

**PRINCIPALS' ADMINISTRATIVE EFFECTIVENESS, SCHOOL CLIMATE AND COUNSELING INTERVENTIONS AS PREDICTORS OF STUDENTS' ACHIEVEMENT IN BASIC SCIENCE AND TECHNOLOGY IN EBONYI STATE, NIGERIA**

*A EFICÁCIA ADMINISTRATIVA DOS DIRETORES, O AMBIENTE ESCOLAR E AS INTERVENÇÕES DE ORIENTAÇÃO COMO FATORES PREDITIVOS DO DESEMPENHO DOS ALUNOS EM CIÊNCIAS E TECNOLOGIA BÁSICAS NO ESTADO DE EBONYI, NIGÉRIA*

Article received on: 9/16/2025

Article accepted on: 12/15/2025

**David Onyeamechi Ekeh\***

\*Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[revdavemaria@gmail.com](mailto:revdavemaria@gmail.com)

**Mercy Ifunanya Ani\*\***

\*\*Department of Science Education, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[ani.mercy@funai.edu.ng](mailto:ani.mercy@funai.edu.ng)

**Chinyere Lambert Ekeh\*\*\***

\*\*\*Guidance and Counselling Department, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[chibestekel1@gmail.com](mailto:chibestekel1@gmail.com)

**Bianca Uzoamaka Mbonu-Adigwe\*\*\*\***

\*\*\*\*Department of Science Education, University of Nigeria, Nsukka, Enugu State, Nigeria  
Orcid: <https://orcid.org/0000-0002-4873-5204>  
[bianca.mbonuadigwe@unn.edu.ng](mailto:bianca.mbonuadigwe@unn.edu.ng)

**Ifebuche Ogechi Attah\*\*\*\***

\*\*\*\*Department of Science Education, University of Nigeria, Nsukka, Enugu State, Nigeria  
[Ifebucheogechi20@gmail.com](mailto:Ifebucheogechi20@gmail.com)

**Claris Nnenna Eze\***

\*Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[clariseze@gmail.com](mailto:clariseze@gmail.com)

**Aloysius Orogwu Alo\***

\*Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[aloyusiorogwu8@gmail.com](mailto:aloyusiorogwu8@gmail.com)

**Alieze Sunday Ekpa\***

\*Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria

**Laetitia Ugochi Nnadede\***

\*Department of Educational Management and Foundational Studies, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria  
[srnnadedeadriana@gmail.com](mailto:srnnadedeadriana@gmail.com)



**Samuel Toyin Famuwagun\*\*\*\***

\*\*\*\*Department of Science Education, Federal University Oye Ekiti, Ekiti State, Nigeria  
[samuel.famuwagun@fuoye.edu.ng](mailto:samuel.famuwagun@fuoye.edu.ng)

**Peter Ndubuisi Chukwu\*\*\*\*\***

\*\*\*\*\*Department of Educational Management, Enugu State University of Science and Technology (ESUT), Agbani, Enugu State, Nigeria  
[peter.chukwu@esut.edu.ng](mailto:peter.chukwu@esut.edu.ng)

The authors declare that there is no conflict of interest

## Abstract

This study investigated the predictive power of principals' administrative effectiveness, school climate, and counselling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The study adopted a correlational research design. Multistage sampling procedure was used to draw a sample of size of 353 Junior Secondary School (JSS III) students in Ebonyi State. Data were collected using four research instruments: Principals' Administrative Effectiveness Questionnaire (PAEQ), School Climate Questionnaire (SCQ), Counselling Interventions Questionnaire (CIQ), and Students' Academic Achievement Proforma (SAAP). Reliability of the instruments was established using Cronbach's alpha method. Reliability coefficients of 0.91, 0.87, and 0.89 were obtained for PAEQ, SCQ, and CIQ respectively. Data analysis was conducted using regression analysis. Specifically, linear regression was used to answer research questions 1-3, while multiple regression was used to answer research question 4. However, regression t-test was used to test hypotheses 1-3, while hypothesis 4 was tested using regression ANOVA. All the hypotheses were tested at .05 level of significance. The findings revealed that principals' administrative effectiveness alone accounted for 28.4% of the variation in students' achievement, school climate explained 16.2%, and counselling interventions contributed 11.6%. Combined, the three variables jointly accounted for 43.7% of the variation in students' performance in Basic Science and Technology. All three predictors demonstrated significant individual and joint predictive power on students' achievement. The results suggest that while each factor is important, their combined influence produces the greatest impact on academic outcomes. Based on these findings, the study recommends the continuous professional development of principals, the creation of a supportive and disciplined school climate, the strengthening of counselling services, and the adoption of an integrated approach that combines administrative effectiveness, school climate, and counselling

