positive teaching attributes. It is therefore, concluded that the professional attributes of senior secondary school teachers in the North Central of Nigeria are positive

Research Question Two: What is the relationship between teachers' pedagogical content knowledge and academic achievement of senior secondary school students in the North Central of Nigeria?

Figure 1: Scatterplot of teachers' pedagogical content knowledge and academic achievement.

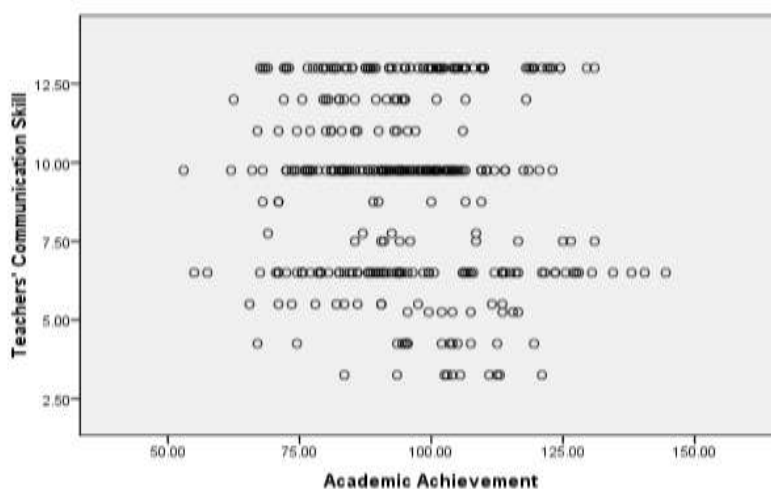


As shown in Figure 1, the scatterplot illustrates the relationship between teachers' pedagogical content knowledge (PCK) and students' academic achievement in senior secondary schools in North Central Nigeria. The data appear widely dispersed without a clear upward or downward trend, indicating a 'weak or negligible linear relationship' between teachers' PCK and students' academic achievement. Most data points cluster around PCK scores of 15 to 25 and academic achievement scores of 75 to 125, suggesting that students' achievement does not consistently increase or decrease with varying levels of teachers' PCK. Overall, the graph suggests 'no strong association' between teachers' pedagogical content knowledge and students' academic achievement.

Research Question Three: What is the relationship between teachers' communication skills and academic achievement of senior secondary school students in the North Central of Nigeria?

Figure 2: Scatterplot of teachers' communication skills and academic achievement.

Teachers' Communication Skills and Students' Academic Achievement

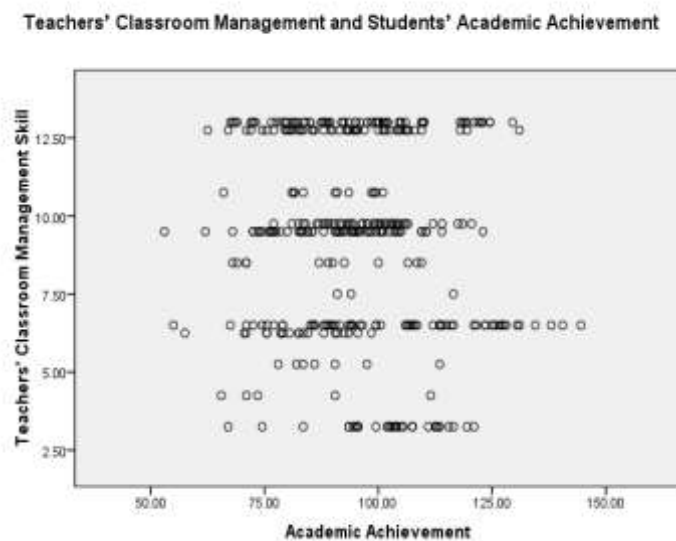


As shown in the scatterplot, figure 2 illustrates the relationship between teachers' communication skills and students' academic achievement in senior secondary schools in North Central Nigeria. The scatter points are dispersed, with slight concentration in mid-range scores.

to-high communication skill range, indicating a 'weak linear relationship' between communication skills and academic achievement. Most data points are concentrated around communication scores of 2.50 to 12.50 and academic scores of 75 to 125. This suggests that variations in teachers' communication skills have minimal direct influence on students' academic achievement.

Research Question Four: What is the relationship between teachers' classroom management and students' academic achievement of senior secondary school students in the North Central of Nigeria?

Figure 3: Scatterplot of relationship between teachers' classroom management and students' academic achievement.



