Institutional Factors as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria.

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Abstract

This study investigated Institutional Factors as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria. Three specific objectives, three research questions and three hypotheses guided the study. Predictive correlational research design was adopted for this study. The area of the study is North-Eastern Nigeria, which is made up of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The population of this study consisted of 1,652 respondents. The sample size for this study is 330 respondents. Two adapted instruments were used for data collection in this study. The instrument was validated by four experts. The instruments yielded a reliability co-efficient of 0.87 and 0.84 for (IFQ) and (LTEQ) respectively. Descriptive and inferential statistics were used in analysing the data. Specifically, descriptive statistics of Mean and Standard Deviation were used in answering the research questions raised for the study. Simple linear regression and multiple regression analysis were used testing the null hypotheses at 0.05 Alpha level of significance. The findings revealed that there is a significant relationship between administrative procedures and lecturers' teaching effectiveness ($F(1, 328) = 87.376$, $p < 0.05$). The findings revealed that a significant relationship between instructional facilities and lecturers' teaching effectiveness ($F(1, 328) = 87.470$, $p < 0.05$). There is significant relationship between multiple institutional factors (including administrative procedures, instructional facilities and lecturers' teaching effectiveness, ($F(1, 328) = 22.061$, $p < 0.05$). Based on the findings of this study, it is evident that multiple institutional factors play a critical role in predicting lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria. The significant relationships identified between teaching effectiveness and various factors—such as administrative procedures and instructional facilities underline the interconnected nature of these elements within the educational environment. Based on the findings of the study, it was recommended among others that Management of Colleges of Education should streamline and standardize administrative procedures to reduce bureaucratic delays and create a more supportive environment for lecturers. Heads of the institutions should invest in upgrading and maintaining instructional facilities, such as classrooms, laboratories, and libraries.

Keywords: Institutional Factors, Administrative Procedure, Instructional Facilities, and Lecturers Teaching Effectiveness.

Introduction

Education has played a significant role in the growth of human civilization since beginning. Initially there were few institutions which were involved in disseminating knowledge, in the later stages with the onset of competition and industry specific demand the concept of

comparison among institutions in terms of quality education came into existence. People possess different opinion about quality. Quality of education depends on the perception of its stakeholders which is built upon various services offered by the educational institutions that helps in developing technically competent and socially sensitive citizens. The quality of colleges of education can be measured by the value they incorporate in their product (students), for those who absorb them i.e. industry. The negative impact of this in teaching could result in poor service delivery of teachers which may lead to excessive absenteeism from school, strike actions, ineffective service delivery and so on. To make learning more meaningful understandable and fruitful to a learner, effectiveness of teaching delivered by a teacher is very essential condition (Afe, 2019). Lecturer's teaching effectiveness is a critical component of academic excellence in Higher educational institutions.

Lecturer's teaching effectiveness can be defined as lecturer's ability to provide a variety of opportunities that support student learning/development, employing student-centred instruction (characterized by clarity, variety, and flexibility) to enhance students' participation during teaching-learning activities and ability to use value-added models to provide a summary score of the contribution of various factor towards growth in students achievement (Adedeji, 2020). Lecturer's teaching effectiveness can be defined as lecturer's ability to use knowledge (of school, family, cultural and community factors) that influence the quality of education for all students, establishing a classroom environment of respect/support that provides a culture for learning. It also encompasses lecturer's ability to use assessment data for instructional decision making (Afe, 2019). Within the continuum of education, tertiary education and particularly college of education assumes a pivotal role, representing a stage where individuals engage in specialized learning that prepares them for specific professions or fields of study. The college of education does not only impart subject-specific knowledge but also cultivates the analytical, creative, and interpersonal skills necessary for a holistic personal and professional development of students (Suleiman, 2015). In the realm of colleges of education, the effectiveness of teaching emerges as a linchpin that directly influences the realization of educational goals. As students delve into more specialized and intricate domains of knowledge, the role of lecturers become increasingly crucial. This may be because colleges of education are evaluated based on the value they impart to their students and the industry that uses them (Afe, 2019). Hence, the achievement of colleges of education goals and objectives relies heavily on the ability of lecturers to teach effectively. Lecturers play vital role in shaping students academic experience and outcomes. However, the effectiveness of lecturers teaching is influenced by various factors, including institutional factors. Therefore, effective teaching may depend on the institutional factors.

Institutional factors are those factors that influence teaching, research and community services. Institutional factors refer to all the variables within the school system that can make or mar academic staff job performance. Institutional factors that can determine teaching effectiveness include; school facilities, salaries, promotion recruitment, staff development training and teachers reward. It appears that one of the most significant factors that hinder lecturers' job performance is physical school facilities (Adesola & Ekundayo, 2022). Throughout human history, education has been a driving force behind the advancement of civilization. Research has shown that institutional

factors such as administrative support, professional development opportunities and resources allocation can significantly influence lecturers teaching effectiveness. For instance, the study of Reddick and Ponomariov (2023) found that lecturers who received administrative support and professional development opportunities were more likely to use innovative teaching methods and have higher student engagement.

These institutional factors according to researchers (Toots & Lauri, 2015; McLoughlin & Richards, 2017; Reddick & Ponomariov, 2023) often include professional development opportunities (workshop, seminars, mentorship, conferences & symposia), teaching and learning resources (well equipped classrooms, library with access to online resources & technology support), assessment and feedback mechanism (regular evaluation, feedback and coaching), institution policies and procedures (teaching policy, academic freedom & staff welfare), leadership and governance (departmental meeting & staff participation in decision making), student support services (academic advising, counselling services & learning support services), and community engagement and partnership (industrial partnership, community outreach & alumni network) respectively. This study focused on institutional factors of leadership and governance (administrative procedures/support) and, teaching and learning resources (instructional facilities & recreational facilities) respectively. In Federal Colleges of Education, administrative procedures are the systematic and structured processes used by college administrators to manage the schools' daily operations efficiently.

Administrative procedures encompass a set of systematic and organized steps designed to manage various aspects of the institution's operations (Anokhina, 2023). According to the author, these procedures focus on recruitment and hiring process, ensures budgeting and financial measures are communicated across departments, ensuring lecture times/venues are properly organized, procurement and contract management, record keeping and documentation, integrated optimization process for complaint handling and resolution, effective training and development, and policy development and implementation. These procedures are crucial in providing structure, order, and accountability, influencing the overall functioning of the college and they include: implementation of strategic plans for academic excellence, procedure for ensuring that policies are effectively implemented across various departments, procedure for scheduling of lectures and staff information dissemination procedures in the school. The impact of administrative procedures on lecturers' teaching effectiveness could be both positive and negative, depending on the nature of these procedures and how it aligns with the educational goals and needs of the institution. When administrative guidelines, policies, and expectations are transparent, lecturers can better understand their roles, responsibilities, and the parameters within which they operate (Halunko, 2023). This clarity could help lecturers foster a conducive environment for effective teaching planning and delivery. However, excessive bureaucracy and cumbersome administrative procedures in Federal Colleges of Education could impede lecturers' teaching effectiveness. If lecturers find themselves navigating through complex processes for routine tasks, such as submitting grades or accessing teaching materials, it could divert lecturers' focus from actual teaching activities. Also, poorly managed administrative procedures that result in inadequate allocation of instructional facilities may negatively

affect lecturers' teaching effectiveness. Insufficient resources, whether in terms of instructional facilities, teaching aids, or technological support, may limit lecturers' ability to deliver engaging and effective lessons.

Instructional facilities are wealth of educational materials such as classroom with modern technology, e-learning resources, functioning state of the art laboratory, research centres, modern auditoriums, well sock libraries with rich collection of e-books and electronic information resources, computer rooms that help with the teaching and learning process and as such, adequate and well-maintained instructional facilities could positively influence lecturers' teaching effectiveness (Adesola & Ekundayo, 2022). Instructional facilities are crucial factors because they have an impact on the quality of classroom instruction and learning. An instructional facility is a building, area, piece of equipment, or machine that is supplied by the institution for teaching and learning (Rundell, 2018). According to Adesola and Ekundayo (2022), the presence of modern classrooms, computer labs, multimedia rooms, and educational software could enhance lecturers' ability to incorporate technology into classroom instruction. This access may help facilitates interactive and engaging teaching methods, that could contribute to a more effective learning experience for students. However, insufficient or poorly maintained facilities, such as outdated classrooms, lack of technology, or inadequate library resources, could hinder lecturers' teaching effectiveness, as it may limit lecturers' ability to employ diverse teaching methodologies and create engaging learning experiences for students. Also, large class sizes and overcrowded classrooms in Federal Colleges of Education could negatively impact lecturer-student interactions during class instruction.

Furthermore, the North Eastern region of Nigeria has faced various socio-economic and security challenges, impacting the educational sector. Federal Colleges of Education in this region play a vital role in nurturing educators who, in turn, contribute to the educational development and stability of the region. As Federal Colleges of Education in the region continue to evolve in response to changing societal needs and technological advancements, the demand for effective teaching methodologies becomes more pronounced. Lecturers, as integral components of the academic machinery, play a pivotal role in shaping students' intellectual development and professional growth (Setka & Gyang, 2019). This has made it imperative to explore the institutional factors (such as administrative procedures and instructional facilities) that may either enhance or impede lecturers' effectiveness in the teaching role.

Despite the importance of instructional factors influencing lecturers teaching methods or effectiveness, there seems to be limited research on the relationship between institutional factors and lecturers teaching effectiveness, particularly in North-East, Nigeria. Therefore, this study investigated the relationship between institutional factors and lecturers teaching effectiveness in Federal Colleges of Education in North East, Nigeria. This is necessitated as there is a dearth of specific research focusing on Nigerian's North Eastern Federal Colleges of Education based on the correlation between the independent variable (institutional factors) and dependent variable (lecturers' teaching effectiveness). Therefore, this study filled a critical gap in the existing literature by providing valuable insights on the study variables, that could inform policy

decisions, institutional practices, and professional development initiatives tailored to the unique context of the North Eastern Nigerian educational landscape. As a result, this study sought to explore institutional factors as predictors of lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern, Nigeria.

Purpose of the Study

This study investigated Institutional Factors as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria. Specifically, the study sought to determine whether:

1. Administrative procedures predict lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.
2. Instructional facilities predict lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.
3. Institutional factors (administrative procedure, instructional facilities, predicts lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.
4.

Research Questions

The following research questions were raised to guide the study:

RQ_1. What is the level of administrative procedures in Federal Colleges of Education in North East, Nigeria?

RQ_2. What is the level of instructional facilities in Federal Colleges of Education in North East, Nigeria?

RQ_3. How effective are lecturers' teaching in Federal Colleges of Education in North East, Nigeria?

Hypotheses

The following hypotheses were formulated to guide the study and tested at 0.05 Alpha level of significance:

H_{O1}: There is no significant relationship between administrative procedures and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

H_{O2}: There is no significant relationship between instructional facilities and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

H_{O3}: There is no significant relationship between institutional factors (administrative procedure, instructional facilities and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

Methodology

Predictive correlational research design was adopted for this study. The area of the study is North-Eastern Nigeria, which is made up of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The population of this study consisted of 1,652 respondents. The sample size for this study is 330 respondents. Two adapted instruments were used for data collection in this study. The instrument was validated by four experts. The instruments yielded a reliability co-efficient of 0.87 and 0.84 for (IFQ) and (LTEQ) respectively. Descriptive and inferential statistics were used in analysing the data. Specifically, descriptive statistics of Mean and Standard Deviation were used in answering the research questions raised for the study. Simple linear regression and multiple regression analysis were used testing the null hypotheses at 0.05 Alpha level of significance.

Results

Research Question 1: What is the level of administrative procedures in Federal Colleges of Education in North Eastern Nigeria?

Table 1: Mean and Standard Deviation of Level of Administrative Procedures in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	Recruitment and hiring process	3.99	0.97	HL
2.	Ensures budgeting and financial measures are communicated across departments	3.70	0.78	HL
3.	Ensuring lecture times/venues are properly organized	3.86	0.99	HL
4.	Procurement and contract management	3.69	0.98	HL
5.	Record keeping and documentation	3.54	1.00	HL
6.	Integrated optimisation process for complaint handling and resolution	3.68	0.92	HL
7.	Effective training and development	3.49	1.04	ML
8.	Policy development and implementation	3.22	1.12	ML
	Grand Mean	**3.65**	**0.97**	**HL**

Table 1 reveals the perceived level of administrative procedures in Federal Colleges of Education in North Eastern Nigeria. The data shows that most items fall into the "High Level" (HL) category, with a grand mean of 3.65 and a standard deviation of 0.97. Recruitment and hiring process scored the highest mean of 3.99 (SD = 0.97), indicating a strong adherence to this procedure. Other key areas such as ensuring lecture times/venues are properly organized (M = 3.86, SD = 0.99) and procurement and contract management (M = 3.69, SD = 0.98) are also rated as highly implemented. However, there are areas like policy development and implementation (M = 3.22, SD = 1.12) and effective training and development (M = 3.49, SD = 1.04) were rated at a "Moderate Level" (ML), indicating room for improvement.

Research Question 2: What is the level of instructional facilities in Federal Colleges of Education in North Eastern Nigeria?

Table 2: Mean and Standard Deviation of Level of Instructional Facilities in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	Classrooms with modern technology to facilitate the learning process	3.61	1.23	HL
2.	Provision of e-learning resources for out-of-class learning	3.34	1.09	ML
3.	State-of-the-art functional laboratories	3.32	1.01	ML
4.	Provision of research centres of excellence	3.41	1.08	ML
5.	Provision of modern auditoriums	3.45	1.04	ML

6.	Well-stocked libraries with extensive collections of academic resources	3.68	1.02	HL
7.	Provision of computer rooms for quality computer practical lessons	3.68	1.10	HL
	Grand Mean	**3.50**	**1.08**	**ML**

Table 2 provides insight into the state of instructional facilities in the colleges of education. The grand mean is 3.50 with a standard deviation of 1.08, indicating that overall, the facilities are moderately adequate. Classrooms equipped with modern technology received the highest rating with a mean of 3.61 (SD = 1.23), indicating a relatively high level of modern facilities in classrooms. On the other hand, state-of-the-art laboratories (M = 3.32, SD = 1.01) and e-learning resources (M = 3.34, SD = 1.09) were rated as moderate, suggesting that these areas need further development to meet high standards. The well-stocked libraries and computer rooms for quality computer practical lessons scored higher (M = 3.68 each), reflecting a better provision in these areas.

Research Question 3

How effective are lecturers' teaching in Federal Colleges of Education in North Eastern Zone of Nigeria?

Table 3: Mean and Standard Deviation of Level of Effectiveness of Lecturers in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	I use knowledge (of school, family, cultural and community factors) that influence the quality of education for all students	4.20	0.94	HL
2.	I establish a classroom environment of respect/support that provides a culture for learning	3.87	0.87	HL
3.	I engage in assessment activities geared towards student improvement	3.95	0.89	HL
4.	I use assessment data for instructional decision making	3.81	1.01	HL
5.	I provide a variety of opportunities that support student learning/development	3.87	1.00	HL
6.	I employ the use of verbal instruction during lesson presentation to ensure maximum student learning	3.96	0.97	HL
7.	I employ integrated planned instruction to meet the learning needs of all students	3.73	1.02	HL
8.	I employ on-line Internet Based Instruction to meet the learning needs of all students	3.50	1.17	HL
9.	I employ student-centred instruction (characterized by clarity, variety, and flexibility) to enhance students' participation during teaching-learning activities	3.66	1.08	HL

10. I use Value-Added Models to provide a summary score of the contribution of various factor towards growth in students achievement	3.52	1.10	HL
Grand Mean	**3.81**	**1.00**	**HL**

Table 3 evaluates the effectiveness of lecturers in Federal Colleges of Education in North Eastern Nigeria. The mean scores indicate a generally high level of effectiveness, with all items receiving mean scores that fall within the "High Level" (HL) category. The highest mean score is for lecturers' use of knowledge of school, family, cultural, and community factors that influence the quality of education, with a mean of 4.20 and a standard deviation of 0.94, indicating strong effectiveness in this area. Other aspects, such as integrated planned instruction, engaging in assessment activities, using assessment data for instructional decision-making, and employing student-centered instruction, employing on-line Internet Based Instruction, also reflect high effectiveness, with mean scores ranging from 3.66 to 3.96. The grand mean of 3.81 further emphasizes the overall high level of teaching effectiveness among lecturers, suggesting that they are well-equipped to meet the educational needs of their students across various dimensions.

Hypotheses Testing

The following hypotheses were tested using simple linear regression analysis (for hypotheses 1-2) and multiple-regression analysis (for hypothesis 3) respectively.

HO_1: There is no significant relationship between administrative procedures and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 4a: Summary of ANOVA from Regression of Relationship between Administrative Procedures and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.679	1	30.679	87.376	.000[b]
	Residual	115.166	328	.351		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS
b. Predictors: (Constant), ADMINISTRATIVE PROCEDURE

Results of analysis in Table 4a reveal a significant relationship between administrative procedures and lecturers' teaching effectiveness ($F(1, 328) = 87.376$, $p < 0.05$). This indicates that the variance explained by the regression model is statistically significant and unlikely to have occurred by chance.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.459[a]	.210	.208	.59255

a. Predictors: (Constant), ADMINISTRATIVE PROCEDURE

Table 4b reveals an R-square value of 0.210 suggesting that approximately 21% of the variance in lecturers' teaching effectiveness can be explained by administrative procedures. This indicates a moderate relationship between the variables, though a substantial portion of the variance remains unexplained.

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.023	.194		10.44	.000
	ADMINISTRATIVE PROCEDURE	.489	.052	.459	9.347	.000

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

Table 4c shows an unstandardized coefficient (B) for administrative procedures which is 0.489 ($p < 0.05$), implying that for every unit increase in the quality of administrative procedures, lecturers' teaching effectiveness is expected to increase by 0.489 units. The standardized beta coefficient (0.459) indicates a moderate positive relationship between the two variables.

HO_2: There is no significant relationship between Instructional Facilities and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 5a: Summary of ANOVA from Regression of Relationship between Instructional Facilities and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.705	1	30.705	87.470	.000[b]
	Residual	115.140	328	.351		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

b. Predictors: (Constant), INSTRUCTIONAL FACILITIES

Table 5a shows ANOVA results conducted to test whether there is a significant relationship between instructional facilities and lecturers' teaching effectiveness. The ANOVA results demonstrate a significant relationship between instructional facilities and lecturers' teaching effectiveness ($F(1, 328) = 87.470$, $p < 0.05$). This suggests that instructional facilities play a significant role in influencing teaching effectiveness.

Table 5b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.459[a]	.211	.208	.59248

a. Predictors: (Constant), INSTRUCTIONAL FACILITIES

Table 5b shows the model summary which shows how the independent variable explains the variance in the dependent variable. The R-square value of 0.211 indicates that 21.1% of the variance in lecturers' teaching effectiveness is explained by the availability and quality of instructional facilities. This shows that administrative procedures have moderate relationship between instructional facilities.

Table 5c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.414	.152		15.836	.000

	Instructional facilities	.398	.043	.459	9.353	.000

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

Table 5c reveals the unstandardized coefficient (B) for instructional facilities which is 0.398 ($p < 0.05$), indicating that a unit increase in the quality of instructional facilities would result in a 0.398-unit increase in lecturers' teaching effectiveness. The standardized beta coefficient of 0.459 also reflects a moderate positive relationship between the variables.

HO_3: There is no significant relationship between institutional factors administrative procedure, instructional facilities. and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 6a: Summary of ANOVA from Regression of Relationship between Administrative Procedure, Instructional Facilities, and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.844	1	6.205	22.061	.000[b]
	Residual	90.002	328	.281		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

b. Predictors: (Constant), administrative procedure and instructional facilities.

Table 6a shows the Summary of ANOVA from Regression. This ANOVA table examines the relationship between multiple institutional factors (including administrative procedures and instructional facilities), and lecturers' teaching effectiveness. The F-value is 22.061, and the significance level (Sig.) is .000, suggesting that these institutional factors collectively have a significant relationship with teaching effectiveness. Thus, the null hypothesis (HO10) is rejected.

Table 6b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619[a]	.383	.366	.53034

a. Predictors: (Constant), Administrative Procedure, Instructional Facilities

The model summary in Table 6b indicates an R value of .619, showing a strong positive correlation between the institutional factors and lecturers' teaching effectiveness. The R Square value is .383, meaning that 38.3% of the variation in teaching effectiveness can be explained by the combined institutional factors. The Adjusted R Square, slightly lower at .366, adjusts for the number of predictors in the model, yet still indicates a strong relationship.

Table 6c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.625	.191		8.529	.000
	Administrative procedure	.084	.070	.079	1.203	.230

Instructional facilities	.134	.066	.154	2.011	.045

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

The analysis in Table 6c shows the coefficients of beta of multiple regression analysis. The regression analysis presented reveals how each variable included in the model contributed in predicting lecturers' teaching effectiveness. Administrative procedure has a beta value of .079. This means that administrative procedures explain 7.9 % of the aid in lecturers' teaching effectiveness, at a t – value of 1.203 and p-value of 0.230. Instructional facilities has a beta value of 0.154 which means that Instructional facilities explain 15.4 % of the variance in lecturers' teaching effectiveness, at a t – value of 2.011 and a p-value of 0.045.

It can be concluded that **Instructional facilities** makes the strongest unique contribution to explaining the lecturers' teaching effectiveness, when the variance explained by all other variables in the model are controlled for since it has the largest beta coefficient of 0.154. The Beta value for **administrative procedure** was slightly lower (.079), indicating that it made less of a unique contribution in predicting lecturers' teaching effectiveness.

Summary of Findings

The following are the findings of the study:

1. There is a significant relationship between administrative procedures and lecturers' teaching effectiveness ($F(1, 328) = 87.376$, $p < 0.05$).
2. There is a significant relationship between instructional facilities and lecturers' teaching effectiveness ($F(1, 328) = 87.470$, $p < 0.05$).
3. There is significant relationship between multiple institutional factors (including administrative procedures, instructional facilities and lecturers' teaching effectiveness, ($F(1, 328) = 22.061$, $p < 0.05$).