## Resumo

*Este estudo investigou o poder preditivo da eficácia administrativa dos diretores, do clima escolar e das intervenções de aconselhamento sobre o desempenho dos alunos em Ciências Básicas e Tecnologia no Estado de Ebonyi, Nigéria. O estudo adotou um delineamento de pesquisa correlacional. Um procedimento de amostragem em múltiplos estágios foi utilizado para selecionar uma amostra de 353 alunos do Ensino Fundamental II (JSS III) no Estado de Ebonyi. Os dados foram coletados utilizando quatro instrumentos de pesquisa: Questionário de Eficácia Administrativa dos Diretores (PAEQ), Questionário de Clima Escolar (SCQ), Questionário de Intervenções de Aconselhamento (CIQ) e Formulário de Desempenho Acadêmico dos Alunos (SAAP). A confiabilidade dos instrumentos foi estabelecida utilizando o método alfa de Cronbach. Os coeficientes de confiabilidade obtidos foram de 0.91, 0.87 e 0.89 para o PAEQ, SCQ e CIQ, respectivamente. A análise dos dados foi realizada por meio de análise de regressão. Especificamente, a regressão linear foi utilizada para responder às questões de pesquisa 1 a 3, enquanto a regressão múltipla foi utilizada para responder à questão de pesquisa 4. No entanto, o teste t de regressão foi utilizado para testar as hipóteses 1 a 3, enquanto a hipótese 4 foi testada utilizando ANOVA de regressão. Todas as hipóteses foram testadas com um nível de significância de 0.05. Os resultados revelaram que a eficácia administrativa dos diretores, por si só, explicou 28.4% da variação no desempenho dos alunos, o clima escolar explicou 16.2% e as intervenções de aconselhamento contribuíram com 11.6%. Combinadas, as três variáveis explicaram conjuntamente 43.7% da variação no desempenho dos alunos em Ciências Básicas e Tecnologia. Todos os três preditores demonstraram poder preditivo significativo, tanto individual quanto conjunto, sobre o desempenho dos alunos. Os resultados sugerem que, embora cada fator seja importante, sua influência combinada produz o maior impacto nos resultados acadêmicos. Com base nessas*

interventions. The study concludes that school-related factors play a significant role in shaping students' academic achievement and should be strategically managed to improve learning outcomes in Basic Science and Technology in Ebonyi State.

**Keywords:** Principals' Administrative Effectiveness. School Climate. Counselling Interventions. Academic Achievement. Basic Science and Technology.

*descobertas. o estudo recomenda o desenvolvimento profissional contínuo dos diretores, a criação de um ambiente escolar acolhedor e disciplinado, o fortalecimento dos serviços de aconselhamento e a adoção de uma abordagem integrada que combine eficácia administrativa, clima escolar e intervenções de aconselhamento. O estudo conclui que os fatores relacionados à escola desempenham um papel significativo na formação do desempenho acadêmico dos alunos e devem ser gerenciados estrategicamente para melhorar os resultados de aprendizagem em Ciências Básicas e Tecnologia no Estado de Ebonyi.*

**Palavras-chave:** Eficácia administrativa dos diretores, clima escolar, intervenções de aconselhamento, desempenho acadêmico, ciências básicas e tecnologia.

## 1 INTRODUCTION

Education remains a critical instrument for national development, serving as a means of fostering human capital development, technological advancement, and socio-economic growth. In Nigeria, the importance of education is reflected in its national policy emphasis on science and technology as drivers of development. Consequently, Basic Science and Technology at the junior secondary school level plays a foundational role in equipping students with scientific knowledge, skills, and attitudes necessary for higher education and participation in a technology-driven society. However, students' academic achievement in Basic Science and Technology has remained consistently low in many parts of Nigeria, including Ebonyi State, thereby raising concerns among stakeholders in the education sector (Federal Republic of Nigeria, 2014; NECO, 2022-2025). Academic achievement is a multidimensional construct influenced by a wide range of school-based and student-related factors. Among the school-based determinants, principals' administrative effectiveness, school climate, and counselling interventions have been widely recognized as crucial variables shaping students' learning outcomes (Hallinger & Heck, 2010; Ibrahim & Al-Taneiji, 2013; Leithwood *et al.*, 2020). These variables are interconnected and collectively determine the quality of teaching and learning within the school system. Therefore, examining their predictive influence

provides a comprehensive understanding of the factors affecting students' academic achievement.

The role of the principal as the chief administrator of the school cannot be overemphasized. Principals are responsible for translating educational policies into practice through effective leadership, supervision, and management of human and material resources. Administrative effectiveness involves competencies such as instructional leadership, decision-making, communication, staff motivation, and resource allocation. Research has shown that principals who demonstrate high levels of administrative effectiveness tend to create environments that support teaching and learning, thereby improving students' academic achievement (Hallinger & Heck, 2010; Robinson *et al.*, 2008; Leithwood *et al.*, 2020; Orji *et al.*, 2024). Conversely, ineffective administration often leads to poor supervision of instruction, low teacher morale, and inadequate implementation of school programmes, which negatively affect students' outcomes (Ibrahim & Al-Taneiji, 2013; Bush, 2015).