As shown in figure 3, the scatterplot displays the relationship between teachers' classroom management skill and students' academic achievement. The data points are spread out, with many clustered at mid and upper classroom management scores. Again, the plot suggests a 'weak or minimal relationship'. Classroom management might influence achievement, but the effect is not clearly linear or strong in this data. Most of the points fall within the range of 3.0 to 12.50 for classroom management and 75 to 125 for academic scores. This suggests students' academic performance is not strongly tied to how teachers manage their classrooms.

Research Question Five: Does gender have relationship with teacher attributes and students' academic achievement?

Table 2: One-way ANOVA of relationships between teacher attributes and students' academic achievement.

ANOVA

Source of variance	Sum Squares	of Df	Mean Square	Calculated F-ratio	P-value
Between Groups	46000.939	1	46000.939	967.448	.000
Within Groups	18068.519	380	47.549		

Total	64069.457	381			
Between Groups	21.880	1	21.880	.088	.767
Within Groups	94767.614	380	249.388		
Total	94789.495	381			

As shown in table 2, the table presents the results of one-way ANOVA tests to examine whether gender has a significant relationship on: Teachers' Attributes; $F = 967.448$, $p = .000$, Since $p < 0.05$, there is a statistically significant difference in teachers' attributes based on gender. For Academic Achievement; $F = 0.088$, $p = .767$. Since $p > 0.05$, there is no statistically significant difference in academic achievement based on gender.

Testing of Hypotheses

H_{01} : There is no significant relationship between teachers' attributes and students' academic achievement in the North Central of Nigeria.

Table 3a: Model Summary of Teacher Attributes and Students' Academic Achievement

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.225 ^a	.051	.043	15.42786

As shown in 3a, it presents the model summary of the relationship between teacher attributes and students' academic achievement in the North Central of Nigeria. The $R = .225$, $R^2 = .051$: Indicates a weak positive relationship between teachers' attributes and students' academic achievement at 0.05 level of significance. Only 5.1% of the variance in students' academic achievement is explained by the model (teachers' attributes). The adjusted $R^2 = .043$: Slightly adjusted for the number of predictors. Still low, indicating a weak model fit.

To determine the statistical significance of the relationship between teachers' attributes and academic achievement, further analysis was conducted, and the results are presented in table 3b.

Table 3b: ANOVA of Teachers' Professional Attributes and Students' Academic Achievement

Model		Sum of Squares	df	Mean Square	F	Sig. (p-value)
1	Regression	4818.410	3	1606.137	6.748	.000 ^a
	Residual	89971.085	378	238.019		
	Total	94789.495	381			

a. Predictors: (Constant), Classroom Management, Pedagogical Content Knowledge, Communication Skill

b. Dependent Variable: Academic Achievement

Table 3b presents ANOVA of relationship between teachers' attributes and students' academic achievement in the North Central of Nigeria. $F = 6.748$, $p = .000$, the model is statistically significant at 0.05 level of significant. This means the combination of the three teacher attributes (pedagogical content knowledge, communication skill, classroom management) significantly predicts' academic achievement. The hypothesis (H_01) is therefore rejected.

To further show the statistical significance of each of the independent variables (teachers' attributes), analysis was further carried out, and results are presented in table 3c.

Table 3c: Coefficients of Relationship between Teachers' Attributes and Students' Academic Achievement

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.(p-value)
	B	Std. Error	Beta	t	
1 (Constant)	94.720	3.006		31.507	.000
Pedagogical Content Knowledge	1.251	.418	.466	2.994	.003
Communication Skill	2.343	1.636	.418	1.432	.153
Classroom Management	-4.877	1.435	-.962	-3.400	.001

a. Dependent Variable: Academic Achievement

The table 3c shows the statistical significance of each teacher's attributes variable. For 'Pedagogical Content Knowledge', $B = 1.251$, $\beta = .466$, $t = 2.994$, $p = .003$. It is significant positive predictor of academic achievement at 0.05 level of significant. Students perform better when teachers have stronger PCK. For Communication Skill; $B = 2.343$, $\beta = .418$, $t = 1.432$, $p = .153$. It is not statistically significant, Communication skill does 'not significantly' predict achievement in this model. For Classroom Management Skill; $B = -4.877$, $\beta = -.962$, $t = -3.400$, $p = .001$. It is a significant negative predictor, at 0.05 level of significance. Surprisingly, this shows that poor classroom management may be associated with lower achievement, or it may reflect an inverse relationship due to contextual factors.