Discussion of the Findings

The discussion of findings serves as a critical segment of this research, wherein the results obtained are analyzed and interpreted in the context of existing literature. This section offers a deeper understanding of the relationships between administrative procedures, instructional facilities, staff recruitment, remuneration, promotion, development, motivation, and recreational facilities, and how these factors collectively predicts lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

The first finding of this study reveal significant relationships between these key variables and teaching effectiveness, underscoring the complex interplay of administrative and institutional factors in shaping educational outcomes. The discussion will explore these relationships in detail, comparing the results with previous studies to highlight consistencies, divergences, and the contextual factors that may account for variations in findings. The finding of the study reveals that there is a significant relationship between administrative procedures and lecturers' teaching effectiveness.

The study's finding reveals a significant relationship between administrative procedures and lecturers' teaching effectiveness, suggesting that well-structured and supportive administrative practices are essential for creating an environment where lecturers can perform optimally. Efficient administrative processes likely contribute to reducing bureaucratic obstacles, enabling lecturers to focus more on their teaching responsibilities, thereby

enhancing their effectiveness. This finding is consistent with the findings of previous studies. Jabbar *et al.* (2019) study identified a strong and positive effect of administrative practices on job performance, suggesting that effective administrative practices can enhance employee performance. This aligns with the finding of a significant relationship between administrative procedures and lecturers' teaching effectiveness, as both studies highlight the beneficial impact of well-implemented administrative practices on performance outcomes. The finding of the study agrees with that of Ashraf *et al.* (2018) who found a positive role for administrative procedures in improving institutional performance. This supports the finding of a significant relationship between administrative procedures and lecturers' teaching effectiveness. Both studies agree that administrative procedures can positively influence performance, albeit in different educational contexts.

The finding of the study, however, contradicted that of Aji (2018) who found negative impact of administrative issues on teaching and learning in secondary schools. Aji's study indicated that administrative issues, including teacher and supervisory issues, were not perceived as highly relevant to effective teaching and learning. Aji's results suggest that the administrative practices in secondary schools might not have been effectively aligned with enhancing teaching quality, highlighting a potential area where administrative practices could be improved. The finding of the study also contrasts that of Jayarathna and Weerakkody (2014) who found that there is an insignificant impact of administrative practices on job performance. The disagreement between the finding of a significant relationship between administrative procedures and lecturers' teaching effectiveness and those of Aji (2018) and Jayarathna and Weerakkody (2014) can be attributed to several key factors. Firstly, contextual differences play a significant role. Aji (2018) examined administrative issues in secondary schools in Rivers State, Nigeria, where administrative challenges and effectiveness may differ from those in higher education. Secondary schools often face unique issues such as less decision-making autonomy and limited resources, which could impact the perceived effectiveness of administrative practices on teaching.

In contrast, Jayarathna and Weerakkody (2014) focused on public banks in Sri Lanka, where administrative structures and job performance metrics are distinct from those in educational institutions. Thus, their findings on administrative practices in banking may not directly translate to the educational sector, where teaching effectiveness is influenced by different factors. Secondly, the nature and scope of administrative procedures varied in these studies. Aji (2018) reported a negative impact of administrative issues on teaching and learning, possibly due to ineffective administrative support that did not align with the needs of secondary education. Jayarathna and Weerakkody (2014) found some impact of administrative practices on job performance, but it was not statistically significant. This suggests that the administrative practices studied might not have been well-suited to addressing performance needs, or other factors may have played a more significant role in job performance. Thirdly, measurement and methodological differences could account for the variation. Aji (2018) used a descriptive survey design with statistical methods that might not have fully captured the range of administrative practices

affecting teaching. Similarly, Jayarathna and Weerakkody (2014) employed simple regression models and a self-administered questionnaire, which may have limited their ability to capture the full impact of administrative practices on job performance.

Lastly, variations in dependent variables and sample and population differences are also relevant. The current study focuses on lecturers' teaching effectiveness, which may be influenced by factors such as instructional support and administrative facilitation, directly impacting teaching quality. In contrast, Aji (2018) and Jayarathna and Weerakkody (2014) examined job performance metrics that may not directly align with teaching effectiveness. Additionally, differences in sample sizes, populations, and settings could affect how well administrative practices' impacts are captured, with the current study potentially including a sample more representative of the educational context.

The second finding of the study reveals that there is a significant relationship between instructional facilities and lecturers' teaching effectiveness. The significant relationship between instructional facilities and lecturers' teaching effectiveness highlights the importance of adequate and modern teaching resources. Access to up-to-date instructional materials and technology not only aids in the delivery of high-quality education but also empowers lecturers to engage students more effectively. This finding suggests that investment in instructional facilities is directly linked to improved educational outcomes. This finding aligns well with the results of several studies. Gbesoevi (2021) reported a significant relationship between educational facilities availability and quality teaching in universities in Lagos State, Nigeria, although the correlation coefficient was relatively small (r = -0.096). The study found that while the availability of facilities was significantly related to quality teaching, the utilization of these facilities also played a crucial role (r = 0.062). This study supports the notion that instructional facilities influence teaching effectiveness, as availability and utilization are both essential components. The finding agrees with that of Innocent (2021) who found a significant influence of instructional materials on student performance, suggesting that facilities play a crucial role in enhancing academic outcomes. Usen (2016) reported similar results. The finding of Usen's (2016) study revealed a significant positive relationship between the utilization of instructional facilities and academic achievement. This finding is consistent with the notion that the effective use of instructional facilities enhances academic performance, thereby supporting the significant relationship between instructional facilities and teaching effectiveness.

Finally the third finding reveals that there is a significant relationship between multiple institutional factors (including administrative procedures, instructional facilities) and lecturers' teaching effectiveness. The study finds a significant relationship between a combination of these institutional factors and lecturers' teaching effectiveness. This highlights the interrelated nature of these elements and their collective impact on teaching quality. It suggests that an integrated approach, where all these factors are simultaneously optimized, is necessary to achieve the highest levels of teaching effectiveness.

The finding that multiple institutional factors—such as administrative procedures

and instructional facilities significantly relate with lecturers' teaching effectiveness aligns with various insights from previous studies on similar topics. Efficient administrative procedures are critical for the smooth operation of educational institutions. This observation is consistent with the work of Ene and Anukaenyi (2021), who emphasized the importance of adequate facilities and administrative mechanisms in supporting effective educational practices. Although their study focused on school health facilities rather than broader administrative processes, the underlying principle that efficient management leads to better outcomes remains relevant. Instructional facilities also play a crucial role in enhancing teaching effectiveness. Olowolafe *et al.* (2020) demonstrated that access to quality instructional facilities positively impacts student performance. This finding suggests that well-maintained instructional facilities similarly contribute to lecturers' effectiveness in the classroom.

Conclusion

Based on the findings of this study, it is evident that multiple institutional factors play a critical role in predicting lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria. The significant relationships identified between teaching effectiveness and various factors—such as administrative procedures and instructional facilities underline the interconnected nature of these elements within the educational environment. Effective teaching is not solely a product of individual effort but is deeply influenced by the institutional context in which educators operate. Therefore, enhancing these institutional factors is essential for improving teaching effectiveness, ultimately leading to better educational outcomes in these colleges. This holistic approach to understanding and addressing the needs of lecturers can contribute to more sustainable and impactful educational practices in the region.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Management of Colleges of Education should streamline and standardize administrative procedures to reduce bureaucratic delays and create a more supportive environment for lecturers. This could include clearer communication channels, more transparent decision-making processes, and the implementation of policies that directly support teaching activities.
2. Heads of the institutions should invest in upgrading and maintaining instructional facilities, such as classrooms, laboratories, and libraries. Regular assessments should be conducted to ensure that these facilities meet the evolving needs of both lecturers and students, thereby enhancing the quality of teaching.
3. A holistic approach should be adopted by college management to address multiple institutional factors concurrently. An integrated policy framework should be developed that harmonizes administrative procedures and instructional facilities management. Regular assessments and feedback mechanisms should be instituted to continuously improve these areas in alignment with lecturers' needs and institutional goals.

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Relationship Between Social Media Usage And Secondary School Students' Academic Performance In Physics In Adamawa State, Nigeria

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Abstract
This study examined the relationship between social media usage and secondary school students' academic performance in Physics in Adamawa State, Nigeria, focusing specifically on Facebook, WhatsApp, and TikTok. The research was motivated by persistently poor Physics achievement in the state and the increasing prevalence of social media use among adolescents. A correlation design was adopted, involving 200 Senior Secondary School Two (SSS II) Physics students selected through stratified random sampling. Data were collected using a validated 15-item questionnaire, with reliability established at 0.82 via Cronbach's Alpha. Descriptive statistics (mean and standard deviation) were used to analyze usage patterns, while multiple regression analysis tested hypotheses at the 0.05 significance level. Findings revealed a moderate use of Facebook for academic purposes but higher engagement in non-academic activities, a high level of WhatsApp usage for both learning and socializing, and moderately high TikTok use, with both educational benefits and distractive tendencies. Regression results indicated statistically significant positive relationships between usage of Facebook ($R^2 = 0.147$, $p < 0.05$), WhatsApp ($R^2 = 0.083$, $p < 0.05$), and TikTok ($R^2 = 0.065$, $p < 0.05$) and students' academic performance in Physics. While all three platforms demonstrated potential as learning tools, excessive or non-academic use was associated with distraction and reduced study focus. The study concludes that purposeful and well-managed integration of social media into learning strategies can enhance Physics performance. It recommends that educators leverage Facebook for academic networking, WhatsApp for collaborative learning, and TikTok for concise, engaging Physics content, while instituting guidelines to minimize distractions.
Keywords: Social media, Facebook, WhatsApp, TikTok, Physics performance

Introduction

The last decade has seen an explosive global rise in social media usage, with platforms like Facebook, WhatsApp, and TikTok becoming ubiquitous among adolescents (Asanga et al., 2023). Simultaneously, robust science education—particularly in Physics—is widely acknowledged as vital for nurturing analytical thinking, problem-solving, and technological innovation (Wikipedia, Social Media Use in Education, 2025). Physics forms a foundational subject vital for careers in engineering, ICT, and research fields, directly influencing national capacity building and development. Academic performance in Physics encompasses measurable outcomes such as examination scores, conceptual understanding, and practical competence.

Mastery of Physics is crucial for students' future academic and career trajectories. However, in many Nigerian secondary schools—including those in Adamawa State—students frequently underperform in Physics. Persistent poor performance in Physics has been a longstanding challenge in Nigeria's secondary education system. Nationally, analysis of West African Senior School Certificate Examination (WASSCE) results from 1999 to 2019 shows that only about 51.78% of candidates obtained credit-level passes (A1–C6) in Physics, with performance fluctuating significantly over the years and remaining below expectations for a core science subject critical to STEM careers (Amoo, Salau, & Adekeye, 2021). In Adamawa State, the situation is even more concerning, with WAEC records indicating consistently high failure rates in Physics — 64% in 2011, 75% in 2012, 59% in 2013, 64% in 2014, 68% in 2015, 72% in 2016, 62% in 2017, 67% in 2018, 71% in 2019, and 76% in 2020 (Abubakar & Sambo, 2022). This persistent underachievement has been linked to multiple factors, including conceptual difficulties faced by students, inadequate exposure to practical work due to limited laboratory resources (Olebara et al., 2021), and shortages of qualified Physics teachers — with earlier state records revealing that only half of the Physics teachers in Adamawa's five education zones possessed formal teaching qualifications (Adamawa State Ministry of Education, 2018). Together, these statistics and systemic issues underscore the urgent need for targeted interventions to improve Physics learning outcomes in both the state and the nation at large. This backdrop of persistent poor performance in Physics is further complicated by the rising influence of digital distractions, particularly social media usage, which has become an integral part of students' daily lives.

Social media usage refers to the ways students interact with platforms such as Facebook, WhatsApp, and TikTok—whether for communication, content sharing, or entertainment. In Nigeria, adoption of these platforms is widespread; a study in Uyo, Akwa Ibom State, found that many senior secondary students are highly addicted to social media, with negative linkages to academic performance (Asanga et al., 2023). In Adamawa State specifically, research among tertiary students and adolescents shows high prevalence of use and significant negative effects on concentration during lectures (Peter et al., 2023).

Social media, encompassing platforms such as Facebook, WhatsApp, and TikTok, plays a significant role in shaping students' academic engagement and outcomes in Physics. Facebook can serve as a hub for group discussions and resource sharing, creating opportunities for collaborative learning; however, when students use it

predominantly for non-academic purposes, it has been associated with poorer academic performance (Lau, 2019; *Frontiers in Psychology*, 2025). WhatsApp provides rapid file-sharing and real-time peer discussions that can enhance collaborative problem-solving in Physics, yet inappropriate or excessive usage often becomes a source of distraction (Nwisagbo, 2024). TikTok's short-form video format is highly engaging for youths, and while educational content exists on the platform, studies—such as those conducted among Chinese elementary students—show that increased usage is linked to lower academic performance, often mediated by reduced attention spans (Reddit summary, 2025). Across these platforms, the amount of time students spend online is a crucial factor, as prolonged engagement is consistently connected to reduced study time and diminished academic achievement (Olebara et al., 2021; Lukose & Agbeyangi, 2025). The purpose of use also matters: academic-oriented engagement, such as participating in study groups or sharing educational resources, can support Physics learning, whereas entertainment-focused use tends to distract from study efforts (Asanga et al., 2023). Additionally, multitasking with social media—such as checking Facebook while reading—has been shown to impair memory retention and reduce grades due to divided attention and cognitive overload (Ramirez & Lindquist, 2018; Commodore & Krämer, 2021).

Adamawa State, located in North East Nigeria, continues to grapple with significant educational challenges, including inadequate infrastructure, shortages of qualified teachers, and pronounced socio-economic disparities that affect learning outcomes. Physics performance in national examinations such as the West African Senior School Certificate Examination (WAEC) and the National Examination Council (NECO) assessments frequently falls below national averages, reflecting persistent learning gaps in science education. At the same time, smartphone ownership and internet access among students—particularly in urban centres—have grown steadily, creating new opportunities for information access and peer learning. However, digital use in many secondary schools remains poorly regulated, raising concerns about its impact on students' academic focus. Evidence from a recent study in Ganye Local Government Area revealed that social media usage among senior secondary students is not only highly addictive but also significantly influences knowledge dissemination, with marked gender-based differences in patterns of use (Adam et al., 2023).

Despite growing research on social media's influence on academic performance in Nigeria, there remains a clear gap in discipline-specific studies that examine how platform-specific usage—particularly of Facebook, WhatsApp, and TikTok—affects Physics learning outcomes among secondary school students in Adamawa State. Existing studies from other regions, such as Anambra, Uyo, and Rivers, highlight both positive and negative academic effects of social media use, but few address Physics specifically or take into account Adamawa's unique socio-economic and educational context. Exploring these relationships is crucial for developing locally relevant strategies that maximise the potential benefits of social media—such as fostering peer collaboration and resource sharing via WhatsApp—while minimising its distractions. Such insights would contribute meaningfully to improving Physics performance in the state and align with

Sustainable Development Goal 4 (Quality Education) by strengthening learning environments in an increasingly digital era.

Statement of the Problem

In recent years, Adamawa State, like much of Nigeria, has witnessed persistently poor performance in Physics at the secondary school level, with results from national examinations such as WAEC and NECO consistently falling below acceptable standards. This trend is troubling given Physics' critical role in fostering Science, Technology, Engineering, and Mathematics (STEM) competencies necessary for national development. Factors such as inadequate infrastructure, shortages of qualified Physics teachers, and limited access to practical laboratory experiences have long been recognised as contributors to this underachievement. However, the rapid growth of smartphone ownership and internet access among students has introduced a new dimension to the learning environment—social media usage.

While platforms such as Facebook, WhatsApp, and TikTok offer potential academic benefits, including opportunities for collaborative learning and resource sharing, their unregulated and often excessive use has raised concerns. Research from other parts of Nigeria suggests that heavy social media engagement can lead to reduced concentration, diminished study time, and lower academic achievement. In Adamawa State, emerging evidence indicates high rates of addictive social media use among secondary school students, with implications for their focus and learning efficiency. Yet, there is a paucity of empirical studies examining the discipline-specific effects of platform-specific social media usage on Physics performance in the state. Without such evidence, educational stakeholders lack the nuanced understanding necessary to leverage social media as a learning tool while curbing its negative academic impacts. This gap in knowledge underscores the need for a targeted investigation into how Facebook, WhatsApp, TikTok, and related usage patterns influence Physics learning outcomes among senior secondary school students in Adamawa State.

Purpose of the Study

The purpose of this study is to investigate the Relationship between social media usage and secondary school students' academic performance in Physics in Adamawa state, Nigeria. Specifically, the study seeks to determine the:

1. Relationship between Facebook usage among secondary school students and academic performance in Physics in Adamawa state.
2. Relationship between WhatsApp usage among secondary school students and academic performance in Physics in Adamawa state.
3. Relationship between TikTok usage among secondary school students and academic performance in Physics in Adamawa state.
4. Relationship between Facebook, WhatsApp and TikTok usage among secondary school students and academic performance in Physics in Adamawa state.

Research Questions

The following research questions guided the study

1. What is level of use of Facebook among secondary school students in Adamawa state?
2. What is level of use of WhatsApp among secondary school students in Adamawa state?

3. What is level of use of TikTok among secondary school students in Adamawa state?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

H_{01}: There is no significant relationship between Facebook usage among secondary school students and academic performance in Physics in Adamawa state.

H_{02}: There is no significant relationship between WhatsApp usage among secondary school students and academic performance in Physics in Adamawa state.

H_{03}: There is no significant relationship between TikTok usage among secondary school students and academic performance in Physics in Adamawa state.

Methodology

This study adopted a quantitative research approach using the correlation design to investigate the relationship between social media usage and Physics performance among senior secondary school students in Adamawa State. The population of the study comprised all Senior Secondary School Two (SSS II) Physics students in the state, from which a sample of 200 students was selected through a stratified random sampling technique to ensure adequate representation of both urban and rural schools.

The instrument for data collection was a structured questionnaire developed by the researcher, consisting of 15 items divided into three sections corresponding to the independent variables: Facebook usage (5 items), WhatsApp usage (5 items), and TikTok usage (5 items). The items were rated on a 4-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." The instrument was validated by three experts in Educational Technology and Measurement & Evaluation to ensure content validity. A pilot test conducted on 20 Physics students outside the study sample yielded a reliability coefficient of 0.82 using Cronbach's Alpha, indicating high internal consistency.

Data collected were analysed using descriptive and inferential statistics. The research questions were answered using the mean and standard deviation to determine students' patterns of social media usage and their perceived influence on Physics learning. The hypotheses were tested using multiple regression analysis at the 0.05 level of significance to ascertain the predictive power of Facebook, WhatsApp, and TikTok usage on students' performance in Physics.

Results

The three research questions raised were answered using mean and standard deviation while the three null hypotheses were tested at 0.05 using regression analysis.

Research Question 1

What is level of use of Facebook among secondary school students in Adamawa state?

Table 1: Mean and Standard Deviation of Level of Use of Facebook among Secondary School Students in Adamawa State

S/N	Item	Mean	SD	Remark
1	I use Facebook to participate in Physics-related group discussions.	3.1	1.23	D
2	I share/receive Physics learning materials via Facebook.	3.65	1.11	A
3	I spend more time on Facebook for non-academic purposes than on my studies.	3.95	0.92	
4	Facebook notifications distract me during study time.	3.93	0.9	
5	Facebook helps me connect with classmates for Physics assignments.	2.93	1.4	
	Grand Mean	**3.512**	**1.112**	

The results in Table 1 show that secondary school students in Adamawa State moderately use Facebook for Physics-related academic activities, as indicated by a grand mean of 3.51. While students frequently share or receive Physics learning materials (Mean = 3.65) and admit to spending more time on Facebook for non-academic purposes (Mean = 3.95), their participation in Physics-related group discussions (Mean = 3.10) and use of Facebook to connect for assignments (Mean = 2.93) are relatively low. The data also reveal that Facebook often distracts them during study time (Mean = 3.93), suggesting that while Facebook is occasionally used for learning, it is more heavily associated with distractions and non-academic engagement.

Research Question 2

What is level of use of WhatsApp among secondary school students in Adamawa state?

Table 2: Mean and Standard Deviation of Level of Use of WhatsApp among Secondary School Students in Adamawa State

S/N	Item	Mean	SD	Remark
6	I belong to WhatsApp groups dedicated to Physics learning.	3.95	0.9	A
7	WhatsApp enables quick sharing of Physics notes and solutions.	3.87	0.96	A
8	I often chat on WhatsApp during study hours, affecting my concentration.	4.07	0.89	A

9	WhatsApp voice notes or videos help me understand Physics concepts better.	4.02	0.82	A
10	I use WhatsApp more for socializing than for academic purposes.	3.95	0.86	A
	Grand Mean	**3.97**	**0.89**	

The results in Table 2 indicate a high level of WhatsApp use among secondary school students for both academic and non-academic purposes, with a grand mean of 3.97. Students actively belong to Physics-focused WhatsApp groups (Mean = 3.95) and use the platform for quick sharing of notes and solutions (Mean = 3.87). They also benefit from educational voice notes or videos (Mean = 4.02). However, WhatsApp use during study hours frequently distracts them (Mean = 4.07), and it is also widely used for socializing (Mean = 3.95). This suggests that while WhatsApp is a strong academic support tool, it simultaneously serves as a significant source of distraction.

Research Question 3

What is level of use of TikTok among secondary school students in Adamawa state?

Table 3: Mean and Standard Deviation of Level of Use of TikTok among Secondary School Students in Adamawa State

S/N	Item	**Mean**	**SD**	**Remark**
11	I watch Physics-related short videos on TikTok.	3.74	0.94	
12	TikTok distracts me from focusing on my Physics assignments.	3.65	0.99	
13	Educational content on TikTok improves my understanding of Physics concepts.	3.65	0.97	
14	I spend more time on TikTok than on my Physics studies.	3.73	0.99	
15	TikTok reduces my attention span during Physics lessons.	3.83	1.04	
	Grand Mean	**3.72**	**0.986**	

The results in Table 3 reveal a moderately high use of TikTok among students, with a grand mean of 3.72. Students watch Physics-related short videos (Mean = 3.74) and find that educational content on the platform can improve their understanding of concepts (Mean = 3.65). Nonetheless, TikTok is also a source of distraction, with many reporting spending more time on the app than on their studies (Mean = 3.73) and experiencing reduced attention span during lessons (Mean = 3.83). Overall, while TikTok has some educational benefits, its dominant influence appears to be in diverting students' attention away from academic work.