In addition to leadership, school climate is another critical factor that may influence students' academic achievement. School climate refers to the overall quality and character of school life, including norms, values, relationships, teaching practices, and organizational structures (National School Climate Council, 2007). School climate has emerged as a critical determinant of students' academic achievement because it defines the conditions under which teaching and learning take place. It encompasses the quality of interpersonal relationships, safety, discipline, teaching practices, and the general emotional and psychological atmosphere of the school (Cohen *et al.*, 2009; Thapa *et al.*, 2013). A positive school climate fosters a sense of belonging, security, and respect among students, which enhances their engagement and participation in academic activities. When students feel emotionally safe and supported, they are more likely to concentrate, persist in learning tasks, and achieve better academic outcomes. In contrast, a negative school climate characterized by insecurity, poor relationships, and disorder can lead to anxiety, absenteeism, and disengagement from learning (Wang & Degol, 2016).

Furthermore, the nature of teacher-student relationships and the level of academic emphasis within the school significantly shape students' achievement. Supportive and respectful interactions between teachers and students promote trust and create opportunities for effective instruction, thereby improving students' understanding and

performance. Similarly, a school climate that sets high academic expectations, recognizes students' efforts, and encourages excellence motivates learners to perform better (Akinnubi *et al.*, 2024). In addition, orderly and well-managed school environments maximize instructional time and reduce disruptions, which are essential for effective learning (Hoy & Miskel, 2013). Peer influence within the school also contributes to shaping students' attitudes toward learning, as positive peer interactions can reinforce good study habits and academic aspirations (Cohen *et al.*, 2009).

Importantly, school climate also functions as a mechanism through which school leadership influences students' academic outcomes. Effective principals foster a conducive school climate by promoting collaboration, maintaining discipline, and ensuring a supportive learning environment, which in turn enhances students' achievement (Hallinger & Heck, 2010; Leithwood *et al.*, 2020). However, many Nigerian secondary schools still experience challenges such as poor infrastructure, weak disciplinary systems, and inadequate teacher-student relationships, all of which undermine a positive school climate and hinder students' academic performance (Oyebanji, 2020). Therefore, improving school climate remains essential for enhancing students' academic achievement, particularly in Basic Science and Technology where effective learning requires active engagement, motivation, and supportive learning conditions.

Furthermore, counselling interventions constitute an important support system within the school that addresses students' academic, social, and emotional needs. Guidance and counselling services help students develop appropriate study habits, manage stress, resolve personal conflicts, and make informed academic and career decisions. Adolescents in secondary schools are particularly vulnerable to various psychological and social challenges that can hinder their academic performance. Effective counselling interventions provide the necessary support to help students overcome these challenges and improve their academic outcomes (Gysbers & Henderson, 2012; Suleiman *et al.*, 2021). Studies have shown that schools with functional counselling programmes record better student adjustment and higher academic achievement compared to those without such services (Lapan *et al.*, 2012; Aniebo *et al.*, 2025). Despite the recognized importance of counselling services, their implementation in many Nigerian secondary schools remains inadequate. Issues such as shortage of trained

counsellors, lack of counselling facilities, and poor integration of counselling into the school system limit their effectiveness (Suleiman *et al.*, 2021; Egbo, 2015). This situation underscores the need to examine counselling interventions as a significant predictor of students' academic achievement alongside other school variables.

It is also important to note that principals' administrative effectiveness, school climate, and counselling interventions are not independent of one another. Rather, they are interrelated components of the school system. For instance, an effective principal is more likely to establish a positive school climate and ensure the provision of functional counselling services. Similarly, a supportive school climate enhances the effectiveness of counselling interventions and promotes better student outcomes. This interrelationship aligns with systems theory, which posits that different components of an organization work together to influence overall performance (Bertalanffy, 1968; Hoy & Miskel, 2013). However, most existing studies have examined these variables in isolation, with limited attention given to their combined and relative predictive influence on students' academic achievement, particularly in Basic Science and Technology. This creates a gap in the literature, as understanding the joint contribution of these variables is essential for developing holistic and evidence-based interventions aimed at improving students' performance.

In Ebonyi State, the persistent poor achievement of students in Basic Science and Technology suggests that existing administrative practices, school environments, and student support systems may not be sufficiently effective. This calls for a comprehensive investigation into how principals' administrative effectiveness, school climate, and counselling interventions jointly and independently predict students' academic achievement in the subject. The argument of this study is therefore premised on the notion that improving students' academic achievement requires a holistic approach that integrates effective school leadership, a conducive learning environment, and adequate student support services. By examining these variables as predictors of students' academic achievement in Basic Science and Technology, this study seeks to contribute to the existing body of knowledge and provide practical insights for improving educational outcomes in Ebonyi State and Nigeria at large.

## **2 PURPOSE OF THE STUDY**

The purpose of the study was to investigate principals' administrative effectiveness, school climate and counseling interventions as predictors of students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. Specifically, the study determined the;

1. Predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.
2. Predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.
3. Predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.
4. Joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

## **3 RESEARCH QUESTIONS**

The following research questions guided the conduct of the study;

1. What is the predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?
2. What is the predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?
3. What is the predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?
4. What is the joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?

## 4 HYPOTHESES

The following null hypotheses tested at 0.05 level of significance was formulated to further guide the study;

1. There is no significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria.
2. There is no significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria.
3. There is no significant predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria.
4. There is no significant joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria.