In conclusion, a multiple regression analysis revealed that there is a 'significant relationship' between teachers' attributes and students' academic achievement. Among the attributes, pedagogical content knowledge and classroom management' significantly influence achievement, while 'communication skills' do not show a statistically significant effect in this model.

H_{02} : There is no significant relationship between teachers' pedagogical content knowledge and students' academic achievement in the North Central of Nigeria.

Table 4: Pearson Product Moment Correlation (PPMC) of relationship between teachers' pedagogical content knowledge and students' academic achievement

Variables	N	Mean	Std. Dev	df	R	p-value
Teachers' Pedagogical Content Knowledge	382	2.63	.273	380	-.044**	.391

Variables	N	Mean	Std. Dev	df	R	p-value
Teachers' Pedagogical Content Knowledge	382	2.63	.273			
Academic Achievement	382	63.72	2.050			

****.** Correlation is not significant at the 0.05 level (2-tailed)

Table 4 presents the Pearson Product Moment Correlation (PPMC) analysis of the relationship between teachers' pedagogical content knowledge and students' academic achievement. The analysis involved 382 participants, with mean scores of 2.63 (SD = 0.273) for teachers' pedagogical content knowledge and 63.72 (SD = 2.050) for students' academic achievement. The correlation analysis revealed a weak negative correlation ($r = -0.044$) between the two variables. However, with a p-value of 0.391 ($p > 0.05$), the results indicate no statistically significant relationship between teachers' pedagogical content knowledge and students' academic achievement. Therefore, the null hypothesis is accepted, suggesting that teachers' pedagogical content knowledge does not significantly influence students' academic achievement in this study.

H_{03} : There is no significant relationship between teachers' communication skills and students' academic achievement in the North Central of Nigeria.

Table 5: Pearson product moment correlation of relationship between teachers' communication skills and students' academic achievement

Variables	N	Mean	Std. Dev	df	R	p-value
Teachers' Communication Skill	382	2.87	.060			
Students' Academic Achievement	382	63.72	2.050	380	-.088**	.043

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

Table 5 presents the Pearson Product Moment Correlation (PPMC) analysis of the relationship between teachers' communication skills and students' academic achievement in North Central Nigeria. The analysis involved 382 participants, with mean scores of 2.87 (SD = 0.060) for teachers' communication skills and 63.72 (SD = 2.050) for students' academic achievement. The correlation analysis revealed a weak negative correlation ($r = -0.088$) between the two variables. With a p-value of 0.043 ($p < 0.05$), the results indicate a statistically significant relationship. Therefore, the null hypothesis is rejected, suggesting a significant but weak negative relationship between teachers' communication skills and students' academic achievement in North Central Nigeria.

H_{04} : There is no significant relationship between teachers' classroom management skills and students' academic achievement in the North Central of Nigeria.

Table 6: Pearson product moment correlation of relationship between teachers' classroom management skills and students' academic achievement

Variables	N	Mean	Std. Dev	df	r	p-value
Teachers' Classroom Management skills	382	2.75	.269	380	-.112**	.028
Students' Academic Achievement	382	63.72	2.050			

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

Table 6 presents the Pearson Product Moment Correlation (PPMC) analysis of the relationship between teachers' classroom management skills and students' academic achievement in North Central Nigeria. The analysis involved 382 participants, with mean scores of 2.75 (SD = 0.269) for teachers' classroom management skills and 63.72 (SD = 2.050) for students' academic achievement. The correlation analysis revealed a weak negative correlation ($r = -0.112$) between the two variables. With a p-value of 0.028 ($p < 0.05$), the results indicate a statistically significant relationship. Therefore, the null hypothesis is rejected, suggesting a significant relationship between teachers' classroom management skills and students' academic achievement in North Central Nigeria.

H₀₅: There are no significant relationships between teacher attributes and academic achievement of male and female students in the North Central of Nigeria.

Table 7a: Model Summary of Teachers' Attributes, Gender, and Students' Academic Achievement.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.103 ^a	.011	.000	15.77188

a. Predictors: (Constant), Interaction Terms, Gender, Teachers' Attributes.

Table 7a presents the Model Summary of the relationship between teachers' attributes, gender, and students' academic achievement in the North Central region of Nigeria.

The $R = .103$, $R^2 = .011$, Adjusted $R^2 = .000$, this shows that only 1.1% of the variation in students' academic achievement is explained by the combined influence of teacher attributes, gender, and their interaction. The adjusted R^2 of .000 confirms the model has very weak explanatory power. The Standard Error of the Estimate is 15.77188, indicating the average difference between predicted and actual academic achievement scores.