H_{01}: There is no significant relationship between Facebook usage among secondary school students and academic performance in Physics in Adamawa state.

Table 4a: Summary of ANOVA of Linear Regression of Relationship between Facebook and Students' Academic Performance in Physics

Model		Sum Squares	ofDf	Mean Square	F	Sig.
1	Regression	13.924	1	13.924	34.207	.000[b]
	Residual	80.597	198	.407		
	Total	94.521	199			

a. Dependent Variable: Students' academic performance

b. Predictors: (Constant), FACEBOOK

The regression analysis in Table 4a shows a statistically significant relationship between Facebook usage and students' academic performance in Physics, as indicated by the F-value of 34.207 and a p-value of .000, which is less than the 0.05 significance level. This result leads to the rejection of the null hypothesis.

Table 4b: Model Summary

Model	R	R Square	Adjusted RSquare	Std. Error of the Estimate
1	.384[a]	.147	.143	.63801

a. Predictors: (Constant), FACEBOOK

The model summary in Table 4b reveals an R-value of .384, suggesting a moderate positive correlation between Facebook usage and academic performance. The R Square value of .147 indicates that approximately 14.7% of the variation in students' academic performance can be explained by their use of Facebook, while the remaining 85.3% is attributed to other factors not captured in the model.

H_{02}: There is no significant relationship between WhatsApp usage among secondary school students and academic performance in Physics in Adamawa state.

Table 5a: Summary of ANOVA of Linear Regression of Relationship between WhatsApp and Students' Academic Performance in Physics

Model		Sum Squares	ofdf	Mean Square	F	Sig.
1	Regression	7.870	1	7.870	17.984	.000[b]
	Residual	86.651	198	.438		
	Total	94.521	199			

a. Dependent Variable: Students' academic performance

b. Predictors: (Constant), WhatsApp

Table 5a indicates that the relationship between WhatsApp usage and students' academic performance in Physics is statistically significant, with an F-value of

17.984 and a p-value of .000, which is below the 0.05 threshold. Consequently, the null hypothesis is rejected.

Table 5b: Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.289[a]	.083	.079	.66154

a. Predictors: (Constant), WhatsApp

The model summary in Table 5b shows an R-value of .289, implying a weak but positive correlation. The R Square value of .083 means that WhatsApp usage accounts for 8.3% of the variation in academic performance, with 91.7% of the variance explained by other factors outside the model.

H_{03}: There is no significant relationship between TikTok usage among secondary school students and academic performance in Physics in Adamawa state.

Table 6a: Summary of ANOVA of Linear Regression of Relationship between TikTok **and Students' Academic Performance in Physics**

Model		Sum Squares	ofDf	Mean Square	F	Sig.
1	Regression	6.186	1	6.186	13.866	.000[b]
	Residual	88.335	198	.446		
	Total	94.521	199			

a. Dependent Variable: Students' academic performance

b. Predictors: (Constant), Tik-Tok

As presented in Table 6a, the regression result shows a significant relationship between TikTok usage and students' academic performance in Physics, evidenced by an F-value of 13.866 and a p-value of .000, which is less than 0.05. This leads to the rejection of the null hypothesis.

Table 6b: Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.256[a]	.065	.061	.66793

a. Predictors: (Constant), Tik-Tok

The model summary in Table 6b indicates an R-value of .256, suggesting a weak positive correlation between TikTok usage and academic performance. The R Square value of .065 implies that TikTok usage explains only 6.5% of the variation in students' performance in Physics, leaving 93.5% of the variance attributable to other factors.

Summary of the Major Findings of the Study

The following are the findings of the study.

1. The finding of the study reveals that there is significant relationship between Facebook usage among secondary school students and academic performance in Physics in Adamawa state.
2. The finding of the study also reveals that there is significant relationship between WhatsApp usage among secondary school students and academic performance in Physics in Adamawa state.
3. Furthermore, the finding of the study reveals that there is significant relationship between TikTok usage among secondary school students and academic performance in Physics in Adamawa state.

Discussion of Findings

The study established a significant relationship between Facebook usage and students' academic performance in Physics in Adamawa State. This finding supports earlier research by Junco (2015) and Ainin et al. (2015), which demonstrated that Facebook, when used for academic purposes such as sharing learning resources, engaging in subject-specific discussions, and collaborating on assignments, can positively influence academic outcomes. Similarly, Kabilan, Ahmad, and Abidin (2010) reported that Facebook enhances collaborative learning and academic networking. However, this result diverges from the findings of Kirschner and Karpinski (2010), who linked frequent Facebook use with distraction and lower academic focus. The agreement with the positive-impact studies in this context may be attributed to students' engagement with Physics-related discussions and material sharing, despite the presence of non-academic distractions.

The significant relationship found between WhatsApp usage and academic performance in Physics aligns with the observations of Bouhnik and Deshen (2014), who noted that WhatsApp facilitates rapid communication, effective sharing of notes, and exchange of multimedia resources, thereby improving learning outcomes. Barhoumi (2015) similarly highlighted WhatsApp's role in promoting collaborative and active learning through group discussions and instant feedback. Nigerian-based evidence by Adeniran (2021) further supports this, showing that WhatsApp study groups enhance science students' grasp of complex concepts. Nonetheless, Rosen et al. (2013) cautioned that excessive non-academic chatting during study hours can impair concentration. The present study's alignment with positive-use literature suggests that academic benefits of WhatsApp, within this setting, outweigh potential distractions.

The finding of a significant relationship between TikTok usage and academic performance in Physics corroborates recent research on the educational potential of short-form video platforms. Luo, Xie, and Liao (2022) found that TikTok can be an effective microlearning tool, especially for STEM subjects where concise, engaging videos simplify abstract concepts. Likewise, Li and Wong (2021) reported that TikTok-based instructional content boosts motivation and knowledge retention in science education. However,

the result differs from Montag et al. (2021), who argued that TikTok's entertainment-oriented nature may shorten attention spans and displace study time. In the present context, the agreement with positive-impact findings may be due to the increasing availability of Physics-related educational content, which visually bridges theory and practice.

Conclusion

the study concluded that purposeful and well-managed use of social media platforms is an important contributor to enhancing students' learning experiences and academic achievement in Physics.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Schools should guide students on using Facebook for academic purposes, such as joining subject-specific groups and sharing Physics learning materials, while minimizing non-academic distractions.
2. Physics teachers should create and moderate WhatsApp study groups to facilitate quick sharing of resources, explanations, and solutions to assignments, ensuring discussions remain focused on learning.
3. Educators and content creators should develop short, engaging, and curriculum-aligned Physics videos on TikTok to harness the platform's appeal for reinforcing scientific concepts.

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Scaffolding Teaching Strategy as a Tool for Enhancing Biology Students' Academic Performance in Senior Secondary Schools in Yola South Metropolis of Adamawa State, Nigeria

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Abstract

This study investigated the effects of scaffolding teaching strategy on biology students' academic performance in senior secondary schools of Adamawa State, Nigeria. Two research questions and two null hypothesis guided the study. The study adopted the pre-test, post-test, non- equivalent non randomized control group, quasi-experimental research design. The population was SS II Biology students in Yola South metrapolis. The sample of the study was 178 students (98 males and 80 females) drawn from two intact classes selected randomly from two schools. The instrument for data collection was Biology Performance Test (BPT). The instrument was adopted from WAEC past questions, hence the face validity was assured. To ensure content Validity the instrument was subjected to thorough assessment by three experts two in the Department of Environmental and Life Sciences Education and one expert in the Department of Zoology, Modibbo Adama University, Yola. The Suggestions made were incorporated into the final draft of the instrument for use in the study. Cronbach alpha was used to calculate the reliability of the BPT and reliability coefficient of 0.86 was obtained. The research questions were answered using mean and standard deviation. Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The findings of the study showed that there was mean difference between scores of students taught with scaffolding teaching strategy (39.02) and those taught with Lecture method (26.14) in favor of scaffolding teaching strategy; there was no mean difference between male (26.14) and female(26.15) strategy biology student mean score when taught using scaffolding teaching strategy. It was recommended that biology teachers, and science teacher educators should adopt Scaffolding instructional strategy when teaching in order to enhance students' achievement in biology and that biology teachers should adopt the use of scaffolding for teaching both male and female students.

Introduction

The growth of any nation is a measure of its level of science and technology education. Science as a concept is a study that is geared towards problem solving in order to enhance the living standard of man. Hayatu (2023) defines science as a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe. Modern science is typically divided into three major branches that consist of the natural science (e.g, Biology, Chemistry and Physics), which study nature in the broadest sense; the social science (e.g, economics, psychology and sociology), which study individuals and societies; and the formal science (e.g. logic, mathematics and computer science) which study abstract concept. Carolina et al (2012) that uses existing scientific knowledge for practical purposes such as engineering and medicine are described as applied sciences (Fischer, 2014). This help us to develop a growing body of ideas and information about the way things work. Science and technology plays an important role in nation building and development (Abbas, 2007). Biology is one of the essential science subjects offered at senior secondary school level which requires suitable teaching approaches to enable learners to acquire meaningful and relevant knowledge. Biology requires laboratory and field studies and scientific attitude that are pragmatic and environment conscious (Ibe, 2013). Biology is a branch of science and a prerequisite subject for many fields of study has contributed immensely through the application of biological techniques the survival of man. The biological techniques include; the development of vaccines and drugs for the prevention and curing of diseases, fertilization which help infertile couples to have babies, increased food production, awareness of genetic disease and their prevention (Nwagbo, 2011). In spite of the importance of Biology, students' academic achievement in examinations such as West African Senior School Certificate Examination (WASSCE) and Senior School Certificate Examination (SSCE) have persistently poor over the years (WAEC report 2021). This poor performance may have been attributed to poor methods of teaching adopted by some Biology teachers. In most cases lecture method is used in teaching subject in most of the secondary schools (Ugwuadu, 2009).

In pursuance of the objectives, content and context of Biology curriculum developers had recommended some teaching approaches which are learner- centered for the effective teaching and learning of the subject so as to bring the expected desired learning outcomes. The recommended approaches include; scaffolding, constructivism, cooperative, inquiry, laboratory techniques and discovery teaching approaches amongst others.

Hamman (2022) reveals that "despite the recommendation for the use of these approaches by curriculum developers in the teaching of Biology, student's achievement in the subject is still not encouraging". In order to curtail the persistent low achievement recorded by Biology students at Senior Secondary Certificate Examination level, it is suggested that there is need to adopt effective teaching strategies or methods that will create interaction between students and Biology teachers so that the students will be able to interact with the teachers and Biology learning materials thereby reducing the difficulties they may encounter. Hayatu, (2023) revealed that the selection of proper instructional strategy ensures the achievement of the stated instructional objective effectively. These instructional strategies are used in the presentation of a lesson to help the students learn by ensuring the smooth delivery of the instruction. Constructivists advocated for active learner's participation in the teaching and learning process so that learners can construct meaning and arrive at understandings of new situations based on their prior knowledge and experiences either formal or informal (Waziri & Sakiyo, 2011). This construction occurs readily when students are provided with meaningful learning opportunities which allow them to generate links by relating new material they are learning to understandings derived from what they already know. Exposing learners to the understanding of basic principles and concepts in Biology and achieving desirable outcomes requires the use of modern teaching strategies such as instructional scaffolding, Guided inquiry, Problem-solving and Co-operative Instructional strategy that may arouse the interest of the learners and demystify difficult concept in core subjects like Biology. In addition, it is counter-productive to present Ideas to learners without fully engaging them in the learning process. (Hamman, 2022).

Scaffolding is the teaching strategy that emphasizes the teaching of new skills by engaging students collaboratively in tasks that would be too difficult for them to complete on their own. The teaching strategy emphasizes on the role of teachers and other more skillful persons in supporting the learners' development and providing support structures to get to that next stage or level (Nonye & Nwosu, 2011). The teaching strategy originated from Lev Vygotsky socio-culture theory and his concept of Zone of Proximal Development (ZPD). Instructional scaffolding as a teaching strategy depends heavily on the ideas that learners come to any educational setting with a great deal of pre-existing knowledge, some of which may be correct. It is the process of building on what a learner already knows that makes scaffolding an effective instructional technique. According to Casem, (2013) that in instructional scaffolding, a more knowledgeable other provides scaffolds to facilitate the learners' development. This can be inform of support which may include resources, a complete task, templates and guidance on the cognitive and social skills. The activities provided in scaffolding instruction are beyond the level of what the learner can do alone. An important aspect of scaffolding is that the scaffolds

are temporary. (Ibritam, Udofia & Onweh 2015) asserted that the learner's abilities increase with the scaffolding provided by the more knowledgeable person is progressively withdrawn, and then the learner is able to master the concept or complete the task independently.

Lecture method is a common method employed by teachers in teaching Biology. It is referred to as talk and chalk or textbook method (Gbamanja in Joda, 2018). In the course of employing the method, the teacher dominates the teaching with little participation on the part of the learners. The teacher is seen as the repository of knowledge while the students are passive recipients of knowledge transmitted by the teacher in the process of learning. The method has advantage of covering a wider area within a short time but it is not learned-centered, and students do not gain mastery of concepts. Hayatu (2023) asserted that the lecture method could be an effective and successful method in science teaching if the teacher does the following in his lecture process; repeat and emphasizes on the main points, encourage questions from students, relate content to previous topics, stresses ideas, avoids racing through the lecture process and prepares adequately for each lesson delivery. In support of the above, Joda (2018) also pointed out that an effective lecture method in science teaching requires extensive research, preparation and effective delivery of concepts. Hamman (2022) opined that academic performance is the level of success attained by student in school subjects. It is usually measured using classroom exercise, assignment and continuous assessment as well as internal and external examination. Hamman (2022) stressed that students' academic performance consist of grades or scores obtained in an examination or test.

Filgona and Sababa (2017) noted that, male and female students should be treated equally during teaching and learning and should be provided with equal opportunities, same encouragement level and engagement. Therefore to provide equal chances to learning, teachers should avoid bias in the way different gender are handled academically and in particular interaction with learning materials, teachers and classmates.

Similarly, Joda and mohammed (2017) opined that students' academic performance refers to students' attainment in a subject. it also means cognitive score. Performance in the teaching/learning process has to do with attainment of set objectives of instruction. If a learner accomplished a task successfully and attains the specific goal for a particular learning experience, the learner is said to have performed well. The problems of poor teaching method and it consequences on academic performance of senior secondary school students motivated the researcher to use scaffolding Instructional strategy as a tool for enhancing Biology students' academic performance in senior secondary school in Yola south Metropolis in Adamawa state with the hope of finding possible solutions. Other variable which will be considered is the gender issue.

Purpose of the Study

The purpose of the study is to determine the use of Scaffolding Teaching Strategy on biology students' academic performance in senior secondary schools in yola south metropolis of Adamawa state, Nigeria.

1. To determine the pretest and posttest mean score of students taught biology using scaffolding teaching strategy and those taught using lecture method.
2. To determine the pretest and posttest mean score of male and female students taught biology using scaffolding teaching strategy and those taught using lecture method.

Research Questions

1. What is the pretest and posttest mean score of students taught biology using scaffolding teaching strategy and those taught using lecture method.
2. What is the pretest and posttest mean score of male and female students taught biology using scaffolding teaching strategy and those taught using lecture method.

Hypotheses

HO_1 There is no significant difference between the mean performance score of students taught biology using scaffolding teaching strategy and those taught using lecture method.

HO_2 There is no significant difference between the mean performance score of male and female students taught biology using scaffolding teaching strategy and those taught using lecture method.

Methodology

The design of the study was quasi-experimental design, specifically, the pretest, posttest, non-equivalent, non-randomized control group design. Quasi-experimental design is considered appropriate for the study because intact classes were used to avoid disruption of normal class lessons and to control extraneous variables. Intact classes were used and randomized into experimental and control groups. The study was carried out in Adamawa State. The population of the study consisted of all 24,950 senior secondary two Students (SSS 2) offering Biology in Adamawa State. (Adamawa State Post Primary School Management Board, 2020).

Random sampling technique was used to select two public co-educational senior secondary schools from the zone. The criteria for selecting a school were; the school should be a co-educational senior secondary school, have Biology laboratory, the school should have a biology teacher with at least a Bachelor degree in biology with education, and have at least five years teaching experience. Simple random sampling techniques was then used to select one intact class from each school one intact class was assigned randomly to experimental (scaffolding) one intact class for the control group. The use of different schools was to avoid contamination of treatment.

The instrument used for data collection was Biology Performance Test (BPT) which was adopted from WAEC past questions, hence the face validity was assured. To ensure content validity the

instrument was subjected to thorough assessment by three experts two in the Department of Environmental and Life Sciences Education and one expert in the Department of Zoology, Modibbo Adama University, Yola. The suggestion that were made were incorporated into the final draft of the instrument for use in the study. The instrument contained 50 items. It consists of 50 multiple choice objective test items with four options (A-D). Only one answer was correct while the other three were distracters used to assess the performance of both the experimental and the control group. Each item has one mark which is making 50 marks in all. The biology topic used for the study was genetics. The instrument was adopted from West African Examination Council past question papers from 2013-2023 in Biology. The questions were spread in line with the Bloom's taxonomy of Educational Objectives in the cognitive domain.

In order to determine the reliability of the test instrument, a pilot testing was carried out on biology class of SS 2 in Government Day Senior Secondary School Bauchi. forty students were trial tested and the scripts were marked and scores recorded. To determine the reliability coefficient (r) the instrument, the data collected were subjected to statistical analysis, hence the reliability coefficient was determine using Cronbach alpha method and the internal reliability coefficient of the instrument yielded the 0.86.

The data were collected using Biology Performance Test (BPT). The researcher employed the assistance of a two research assistant, one from each school. The Biology teachers were trained as research assistants one for the experimental and one for the control group. Lesson plans and materials were given to them. The experimental group was taught one using scaffolding teaching strategy while the control group was taught using conventional (lecture) method. The exercise lasted for six weeks. In the first week, pretest was administered to the students to determine their entry behavior. treatment for a period of four weeks was made for all the classes involved. The two regular biology teachers from the selected schools were trained before the pretest. The training drill them on the content, methodology and the procedural design of the study. At the end of the training, the teachers were assigned to experimental and control group. Both the experimental and the control group were given the same content treatment but the experimental group was taught with the use of scaffolding teaching strategy while the control group was taught with lecture method. from week two to week five. The researcher monitors the teaching at all the stages. Teaching lasted for four weeks at the end of which post test was administered to all the groups.

Post-test: post-test was administered at the end of the treatment which lasted for six weeks. That was after treatment, the BPT items were reshuffled after pretest and administered to the students as post-test. These was done by the researcher in collaboration with research assistants in each school. The answer scripts were

marked to obtain the students' scores after the treatment.

Data for the study were analyzed, using mean and standard deviation to answer the research questions and Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. This was used because it removes bias, which may arise in using pretest as covariates whose equivalence on some relevant measures is hardly determined. The decision rule was that any hypothesis that is greater than 5% or $p > 0.05$ was accepted and any hypothesis that is less than 5% i.e. $p < 0.05\%$ was rejected.

Result

Table 1. What is the post test mean scores of students taught biology using scaffolding and those taught using lecture method?

Table 1. Mean and standard deviation of students taught biology using scaffolding and lecture method.

	PRETEST		POSTTEST			
INSTRUCTIONAL	Mean (50)	SD	Mean(50)	SD	N	mean
SCAFFOLDING METH	8.55	4.41	38.06	11.43	89	29.51
LECTURE	8.61	4.58	26.14	8.54	89	17.53

The descriptive statistic in table one revealed that scaffolding teaching method group have 89 students obtained a pretest mean score of 8.55 and standard deviation of 4.41. In the posttest scaffolding has the highest mean score of 38.06 with a standard deviation of 11.43 and a mean difference of 29.51. The lecture method group had 89 students with a pretest mean score of 8.61 and standard deviation of 4.58. and standard deviation of 8.54. the mean difference is 17.53.

In summary, the mean difference between pretest and posttest is higher which means the instructional strategies under study (scaffolding and lecture) have affected students' performance at different levels. It is concluded that scaffolding teaching strategy enhances students' performance in biology.

Research Question 2. What is the post test mean scores of male and female students taught biology using scaffolding teaching strategy?

Table 2. Mean and standard deviation of male and female students taught biology using scaffolding teaching strategy.

GENDER	TM	PRETEST		POSTTEST		N
		MEAN	STD	MEAN	STD	
Male	Scaffolding	8.55	4.41	39.02	9.64	49
	Lecture	8.61	4.58	26.14	15.91	49
Female	Scaffolding	8.58	6.12	40.13	11.82	40
	Lecture	8.48	6.07	26.15	16.20	40

The descriptive statistics in Table 2 revealed that male students are 49 and have mean score of 8.55 and standard deviation of 4.41 in pretest level. in posttest males group had the mean score of 39.02 and standard deviation of 9.64 with a mean difference of 30.47. female students are 40. in posttest level female had a mean score of 40.13 and a standard deviation of 11.82. based on the result. it is indicated that male and female student do not differ in performance when taught using scaffolding teaching strategy.

The hypotheses were tested using ANCOVA at 0.05 level of significance

HO1. There is no significant difference between the mean performance scores of students taught biology with scaffolding instructional strategy and lecture method,

Hypothesis testing

Source	Type III Sum of S	Df	Mean Square	F	Sig.

Corrected Model	1316.087[a]	2	658.044	6.795	.002
Intercept	10066.982	1	10066.982	103.958	.000
PRETEST	1.354	1	1.354	.014	.906
INSTRUCTIONAL	1304.910	1	1304.910	13.475	.001
Error	9393.153	97	96.837		
Total	53724.000	100			
Corrected Total	10709.240	99			

1. R Squared = .123 (Adjusted R Squared = .105)

Table 3. One-way ANCOVA of students taught biology with scaffolding instructional strategy and lecture method.