## 5 METHODS

This study adopted a correlational research design. The design is considered appropriate because it enabled the researchers to examine the extent to which principals' administrative effectiveness, school climate, and counselling interventions predict students' academic achievement in Basic Science and Technology without manipulating any of the variables. The design also allows for the determination of both individual and combined (joint) contributions of the predictor variables to the criterion variable. The study was conducted in Ebonyi State, Nigeria. Ebonyi State is located in the South-East geopolitical zone of Nigeria and comprises thirteen (13) Local Government Areas. The state operates a public secondary school system under the supervision of the State Ministry of Education. The choice of Ebonyi State was based on reports of fluctuating and generally low academic achievement of students in Basic Science and Technology in recent years. Sample size of 354 JSS 3 students was used for the study. The study utilized four instruments for data collection: the Principals' Administrative Effectiveness Questionnaire (PAEQ), the School Climate Questionnaire (SCQ), the Counselling Interventions Questionnaire (CIQ), and the Students' Academic Achievement Proforma

(SAAP). The PAEQ is a structured Likert-type questionnaire designed to measure the extent of principals' effectiveness in areas such as supervision, leadership, decision-making, and resource management. The SCQ was used to assess the nature of the school environment, including interpersonal relationships, safety, discipline, and overall conduciveness for learning. The CIQ is designed to measure the effectiveness of counselling services in addressing students' academic, social, and emotional needs. All three questionnaires are structured on a four-point scale of Strongly Agree, Agree, Disagree, and Strongly Disagree. In contrast, the SAAP is a data-recording instrument used to collect students' academic scores in Basic Science and Technology from school records, providing an objective measure of their academic achievement. The instruments were face validated by four experts in Educational Administration, Guidance and Counselling, and Measurement and Evaluation; Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State and one from Department of Science Education (Integrated Science Unit), University of Nigeria, Nsukka. The reliability of the instruments (PAEQ, SCQ, and CIQ) were determined using the Cronbach Alpha method after administering the instruments 30 JSS 3 students in Enugu, which is outside the study area but with similar characteristics. Reliability coefficient of 0.91, 0.87, and 0.89 were obtained for PAEQ, SCQ, and CIQ respectively. To collect pertinent data for the study, the researchers administered the instruments to the respondents in the sample schools. Copies of the instruments were distributed to respondents and retrieved immediately after completion to ensure a high return rate. However, students' academic scores were collected from school records with permission from school authorities. Regression analysis was used for data analysis. Specifically, linear regression analysis was used to answer research questions 1-3, while research question 4 was answered using multiple regression. Hypotheses 1-3 were answered using regression t-test, while regression ANOVA was used to test hypothesis 4. All hypotheses were tested at 0.05 level of significance.

## 6 RESULTS

### 6.1 Research question one

What is the predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?

**Table 1**

*Linear regression analysis of the predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.533 <sup>a</sup>	.284	.282	3.07604

(R<sup>2</sup>) = Coefficient of Determination

The result in Table 1 shows that the correlation coefficient between principals' administrative effectiveness and students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was .533. This means that there exist a moderate positive relationship between principals' administrative effectiveness and students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. Table 1 also revealed that the coefficient of determination (R<sup>2</sup>) associated with the correlation coefficient of .533 was .284. This coefficient of determination (R<sup>2</sup>) indicates that 28.4% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to principals' administrative effectiveness. This is an indication that 71.6% of the variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to other factors other than principals' administrative effectiveness.

### 6.2 Hypothesis one

There is no significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

**Table 2**

*Regression t-test analysis of significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1						
	(Constant)	27.216	1.094		24.881	.000
	Principals_Admi_Effective.	.306	.026	.533	11.814	.000

The result in Table 2 shows that t-value of 11.814 with associated exact probability value of .000 was obtained. This probability value of 0.000 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant since the obtained probability value of 0.000 is less than 0.05. Thus, the null hypothesis of no significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was rejected. The researchers therefore, conclude that there is a significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

### 6.3 Research question two

What is the predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?

**Table 3**

*Linear regression analysis of the predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.402 <sup>a</sup>	.162	.159	3.32812

(R<sup>2</sup>) = Coefficient of Determination

The result in Table 3 shows that the correlation coefficient between school climate and students' achievement in Basic Science and Technology in Ebonyi State,

Nigeria was .402. This means that, there exist a moderate positive relationship between school climate and students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The Table also revealed that, the coefficient of determination ( $R^2$ ) associated with the correlation coefficient of .402 was .162. This coefficient of determination ( $R^2$ ) indicates that 16.2% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to school climate. This is an indication that 83.8% of the variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to other factors other than school climate.

#### 6.4 Hypothesis two

There is no significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

**Table 4**

*Regression t-test analysis of significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	29.967	1.229		24.374	.000
School_Climate	.255	.031	.402	8.242	.000

The result in Table 4 shows that t-value of 8.242 with associated exact probability value of .000 was obtained. This probability value of 0.000 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant since the obtained probability value of 0.000 is less than 0.05. Thus, the null hypothesis of no significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was rejected. The researchers therefore, conclude that there is a significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

### 6.5 Research question three

What is the predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?