To determine the statistical significance of the relationships between teacher attributes, and academic achievement for male and female students, further analysis was carried out and results as presented on Table 7b.

Table 7b: ANOVA of Teachers' Attributes, Gender, and Students' Academic Achievement.

Model	Sum Squares	of df	Mean Square	F	Sig. (p-value)
1 ^a Regression	1009.870	4	252.468	1.015	.399 ^a
Residual	93779.624	377	248.752		
Total	94789.495	381			

a. Predictors: (Constant), Interaction Terms, Gender, Teachers' Attributes.

b. Dependent Variable: Academic Achievement

The ANOVA table 7b shows whether the independent variables (teachers' attributes, gender, and interaction terms) significantly influence the dependent variable (academic achievement).

The $F = 1.015$, Sig. (p-value) = .399. Since $p > 0.05$, the model is not statistically significant. The hypothesis (H_{05}), stating "there are no significant relationships between teacher attributes and academic achievement of male and female students in the North Central of Nigeria," is therefore accepted.

To further determine the statistical significance of the relationships between teacher attributes and academic achievement for male and female students, further analysis was carried out and results as presented on Table 7c.

Table 7c: Coefficients of Teachers' Attributes, Gender, and Students' Academic Achievement.

Model	Unstandardized Coefficients		Standardized Coefficients		Sig. (p-value)
	B	Std. Error	Beta	t	
1 (Constant)	70.777	44.844		1.578	.115
Teachers' Attributes	-.068	.729	-.056	-.093	.926
Gender	9.226	15.297	.292	.603	.547
Interaction Terms	-.005	.006	-.446	-.856	.393

a. Dependent Variable: Academic Achievement

Table 7c presents the coefficients of the relationship between teachers' attributes, gender, and students' academic achievement. The results show that teacher attributes ($p = .926$); not significant, Gender ($p = .547$); not significant, and Interaction terms ($p = .393$); not significant.

The analysis shows that teacher attributes, gender, and their interactions do not have a significant relationship with students' academic achievement in this model, ($p > 0.05$). Thus, the null hypothesis (H_{05}) was retained.

Discussion of Findings

The findings of this study reveal significant relationships between teachers' attributes and students' academic achievement. Here's a discussion of the results:

Teachers' Attributes and Students' Academic Achievement: The significant relationship between teachers' attributes and students' academic achievement (H_{01})

suggests that teachers' characteristics and qualities of teaching and learning can impact student outcomes. This supports the idea that teacher attributes can influence student motivation, engagement, and ultimately, academic performance. The findings of this study is similar to that of Shalian (2021), which found that there is a positive and significant relationship between teachers' communication skills and students' academic adjustment and academic well-being. It also supports the study of Suglo, Bornaa, Iddrisu, et al (2023), which found a significant relationship between the independent variable teacher's pedagogical content knowledge and the dependent variable academic performance in circle theorem signifying that students' performance in circles theorem depends on the pedagogical content knowledge of the teacher. Students' attitudes and behaviors are predicted by teaching practices most proximal to these measures, including teachers' emotional support and classroom organization.

Specific Teacher Attributes and Students' Academic Achievement: The negative relationships between teachers' communication skill (Ho4) and classroom management skill (Ho5) and students' academic achievement suggest that these specific teacher attributes can hinder student learning. This highlights the importance of teachers developing effective communication and classroom management skills to support student achievement. According to findings of Kim, Jang, & Rhee (2023), enthusiastic teachers foster more engaged classrooms, communication skills and relational warmth are positively associated with students' motivation and academic outcomes.

Conclusion

Based on the findings of this study, it is concluded that teacher attributes have a significant impact on students' academic achievement. Pedagogical content knowledge is a key positive predictor of academic achievement. Teachers' communication skills and classroom management skills have a negative impact on students' academic achievement. And no significant differences between male and female teacher attributes and students' academic achievement.

Recommendations

In view of the findings of this study, the following recommendations were made:

1. Educational institutions should invest in comprehensive professional development programs that enhance teachers' pedagogical content knowledge, communication, and classroom management skills to collectively boost student performance.
2. Teacher training curricula should emphasize deep subject mastery and instructional strategies, ensuring that teachers can effectively connect content with appropriate teaching methods to improve student understanding and outcomes.
3. Teachers should receive specialized coaching on how to use communication and classroom management strategies more positively and constructively, fostering engagement and reducing tension or instructional inefficiencies.

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