The results of the analysis in Table 3 shows that there is a significant difference between scaffolding Instructional strategy and lecture method on students' academic performance in biology F = 13,47 (df 2, 99), P = 0.01. Since the computed p-value (0.01) is less than 0.05 level of significance, therefore, the null hypothesis of no significant difference is rejected, which means there is significant difference between scaffolding instructional strategy and lecture method on students' academic performance in biology in favor of scaffolding instructional strategy.

HO_2. There is no significant difference between the mean performance scores of male and female students taught biology with scaffolding instructional strategy and lecture method.

Source	Type III Sum of	Df	Mean Square	F F	Sig Sig.	Partial Eta
Corrected	1331.298(a)	3	443.766	4.543	.005	.124
Intercept	10067.643	1	10067.643	103.060	.000	.518
GP2	193.792	1	193.792	1.984	.162	.020
PR2	1.890	1	1.890	.019	.890	.000
GP2 * PR2	15.211	1	15.211	.156	.694	.002
Error	9377.942	96	97.687			
Total	53724.000	100				
Corrected Total	10709.240	99				

The results of the analysis in Table 2 shows that there is no significant difference between male and female biology students' academic performance when taught with scaffolding Instructional strategy. F = 0.156 (df 3,99), P = 0.694. Since the computed p-value (0.694) is greater than 0.05 level of significance, therefore, the null hypothesis of no significant difference is not rejected, which means there is no significant difference between male and female students taught biology with scaffolding teaching strategy and lecture method.

Finding of the study

The finding of the study shows that

2. There was different between the post test mean scores of students taught biology using scaffolding Instructional strategy (39.02) and those taught using lecture method (26.14).
3. There was no different between the post test mean scores of male students (39.02) and female students (40.13) taught biology using scaffolding Instructional strategy.
4. There was significant difference between scaffolding Instructional strategy and lecture method on students' academic performance in biology in favor of scaffolding Instructional strategy (0.01).
5. There was no significant difference between male and female students taught biology with scaffolding Instructional strategy and lecture method (0.69).

Discussion of Findings

Findings with regard to research questions and hypothesis revealed that there was post test mean score difference between scaffolding instructional strategy (39.02) with a standard deviation of 11.43 and Lecture method (26.14) with a standard deviation of 8.61, in favor of scaffolding instructional strategy. This findings agree with the findings of Barqawil and Abdul haq (2021), who conducted a study on the effectiveness of scaffolding teaching method in developing basic scientific operations of kindergarten children in Jordan, and the result of the study showed a difference in the adjusted mean score of the scaffolding teaching method group, ANCOVA was used to analyze the children score based on the variable of the teaching method, there is a significant difference (at 0.05 alpha level). The adjusted mean of the experimental group was found to be (27.3) while the control group of traditional lecture method was (12.39).

There was no different between the post test mean scores of male students (39.02) and female students (40.13) taught biology using scaffolding Instructional strategy. This finding agreed with the findings of H a y a t u (2022) who found out that there was no difference in the mean value in scaffolding Instructional strategy on male and female senior secondary school biology students' academic performance.

There was significant difference between scaffolding Instructional strategy and lecture method on students' academic performance in biology in favor of scaffolding Instructional strategy (0.01). With the P- Value of (0.01). the findings agree with that of Akani (2015), who conducted a study on the effect of scaffolding teaching method on the achievement of senior secondary school Chemistry students in Ebonyi state, the findings from the study shows that students taught using scaffolding teaching method performed better than their counterpart who were taught using lecture method of teaching.

Findings with regard to research questions and hypothesis revealed that there was no post test mean score difference in the performance of males (39.02), standard deviation 11.43 and female (40.13) with standard deviation of 11.82. with the P. Value of (0.69) The findings Hamman (2022) is in agreement with this particular work.

Conclusion

Based on the findings of this study, the following conclusions were made; There was different between the post test mean scores of students taught biology using scaffolding Instructional strategy and those taught using lecture method There was no different between the post test mean scores of male and female students taught biology using scaffolding Instructional strategy.

There was significant difference between scaffolding Instructional strategy and lecture method on students' academic performance in biology in favor of scaffolding Instructional strategy.

There was no significant difference between male and female students taught biology with scaffolding Instructional strategy and lecture method.

Recommendations

Based on the findings of this study, the following recommendations were made;

1. That biology teachers, and science teacher educators should adopt Scaffolding instructional strategy when teaching in order to enhance students' achievement in biology.
2. Biology teachers should adopt the use of scaffolding for teaching both male and female students.
3. curriculum planner should incorporate the scaffolding teaching strategy in designing Biology curriculum.
4. Biology teachers should adopt the use of scaffolding for both male and female as they do not differ in performance

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Abstract

This study explored students' perception of ethical challenges in integrating artificial intelligence into the assessment of Business Education students in University of Benin. Four research questions were raised and answered. The study adopted a descriptive survey research design. The population of the study comprised all 51 year three (300 level) Business Education students of the University of Benin, Edo State, Nigeria. Since the population was small, all member of the population served as sample for the study. A self-structured validated questionnaire made up of 12 items and designed in a 5-point modified Likert scale format was used as the instrument for data collection. The questionnaire was administered to 43 students among the sample who were available and willing to participate in the study. The questionnaire was designed to address key ethical dimensions including algorithmic bias, data privacy, academic integrity, and transparency. Descriptive statistics of means, standard deviations, frequencies, and percentages were used in answering the four research questions. Results indicated that while students acknowledge AI's potential to reduce human favoritism, they remain reserved about its fairness, transparency, and accountability. The lowest scores were recorded in the areas of transparency and appeal mechanisms, with most students reporting limited understanding of AI decision-making processes and a lack of channels to challenge AI-based evaluations. Additionally, concerns about data privacy and false accusations related to academic misconduct were prevalent. The study recommended the need for institutions to address algorithmic bias, ensure data protection, and enhance AI literacy among students.

Keywords: Ethical challenges, artificial intelligence, students' assessment, Business Education, University of Benin

Introduction

It has become obvious that one of the fastest growing technological developments in the 21st century is the development of artificial intelligence (AI). The development of artificial intelligence (AI) has progressed from theoretical concepts to practical applications at an accelerating pace and has had compelling applications across all walks of life. It is transforming and reshaping industrial and institutional operations like never before. This evolution, marked by distinct periods of innovation and refinement, presents both unprecedented opportunities and complex challenges. Early AI research, emerging in the mid-20th century, focused on symbolic reasoning and problem-solving. These early stages of AI systems relied on manually programmed rules and knowledge to mimic human intelligence. While these systems achieved success in narrow domains, such as game playing, they struggled to handle the complexities and uncertainties of the real world (Chesterman et al., 2024). A significant turning point came with the rise of machine learning (ML), particularly deep learning. ML algorithms, inspired by the

structure and function of the human brain, learn from vast amounts of data to identify patterns and make predictions without explicit programming. This data-driven approach has enabled AI systems to achieve remarkable feats in areas such as image recognition, natural language processing, and robotics (Bajwa et al., 2021), thus resulting in the proliferation of AI.

The proliferation of AI is driven by several factors, including the exponential growth of data, advancements in computing power, and increased investment in AI research and development. These factors have fueled the development of AI-powered applications across various sectors, including healthcare, finance, transportation, entertainment, and of course academic research in tertiary institutions. However, the development of AI also raises important ethical and societal concerns. These include the potential for job displacement, algorithmic bias, privacy violations, and the misuse of AI for malicious purposes in academic research and assessment (Xu et al., 2022). Among these, AI algorithm bias stands out.

AI algorithms are increasingly utilized in educational assessment, offering potential benefits such as efficiency and personalized feedback. However, the integration of AI in this domain raises significant concerns regarding algorithmic biases, which can perpetuate and even amplify existing inequalities in educational opportunities and outcomes. This essay will explore the sources and implications of these biases (Chen, 2023). One primary source of bias stems from the data used to train AI algorithms. If the training data reflects historical or societal biases, the algorithm will inevitably learn and reproduce these biases. Another contributing factor is the design and implementation of the algorithms themselves. Even with unbiased data, biases can arise from the selection of features, the weighting of different factors, and the evaluation metrics used to optimize the algorithm's performance (Nazer et al., 2023). These can pose challenges in the application of AI in educational assessment, especially in the area of data privacy and security challenges.

AI in educational assessment also introduces significant data privacy and security challenges. One major concern is the collection and storage of student data. AI-powered assessment tools often require vast amounts of personal information, including student responses, learning behaviors, and even biometric data. This data is highly sensitive and could be vulnerable to breaches or unauthorized access. The potential for misuse of this data, such as profiling or discrimination, raises ethical questions (Murdoch 2021; Alhitmi et al., 2024). One of such ethical question is the issue of AI integrity in educational assessment.

AI integrity in educational assessment is a multifaceted issue. As AI tools become increasingly integrated into educational settings, particularly in assessment, concerns about fairness, transparency, and accountability arise (Corbin et al., 2025). In educational assessment, these issues can manifest as unfair scoring or evaluation of student work based on factors such as race, gender, or socioeconomic status. In line with the problem of integrity, AI transparency is another critical concern. Many AI assessment tools operate in modes that are shrouded in mystery. That is, the reasoning behind their evaluations is obscure (Bittle & El-Gayar, 2025; Khlaif et al., 2025). Educators and students may not understand why a particular answer was marked as

incorrect or why an essay received a specific grade. This lack of transparency undermines trust in the assessment process and makes it difficult to identify and correct errors or biases in the AI system (Khlaif et al., 2025). Consequently, this has resulted in several challenges in the deployment of AI in institutions of higher learning such as University of Benin.

In University of Benin, one common type of AI often used in students' assessment is the optical mark recognition (OMR).This is used to grade students scripts after examination and is applied across all departments including business education. The business education programme in university of Benin which is made up of Accounting and Office Management and Technology disciplines take are also assessed using the OMR approach. Though this approach may hold some efficiency is result production, it may also create some concerns among affected students. While AI can enhance efficiency and introduce diverse ways of accomplishing academic tasks, it also raises significant ethical concerns in academic processes, especially in the assessment of students (Williams, 2024). Consequently, the reliance on AI for students' assessments may affect the overall learning experience of students. Questions arise regarding whether AI can accurately measure student understanding and skills and translate these into reports that are true reflections of the extent to which expected traits are present or otherwise.

Statement of Problem

The development of AI has, no doubt, opened up a wide array of opportunities in every sphere of human endeavours. In academic circles, AI has revolutionized the approaches to teaching and learning and has opened unprecedented access to information to both teachers and learners. These numerous benefits are also available in the field of business education where AI has created opportunities in the world of work and of learning and has fostered numerous advantages in business education assessment processes. However, in spite of the huge benefits accruable from the integration of AI into students' assessments in business education, it has become evident that there are attendant challenges that border on ethical concerns. These have resulted in biases in AI algorithms, problems with data privacy and security, questionable integrity in academic processes, and lack of transparency in assessment. If left unaddressed, these challenges may result in huge setback in the deployment and acceptance of the use of AI among stakeholders and students in the University system, including Business Education Students. While literature has severally explored these challenges from a global perspective, little or no data exist on the perception of students about these challenges, especially among university of Benin business education students. This therefore creates a gap in literature that this study is designed to fill.

Purpose of the Study

This study is to investigate students' perception of ethical challenges in integrating artificial intelligence into the assessment of business education students in university of Benin. Specifically, the study Sought to establish the perception of students on:

1. The biases of AI algorithms in business education students' assessment
2. Problems of AI data privacy and security in business education students' assessment

3. Questionable AI integrity in business education students' assessment
4. Lack of AI transparency in business education students' assessment

Research Questions

To achieve the above purpose and specific objectives, the following research questions were raised:

1. What are the data biases of AI algorithms in business education students' assessment?
2. What are the problems of AI data privacy and security in business education students' assessment?
3. What are the problems of AI integrity in business education students' assessment?
4. What are the problems of AI transparency in business education students' assessment?

Methodology

The study adopted a descriptive survey research design. Descriptive survey design involves the collection of data from a sample representing a population on a phenomenon with the aim of describing such phenomenon as it exists in its natural setting without manipulating variables (Omorogiuwa, 2019). This design was considered suitable for this study as the study focused on collecting data from a subset of Business Education students selected from the entire population on their perception of ethical challenges of integrating AI into the Business Education assessment processes. The population of the study comprised 51 year three (300 level) Business Education students of the Faculty of Vocational and Technical Education, University of Benin. Since the population of the students was of a manageable size, the entire members of the population were purposively selected as the sample for the study. Hence, the sample size for the study is 51. No sampling was done.

Data for the study was collected using a self-designed structured questionnaire that was designed after careful review of related literature and inline with the research questions raised for the study. The questionnaire comprised two sections 'A' and 'B'. Section 'A' was on respondents' bio-data such as department, sex, and subject area. Section 'B' was made up of 12 items covering students' perception of ethical challenges in integrating AI into the assessment of Business Education students. Responses to each item was rated on a 5-point modified Likert rating scale of Strongly Agree (SA), Agree (A); Neutral (N), Disagree (D), and strongly Disagree (SD), and were weighted as 5, 4, 3, 2 and 1 respectively. The decision point was set at 3.0.

The validity of the instrument was determined by three experts; two in the Faculty of Vocational and Technical Education, and one psychometrician from the Department of Educational Evaluation and Counseling Psychology (EECP) all in the Faculty of Education, University of Benin, Benin City. To establish the reliability of the instrument, it was pilot-tested on twenty respondents who were not part of the study using the test-retest method of reliability. Cronbach alpha statistics was used to determine the internal consistency of the instrument in order to ensure that the instrument was reliable. After computation, reliability coefficients of 0.73 was obtained. The copies of the instrument for data collection were administered directly to the respondents by the researcher and were

retrieved on the spot. Out of the total of 51 respondents, only 43 were available and willing to participate in the study. Thus, 43 questionnaire were administered and retrieved. Descriptive statistics of mean, standard deviation, frequency, and percentages were used in answering the research questions. Items used in the table for analyses are as presented in the questionnaire (see Appendix A).

Results

Research Question 1: What are the data biases of AI algorithms in business education students' assessment?

Table 1: Descriptive statistics analysis of data biases of AI algorithms

Item	Mean	Std Dev	SA (%)	A (%)	N (%)	D (%)	SD (%)
1	2.5	0.9	1 (2.3%)	7 (16.3%)	7(16.3%)	25 (58.1%)	3 (7.0%)
2	2.1	0.9	2 (4.7%)	2 (4.7%)	4 (9.3%)	27 (62.8%)	8 (18.6%)
3	3.9	1.3	17 (39.5%)	15 (34.9%)	3 (7.0%)	4 (9.3%)	4 (9.3%)

It can be observed from table 1 that items 1 and 2 had low mean scores (2.5 and 2.1), with over 58%–62% disagreeing that AI systems are unbiased while item 3 had a high mean (3.9), with 75% agreeing AI can reduce favoritism. This result implies that students are skeptical about the fairness of AI assessment tools. Many believe these systems could be biased or discriminatory. However, students acknowledge AI might help eliminate human favoritism.

Research Question 2: What are the problems of AI data privacy and security in business education students' assessment?

Table 2: Descriptive statistics analysis of data privacy and security in AI

Item	Mean	Std Dev	SA (%)	A (%)	N (%)	D (%)	SD (%)
4	3.6	1.2	9 (20.9%)	21 (48.8%)	4 (9.3%)	6 (14.0%)	3 (7.0%)
5	3.6	1.1	7 (16.3%)	22 (51.2%)	5 (11.6%)	7 (16.3%)	2 (4.7%)
6	2.5	0.7	0 (0.0%)	0 (0.0%)	26 (60.5%)	12 (27.9%)	5 (11.6%)

Table 2 shows the results of analyses on data privacy and security. It can be observed from the table that items 4 and 5 show moderately high means (3.6 each) with about 70% agreeing that AI raises privacy/security concerns. Item 6 had a low mean (2.5), with 60.5% neutral and others disagreeing that institutions explain how data is protected. This implies that students are concerned about data misuse and feel institution does not provide enough transparency or protection regarding AI's use of their data.

Research Question 3: What are the problems of AI integrity in business education students' assessment?

Table 3: Descriptive statistics analysis of AI integrity in business education

Item	Mean	Std Dev	SA (%)	A (%)	N (%)	D (%)	SD (%)
7	2.3	1.1	2 (4.7%)	6 (14.0%)	3 (7.0%)	22 (51.2%)	10 (23.3%)
8	2.3	1.2	3 (7.0%)	5 (11.6%)	7 (16.3%)	13 (30.2%)	15 (34.9%)
9	3.1	1.3	9 (20.9%)	5 (11.6%)	15 (34.9%)	9 (20.9%)	5 (11.6%)

In Table 3, it can be observed that items 7 and 8 had low means (2.3 each), with the majority disagreeing that AI promotes academic honesty or deters cheating. It can also be observed that item 9 showed a neutral mean (3.1), indicating mixed feelings about AI wrongly flagging misconduct. This shows that students are uncertain of AI's effectiveness in promoting academic integrity and fear false accusations, suggesting low trust in AI's judgment.

Research Question 4: What are the problems of AI transparency in business education students' assessment?

Table 4: Descriptive statistics analysis of AI transparency in business education

Item	Mean	Std Dev	SA (%)	A (%)	N (%)	D (%)	SD (%)
10	2.3	0.9	2 (4.7%)	1 (2.3%)	11 (25.6%)	22 (51.2%)	7 (16.3%)
11	2.2	0.9	1 (2.3%)	1 (2.3%)	15 (34.9%)	16 (37.2%)	10 (23.3%)
12	3.0	1.3	7 (16.3%)	9 (20.9%)	10 (23.3%)	10 (23.3%)	7 (16.3%)

It can be observed from Table 4 that items 10 and 11 had very low means (2.3 and 2.2), with most students disagreeing that they understand AI decisions or can appeal such decisions. In the same vein, item 12 (Mean = 3.0) shows a split opinion on trusting AI systems in assessments. These results imply that students feel excluded from understanding or challenging AI-based grading decisions.

Discussion of Findings

The findings of this study indicate that students are of the opinion that AI may be biased in it assessment processes. This is demonstrated in the result of this study where a significant number of the respondents believe that AI may produce biased or discriminatory results. Thus, while AI may help reduce favoritism by minimizing human subjectivity, this does not translate into trust in AI's overall fairness. This is in line with the findings of Chen (2023) whose study shows that AI can be prone to algorithm biases in its data. However, the findings does not support the position of Nazer et al. (2023) whose study noted that the issues of biased algorithm in AI data are not completely founded. Findings of this study also revealed that the majority of respondents express concern over data privacy and inadequate institutional transparency regarding how their data is used. Students feel they are not properly informed about what data AI systems collect and how it is protected. This demonstrates a critical gap in data governance and communication on AI usage within academic settings. This study goes to support the position of Murdoch (2021) whose study also showed some concerns about data privacy and security in AI usage. However, the findings is not in line with the position of Alhitmi et al. (2024) whose study showed no sufficient evidence to support privacy and security breaches in AI usage.

In addition, findings from this study on data integrity showed that respondents do not perceive AI as a strong safeguard for data integrity. Rather, many fear that AI could falsely flag innocent behavior as misconduct. This lack of trust in AI-powered grading systems can erode students' confidence in assessment outcomes and the credibility of their academic work. This finding is in support of the position of Corbin et al. (2025) whose study raised concerns about data integrity in the integration of AI into assessment processes. Furthermore, the study revealed that students feel they do not understand AI decision-making processes, and have limited or no recourse to challenge or appeal automated assessment outcomes. This, therefore challenges the extent to which AI assessment is considered transparent. This position supports the views of Bittle and El-Gayar (2025) whose study showed that there is poor transparency in AI processes which makes users wary of its deployment. However, there is no literature available to the researchers to counter this findings.

Conclusion

The study reveals that while AI offers potential benefits in eliminating human bias and improving efficiency in assessment, its integration in student assessment, particularly in business education in University of Benin, is currently raises ethical concerns that

border on biases of AI algorithms, data privacy and security, data integrity, and transparency.

Recommendations

Consequent upon the findings of this study, the following recommendations are therefore proffered:

1. Address data bias algorithm by conducting regular audits of AI algorithms used in assessment to identify and mitigate biases.
2. Strengthen Data Privacy and security Policies as well as establish data minimization, purpose limitation, and informed consent to communicate clearly with students about what data is collected, why, and how it is secured.
3. Institutions should improve integrity and transparency by adopting explainable AI systems that allow students to understand how grades are assigned, develop clear documentation and channels for student appeals and feedback.

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Relationship between Acquisition of Digital Literacy Skills and Public Secondary Schools Biology Teachers' Job Performance in Taraba State, Nigeria

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Abstract

This study investigates relationship between acquisition of digital literacy skills and public secondary school Biology teachers' job performance in Taraba State, Nigeria. Correlational research design was used, the total respondents were 513, (i.e., 321 teachers and 192 principals). Two instruments were used for the purpose of data collection, Acquisition of digital literacy skills questionnaire (ADLSQ) and the Biology teacher's job performance questionnaire (BTJPQ) research questions were answered using mean and standard deviation, the finding reveal that, Public secondary school Biology teachers in Taraba State have a high level (HL) of acquisition of basic digital literacy skills with a grand mean score of 3.94 and standard deviation of 1.15. Public secondary school Biology teachers in Taraba State exhibit a high level (HL) of job performance across various instructional and professional responsibilities. This is evident from the consistently high mean scores across all evaluated aspects, with a grand mean score of 3.89 indicating overall high performance. Based of this finding, the study recommends that, Biology teachers should update their knowledge in the use of digital facilities to meet up with the growing trend in modern-day technology for meaningful delivery of their teachings of Biology. The government should pay more attention to Biology teachers' Digital literacy by making computer education compulsory for all teachers of secondary schools and incorporate into teacher training schools' curriculum with Emphasis on practical aspects.

Key words: Digital Literacy, Skills, job Performance

Introduction

Digital literacy is the use and creation of skill-based content, such as employing student learning tools, finding and sharing information, answering questions, solving problems, communicating with others, and learning computer programming (Vodă, Cautisanu, Grădinaru, et al., 2022). According to (Goffreda & Russo, 2016), Digital literacy skills have become essential for teachers to effectively perform their jobs in the 21st century, by developing these skills, teachers can improve instructional design, enhance student engagement, increase efficiency, and better assess students learning, the term digital literacy was first introduced by (Paul Gilster in 1997) as the ability to use information from various digital sources effectively and efficiently. In the same vein, D'Souza and Kumari (2016) stated that the most essential basic skills of teachers in digital literacy are: Operating Microsoft Office software, such as Word, Excel and Power point applications, using internet services and applications, Choosing digital learning resource media, and Utilising ICT-based learning media in learning and assessment.