**Table 5**

*Linear regression analysis of the predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.341 <sup>a</sup>	.116	.114	3.41687

(R<sup>2</sup>) = Coefficient of Determination

The result in Table 5 shows that the correlation coefficient between counseling interventions and students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was .341. This means that, there exist a low positive relationship between counseling interventions and students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The Table also revealed that, the coefficient of determination (R<sup>2</sup>) associated with the correlation coefficient of .341 was .116. This coefficient of determination (R<sup>2</sup>) indicates that 11.6% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to counseling interventions. This is an indication that 88.4% of the variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to other factors other than counseling interventions.

### 6.6 Hypothesis three

There is no significant predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

**Table 6**

*Regression t-test analysis of significant predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.967	1.229		24.374	.000
	School_Climate	.255	.031	.402	8.242	.000

The result in Table 6 shows that t-value of 8.242 with associated exact probability value of .000 was obtained. This probability value of 0.000 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant since the obtained probability value of 0.000 is less than 0.05. Thus, the null hypothesis of no significant predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was rejected. The researchers therefore, conclude that there is a significant predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

#### **6.7 Research question four**

What is the joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria?

**Table 7**

*Multiple regression analysis of the joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661 <sup>a</sup>	.437	.432	2.73633

(R<sup>2</sup>) = Coefficient of Determination

The result in Table 7 shows that the correlation coefficient among principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria was .661. This

means that. there exist a high positive relationship among principals' administrative effectiveness. school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria. The Table also revealed that. the coefficient of determination ( $R^2$ ) associated with the correlation coefficient of .661 was .437. This coefficient of determination ( $R^2$ ) indicates that 43.7% of variation in students' achievement in Basic Science and Technology in Ebonyi State. Nigeria is jointly attributed to principals' administrative effectiveness. school climate and counseling interventions. This is an indication that 56.3% of the variation in students' achievement in Basic Science and Technology in Ebonyi State. Nigeria is attributed to other factors other than principals' administrative effectiveness. school climate and counseling interventions.

### 6.8 Hypothesis four

There is no significant joint predictive power of principals' administrative effectiveness. school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria.

**Table 8**

*Regression ANOVA of significant joint predictive power of principals' administrative effectiveness. school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State. Nigeria*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2030.716	3	676.905	90.404	.000 <sup>b</sup>
Residual	2620.633	350	7.488		
Total	4651.349	353			

The result in Table 8 shows that F-ratio of 90.404 with associated exact probability value of .000 was obtained. This probability value of 0.00 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant since the obtained probability value of 0.000 is less than 0.05. Thus. the null hypothesis no significant predictive power of principals' administrative effectiveness. school climate and counseling interventions on students' achievement in Basic Science and Technology

in Ebonyi State. Nigeria was rejected. The researchers therefore, conclude that there is a significant joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria.

## **7 DISCUSSION OF THE FINDINGS**

### **7.1 Predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria**

The finding of the study revealed that 28.4% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to principals' administrative effectiveness. Further analysis revealed a significant predictive power of principals' administrative effectiveness on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The finding that principals' administrative effectiveness accounted for 28.4% of the variation in students' achievement in Basic Science and Technology in Ebonyi State indicates a meaningful and statistically significant contribution of school leadership to students' academic outcomes. This proportion reflects a moderate predictive strength, suggesting that while principals' effectiveness is not the sole determinant of achievement, it plays a substantial role in enhancing students' performance. The significant predictive power further implies that improvements in principals' administrative practices such as; instructional supervision, staff coordination, resource management, and maintenance of discipline are likely to translate into improved teaching quality and better learning outcomes for students. This finding reinforces the central position of the principal as a key driver of school effectiveness and academic success.

The possible reasons for this result may be linked to the multiple roles played by principals in shaping the school environment. Principals who are administratively effective are more likely to ensure regular supervision of instruction, which helps teachers adhere to curriculum standards and adopt appropriate teaching strategies. They also promote teacher motivation through recognition, support, and professional development opportunities, thereby enhancing teachers' commitment and productivity. In addition,

effective principals ensure the availability and proper utilization of instructional materials, maintain discipline, and create a conducive learning environment, all of which are essential for effective teaching and learning. These factors collectively contribute to improved students' understanding and performance in Basic Science and Technology.

The finding is in agreement with several previous studies which have established a significant relationship between principals' administrative effectiveness and students' academic achievement. For instance, Hallinger and Heck (2010) found that school leadership significantly influences student outcomes through its impact on school processes and instructional practices. Similarly, Leithwood *et al.* (2020) asserted that effective school leadership is second only to classroom instruction in its influence on students' learning. Robinson *et al.* (2008) also reported that leadership practices, particularly those related to teaching and learning, have a strong and direct effect on students' academic achievement. In the Nigerian context, Orji *et al.* (2024) observed that principals' management strategies significantly enhance quality assurance and students' performance in secondary schools. These studies corroborate the present finding by demonstrating that effective administrative practices are consistently associated with improved academic outcomes.