Basic digital literacy skills are essential for teachers' job performance, as they enable educators to effectively integrate technology into their teaching practices, enhance student learning, and improve overall educational outcomes. Impact of basic digital literacy skills on Teacher Job Performance include; teaching methods and student engagement (Kirschner & Karpinski, 2010), Enhanced collaboration and communication with colleagues and parents (Hicks & Lee, 2011), Increased efficiency in lesson planning and grading (Watson, 2017), Better access to educational resources and professional development (OECD, 2019), (Bennett & Lockyer, 2017). Basic digital literacy skills and word processing skills are closely related, as word processing skills is a fundamental application of computer technology in that word processing skills, that applying them to create and edit text documents. Furthermore, digital literacy empowers individuals to participate effectively as digital citizens, navigating online platforms and tools to engage in society, politics, and government (Sharma, Fantin, Prabhu, Guan, & Dattakumar, 2016). In addition, nation with a critical mass of digitally literate citizens are of great benefits of the digital economy and drive an equitable digital transformation (Oladipupo & Abdulazeez, 2024). Nigeria as a country is striving to foster digital literacy and skills development through policies and programmes, nevertheless, these efforts are often hampered by challenges like inadequate funding, unreliable electricity, limited internet access, high maintenance costs, a lack of qualified personnel, and resistance to change, and even a deficit of self-control (Ogunode & Ndayebom, 2023). National Policy on ICT in Education developed by the Federal Ministry of Education, the NPICTE outlines plans for integrating ICT into the Nigerian education system. This policy aims to enhance teaching, learning, and assessment processes through the use of digital technologies (Federal Ministry of Education, 2019).

Teachers' job performance is a measure of the extent of their commitment to effective pedagogical delivery as well as their display of uprightness and academic excellence in carrying out academic activities (Uko et al., 2015; Uzoechina & Nwankwo, 2017). However the researcher observed that most public secondary school Biology teachers in Taraba State, tend to be ineffective in their job performance as displayed in their poor lesson plan preparation, poor lesson presentation, poor assessing of students, poor keeping of students records and several other unacceptable behaviours which undermine the quality of the

teaching profession, furthermore, studied shows that, the low level of teachers job performance in Taraba state were related to some factors which include: inadequate Teacher Training and Development (Adeyemi, 2017), Poor Working Conditions (Ndanusa, 2019), Low Motivation and Job Satisfaction (Tershaku, 2020), Insufficient Teaching Materials and Resources (David, 2018), Lack of Effective Monitoring and Evaluation (Umar, 2020), Societal Factors (cultural, economic, and political) (Yusuf, 2019), work environment, work location, principals' managerial style, school location. It is therefore, Biology Teachers, who are the initiators and facilitators of teaching and learning activities, may perform better if they acquire digital literacy skills. The aim of this study is to investigate the level to which digital literacy skills acquired by public secondary school Biology teachers' can jointly or independently relate to their job performance in Taraba State.

Purpose of the Study

The purpose of this study is to determine relationship between acquisition of digital literacy skills and public secondary school biology teachers' job performance in Taraba State, Nigeria.

1. between acquisition of basic digital literacy skills and public secondary school Biology teachers' job performance in Taraba State.
2. between acquisition of word processing skills and public secondary school Biology teachers' job performance in Taraba State
3. between acquisition of computer presentation skills and public secondary school Biology teachers' job performance in Taraba State
4. between acquisition of spreadsheet skills and public secondary school Biology teachers' job performance in Taraba State.
5. between acquisition of data processing skills and public secondary school Biology teachers' job performance in Taraba State.
6. among acquisition of basic digital literacy skills, word processing skills, computer presentation skills, spreadsheet skills data processing skills and public secondary school Biology teachers' job performance in Taraba State

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

H_{O1}: There is no significant relationship between acquisition of basic digital literacy skills and public secondary school Biology teachers' job performance in Taraba State.

H_{O2}: There is no significant relationship between acquisition of word processing skills and public secondary school Biology teachers' job performance in Taraba State.**H_{O3}**: There is no significant relationship between acquisitions of computer presentation skills public secondary school Biology teachers' job performance in Taraba State.

H_{O4}: There is no significant relationship between acquisition of spreadsheet skills and public secondary school Biology teachers' job performance in Taraba State.

H_{O5}: There is no significant relationship between acquisition of data processing skills, and public secondary school Biology teachers' job performance in Taraba State.

H_{O6}: There is no significant relationship among acquisition of basic digital literacy skills, word processing skills, computer presentation skills, spreadsheet skills, data presentation skills and public secondary school Biology teachers' job performance in Taraba State.

Literature Review

This study is based on Technological Pedagogical Content Knowledge (TPACK) Framework (Mishra & Koehler, 2006) and Job Performance Theory by Campbell, McCloy, Oppler, and Sager, (1993). Digital literacy skills are highlighted as a critical for teachers to effectively perform their jobs in the digital age.

A studied by, Goffreda & Russo, (2016) reported that teachers who possess a high level of digital literacy are better able to create engaging, interactive lessons that cater to a wider range of learners and also (Michael and Igenewari 2018), reported that the use of computer in classroom instruction has transformed teaching and learning, it has improved learning outcome and information sharing, in the same vein, (Ibieta, Hinostroza, Labbe and Claro 2017), established that, teachers that used ICT more frequently for class preparation improved their content delivery in the classrooms. While, (Katz, 2017) viewed, digital literacy skills are essential for teachers, there are potential disadvantages on teachers job performance which consider decreased on incentive and other job satisfaction. (Sharma, 2019) and (Williams, 2018), also reported that, time allocation of the subject (biology), ineffective communication level of learners as well as school location also underpin the teachers jobs performance in our secondary schools in Nigeria.

Therefore, Digital literacy is one's ability to find and evaluate information, utilize information, create new content, share information, and communicate it through appropriate digital technology (Reddy, Sharma, & Chaudhary, 2020). According to Karagözoğlu and Gezer (2022) Digital literacy should be understood as the fundamental skill or ability to use a computer safely and effectively.

Methodology

This study employed correlational research design, The area of the study was Taraba State, Nigeria. population of this study consists of 1,985 school personnel (i.e., 1,637 Biology teachers and 336 principals) in Post Basic Schools in Taraba State.

The sample of the study were 509 respondents (i.e., 321 teachers and 188 principals) in Post Basic Schools in Taraba State, Nigeria. Taro Yamane's formula was used in calculating the sample size, purposive sampling technique was used in selecting the 321 Biology teachers as respondents from the 10 education zones of Taraba State. Two instruments were used for the purpose of data collection, Acquisition of digital literacy skills questionnaire (ADLSQ) was adapted from Adlawan and Quirap (2022) and the Biology teacher's job performance questionnaire (BTJPQ) was adapted from Taraba state post primary school's management board staff annual performance evaluation report (2024).

Acquisition of digital literacy skills questionnaire (ADLSQ) comprises of two sections, section A, have five clusters for convenience considering the level of acquisition; covering level of acquisition of word processing skills, data processing, basic digital literacy skill, spreadsheet skill, and computer presentation skill. It has 60 positively worded statements which was measured using a five point likert-type scale wherein one is the lowest and five is the highest structured on a points scale of very high level (VHL) = 5 points, high level (HL) = 4 points, Medium (ML)=3points, low level (LL)= 2 points and very low level (VLL) = 1 point

Biology Teachers' Job Performance Questionnaire, (BTJPQ) has 15 positively worded statements structured on a 5 point likert-type scale where in one is the lowest and five is the highest structured on a

points scale of very high level (VHL) = 5 points, high level (HL) = 4 points, Medium (ML)=3points, low level (LL)= 2 points and very low level (VLL) = 1 point. The data collected was analyzed using descriptive statistics of mean and standard deviation.

Results and Discussion

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Table 1a: Model Summary Relationship between Acquisition of Basic Digital Literacy Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.833[a]	.695	.693	.27157

a. Predictors: (Constant), Basic Digital Literacy Skills

The regression model yielded an R-value of 0.833, indicating a strong positive relationship between basic digital literacy skills and Biology teachers' job performance. The R-Square value of 0.695 suggests that 69.5% of the variation in teachers' job performance can be explained by their level of basic digital literacy skills. The Adjusted R-Square value of 0.693 further supports the stability of the model, indicating that even with adjustments for sample size, the model maintains its predictive strength. The standard error of the estimate (0.27157) is relatively low, implying a good fit of the model to the data.

Table2: Regression Analysis of Relationship Between Acquisition of Basic Digital Literacy Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	31.215	1	31.215	423.251	.000[b]
	Residual	13.717	186	.074		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance

b. Predictors: (Constant), Basic Digital Literacy Skills

The regression model is statistically significant ($F = 423.251$, $p < 0.05$). This implies that the relationship between basic digital literacy skills and Biology teachers' job performance is not due to chance. The low residual sum of squares (13.717) indicates that the unexplained variance in job performance is minimal, further confirming the model's reliability.

Table 3 Coefficients of Beta of Relationship Between Acquisition of Basic Digital Literacy Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.772	.153		5.045	.000
	Basic Digital Literacy Skills	.807	.039	.833	20.573	.000

a. Dependent Variable: Biology Teachers' Job Performance

The unstandardized coefficient ($B = 0.807$) indicates that for every one-unit increase in basic digital literacy skills, job performance increases by 0.807 units. The standardized beta coefficient ($\beta = 0.833$, $p < 0.05$) confirms that basic digital literacy

skills are a strong predictor of teachers' job performance. Additionally, the constant value (B = 0.772, p < 0.05) suggests that even without the influence of digital literacy skills, teachers maintain a baseline level of job performance.

Table 4: Model Summary Relationship between Acquisition of Word Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577[a]	.333	.330	.40131

a. Predictors: (Constant), Word Processing Skills

The results reveal that the R-value is 0.577, indicating a moderate positive relationship between word processing skills and Biology teachers' job performance. Furthermore, the R-Square value of 0.333 implies that 33.3% of the variance in teachers' job performance is explained by their acquisition of word processing skills, while the Adjusted R-Square value of 0.330 suggests minimal shrinkage in predictive power when applied to the population. The standard error of the estimate (0.40131) indicates a moderate level of unexplained variation.

Table 5: Regression Analysis of Relationship Between Acquisition of Word Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.976	1	14.976	92.989	.000[b]
	Residual	29.956	186	.161		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance

b. Predictors: (Constant), Word Processing Skills

The results of analysis in Table show that, the regression model is statistically significant (F = 92.989, p < 0.05). This implies that the relationship between word processing skills and job performance is not due to random chance. The sum of squares for regression (14.976) demonstrates the proportion of variance accounted for by the independent variable, while the residual sum of squares (29.956) represents unexplained variance.

Table 8c: Coefficients of Beta of Relationship Between Acquisition of Word Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.930	.205		9.391	.000
	Word Processing Skills	.508	.053	.577	9.643	.000

a. Dependent Variable: Biology Teachers' Job Performance

The results of analysis in Table 8c indicate that the unstandardized coefficient (B = 0.508, p < 0.05) suggests that for every unit increase in word processing skills, job performance improves by 0.508 units. The standardized beta coefficient (β = 0.577, p < 0.05) confirms that word processing skills have a moderately strong predictive effect on job performance. Additionally, the constant value (B = 1.930, p < 0.001) implies that even in the absence of word

processing skills, Biology teachers still demonstrate a baseline level of job performance.

H_{O3}: There is no significant relationship between acquisitions of computer presentation skills public secondary school Biology teachers' job performance in Taraba State.

Table 9a: Model Summary Relationship between Acquisition of Computer Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.525[a]	.276	.272	.41828

a. Predictors: (Constant), Computer Presentation Skills

The results of analysis in Table 9a reveal that the R-value is 0.525, indicating a moderate positive relationship between computer presentation skills and Biology teachers' job performance. The R-Square value of 0.276 suggests that 27.6% of the variation in job performance is attributed to computer presentation skills, while the Adjusted R-Square value of 0.272 confirms the model's predictive stability. The standard error of the estimate (0.41828) reflects a moderate level of unexplained variance.

Table 9b: Summary of ANOVA from Regression Analysis of Relationship Between Acquisition of Computer Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.390	1	12.390	70.816	.000[b]
	Residual	32.542	186	.175		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance
b. Predictors: (Constant), Computer Presentation Skills

The results of analysis in Table 9b indicate that the regression model is statistically significant ($F = 70.816$, $p < 0.05$). This implies that the relationship between computer presentation skills and job performance is not due to chance. The sum of squares for regression (12.390) represents the portion of variance explained by the model, while the residual sum of squares (32.542) accounts for unexplained variability.

Table 9c: Coefficients of Beta of Relationship Between Acquisition of Computer Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.224	.200		11.095	.000
	Computer Presentation Skills	.431	.051	.525	8.415	.000

a. Dependent Variable: Biology Teachers' Job Performance

The results of analysis in Table 9c reveal that the unstandardized coefficient (B = 0.431, p < 0.05) suggests that for every unit increase in computer presentation skills, job performance improves by 0.431 units. The standardized beta coefficient (β = 0.525, p < 0.05) demonstrates that computer presentation skills have a moderate predictive effect on job performance. The constant value (B = 2.224, p < 0.05) suggests that teachers exhibit a baseline level of job performance even in the absence of computer presentation skills.

H_{O4}: There is no significant relationship between acquisition of spreadsheet skills and public secondary school Biology teachers' job performance in Taraba State.

Table 10a: Model Summary Relationship between Acquisition of Spreadsheet Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.482[a]	.233	.229	.43054

a. Predictors: (Constant), Spreadsheet Skills

The results of analysis in Table 10a reveal that the R-value is 0.482, indicating a moderate positive relationship between spreadsheet skills and Biology teachers' job performance. The R-Square value of 0.233 suggests that 23.3% of the variance in job performance is explained by teachers' acquisition of spreadsheet skills, while the Adjusted R-Square value of 0.229 confirms the model's predictive stability. The standard error of the estimate (0.43054) indicates a moderate level of unexplained variation.

Table 10b: Summary of ANOVA from Regression Analysis of Relationship Between Acquisition of Spreadsheet and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10.454	1	10.454	56.394	.000[b]
	Residual	34.478	186	.185		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance

b. Predictors: (Constant), Spreadsheet Skills

The results of analysis in Table 10b show that the regression model is statistically significant (F = 56.394, p < 0.05). This implies that the relationship between spreadsheet skills and job performance is not due to random chance. The sum of squares for regression (10.454) represents the portion of variance explained by the model, while the residual sum of squares (34.478) accounts for unexplained variability.

Table 10c: Coefficients of Beta of Relationship Between Acquisition of Spreadsheet Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	2.353	.207		11.354	.000
	Spreadsheet Skills	.389	.052	.482	7.510	.000

a. Dependent Variable: Biology Teachers' Job Performance

The results of analysis in Table 10c reveal that the unstandardized coefficient (B = 0.389, p < 0.05) suggests that for every unit increase in spreadsheet skills, job performance improves by 0.389 units. The standardized beta coefficient (β = 0.482, p < 0.05) confirms that spreadsheet skills have a moderate predictive effect on job performance. Additionally, the constant value (B = 2.353, p < 0.05) suggests that teachers exhibit a baseline level of job performance even in the absence of spreadsheet skills.

The results confirm that the relationship between spreadsheet skills and job performance is statistically significant (p < 0.05). Therefore, the null hypothesis (H_{O4}) is rejected, indicating that spreadsheet skills, such as data organization, calculations, and analysis, contribute to improved teaching effectiveness and administrative efficiency among Biology teachers.

H_{O5}: There is no significant relationship between acquisition of data processing skills, and public secondary school Biology teachers' job performance in Taraba State.

Table 11a: Model Summary Relationship between Acquisition of Data Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.467[a]	.218	.214	.43464

a. Predictors: (Constant), Data Processing Skills

The results of analysis in Table 11a reveal that the R-value is 0.467, indicating a moderate positive relationship between data processing skills and Biology teachers' job performance. The R-Square value of 0.218 suggests that 21.8% of the variation in job performance is explained by teachers' acquisition of data processing skills, while the Adjusted R-Square value of 0.214 confirms the model's predictive stability. The standard error of the estimate (0.43464) reflects a moderate level of unexplained variance.

Table 11b: Summary of ANOVA from Regression Analysis of Relationship Between Acquisition of Data Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.794	1	9.794	51.845	.000[b]
	Residual	35.138	186	.189		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance
b. Predictors: (Constant), Data Processing Skills

The results of analysis in Table 11b indicate that the regression model is statistically significant (F = 51.845, p < 0.05). This implies that the relationship between data processing skills and job performance is not due to chance. The sum of squares for regression (9.794) represents the proportion of variance explained by the model, while the residual sum of squares

(35.138) accounts for unexplained variability.

Table 11c: Coefficients of Beta of Relationship Between Acquisition of Data Processing Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.424	.206		11.759	.000
	Data Processing Skills	.371	.052	.467	7.200	.000

a. Dependent Variable: Biology Teachers' Job Performance

The results of analysis in Table 11c reveal that the unstandardized coefficient (B = 0.371, $p < 0.05$) suggests that for every unit increase in data processing skills, job performance improves by 0.371 units. The standardized beta coefficient ($\beta = 0.467$, $p < 0.05$) confirms that data processing skills have a moderate predictive effect on job performance. The constant value (B = 2.424, $p < 0.05$) suggests that teachers exhibit a baseline level of job performance even in the absence of data processing skills. The results confirm that the relationship between data processing skills and job performance is statistically significant ($p < 0.05$). Consequently, the null hypothesis (H_{O5}) is rejected, indicating that acquiring data processing skills, such as handling student records, analyzing research data, and processing examination scores, enhances Biology teachers' efficiency and effectiveness in classroom management.

H_{O6}: There is no significant relationship Among Acquisition of Basic Digital Literacy Skills, Word Processing Skills, Computer Presentation Skills, Spreadsheet Skills, Data Presentation Skills and public secondary school Biology teachers' job performance in Taraba State.

Table 12a: Model Summary Relationship Among Acquisition of Basic Digital Literacy Skills, Word Processing Skills, Computer Presentation Skills, Spreadsheet Skills, Data Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.852[a]	.726	.719	.25989

a. Predictors: (Constant), Data Processing Skills, Word Processing Skills, Basic Digital Literacy Skills, Computer Presentation Skills, Spreadsheet Skills

The results of analysis in Table 12a reveal that the R-value is 0.852, indicating a strong positive relationship among digital literacy skills, word processing, computer presentation, spreadsheet, and data processing skills and Biology teachers' job performance. The R-Square value of 0.726 suggests that 72.6% of the variation in teachers' job performance is explained by these skills, while the Adjusted R-Square value of 0.719 confirms the model's predictive stability. The standard error of the estimate (0.25989) indicates a low level of unexplained variation.

Table 12b: Summary of ANOVA from Regression Analysis of Relationship Among Acquisition of Basic Digital Literacy Skills, Word Processing Skills, Computer Presentation Skills, Spreadsheet Skills, Data Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	32.639	5	6.528	96.648	.000[b]
	Residual	12.293	182	.068		
	Total	44.932	187			

a. Dependent Variable: Biology Teachers' Job Performance

b. Predictors: (Constant), Data Processing Skills, Word Processing Skills, Basic Digital Literacy Skills, Computer Presentation Skills, Spreadsheet Skills

The results of analysis in Table 12b show that the regression model is statistically significant ($F = 96.648$, $p < 0.05$). This confirms that the combination of these digital skills significantly predicts job performance. The sum of squares for regression (32.639) represents the portion of variance explained by the model, while the residual sum of squares (12.293) accounts for unexplained variability.

Table 12c: Coefficients of Beta of Relationship Among Acquisition of Basic Digital Literacy Skills, Word Processing Skills, Computer Presentation Skills, Spreadsheet Skills, Data Presentation Skills and Public Secondary School Biology Teachers' Job Performance in Taraba State

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.436	.168		2.586	.010
	Basic Digital Literacy Skills	.699	.049	.722	14.286	.000
	Word Processing Skills	.195	.047	.222	4.176	.000
	Computer Presentation Skills	-.052	.053	-.064	-.993	.322
	Spreadsheet Skills	.008	.053	.010	.158	.875
	Data Processing Skills	.043	.051	.054	.842	.401

a. Dependent Variable: Biology Teachers' Job Performance

The results of analysis in Table 12c indicate that among the predictors, basic digital literacy skills ($B = 0.699$, $\beta = 0.722$, $p < 0.05$) and word processing skills ($B = 0.195$, $\beta = 0.222$, $p < 0.05$) have significant positive relationship with job performance. However, computer presentation skills ($B = -0.052$, $\beta = -0.064$, $p = 0.322$), spreadsheet skills ($B = 0.008$, $\beta = 0.010$, $p = 0.875$), and data processing skills ($B = 0.043$, $\beta = 0.054$, $p = 0.401$) do not show significant relationship with job performance. It can be concluded that Basic Digital Literacy Skills make the strongest unique contribution to explaining the job performance, when the variance explained by all other variables in the model are controlled for since it has the largest beta coefficient of .722. The Betavalue for Spreadsheet Skills was slightly lower (.010), indicating that it made less of a unique contribution in predicting job performance. The results confirm that the relationship between the acquisition of the skills and job performance is statistically significant ($p < 0.05$). Consequently, the null hypothesis (H_{O6}) is rejected, indicating that acquiring digital literacy and word processing skills has the most substantial impact on Biology teachers' job performance, while other skills show varying levels of influence.

Conclusion

Public secondary school Biology teachers in Taraba State exhibit a high level (HL) of digital literacy skill in Taraba State.

Based on the findings of this study, the following recommendations are made:

1. Biology teachers should update their knowledge in the use of digital facilities beyond the average extent to be able to meet up with the growing trend in modern-day technology for meaningful delivery of their teachings of Biology.
2. Emphasis should be laid on computer education through workshops, seminars and conferences for Biology teachers on the use of modern computer application packages, thereby enhancing their job performance.

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Staff Recruitment and Staff Remuneration as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria.