## **7.2 Predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria**

The finding of the study revealed that 16.2% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to school climate. Further analysis revealed a significant predictive power of school climate on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The finding indicates that the quality of the school environment plays a meaningful, though moderate, role in shaping students' academic outcomes. This proportion suggests that while school climate is not the most dominant predictor, it significantly contributes to students' achievement in Basic Science and Technology. The result of a significant predictive power further implies that improvements in the overall atmosphere of the school, such as; safety, discipline, teacher-student relationships, and academic support are likely to lead to measurable improvements in students' achievement. This highlights the importance of

creating a conducive learning environment that supports both the academic and emotional needs of students.

The possible reasons for this finding may be linked to the multiple dimensions through which school climate affects learning. A positive school climate fosters a sense of belonging and emotional security among students, which enhances their willingness to participate actively in classroom activities. When students feel safe and supported, they are more likely to concentrate, complete assignments, and perform better academically. In addition, good teacher-student relationships within a positive school climate promote effective communication and individualized support, helping students better understand difficult concepts in subjects like Basic Science and Technology. Furthermore, orderly and well-disciplined school environments reduce distractions and maximize instructional time, thereby improving learning outcomes. Peer interactions within a positive school climate can also encourage collaborative learning and reinforce positive academic behaviors.

The finding is in agreement with several empirical studies that have established a significant relationship between school climate and students' academic achievement. For instance, Cohen *et al.* (2009) emphasized that a positive school climate enhances students' engagement, learning, and academic success. Similarly, Thapa *et al.* (2013) found that supportive school environments characterized by mutual respect and effective discipline are associated with improved academic outcomes. Wang and Degol (2016) also reported that school climate significantly predicts students' academic performance through its influence on motivation, engagement, and emotional well-being. In the Nigerian context, Akinnubi *et al.* (2024) found that school climate significantly influences students' commitment to academic activities and overall achievement, while Oyebanji (2020) reported a positive relationship between school climate and students' academic performance. These studies support the present finding and confirm that school climate is an important determinant of students' academic success.

### **7.3 Predictive power of counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria**

The finding of the study revealed that 11.6% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is attributed to counseling intervention. Further analysis revealed a significant predictive power of counseling intervention on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The finding indicates that counselling services make a meaningful, though relatively modest, contribution to students' academic achievement. This proportion suggests that counselling is an important supportive factor in the learning process, even if it is not as strong as core instructional or administrative variables. The significant predictive power further implies that effective counselling interventions, such as; academic guidance, study skills training, career counselling, and emotional support have the capacity to improve students' performance in Basic Science and Technology. In essence, students who receive adequate counselling support are more likely to develop positive attitudes toward learning, manage academic challenges effectively, and achieve better results.

The possible reasons for this finding may be linked to the role of counselling in addressing students' psychological, emotional, and academic needs. Counselling interventions help students develop effective study habits, time management skills, and goal-setting strategies, which are essential for academic success. They also assist students in coping with stress, anxiety, peer pressure, and other personal issues that may negatively affect their concentration and performance in school. Furthermore, counselling services provide guidance on subject choices and career pathways, thereby increasing students' motivation and commitment to their studies. In subjects like Basic Science and Technology, where conceptual understanding and consistent effort are required, such support can significantly enhance students' learning outcomes. Moreover, the relatively lower percentage of variation explained (11.6%) suggests that counselling intervention alone cannot account for a large proportion of students' academic achievement. This may be due to the fact that counselling services in many Nigerian secondary schools are often underdeveloped, with inadequate personnel, limited resources, and poor implementation. As a result, their potential impact on students' achievement may not be fully realized. It

also indicates that counselling works in conjunction with other factors such as principals' administrative effectiveness, school climate, teacher quality, and availability of instructional materials.

This finding is in agreement with previous empirical studies that have established a significant relationship between counselling services and students' academic achievement. For instance, Gysbers and Henderson (2012) emphasized that comprehensive school counselling programmes enhance students' academic development by addressing their educational and personal needs. Similarly, Lapan, Whitcomb, and Aleman (2012) reported that students in schools with well-implemented counselling programmes demonstrated better academic outcomes and higher levels of school engagement. In the Nigerian context, Suleiman *et al.* (2021) found that effective guidance and counselling services positively influence students' academic performance by helping them overcome personal and social challenges that may hinder learning. Aniebo *et al.* (2025) also observed that counselling services significantly predict students' academic achievement when combined with other school-related variables. These studies support the present finding and affirm the relevance of counselling interventions in improving students' academic performance.