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Abstract
This study investigated staff recruitment and staff remuneration as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria. Three specific objectives, three research questions and three hypotheses guided the study. Predictive correlational research design was adopted for this study. The area of the study is North-Eastern Nigeria, which is made up of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The population of this study consisted of 1,652 respondents. The sample size for this study is 330 respondents. Two adapted instruments were used for data collection in this study. The instrument was validated by four experts. The instruments yielded a reliability co-efficient of 0.87 and 0.84 for (IFQ) and (LTEQ) respectively. Descriptive and inferential statistics were used in analysing the data. Specifically, descriptive statistics of Mean and Standard Deviation were used in answering the research questions raised for the study. Simple linear regression and multiple regression analysis were used testing the null hypotheses at 0.05 Alpha level of significance. The findings revealed that there is a significant relationship between staff recruitment and lecturers' teaching effectiveness. The findings revealed that a significant relationship between staff remuneration and lecturers' teaching effectiveness. There is significant relationship between staff recruitment, staff remuneration and lecturers' teaching effectiveness, ($F(1, 328) = 22.061$, $p < 0.05$). Based on the findings of this study, it was recommended among others that management of Colleges of Education should ensure that recruitment practices are refined to attract and retain highly qualified and motivated lecturers. This may involve revising recruitment criteria, ensuring transparency in the hiring process, and offering competitive incentives to attract top talent.Federal Government should review and adjust staff remuneration packages to ensure they are competitive and reflective of the lecturers' qualifications and contributions.

Keywords: Staff Recruitment, Staff Remuneration, and Lecturers Teaching Effectiveness.

Introduction

People possess different opinion about quality. Quality of education depends on the perception of its stakeholders which is built upon various services offered by the educational institutions that helps in developing technically competent and socially sensitive citizens. The quality of colleges of education can be measured by the value they incorporate in their product (students), for those who absorb them i.e. industry. The negative impact of this in teaching could result in poor service delivery of teachers which may lead to excessive absenteeism from school, strike actions, ineffective service delivery and so on. To make learning more meaningful understandable and fruitful to a learner, effectiveness of teaching delivered by a teacher is very essential condition (Afe,

2019). Lecturer's teaching effectiveness is a critical component of academic excellence in Higher educational institutions. According to Hohoev (2019), recruiting lecturers with strong academic backgrounds, teaching expertise, and a passion for teaching positively influences the overall quality of teaching.

Staff recruitment in Federal Colleges of Education is a set of operations used to obtain a sufficient number of the appropriate personnel especially lecturers at the right time and from the right places. The goal of recruiting is to pick people who best suit the needs of the workplace, as well as to build and maintain a qualified and appropriate staff that allows an organisation to fulfil its human resource plan (Armstrong, 2019). According to lgbokwe-Ibeto and Agbodike (2015), recruitment is the process of obtaining individuals who are available and competent to fill a vacancy in an organisation. However, recruitment entails finding the best candidate for the job. An effective staff recruitment process in Federal Colleges of Education contributes to the selection of highly qualified and experienced lecturers. Also, a well-planned recruitment strategy could result in a diverse pool of lecturers with various skills and specializations. This diversity may help enrich the learning environment, providing students with exposure to a range of perspectives and expertise, thereby enhancing the effectiveness of teaching. However, inconsistent recruitment standards may result in variations in the qualifications and competencies of lecturers. This lack of uniformity could affect the overall coherence and quality of education, as lecturers may differ significantly in their preparedness for teaching roles. In the same vein, prolonged or frequent vacancies in teaching positions may lead to overburdened existing staff, potentially impacting lecturers' teaching effectiveness. Lecturers may have to take on additional responsibilities, leading to burnout and a compromise in the quality of instruction. However, the key factor that influences a candidate's decision to join an organization is the compensation package or staff remuneration. When lecturers feel valued and adequately compensated for their efforts, lecturer are more likely to invest time and energy in preparing high-quality lessons and engaging with students effectively.

Staff remuneration, according to Wey-Amaewhule and Umor (2021), refers to the compensation, rewards, and benefits provided to employees by an organization in exchange for their work, services, and contributions. According to the authors, remuneration encompasses prompt payment of lecturers' salary, Dearness Allowance (DA), House Rent Allowance (HRA), Transport Allowance (TA), performance-linked incentive, Duty Tour Allowances (DTA), remittance of third-party deductions to benefiting pension bodies and professional growth development allowances to Lecturers. It is a comprehensive set of financial and non-financial elements designed to attract, retain, and motivate employees. The compensation package contains the basic salary, allowances, and additional economic benefits that a person receives while working. Salary is the predetermined monthly payment paid to employees, while a benefit is an additional monetary reward in the form of allowances, that include quarter maintenance, furniture, utilities, meal subsidies, transportation, rent subsidies, and retirement pensions (Mutwiri, 2015; Dawar, 2018); that the federal government offers colleges of education staff in order to make the staff job more appealing. Thus, competitive and fair remuneration packages could contribute to lecturers' motivation and job satisfaction. However, inadequate remuneration may lead to demotivation

and burnout among lecturers. When lecturers feel undervalued or struggle to meet financial needs, it could impact lecturers' enthusiasm for teaching, potentially diminishing teaching effectiveness. In addition, low remuneration for lecturers could also contribute to high turnover rates which may disrupts may lead to a less experienced and less effective teaching faculty. But to counter these effects, staff remuneration are often tied to staff promotion within Federal Colleges of Education.

The consequences of ineffective teaching among FCE lecturers are often evident in some students who struggle to grasp key content and develop critical thinking skills; which has led to lower students' academic achievement, reduced confidence, and increased dropout rates that compromise students' quality educational experience. In addition, poor teaching effectiveness can also cause student disengagement and indifference, causing classroom disturbances, ill-discipline, and a hostile learning environment (Normala & Mohamad, 2021; Reynolds, 2021). So, to ensure a high level of teaching effectiveness in FCEs, school authorities and the Government need empirical and reliable information on how institutional factors relate to teaching effectiveness. Such information, if obtained from a multifactorial study examining how several institutional factors relate to teacher effectiveness in FCEs, will guide the development and implementation of informed policies and programmes for attaining the highest level of teaching effectiveness in FCEs in the Northeast zone of Nigeria.

Whereas it may be common knowledge that effective lecturers help students to excel academically, it is not yet clear how institutional factors mediate teaching effectiveness in Federal Colleges of Education in the Northeast of Nigeria. Many factors within the FCE system affect teaching effectiveness (Ukpabi & Kenneth, 2021; Foluso & Wilfred, 2021; Samuel *et al.*, 2019). Still, the extent to which they relate positively or negatively to teaching effectiveness across colleges in the Northeast is not well established. Studies conducted outside the zone found some institutional factors significantly related to teaching effectiveness, while some were not. Each one of those studies investigated between one and three institutional factors. Because each of those studies investigated a limited number of factors, they were unable to provide a broad and in-depth knowledge of how institutional factors generally relate to teaching effectiveness. So, it is unclear whether their findings can be generalised to the FCEs in the North East, Nigeria given institutional peculiarities and divergencies.

Studies have suggested that factors like administrative procedures (Shchupakivsky, 2019), inadequate instructional facilities (Ahunanya & Ubabundu, 2016), subpar staff remuneration (Shchupakivsky, 2019), impact lecturers' performance. Those studies were predominantly unifactorial, bifactorial or trifactorial and hence did not provide a robust treatise on this issue that involves many factors. Out of the many institutional factors that could affect teaching effectiveness in FCEs, a handful of them have been explored in studies in relation to teaching effectiveness. A veritable source of information on how institutional factors relate to teaching effectiveness in FCEs can only be derived from a multifactorial analysis of how staff recruitment, staff remuneration relate to teaching effectiveness. Hence, this study sought to examine recruitment and remuneration as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria.

Purpose of the Study

This study investigated recruitment and remuneration as predictors of Lecturers' Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria. Specifically, the study sought to determine:

1. Staff recruitment as predictor of lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.
2. Staff remuneration as predictors of lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.
3. The level of Lecturers Teaching Effectiveness in Federal Colleges of Education in North East, Nigeria.

Research Questions

The following research questions were raised to guide the study:

RQ_1. What is the level of staff recruitment in Federal Colleges of Education in North East, Nigeria?

RQ_2. What is the level of staff remuneration in Federal Colleges of Education in North East, Nigeria?

RQ_3. How effective are lecturers' teaching in Federal Colleges of Education in North East, Nigeria?

Hypotheses

The following hypotheses were formulated to guide the study and tested at 0.05 Alpha level of significance:

H_{O1}: There is no significant relationship between staff recruitment and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

H_{O2}: There is no significant relationship between staff remuneration and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

H_{O3}: There is no significant relationship between staff recruitment, staff remuneration and lecturers' teaching effectiveness in Federal Colleges of Education in North East, Nigeria.

Methodology

Predictive correlational research design was adopted for this study. The area of the study is North-Eastern Nigeria, which is made up of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The population of this study consisted of 1,652 respondents. The sample size for this study is 330 respondents. Two adapted instruments were used for data collection in this study. The instrument was validated by four experts. The instruments yielded a reliability co-efficient of 0.87 and 0.84 for (IFQ) and (LTEQ) respectively. Descriptive and inferential statistics were used in analysing the data. Specifically, descriptive statistics of Mean and Standard Deviation were used in answering the research questions raised for the study. Simple linear regression and multiple regression analysis were used testing the null hypotheses at 0.05 Alpha level of significance.

Results

Research Question 1: What is the level of staff recruitment in Federal Colleges of Education in North Eastern Nigeria?

Table 1 Mean and Standard Deviation of Level of Staff Recruitment in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	Lecturer recruitment as applicants to fill the vacancy	3.56	1.16	HL

2.	Trained recruitment staff used to screen all applicants	3.32	1.01	ML
3.	Selection panel trained in current employment legislation	3.22	1.00	ML
4.	Recruitment/selection of teaching staff is informed by current research	3.20	1.14	ML
5.	A structured induction as part of the employment process for all lecturers	3.27	1.06	ML
6.	Lecturer recruitments based on diversity	3.21	1.11	ML
7.	Recruitments include extensive campaigns to attract top-tier talent nationally	2.99	1.16	ML
8.	Faculty exchange programmes with other institutions to attract experienced educators	2.98	1.20	ML
	Grand Mean	**3.22**	**1.10**	**ML**

Table 1 illustrates the level of staff recruitment practices, with a grand mean of 3.22 and a standard deviation of 1.10. Lecturer recruitment as applicants to fill the vacancy scored the highest (M = 3.56, SD = 1.16), indicating a somewhat effective recruitment strategy. However, several key aspects of recruitment, such as the use of trained recruitment staff (M = 3.32, SD = 1.01) and recruitment based on diversity (M = 3.21, SD = 1.11), are only rated as moderate. Lower scores are observed in areas like Faculty exchange programmes with other institutions to attract experienced educators (M = 2.98, SD = 1.20) and recruitments include extensive campaigns to attract top-tier talent nationally (M = 2.99, SD = 1.16), highlighting areas that need significant improvement to enhance the recruitment process.

Research Question 2: What is the level of staff remuneration in Federal Colleges of Education in North Eastern Nigeria?

Table 2: Mean and Standard Deviation of Level of Staff Remuneration in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	Prompt payment of lecturers' salary	4.12	1.06	HL
2.	Swift payment of Dearness Allowance (DA) to Lecturers aimed at offsetting inflation	3.28	1.17	ML
3.	Payment of House Rent Allowance (HRA) to Lecturers that meet their housing needs	3.03	1.29	ML
4.	Prompt payment of Transport Allowance (TA) to Lecturers	2.96	1.32	ML
5.	Prompt payment of performance-linked incentive to lecturers	2.75	1.25	ML
6.	Prompt payment of Duty Tour Allowances (DTA) to lecturers	3.04	1.30	ML
7.	Prompt remittance of third-party deductions to benefiting pension bodies	2.81	1.25	ML
8.	Payment of professional growth development allowances to Lecturers	3.09	1.24	ML
	Grand Mean	**3.14**	**1.23**	**ML**

Table 2 explores the level of staff remuneration, revealing a grand mean of 3.14 and a standard deviation of 1.23. The prompt payment of lecturers' salary stands out with a high mean score of 4.12 (SD = 1.06), indicating a strong commitment to ensuring timely salary payments. In contrast, other aspects such as prompt payment of Duty Tour Allowances (DTA) to lecturers (M = 3.04, SD = 1.30) and prompt payment of performance-linked incentive to lecturers (M = 2.75, SD = 1.25) are rated as moderate, suggesting that these remuneration components could be improved. The overall moderate level of remuneration practices suggests a need for better alignment with the expectations of the staff.

Research Question 3: How effective are lecturers' teaching in Federal Colleges of Education in North Eastern Zone of Nigeria?

Table 3: Mean and Standard Deviation of Level of Effectiveness of Lecturers in Federal Colleges of Education in North Eastern Nigeria

S/N	Item (n=330)	Mean	S. D	Remark
1.	I use knowledge (of school, family, cultural and community factors) that influence the quality of education for all students	4.20	0.94	HL
2.	I establish a classroom environment of respect/support that provides a culture for learning	3.87	0.87	HL
3.	I engage in assessment activities geared towards student improvement	3.95	0.89	HL
4.	I use assessment data for instructional decision making	3.81	1.01	HL
5.	I provide a variety of opportunities that support student learning/development	3.87	1.00	HL
6.	I employ the use of verbal instruction during lesson presentation to ensure maximum student learning	3.96	0.97	HL
7.	I employ integrated planned instruction to meet the learning needs of all students	3.73	1.02	HL
8.	I employ on-line Internet Based Instruction to meet the learning needs of all students	3.50	1.17	HL
9.	I employ student-centred instruction (characterized by clarity, variety, and flexibility) to enhance students' participation during teaching-learning activities	3.66	1.08	HL
10.	I use Value-Added Models to provide a summary score of the contribution of various factor towards growth in students achievement	3.52	1.10	HL
	Grand Mean	**3.81**	**1.00**	**HL**

Table 3 evaluates the effectiveness of lecturers in Federal Colleges of Education in North Eastern Nigeria. The mean scores indicate a generally high level of effectiveness, with all items receiving mean scores that fall within the "High Level" (HL) category. The highest mean score is for lecturers' use of knowledge of school, family, cultural, and community factors that influence the quality of education, with a mean of 4.20 and a standard deviation of 0.94, indicating strong effectiveness in this area. Other aspects, such as integrated planned

instruction, engaging in assessment activities, using assessment data for instructional decision-making, and employing student-centered instruction, employing on-line Internet Based Instruction, also reflect high effectiveness, with mean scores ranging from 3.66 to 3.96. The grand mean of 3.81 further emphasizes the overall high level of teaching effectiveness among lecturers, suggesting that they are well-equipped to meet the educational needs of their students across various dimensions.

Hypotheses Testing

The following hypotheses were tested using simple linear regression analysis (for hypotheses 1-2) and multiple-regression analysis (for hypothesis 3) respectively.

HO_1: There is no significant relationship between staff recruitment and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 4a: Summary of ANOVA from Regression of Relationship between Staff Recruitment and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.136	1	29.136	81.882	.000[b]
	Residual	116.710	328	.356		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS
b. Predictors: (Constant), STAFF RECRUITMENT

Table 4a shows ANOVA Summary. The results of the ANOVA show a significant relationship between staff recruitment practices and lecturers' teaching effectiveness ($F(1, 328) = 81.882$, $p < 0.05$). This suggests that effective staff recruitment has a meaningful impact on teaching effectiveness.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.447[a]	.200	.197	.59651

a. Predictors: (Constant), STAFF RECRUITMENT

Table 4b present the Model Summary. The R-square value of 0.200 indicates that 20% of the variance in teaching effectiveness can be attributed to staff recruitment practices, which is slightly lower than the influence of administrative procedures and instructional facilities.

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.641	.133		19.858	.000
	Staff recruitment	.362	.040	.447	9.049	.000

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

Table 4c presented the Coefficients of beta for the regression analysis. The unstandardized coefficient (B) for staff recruitment is 0.362 ($p < 0.001$), meaning that improving staff recruitment by one unit is expected to increase teaching effectiveness by 0.362 units. The standardized beta coefficient of 0.447 suggests a moderately strong relationship between the two variables.

HO_2: There is no significant relationship between staff remuneration and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 5a: Summary of ANOVA from Regression of Relationship between Staff Remuneration and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.016	1	17.016	43.322	.000[b]
	Residual	128.830	328	.393		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS
b. Predictors: (Constant), STAFF REMUNERATION

Table 5a: ANOVA Summary The ANOVA results indicate a significant relationship between staff remuneration and lecturers' teaching effectiveness ($F(1, 328) = 43.322$, $p < 0.05$). This result suggests that remuneration plays a crucial role in enhancing teaching effectiveness, although the strength of this relationship is lower compared to other factors.

Table 5b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342[a]	.117	.114	.62672

a. Predictors: (Constant), STAFF REMUNERATION

Table 5b presented a Model Summary for the regression analysis. The R-square value of 0.117 implies that 11.7% of the variance in teaching effectiveness can be explained by staff remuneration, which is lower compared to the other predictors, indicating a weaker but still significant influence.

Table 5c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.014	.125		24.072	.000
	Staff remuneration	.253	.038	.342	6.582	.000

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

Table 5c shows the Coefficients of beta. The unstandardized coefficient (B) for staff remuneration is 0.253 ($p < 0.001$), suggesting that an increase in remuneration by one unit would lead to a 0.253-unit increase in teaching effectiveness. The standardized beta coefficient of 0.342 points to a moderate positive relationship, though weaker than other factors.

HO_3: There is no significant relationship between staff recruitment, staff remuneration, and lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria.

Table 6a: Summary of ANOVA from Regression of Relationship between Staff Recruitment, Staff Remuneration, and Lecturers' Teaching Effectiveness in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.844	9	6.205	22.061	.000[b]
	Residual	90.002	320	.281		
	Total	145.845	329			

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

b. Predictors: (Constant), staff recruitment, staff remuneration

Table 6a shows the Summary of ANOVA from Regression. This ANOVA table examines the relationship between staff recruitment, remuneration, and lecturers' teaching effectiveness. The F-value is 22.061, and the significance level (Sig.) is .000, suggesting that these institutional factors collectively have a significant relationship with teaching effectiveness. Thus, the null hypothesis (HO10) is rejected.

Table 6b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619[a]	.383	.366	.53034

a. Predictors: (Constant), Staff Recruitment, Staff Remuneration.

Table 6b shows a Model Summary. The model summary indicates an R value of .619, showing a strong positive correlation between the staff recruitment, remuneration, and lecturers' teaching effectiveness. The R Square value is .383, meaning that 38.3% of the variation in teaching effectiveness can be explained by the combined institutional factors. The Adjusted R Square, slightly lower at .366, adjusts for the number of predictors in the model, yet still indicates a strong relationship.

Table 6c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.625	.191		8.529	.000
	Staff recruitment	.146	.061	.180	2.411	.016
	Staff remuneration	-.112	.058	-.151	-1.927	.055

a. Dependent Variable: LECTURERS' TEACHING EFFECTIVENESS

The analysis in Table 6c shows the coefficients of beta of multiple regression analysis. The regression analysis presented reveals how each variable included in the model contributed in predicting lecturers' teaching effectiveness. Staff recruitment has a beta value of 0.180 that is Staff recruitment explains 18.0 % of the variance in lecturers' teaching effectiveness, at a t – value of 2.41 and a p-value of 0.016. Staff remuneration has a beta value of -0.151. This means that staff remuneration explains 15.1 % of the variance in lecturers' teaching effectiveness, at a t – value of -1.927 and a p-value of 0.055. It can be concluded that **staff recruitment** makes the strongest unique contribution to explaining the lecturers' teaching effectiveness, when the variance explained by all other variables in the model are controlled for since it has the largest beta coefficient of 0.180. The Beta value for **staff remuneration** was slightly lower (-.151), indicating that it made less of a unique contribution in predicting lecturers' teaching effectiveness.

Summary of Findings

The following are the findings of the study:

1. There is a significant relationship between staff recruitment practices and lecturers' teaching effectiveness ($F(1, 328) = 81.882$, $p < 0.05$).
2. There is a significant relationship between staff remuneration and lecturers' teaching effectiveness ($F(1, 328) = 43.322$, $p < 0.05$).
3. There is significant relationship between recruitment, staff remuneration and lecturers' teaching effectiveness, ($F(1, 328) = 22.061$, $p < 0.05$).

Discussion of Findings

The first finding reveals that there is a significant relationship between staff recruitment practices and lecturers' teaching effectiveness. The relationship between staff recruitment practices and teaching effectiveness highlights the importance of hiring qualified and competent educators. Effective recruitment processes ensure that only those with the necessary skills and qualifications are employed, which in turn impacts the quality of instruction. This finding emphasizes the need for rigorous and merit-based recruitment procedures in educational institutions. This finding is supported by findings of some studies. The finding corroborated that of Ukpabi and Kenneth (2021) who found a significant relationship between recruitment, selection, and placement practices and employee performance, though they noted that the independent influence of recruitment and selection on performance was not significant. This finding supports the idea that recruitment practices are crucial to performance outcomes, which can be extended to teaching effectiveness.

Similarly, Agbionu *et al.* (2018) reported that there is a positive relationship between employer reciprocity (which includes aspects of recruitment and engagement) and lecturers' research output. This supports the broader idea that effective recruitment practices, which contribute to overall employee engagement, can positively impact performance. Although their focus was on research output rather than direct teaching effectiveness, the underlying principle of recruitment's impact on performance is relevant. The finding is in tandem with that of Mark *et al.* (2016) who found that recruitment, promotion, and prompt payment of salaries significantly influenced teachers' job performance. This finding aligns well with the notion that

recruitment practices are crucial for improving teaching effectiveness, as it emphasizes the broader impact of HRM practices on job performance, including teaching. In the study conducted by Cameron and Peter (2018) which focused on human resource management in education, specifically the recruitment and selection of teachers in independent schools. Their study revealed that there were no statistical differences in the views of school leaders regarding HRM practices and their efficacy. This suggests that while recruitment and selection processes are used, their perceived impact might be uniform and not strongly differentiated. This finding contrasts with the idea that specific recruitment practices significantly impact teaching effectiveness, as the study did not find notable differences in outcomes or practices.