#### **7.4 Joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria**

The finding of the study revealed that 43.7% of variation in students' achievement in Basic Science and Technology in Ebonyi State, Nigeria is jointly attributed to principals' administrative effectiveness, school climate and counseling interventions. Further analysis revealed a significant joint predictive power of principals' administrative effectiveness, school climate and counseling interventions on students' achievement in Basic Science and Technology in Ebonyi State, Nigeria. The finding highlights the substantial combined influence of these school-related factors on academic outcomes. This proportion indicates a strong joint predictive power, suggesting that nearly half of the differences in students' academic performance can be explained by the interplay of effective school leadership, a supportive and conducive learning environment, and the

provision of adequate counselling services. The significant joint predictive power further confirms that these variables operate together to enhance students' learning experiences, demonstrating that no single factor alone is sufficient to maximize academic achievement. Rather, the integration of effective administrative practices, positive school climate, and comprehensive counselling interventions creates a synergistic effect that supports students' engagement, motivation, and performance in Basic Science and Technology.

The finding underscores the importance of adopting a holistic approach to school management and student support. Educational stakeholders, including policymakers, school administrators, and counsellors, should work collaboratively to strengthen administrative practices, foster a positive school climate, and implement effective counselling programmes. Such an integrated approach is likely to maximize students' achievement in Basic Science and Technology and improve overall educational outcomes in Ebonyi State. The possible reason for the strong joint predictive power observed in this study may lie in the interrelated nature of the three variables. Principals' administrative effectiveness often establishes the structures and policies that promote a positive school climate, such as maintaining discipline, fostering teacher collaboration, and ensuring the availability of instructional materials. A supportive school climate, in turn, provides a conducive environment for learning, promotes healthy teacher-student interactions, and encourages student engagement. Counselling interventions complement these factors by providing students with guidance, emotional support, and strategies to manage academic challenges, thereby enhancing their readiness and ability to learn. Together, these factors create an enabling environment that not only supports instructional quality but also promotes students' academic motivation and resilience, leading to improved performance in Basic Science and Technology.

This finding is consistent with previous studies that underscore the importance of multiple school factors in influencing student outcomes. Hallinger and Heck (2010) and Leithwood *et al.* (2020) emphasized that effective school leadership not only directly affects students' learning but also shapes the school climate and fosters teacher effectiveness, which indirectly improves academic outcomes. Cohen *et al.* (2009) and Thapa *et al.* (2013) similarly reported that a positive school climate significantly contributes to students' motivation, engagement, and achievement. Additionally, counselling interventions have been shown to enhance students' academic performance

by addressing personal, social, and educational needs (Gysbers & Henderson, 2012; Lapan *et al.*, 2012). The current finding aligns with these studies by demonstrating that the combination of leadership effectiveness, conducive school climate, and targeted counselling produces a more powerful impact on academic achievement than any single factor alone.

## 8 CONCLUSION

Based on the findings of the study, the study concludes that school-related factors, particularly leadership effectiveness, school climate, and counselling interventions, play a significant and interrelated role in shaping students' academic achievement in Basic Science and Technology. For educational stakeholders, these findings emphasize the need for policies and interventions that holistically improve school administration, the learning environment, and student support services to achieve higher academic achievement in Basic Science and Technology in Ebonyi State secondary schools.

## RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed to enhance students' achievement in Basic Science and Technology in Ebonyi State, Nigeria:

1. Educational authorities should prioritize the training and continuous professional development of school principals to strengthen their administrative and instructional leadership skills. Workshops, seminars, and leadership programmes should focus on supervision, resource management, curriculum monitoring, and teacher motivation. Strengthening principals' capacity will ensure that schools are well-managed and conducive for effective teaching and learning.
2. School administrators should implement policies that promote a positive and supportive learning environment. This includes fostering good teacher-student and student-student relationships, maintaining discipline, ensuring safety, and providing adequate teaching and learning resources. Creating a conducive school

- climate will enhance students' engagement, motivation, and overall academic performance.
3. Schools should increase the availability and effectiveness of counselling interventions. This can be achieved by employing qualified school counsellors, providing dedicated counselling facilities, and organizing structured counselling programmes that address students' academic, social, and emotional needs. Counselling services should focus on study skills, time management, stress management, and career guidance to support students' holistic development and learning outcomes.
  4. Educational policymakers and school administrators should recognize the synergistic effect of leadership, school climate, and counselling services on academic achievement. Interventions should not focus on any single factor in isolation; rather, integrated strategies that simultaneously improve administrative practices, school environment, and student support services are likely to yield the highest impact on students' achievement.
  5. The Ministry of Education and school management boards should regularly monitor and evaluate the effectiveness of principals' leadership, school climate, and counselling programmes. This will help identify areas needing improvement, ensure accountability, and sustain interventions that positively influence students' academic performance in Basic Science and Technology.

## REFERENCES

- Akinnubi, O. P., Ajape, R. O., & Adeoye, M. A. (2024). The influence of school climate and goal achievement structure in Nigerian public schools. *International Journal of Universal Education*, 2(1), 61–69.
- Aniebo, C. N., Okoro, E. C., & Nwankwo, F. O. (2025). The role of school counselling services in enhancing academic achievement of secondary school students in Nigeria. *Journal of Educational Psychology and Research*, 7(1), 45–58.
- Aniebo, G. C., Okafor, S. O., Eze, C. C., Nwobodo, P., & Chukwu, P. N. (2025). Predictive power of school management practices, vocational skills and counseling services on students' academic achievement. *Cuestiones de Fisioterapia*.
- Bertalanffy, L. (1968). *General system theory: Foundations, development, applications*. George Braziller.