The second finding reveals that there is a significant relationship between staff remuneration and lecturers' teaching effectiveness. The finding that staff remuneration is significantly related to teaching effectiveness suggests that fair and competitive salaries are crucial in motivating lecturers to perform at their best. Adequate remuneration not only serves as a reward for hard work but also reduces the likelihood of job dissatisfaction and turnover, thereby promoting stability and consistency in teaching. The finding is in agreement with that of Foluso and Wilfred (2021) who found that both minimum wage and prompt salary payment significantly influenced teachers' effectiveness. This aligns well with the finding that staff remuneration impacts teaching effectiveness, as their results underscore the importance of competitive wages and timely salary payments in enhancing teacher performance. The finding of the study also agrees with that of Udey (2020) who reported that there is a significant relationship between emoluments (including salaries and fringe benefits) and job effectiveness, which reinforces the idea that adequate compensation is crucial for enhancing lecturers' performance. Setka and Gyang (2019) examined the impact of moonlighting (additional jobs) and found that insufficient salaries and lack of incentives contributed to lecturers' moonlighting behavior, which negatively affected their job effectiveness. While this study highlights that inadequate remuneration leads to decreased effectiveness due to the necessity for additional income sources, it also implies that improving salary and incentives could mitigate such negative effects and improve teaching performance. The significant relationship between moonlighting and job effectiveness indirectly supports the finding that better remuneration can enhance lecturers' effectiveness by reducing the need for moonlighting.

Finally the third finding reveals that there is a significant relationship between multiple institutional factors (including administrative procedures, instructional facilities, staff recruitment, remuneration, promotion, development, rewards, recreational facilities, and healthcare facilities) and lecturers' teaching effectiveness. The study finds a significant relationship between a combination of these institutional factors and lecturers' teaching effectiveness. This highlights the interrelated nature of these elements and their collective impact on teaching quality. It suggests that an integrated approach, where all these factors are simultaneously optimized, is necessary to achieve the highest levels of teaching effectiveness.

The finding that multiple institutional factors—such as staff recruitment and staff remuneration significantly relate with lecturers' teaching effectiveness aligns with various insights from previous studies on similar topics. Efficient staff recruitment are critical for the smooth operation of educational institutions. This observation is consistent with the work of Ene and Anukaenyi (2021), who emphasized the importance of adequate facilities and recruitment practices that supports effective educational practices. Although their study focused on school health facilities rather than broader administrative processes, the underlying principle that efficient management leads to better outcomes remains relevant. Instructional facilities also play a crucial role in enhancing teaching effectiveness. Staff-related factors, including recruitment and remuneration, are also important. The studies by Ahumaraeze and Akani (2023) and Kuponiyi *et al.* (2016) focused on school health services, their findings imply that effective implementation of such services can enhance overall school performance, hinting at the broader impact of resource quality and personnel management on teaching outcomes.

Conclusion

Based on the findings of this study, it is evident that multiple institutional factors play a critical role in predicting lecturers' teaching effectiveness in Federal Colleges of Education in North Eastern Nigeria. The significant relationships identified between teaching effectiveness and various factors—such as staff recruitment practices and remuneration, underline the interconnected nature of these elements within the educational environment. Effective teaching is not solely a product of individual effort but is deeply influenced by the institutional context in which educators operate. Therefore, enhancing these institutional factors is essential for improving teaching effectiveness, ultimately leading to better educational outcomes in these colleges. This holistic approach to understanding and addressing the needs of lecturers can contribute to more sustainable and impactful educational practices in the region.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Management of Colleges of Education should ensure that recruitment practices are refined to attract and retain highly qualified and motivated lecturers. This may involve revising recruitment criteria, ensuring transparency in the hiring process, and offering competitive incentives to attract top talent.
2. Federal Government should review and adjust staff remuneration packages to ensure they are competitive and reflective of the lecturers' qualifications and contributions. This includes considering periodic salary reviews and incorporating additional benefits that address the cost of living and professional development needs.
3. A holistic approach should be adopted by college management to address multiple institutional factors concurrently. An integrated policy framework should be developed that harmonizes staff recruitment, remuneration, and feedback mechanisms should be instituted to continuously improve these areas in alignment with lecturers' needs and institutional goals.

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Influence of Scientific Literacy on the Reincarnation Beliefs of Yungur People of Adamawa State, Nigeria

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Abstract

The study concerns with Influence of Scientific Literacy on the Reincarnation Beliefs of Yungur People of Adamawa State, Nigeria. Four objectives were set, four hypotheses tested at 0.05 level of significance guided the study. Descriptive survey design was adopted for the study. Instrument used for data collection was cognitive test tagged Biology Cognitive Test (BCT) adapted from WAEC past questions from 2010-2015. The instrument was content validated by three experts. The instrument was also tested for reliability, using split half method. The reliability coefficient of 0.78 was obtained. The data collected were collected with the administration of questionnaire and analyzed using Chisquare test if independence. The result revealed that, Scientific literacy has significant influence on Yungur people with formal education. Scientific literacy has no significant influence on Yungur people with formal education based on gender, Scientific literacy has significant influence on Yungur people with informal education, Scientific literacy has significant influence on Yungur people with informal education based on gender. Recommendations made based on the findings are, government should provide laboratory instructional equipment and chemicals (both consumable and non-consumable) in all senior secondary schools including rural ones; biology teachers should organize instructional activities to promote students' scientific literacy; instructional activities involving practical aspects on genetics should be encourage in biology.

Introduction

Scientific Literacy is the expected change in the behavior of young people and school graduates who are able to understand and process scientific information, to apply scientific knowledge to explain the phenomena surrounding reality. A more science literate populace is perceived as being better equipped to contribute to the sustainable economic development and to the social welfare (Athuman, 2017). All people, regardless of age, gender, cultural and ethnic environment, require a certain volume of science knowledge and skills to enable them to realize the personal and social aspects of life hence understanding the natural sciences and their inherent processes contribute to the development of these skills. That is to say that knowledge of science and scientific processes which play undeniable role in life of an individual and society at large is needed. This scientific information is needed to meet the challenges of everyday life for an individual to take decisions on issues pertaining to life and his responsibilities to the society

Science educators, scientists and policy makers agree that development of students' scientific literacy is an important aim of science education. Scientific literacy has been defined by many scholars all of which emphasize students' abilities to make use of scientific knowledge in real- world situations for the advancement of science (Gormally, Brickman & Lutz, 2012). Marks and Eilks (2009) opine that when chemistry lessons are designed to include societal issues and discussion of these issues to involve science and technology, it will help students close the gap between school science and applications. The researchers further asserted that activity theory demands that science education be oriented towards students' personal needs and interests in order to increase the relevance of science education in the eyes of the students and the attainment of basic understanding of relevant science concepts, identifying key scientific issues and also for engaging students in appropriate socio-scientific discussions based on well-grounded knowledge. The scholars categorised scientific literacy into: understanding (knowledge of) one's environment, process of inquiry by which understanding the environment is gained and the spirit of science.

Scientific literacy implies students' application to their scientific knowledge to recognize real issues of life that can be solved by them and that assist decision-making and expression of views on issues relating to nature and its changes resulting from human activity. Application of scientific knowledge and processes associated with familiarizing students with the biological action of ions, the influence of mineral fertilizers on the plants, the effects of ethyl alcohol on human health, the relationship of derivatives of hydrocarbons medicines; to know the basic biological functions of fat and etc., which is presented outside the context of real life situations (Stefanova et al, 2010). Birzina (2011) stated that scientific literacy refers to four interrelated features that involve an individual's scientific knowledge and use of that knowledge to identify questions; acquire of new knowledge; explain scientific phenomenon, and draw evidence-based conclusions about science-related issues; understanding of the characteristic features of science as a form of human knowledge and enquiry; create awareness of how science and technology shape our material, intellectual, cultural environments and willingness to engage in science-related issues with the ideas of science as a

constructive, concerned and reflective citizen.

People conceive scientific literacy in different ways: Scientific literacy is much more than the acquisition of a system of knowledge and knowledge about its formation; it is a system of basic science knowledge, the way of its formation and development of ability for its creative daily use for problem solving (Hazen, 2002). Dani (2009) reported that a Programme for International Student Assessment (PISA) in 2006 targeted scientific literacy and assessed how well prepared 15 year-old students from over 80 countries were for life beyond the classroom.

According to Adolphus and Arokoyu (2012), students who are scientifically literate have the knowledge and understanding of scientific concepts and processes required for participation in a digital age society; can ask, find, or determine answers to questions derived from curiosity about everyday experiences; have the ability to describe, explain and predict natural phenomenon; are able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions; can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed; are able to evaluate the quality of scientific information on the basis of the source and the methods used to generate it; have the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately.

Gormally, Brickman and Lutz (2012) opines that scientific literacy prepares individuals with scientific information for application in any real-world situations beyond the classroom, in ways ranging from evaluating sources of evidence used in media reports about science to recognizing the role and value of science in society to interpreting quantitative information and performing quantitative tasks. Achieving scientific literacy for all is a core rationale for science coursework as part of general education requirements for undergraduate students (Meinwald & Hildebrand, 2010).

Biological literacy is the ability to use natural-scientific knowledge in real life situations. The scientific literacy includes:– natural sciences knowledge (basic knowledge and skills), its use in real-life situations for acquiring new knowledge, formulating questions, making conclusions with the appropriate arguments: problem-solving, which can be investigated and dealt with scientific methods, based on the observations and experiments; understanding and making responsible decisions about the world around them and the changes that it brings; human activities linked with scientific development, technological development, technical development. It means that the scientific literacy is the ability to transfer knowledge and understanding of the nature, its structure and diversity of processes, inquiry activities, communication and cooperating skills to different situations in real life when you need to decide, solve problems, and develop ideas for the society, science and technology interaction. (Biologija, 2011).

Bruna and Marcondes (2018) stated that fundamentals of scientific literacy are as follows: that a scientifically literate person is able to Know how to use scientific language; reading; writing, and systematize the scientific acknowledgement; understand main concepts, principles and scientific

theories; Know how to apply scientific acknowledgement in historical, social and environmental contexts; understand science nature: standards, research, scientific method and nature of science; understand how science and technology work together; understand the impact of science and technology in society.

Some studies were conducted by some scholars on scientific literacy. These include: Adolphus and Arokoyu (2012) whose study was on improving scientific literacy among secondary school students through integration of information and communication technology (ICT) in Rivers state Nigeria. The following conclusions were made: government should provide necessary infrastructure for the integration of ICT in secondary school systems as provided for in the national policy on education, the training and re-training of ICT teachers, instructors should be encouraged in secondary schools, subject teachers in biology, chemistry and physics should be trained on the use of ICT so as to be familiar with teaching packages in their subject areas for use in secondary schools. Marks and Eilks (2009) conducted a study on Promoting Scientific Literacy Using a Socio-critical and Problem-oriented approach to chemistry teaching: concept, examples, and experiences. The researchers concluded that from experience gained in applying the different examples, the potential of the teaching approach was then reflected upon as a source for promoting the process-oriented skills of evaluation and communication as essential parts of a well-developed scientific literacy

Bruna and Marcondes (2018) conducted a study on Fundamentals of Scientific Literacy: A Proposal for Science Teacher Education Programme. The proposal was applied in a Brazilian Federal University located in the metropolitan area of São Paulo-Brazil. Twelve pre-service teachers were used as subjects for the study and attended seventeen classes. The teachers studied three different approaches: Science-Technology-Society (STS), History and Philosophy of Science (HPS), and Inquiry-based Teaching (IBT). Some aspects of Nature of Science were also considered. The scholars elaborated levels of comprehension for each approach in order to analyze pre-service teachers' conceptions.

The scholars' investigated how pre-service teachers understand and reflect on the Scientific Literacy concept and its fundamentals. In order to deepen the research on Scientific Literacy and its fundamentals, the researchers conducted investigation in the discipline "Practice of Teaching Chemistry. The discipline content was scientific literacy concept and its fundamentals: IBT, STS, and HPS. Concerning the idea of investigating a teacher education programme, teacher educator was invited to participate in the research. The teacher educator elaborated a course plan for the discipline "Practice of Teaching Chemistry" and took into account the difficulties faced by students in a similar discipline in the year before, so as to enable rethinking some activities, reformulating them, with the aim of allowing pre-service teachers more time for reflection. For instance, one reformulation was pre-service teachers had to write a journal throughout the discipline, in order to promote their reflection about theory and practice.

The objectives were to: analyze conceptions related to Inquiry-based Teaching (IBT); Science-Technology-Society (STS) and History and Philosophy of Science (HPS) approaches and some aspects of the nature

of science (NOS) hold by pre-service teachers; investigate if and which activities proposed by the teacher educator during the discipline provided the reflecting on pre-service teachers' ideas about the teaching-learning process and scientific literacy concept; analyze whether pre-service teachers have acquired the concept of scientific literacy and its fundamentals; analyze how pre-service teachers' application of scientific literacy and its fundamentals when design lesson plans. Results of the study indicated that some students were able to establish relationships among these approaches and their comprehension of each approach was dependent on the emphasis of the teacher educator.

Dani (2009) conducted a study on Scientific Literacy and Purposes for Teaching Science. A Case Study of Lebanese Private School Teachers. It was a qualitative study consisted of eight intermediate and secondary Lebanese science teachers, five males and three females as participants. All participants taught at private schools where science was taught in English. Schools were selected based on convenience and willingness to participate in the study. Data for the study consisted of interviews (two per participant), classroom observations (three per participant), and artifacts such as lesson plans and classroom handouts. Data was collected over a period of six weeks. Only one interview protocol was used to elicit teachers' beliefs and knowledge of the purposes for teaching science. The interview protocol consisted of 17 questions and was adapted from Grossman's (1990) Conceptions of Teaching Science instrument and Richardson and Simmons' (1994k) Teachers' Pedagogical Philosophy Instrument (TPPI). The interview was conducted one-hour sessions; before and after classroom observations.

Sample questions include: tell me about what you see as the reasons for studying science in middle and high school. What are your goals for your students? Probe for conceptions of teaching, process skills, content, nature of science, inquiry: what learning in your classroom do you think will be most and least valuable to your students outside the classroom environment? All interviews were audiotape-recorded and transcribed.

The results of this study show that participants' purposes for teaching science reflected the four aspects of scientific literacy to varying degrees. All eight teachers cited purposes for teaching science that were aligned with "the knowledge of science," "the interaction of science, technology, and society," and to a lesser extent "the investigative nature of science." Only three of the eight teachers cited purposes for teaching science that were aligned with the "science as a way of knowing" aspect of scientific literacy. The following sections describe participants' purposes for teaching science, followed by a description of the underlying contextual factors that emerged from the analysis: purposes for teaching science correspond with "the knowledge of science, the interaction of science, technology and society and the investigative nature of science. Stefanova, Minevska and Evtimova (2010) conducted a study on scientific literacy: Problems of science education in Bulgarian school. The scholars observed the practice of teaching natural science and had discussions with teachers and students which showed that most teachers do not understand the meaning of the term "scientific literacy". Stefanova et al

concluded that scientific literacy is not set as a goal of teaching natural science, so it remains away and misunderstood from teachers.

Reincarnation is an issue. The belief in it varies from culture to culture and can be defined based on individual (or group of people) that belief in it. Reincarnation is derived from Latin and literally means "to take on the flesh again," in other words, "to take on the fleshy (physical) body (Nagaraj, Nanjegowda & Purushothama, 2013). According to Erne st (2015) it is derived from two Latin words, re (again) and incarno (to enter into the body) or (to en-flesh). Osanyibi and Falana (2016) define reincarnation as the doctrine of the passing of the soul at death into another body or bodies either animal or human. According to Cole and Hollister (2010), reincarnation may be define as a plan whereby imperishable conscious beings are supplied with physical bodies appropriate to their stage of growth, and through which they can come in contact with the lessons of physical life. From their definitions, reincarnation is the belief that after someone dies; his immortal soul separates from the body and lives again in another physical body to start another life anew.

Just as a child goes to school day after day, learning lessons, gathering experience and passing from grade to grade, so do we in our greater soul-life come here to earth many times, learning lessons, gathering experience, and passing from one social grade to another. The human consciousness exists before birth and even before conception; this is the first fundamental fact of reincarnation. The infant is young in body only, for using that body and seeking ever more and more to manifest itself through the agency of the brain and nervous system is a mature consciousness which has had much human experience in the past during other lives on earth.

The second great fact of reincarnation is that the soul or conscious self of a human being is a growing thing, and that its development from its first awakening to the gaining of its splendid maturity is extended over an enormous period of time, measured in tens of thousands of years. The soul is “perfect” at the beginning of its human experience only in the same sense that a seed is perfect, for there is just as much difference relatively between a “young” and “old” soul as there is between an acorn and an oak (Cole & Hollister, 2010).

What does the belief in life after death entail? Is man his body? Is man his soul? Is life soul, body, or both? Can ontological divide be made in the realm of existence? How do we defend our belief in life after death if the body decomposes at death? Is the belief in life after death an epistemic, ethical or metaphysical claim? If the belief in life after death is not an epistemic or metaphysical kind, then of what relevance is it? Is the religious claim to such belief useful if it cannot be validated? In short, can such a belief be proved or disproved?” Although all biological species are characterised by death, man however is dissatisfied with the idea that he could not have further consciousness after death. This is because death has more implications for human beings than to any other living thing. It raises such questions as: Why should man die? What happens at death? What happens after death? What is the meaning and purpose of life? What is the destiny of man? The absurdity that death seems to render human existence gives birth to the desire for continued existence of man. The fundamental and complex implications that

death generates provoked the thought that there must be a part of man that survives death (Akomolafe, nd).

Many societies (or ethnic groups) believe in reincarnation. This ranges from ancient Greeks: Empedocles (c490 – c430 BC), denied through his remarked that what was ordinarily called life was not existence in its fuller sense nor is death destruction. Life, to him, was a period in which things were joined together to form a human being, and death merely a dissolution of this compound, since, he would agree, nothing which *was* could be annihilated (Majeed , 2012). Hindus' belief in reincarnation that the soul or spirit, after biological death, begins a new life in a new body that may be human, animal or spiritual depending on the moral quality of the previous life's actions: that the entire universal process that gives rise to the cycle of death and rebirth, governed by karma, is referred to as "Samsara (Nagaraj et al, 2013). Buddhists' concept of reincarnation believed that the actual process of change from one life to the next is called Sanskrit (Pāli), literal meaning is "becoming again. The Africans thought ancestors properly referred to as the living-dead are believed to have some form of discarnate existence. At the very least, they are, as "partly human and partly spirit" (Mbiti, 1991).

To Egyptians, a living person, however, consisted of a body (*khat*) and soul (*ka*), the latter being the person's double that he was born with: that is the *ka* was thought of as conceptual and a replica of the physical reality. The Egyptians also speculated a bird-like soul which they called *ba*. Their conception of a person appears quite elaborate, for they even included other constituents like mind (*khu*) which was considered as the "shining part" that linked the person to *Ptah (god)* and even the shadow of the person (*khaibit*). Now, given that the *khu* was within the *ka*, and the latter was believed to survive death, one can infer that although a person had both physical and non-material properties, upon death only a rational soul remained.

Osanyibi and Adedeji (2016) asserted that the traditional Yorùbá culture holds the belief in reincarnation (Atunwaye). Atunwaye is believed to be possible in three different forms which are: Ipadawaye (ancestor's rebirth), Akudaaya (die and reappear) and Abiku (born to die). Amakulo (nd) opined that ever before the white men came with the Christian religion and Western civilization, the great grandfathers in Igbo land knew about reincarnation, which they called in local language, "Ịlọ ụwa" (a return to the world). They knew and also believed in life beyond, which they call "Ala-mụọ". By "Ala-mụọ", they mean the inner realms not just the fairyland of folk stories.

Yungur people of Song local government area of Adamawa state traditionally believed in reincarnation which they called *Ownra*. The people believed in the rebirth of *Ownra* into families that were part of while alive. A child born in a family is believed to portray some characteristics of who he/she has reincarnated from. These signs or characteristics can be through the Childs behavior, physical traits and utterances. A reincarnated child is believed to be sexless, that is to say the previous child or ancestor can be either a male or female and may seek to manifest itself in either the body of a male or female child. *Ownra* may exhibit characters that are positive and acceptable to the parents or family, such as coming to stay alive and not troubling its parents with unnecessary illnesses or sicknesses. It may

portray some unwelcomed behavioral traits such as born to die young and to be reborn by the same woman over and over again. When such *Ownra* is discovered in a family, some measures are usually taken to make it stay in the family permanently or follow its kindred spirit and never to come back in the family. This is done by inviting an herbalist or a magician called *eid ganda* who will perform some Magic and traditional rituals ("*kad ganda*") in struggle to keep him alive and live like a normal child (Anana, 2019: oral).

According to Sarojini (2003), Gregor Mendel (1822 – 1840 and Thomas morgan (1866 - 1945) laid the foundation of what is referred today as genetics. Genetics played a great role in explaining how characteristics are passed from one generation to the next. Their experiments were proved and accepted world-wide that characters or traits are transferred from parents to off springs via genes. Genetics is the study of biological inheritance of characters or traits from parents to off springs' via genes**.** Inheritance is a basic principle of genetics and explains how characters are passed from one generation to the next. Genetic inheritance occurs due to genetic material in the form of DNA being passed from parents to their offspring through gamates. When organisms reproduce, all the information for growth, survival, and reproduction for the next generation is found in the DNA which is passed down from the parent to next generation. During sexual reproduction, the gametes of a male and a female individual or parents fuse to form zygotes. Each zygote is diploid as it gets one set of chromosomes, and hence one copy of each gene, from the gamete of each parent. Characters determined by genes are thus transmitted from parents to off spring via gametes. Gametes of male and female individuals that are produce from the parents (**P**) generation are fused (fertilised) to form off springs which are called first filial **(F_1)** generation. The sexual union or mating is termed a cross **(×).** Subsequent crossing among the F_1 generation produces second filial **(F_2)** generation. The transfer of these characters is a continues process such that characters in F_1 generation are transferred to F_2 generation; F_2 generation to F_3 generation**;** F_3 generation to F_4 generation and so on (in the case of breeding true.