- Bush, T. (2015). *Leadership and management development in education*. Sage.
- Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record*, *111*(1), 180–213.
- Egbo, A. C. (2015). *Guidance and counselling: A comprehensive approach*. Cheston Ltd.
- Federal Republic of Nigeria. (2014). *National policy on education* (6th ed.). NERDC Press.
- Gysbers, N. C., & Henderson, P. (2012). *Developing and managing your school guidance program* (5th ed.). American Counseling Association.
- Hallinger, P., & Heck, R. H. (2010). Collaborative leadership and school improvement: Understanding the impact on school capacity and student learning. *Educational Management Administration & Leadership*, *38*(6), 654–678.
- Hoy, W. K., & Miskel, C. G. (2013). *Educational administration: Theory, research, and practice* (9th ed.). McGraw-Hill.
- Ibrahim, A. S., & Al-Taneiji, S. (2013). Principal leadership style, school performance, and teachers' job satisfaction. *International Journal of Educational Management*, *27*(3), 312–328.
- Lapan, R. T., Whitcomb, S. A., & Aleman, N. M. (2012). Connecticut professional school counselors: College and career readiness for all students. *Professional School Counseling*, *16*(2), 88–99.
- Leithwood, K., Harris, A., & Hopkins, D. (2020a). Seven strong claims about successful school leadership revisited. *School Leadership & Management*, *40*(1), 5–22.
- Leithwood, K., Harris, A., & Hopkins, D. (2020b). Seven strong claims about successful school leadership. *School Leadership & Management*, *40*(1), 5–22.
- National Examinations Council. (2023). *Chief examiners' report*.
- Orji, A. T., Kajo, D. T., & Mando, P. N. (2024). Influence of principals' management strategies in the achievement of quality assurance in public secondary schools in Benue State, Nigeria. *International Journal of Research and Innovation in Social Science*, *8*(2), 1876–1886. <https://doi.org/10.47772/IJRISS.2024.802132>
- Oyebanji, O. A. (2020). School climate, academic achievement and students' personal factors as correlates of interest in schooling among undergraduates in Nigeria. *International Journal of Educational Researchers*, *11*(2), 10–19.
- Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly*, *44*(5), 635–674.

- Suleiman, A. B., Mohammed, I., & Adeyemi, T. O. (2021). Influence of guidance and counselling services on students' academic performance in Nigerian secondary schools. *Journal of Education and Practice*, 12(5), 23–31.
- Suleiman, Y., Hanafi, Z., Kamil, L. A., & Bosede, F. F. (2021). Principals' perceptions of guidance and counselling services in Kwara State secondary schools, Nigeria: Implication for stakeholders. *Journal of Multicultural Studies in Guidance and Counseling*, 5(1), 58–83. <https://doi.org/10.17509/jomsign.v5i1.24159>
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research*, 83(3), 357–385.
- West African Examinations Council. (2022). *Chief examiners' report*.
- Wang, M. T., & Degol, J. L. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, 28(2), 315–352.

### **Authors' Contribution**

Peter Ndubuisi CHUKWU (peter.chukwu@esut.edu.ng): Corresponding Author\*

David Onyeamechi EKEH, Mercy Ifunanya ANI and Bianca Uzoamaka MBONU-ADIGWE - Conceptualized the study, formulated the research problem, objectives, and research questions, and coordinated the overall research process.

Claris Nnenna EZE, Aloysius Orogwu ALO and Alieze Sunday EKPA – Reviewed the relevant literature, developed the theoretical framework, and wrote the background and rationale of the study.

Bianca Uzoamaka MBONU-ADIGWE, David Onyeamechi EKEH, Chinyere Lambert EKEH, and Aloysius Orogwu ALO – Designed the methodology, including sampling techniques, instrument development, and research design.

Peter Ndubuisi CHUKWU and Mercy Ifunanya ANI – Performed data analysis and interpreted the findings.

Laetitia Ugochi NNADEDE, Samuel Toyin FAMUWAGUN and Peter Ndubuisi CHUKWU – Drafted the discussion of findings, connected the results to previous studies, and contributed to the writing of the results chapter.

Bianca Uzoamaka MBONU-ADIGWE, Chinyere Lambert EKEH, and Ifebuche Ogechi ATTAH – Prepared the abstract, conclusions, recommendations, and edited the entire manuscript for coherence, style, and formatting.

**Data availability**

All datasets relevant to this study's findings are fully available within the article.

**How to cite this article (APA)**

Ekeh, D. O., Ani, M. I., Ekeh, C. L., Mbonu-Adigwe, B. U., Attah, I. O., Eze, C. N., ... Chukwu, P. N. (2026). PRINCIPALS' ADMINISTRATIVE EFFECTIVENESS, SCHOOL CLIMATE AND COUNSELING INTERVENTIONS AS PREDICTORS OF STUDENTS'. *Veredas Do Direito*, 23(6), e235961. <https://doi.org/10.18623/rvd.v23.5961>