Mendel's experiments still revealed that in sexual reproduction, although the genetic material of two parents is combined and passed on to one individual and the offspring receives a combination of genetic material from two parents, yet certain genes dominate the expression of different traits. In this situation, only characters of the gene suppressing the other is expressed while the character of the gene that is being suppressed does not express itself. The gene that suppresses is termed dominant gene while the gene being suppressed is termed recessive gene. The alleles for each character segregate during gamete production so that each gamete will only have one of the two alleles for each gene. (Mendel's law of segregation)." Pairs of alleles for each characteristic/gene segregate independently of each other". Offspring inherit one allele from each parent for each characteristic (Mendel's law of independent assortment). Mendel's findings on dominant and recessive genes showed that some characters may not be expressed in an individual but can still be passed on to the next generation. Some characters can hide in a particular generation but show later in life in another generation.

Statement of the Problem

The researcher wants to find out the influence of scientific literacy on the reincarnation beliefs of Yungur people of Adamawa state in the 21st century.The purpose of this study was to find out the level of scientific literacy in Yungur people. The specific objectives of this study are to find out whether: Scientific literacy has influence on people with formal education in Yungur people; scientific literacy has influence on people with formal education base on gender in Yungur people; scientific literacy has influence on people with informal education in Yungur people 4. Scientific literacy has influence on people with informal education base on gender in Yungur people

Hypotheses

HOI. Scientific literacy has no significant influence on people with formal education in Yungur people

HO2. Scientific literacy has no significant influence onYungur people with formal education based on gender

HO3. Scientific literacy has no significant influence on people with informal education in Yungur people

HO4. Scientific literacy has no significant influence onYungur people with informal education based on gender

Hoping that the findings of this study may be of benefit to Yungur communities, students, researchers, and biology teachers. Findings of this study may benefit Yungur communities by minimizing conflict issues of resemblances of children between some families; Findings of this study may be of benefit to students and researchers who may wish to use the information for research purpose; they may be of benefit to biology teachers with their pedagogical instructions on topics related to genetics. This study is delimited to Yungur people only. The population of Yungur people was projected to be 191,859 in 2009 at a growth rate of 2.83 percent (Philimon, 2011). People from the three districts: Ditera, Waltadi and Suktu formed the subjects for this study.

Methodology

The research design for this study was survey. The area of the study was Yungur land. Yungur is the major and dominant tribe in Song Local Government. Yungur land is approximately demarcated by borders of latitude 8^0 20' $9^0$48'E and longitude 12^0 6' to 13^0 14'N. The neighboring tribes are Kanakuru in the West (Shelleng Local Government); Lala in the North (Gombi Local Government); Mboi in North West (part of Song Local Government); Libbo/Gompa in the South West (part of Shelleng and Demsa Local Government areas); Bata in the East and Tambo/Bakopi in the South (Girei Local Government area). The land is made up of the following major communities: Laro, Prambe, Sa, Gangir, Pulle, Koti, Bwazange, Bukta, Batum, Dombi, Dirma, Dolom, Mbwai. Waltadi, Biri, Kaira, Kukta, Hombo, Suktu, Satte, Kuma, Kpanta, Tadi, Zau, Zata, Roma, Balma and Bra (Philemon, 2011). Dumne is the capital and the most populated town with representatives of people from the 28 major communities.

Questionnaire was used for data collection. Data was collected on Yungur day: the day in which all people from the 28 major communities are summoned yearly for special activities and deliberations. On administering the questionnaires, three assistants were used. The three assistants were all indigenes of Yungur and holders of second degree. Their assistance has helped to reduce the mortality rate of the questionnaires on retrieval. Chi-

square was the statistical tool used to analysed the data collected. The Null hypotheses were tested at 0.05 confidence level. Decision taken on testing the null hypotheses was to reject null hypothesis when P < 0.05 and not to reject null hypothesis when P > 0.05.

Results

HO1. Scientific literacy has no significant influence onYungur people with formal education.

Table 1. Chiquare of scientific literacy ofYungur people with formal education

Variable	Observed n	Expected n	P-value
Participants with formal education who said no to reincarnation	135	119.5	0.04
Participants with formal education who said yes to reincarnation	104	119.5	

The result of the analysis on table 1 indicated that the computed P-value (0.04) is below 0.05 level of significance. Since the computed P-value is less than the level of significance, therefore the null hypothesis of no significant influence of scientific literacy on Yungur people with formal education is rejected and concluded that scientific literacy has significant influence on Yungur people with formal education. The observed frequency of 135 indicated that, the number of Participants with formal education who said no to reincarnation is higher than the number of Participants with formal education who said yes to reincarnation with observed frequency of 104

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HO2. Scientific literacy has no significant influence onYungur people with formal education based on gender.

Table 2. Chiquare of scientific literacy ofYungur people with formal education based on gender

Gender	Observed **n**	Expected n	P-value
Males	118	119	0.08
Females	120	119	

The result of the analysis on Table 2, indicated that the computed P-value (0.08) is greater than 0.05 level of significance. Since the computed P-value is greater than the

level of significance, therefore the null hypothesis of no significant influence of scientific literacy on Yungur people with formal education based on gender is upheld and concluded that scientific literacy has no significant influence on Yungur people with formal education based on gender. The observed frequency of 118 indicated that, the number of male participants with formal education who said no to reincarnation is slightly lower than the number of female participants with formal education who said yes to reincarnation with observed frequency of 120.

HO3. Scientific literacy has significant influence on Yungur people with informal education

Table 3. Chiquare of scientific literacy ofYungur people with informal education

Variable	Observed n	Expected n	P-value
Participants with informal education who said no to reincarnation	98	101.5	0.02
Participants with informal education who said yes to reincarnation	105	101.5	

The result of the analysis on Table 3 indicated that the computed P-value (0.02) is below 0.05 level of significance. Since the computed P-value is less than the level of significance, therefore the null hypothesis of no significant influence of scientific literacy onYungur people with informal education is rejected and concluded that scientific literacy has significant influence onYungur people with informal education. The observed frequency of 98 indicated that, the number of Participants with informal education who said no to reincarnation is less than the number of Participants with informal education who said yes to reincarnation with observed frequency of 105.

HO4. Scientific literacy has significant influence on Yungur people with informal education based on gender

Table 4. Chiquare of scientific literacy of Yungur people with informal education based on gender

Gender	Observed n	Expected n	P-value
Males	111	101.5	0.01
Females	92	101.5	

The result of the analysis in Table 4, indicated that the computed P-value (0.01) is less than 0.05 level of significance. Since the computed P-value is less than the level of significance, therefore the null hypothesis of no significant influence of scientific

literacy onYungur people with informal education based on gender is rejected and concluded that scientific literacy has significant influence on Yungur people with informal education based on gender. The observed frequency of 111 indicated that, the number of male participants with informal education who said no to reincarnation is higher than the number of female participants with informal education who said yes to reincarnation with observed frequency of 92.

Findings of the Study

Scientific literacy has significant influence on Yungur people with formal education.

.Scientific literacy has no significant influence on Yungur people with formal education based on gender.

Scientific literacy has significant influence on Yungur people with informal education.

Scientific literacy has significant influence on Yungur people with informal education based on gender.

DISCUSSION

From tables I-4, it is clear from the results that scientific literacy has played a significant role in reducing the number of participants who still believe in reincarnation. In this 21st century the whole world has become a global village with multiple access of sources of information which aids in bridging the gap between the literate and illiterate hence scientific literacy. Based on gender, the number of male participants who still belief in reincarnation is higher than the number of female participants (for formal education) and vice versa (for informal education).The differences though slight in both cases may be due to women dedication to religious believes as some women support their opinions of no reincarnation, religious based (for formal education) Again, formal education has significant influence on women towards scientific literacy: women might have learnt faster than men and are influenced faster through scientific literacy. The following recommendations are therefore made: government should provide laboratory instructional equipment and chemicals (both consumable and non consumable) in all senior secondary schools including rural ones; biology teachers should organize instructional activities to promote students' scientific literacy; instructional activities involving practical aspects on genetics should be encourage in biology.

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Provision of School Infrastructural Facilities and Instructional Materials as Correlates of Students' Academic Achievement in Basic Schools in Adamawa State, Nigeria

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Abstract

Despite the implementation of the basic education programmed in Nigeria specifically the study area has encountered numerous constraints over time. This study is designed to examined school infrastructure, instructional material, as correlate of students' academic achievement in Basic Schools in Adamawa State. Two research questions and two research hypotheses were raised to guide the conduct of the study. Correlational survey research design was adopted for this study. The population of the study is 5134 school personnel. The sample size for this study is 372. This sample size was determined using Taro Yamane formula for sample size determination. A self-structured questionnaire and Proforma of 2022/2023 BECE Result were used for data collection. The research questions were answered using descriptive statistic of mean and standard deviation. All the hypotheses analyzed using simple linear regression. The finding also reveals a statistically significant correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State, with F (1, 371) = 103.303, p < 0.05, r – value = 0.467, r – square = .218, r–square adjusted = .216, β = 0.467. The finding reveals that there is a significant correlation between instructional materials and students' academic achievement in basic schools in Adamawa State, with an F-statistic of (F (1, 371) = 164.679) and a p-value less than 0.05, r – value = 0.555, r–square = .308, r– square adjusted = .306, β = 0.555. Based on the findings of this study, the following recommendations were made: Government should allocate resources and prioritize the improvement and maintenance of school infrastructural facilities such as classrooms, laboratories, libraries, and playgrounds. Ministry of Education should provide schools with sufficient and up-to-date instructional materials, including textbooks, workbooks, audio-visual aids, and teaching resources aligned with the curriculum.

Keywords: Universal Basic Education, School Infrastructural Facilities; Instructional Materials and Students' Academic Achievement in Basic Schools.

Introduction

The implementation of the basic education programmed in Nigeria specifically the study area has encountered numerous constraints over time Izuka, Uche and Chukwuemeka (2022). The educational environment in Nigeria, especially in Adamawa State, faces considerable

obstacles that affect the academic success of students. Ensuring the availability of sufficient school infrastructure and teaching resources is essential for creating a supportive learning atmosphere. Studies show that the standard of physical facilities—including classrooms, libraries, laboratories, and sanitation services—has a direct impact on student participation and performance. Likewise, the availability of instructional resources such as textbooks, teaching tools, and technology is vital for improving the educational experience.

It appears that the challenges faced by the student academic achievement do not just stem from a lack of sufficient knowledge and policies, but rather from the successful execution of the UBE programmed. There is Some programmers establish before the implementation of the UBE such as Universal Primary Education (UPE), which was implemented in the country, appears to encountered so many challenges leading to its failure toward achievement of student in basic schools. These challenges encompass a lack of funding, insufficient school infrastructure, inadequate programmed supervision, a scarcity of instructional materials, and a shortage of qualified and competent teachers, among other factors. As observed numerous challenges appear to effect student academic achievement in basic schools in Nigeria, specifically within the confines of Adamawa State. Most UBE schools face challenges such as overcrowded classrooms, insufficient funding, inadequate infrastructure (including a lack of functional libraries and laboratories), a shortage of instructional materials, inadequate supervision and monitoring of the school programmed, and a deficiency in both the quality and quantity of teachers, among other issues. (UBEC, 2019).

Academic achievement is a very important factor to gauge a student's success in an educational setting. The prediction of academic achievement is important in scientific and applicability aspect. One of the very important determinants of acceptability and popularity in the classroom has been found to be academic achievement and the achievement of high grades in examination (El-Anzi, 2015; Pandey, 2018). It has been found to be a crucial factor in determining one's future in the occupation sector and promotion related aspects. In fact, academic scores have become criteria upon which all the teaching-learning activities are measured (Siew & pandey, 2018). It has a crucial influence on not only the students, but also the people and the environment around (El-Anzi, 2015). Siew and Pandey (2018) referred academic achievement as an individual's personality and his belief in the cause of his success or failures plays a very important role in influencing their academic achievement. The basic education school setting is a fertile environment, where an individual gets to ample opportunities to show their talent and perform their best. Academic achievement of student is a phenomenon that has educational, psychological and sociological connotation (Akhihiero, 2019). Thus, students' academic achievement cannot be completely accounted for by only one or two variables but a number of them. Since students' academic achievement depends on number of variables, performance could be enhanced through identifying and manipulating each of such variables. The academic accomplishment of students can't be achieved without teaches content and concept. Therefore, achievement of student significantly correlates by teacher in-service training, as teachers, being professionals, are responsible for imparting knowledge, skills, information, and attitudes to their pupils.

The implication is that the variable goals of education cannot be achieved without participant who are the student and teachers. Thus, educational outcome is measured by the skill, knowledge, social development of student and the level of attainment of these goals depends mainly on through infrastructural facilities and instructional materials (Jaiyeobe, 2017). The author further explains that, infrastructural facilities encompass various elements that contribute to the facilitation and enhancement of teaching and learning processes, ultimately leading to improved academic performance among students. These elements comprise physical structures such as classroom buildings, libraries, and laboratories, as well as amenities like playgrounds, electricity, clean water supply, toilets, furniture, and visual aids, among others. It is imperative that the material resources employed in schools possess a level of quality that facilitates effective instruction and learning, ultimately contributing to the academic achievement of students (Sholihah, 2019). Apart from conducive learning environment, student also need relevant instructional materials like of real objects, improvised aids, charts for easy understanding the lesson, topic or content toward their academic achievement (Universal Basic Education Commission [UBEC], 2019).

Instructional material refers to any additional means of communication that a teacher can employ to solidify a concept during the process of teaching and learning (Salihu & Jamil, 2015). Nevertheless, the utilization of instructional tools has emerged as a new development, contributing to the diversification of message delivery methods. Educators and learners utilize instructional resources to broaden both the repertoire of sensory organs employed and the assortment of materials employed to convey a particular message via the same sensory organ. When instructing a subject, educators often utilize tangible items or simulators to enhance the learning experience. In this context, instructional materials serve as the means by which information is exchanged between a provider and a recipient (Manguwat & Awuya, 2019). Furthermore, the inappropriate utilization of instructional materials and school infrastructural facilities could impede students' academic achievement. Hence, without overseeing, visitation and observation of the school's equipment in term of the utilization and management, students academic achievement will be reduced in Basic Schools (Abdul, 2018).

The aforementioned factors could provide significant obstacles to the successful achievement of student in basic schools, specifically in Adamawa State Nigeria. However, there is a dearth of empirical evidence supporting this claim in Adamawa State or there may be one which the current study is not privy of, therefore suggests a gap in literature that the current study intends to fill. However, this study investigated infrastructural facilities and instructional materials as correlates of students' academic achievement in Basic Schools in Adamawa State, Nigeria.

Purpose of the Study

This investigated infrastructural facilities and instructional materials as correlates of students' academic achievement in Basic Schools in Adamawa State, Nigeria. Specifically, the study sought to:

1. Determine the level to which school infrastructural facilities correlate with students' academic achievement in Basic Schools in Adamawa State.
2. Determine the level to which instructional materials correlate with

students' academic achievement in Basic Schools in Adamawa State.

Research Question

1. To what level do school infrastructural facilities correlate with students' academic achievement in Basic Schools in Adamawa State?
2. To what level does instructional material correlate with students' academic achievement in Basic Schools in Adamawa State?

Research Hypotheses

The following null hypotheses are formulated to guide the study and tested at 0.05 level of significant.

Ho_1: School infrastructural facilities do not significantly correlate with students' academic achievement in Basic Schools in Adamawa State.

Ho_2: Instructional material does not significantly correlate with students' academic achievement in Basic Schools in Adamawa State.

Methodology

Correlational survey research design was adopted for this study. The study was carried out in Adamawa State, Nigeria. The population of the study is 5134 principals and teachers. The sample size for this study is 372. Principal and teachers. This sample size was determine using Tare Yamane formula for sample size determination. Multi-stage sampling procedure was adopted for this study. The instruments used in the collection of data was self-structured questionnaire tilted "School Facilities and Instructional Materials Questionnaire (SFIMQ)" and a frofoma of "student academic achievement (SAA)";in 2022/2023 Basic Education Certificate Examinatin (BECE) Result. (SFIMQ) Yelded a reliability coefficient of 0. 86. Research questions were answered using descriptive statistic of mean and standard deviation. The hypotheses were analysed using simple linear regression analysis, the decision rule for testing the null hypothesis were if $p \leq 0.05$; the hypotheses is rejected and if; $p \geq 0.05$ then do not reject hypothesis.

Results

The results of data analysis are first presented in a general manner with the relevant tables followed by the interpretation.

Research Question 1: To what level does school infrastructural facilities correlate student academic achievement in basic schools in Adamawa State?

Table 1: Mean and Standard Deviation of Level to which School Infrastructural Facilities Correlate with Students' Academic Achievement in Basic Schools in Adamawa State

S/N	Item (n = 372)	Mean	S. D
1	Intensive library building in school motivate student learning process	3.08	1.29
2	Available science laboratory in the school equips learners with scientific knowledge	2.81	1.22

3	Adequate Classroom block in school create conducive teaching and learning	2.73	1.34
4	Available computer centres in school promote learner knowledge of computerization	2.86	1.22
5	Appropriate school building make teachers and learners satisfied.	2.89	1.32
	Grand Mean	**2.87**	**1.28**

Table 1 presents the mean and standard deviation (S. D) of the level to which school infrastructural facilities correlate with students' academic achievement in basic schools in Adamawa State. The mean values indicate the average level of agreement or importance attributed to each item, while the standard deviation indicates the degree of dispersion or variability in the responses. Among the items listed, "Intensive library building in school motivate student learning process" had the highest mean score of 3.08, indicating that respondents, on average, agreed to a moderate extent that an intensive library building in school motivates the student learning process. The standard deviation of 1.29 suggests some variability in the responses, indicating that while there is some agreement, there are also varying opinions among respondents.

The item with the lowest mean score was "Adequate Classroom block in school create conducive teaching and learning" with a mean of 2.73. This indicates that respondents, on average, agreed to a lesser extent that adequate classroom blocks in school create a conducive teaching and learning environment. The standard deviation of 1.34 suggests a relatively higher degree of variability in responses compared to other items, indicating a wider range of opinions among respondents.

The grand mean of 2.87 indicates a moderate level of agreement among respondents regarding the correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State. The standard deviation of 1.28 suggests some variability in responses across the different items, highlighting the diverse perspectives and experiences of the respondents regarding this issue.

Research Question 2: To what level does instructional material correlate student academic achievement in basic schools in Adamawa State?

Table 2: Mean and Standard Deviation of Level to which Instructional Material Correlate with Students' Academic Achievement in Basic Schools in Adamawa State

S/N	Item (n = 372)	Mean	S. D
6	Available of audio materials in the school upgrade learner understanding	3.17	1.26

7	The use of visual materials in the school make teaching and learning effective	3.13	1.27
8	Audio visual materials in the school encourage teaching and learning	2.90	1.29
9	Availability of graphic materials in the school help teachers to explain the lesson.	3.06	1.32
10	Used of interactive material in school create teacher/learner relationship	3.09	1.27
	Grand Mean	**3.07**	**1.28**

Table 2 shows the mean and standard deviation values for respondents' perceptions of instructional materials' impact on student academic achievement in basic schools in Adamawa State. A mean value of 3.07 indicates a moderate level of agreement overall among respondents regarding the correlation between instructional materials and student academic achievement. Looking at the individual items, the mean scores range from 2.90 to 3.17, indicating a generally moderate level of agreement across the specific aspects of instructional materials. The standard deviation values, ranging from 1.26 to 1.32, suggest that there is some variability in responses, with some items having more consistent agreement among respondents than others.

Item 6, regarding the availability of audio materials, has a mean score of 3.17, suggesting that respondents generally agree that the availability of audio materials helps upgrade learner understanding. The relatively low standard deviation of 1.26 indicates that there is a relatively high level of agreement among respondents on this item. Item 8, regarding the impact of audio-visual materials on teaching and learning encouragement, has a mean score of 2.90, indicating a slightly lower level of agreement compared to other items. The standard deviation of 1.29 suggests that there is some variability in respondents' perceptions regarding this aspect of instructional materials.

The results suggest that while there is a moderate level of agreement among respondents regarding the correlation between instructional materials and student academic achievement, there are variations in perceptions across different aspects of instructional materials.

Hypotheses Testing

Ho_1: School infrastructural facilities does not significantly correlate with students' academic achievement in Basic Schools In Adamawa State.

Table 3a: Summary of ANOVA of Linear Regression of Infrastructural Facilities as Correlate of Students' Academic Achievement in Basic Schools in Adamawa State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	114.767	1	114.767	103.303	.000[b]
	Residual	411.061	370	1.111		
	Total	525.828	371			

a. Dependent Variable: Students' academic performance

b. Predictors: (Constant), school infrastructural facilities

The results presented in Table 3a demonstrate the outcomes of an ANOVA analysis applied in a linear regression to investigate the potential relationship between school infrastructural facilities and students' academic performance in basic schools in Adamawa State. The results indicate a statistically significant correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State, with F (1, 371) = 103.303, $p < 0.05$. The p-value of 0.000, being less than the alpha level of 0.05, leads to the rejection of the null hypothesis, confirming the existence of a significant correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State.

Table 3b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.467[a]	.218	.216	1.05403

a. Predictors: (Constant), school infrastructural facilities

The results displayed in Table 3b provide a model summary illustrating how the independent variable accounts for the variability in the dependent variable, along with indicating the strength of the relationship between the variables. The analysis reveals that school infrastructural facilities account for 21.6% of the variance in students' academic achievement. Furthermore, the results indicate a robust and significant correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State, with an R-value of 0.467.

Table 3c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.557	.181		8.597	.000
	School infrastructural facilities	.587	.058	.467	10.164	.000

a. Dependent Variable: Students' academic performance

The findings presented in Table 3c display the Beta coefficient resulting from the regression analysis between school infrastructural facilities and students' academic achievement. The analysis reveals a Beta coefficient of 0.467, with a significance level of $p < 0.05$, indicating a significant relationship between school infrastructural facilities and academic achievement.

Ho_2: Instructional material does not significantly correlate with students' academic achievement in Basic Schools in Adamawa State.

Table 4a: Summary of ANOVA of Linear Regression of Instructional Material as Correlate of Students' Academic Achievement in Basic Schools in Adamawa State

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	161.953	1	161.953	164.679	.000[b]
	Residual	363.875	370	.983		
	Total	525.828	371			

a. Dependent Variable: Students' academic performance

b. Predictors: (Constant), instructional material

Table 4a's analysis summary, using ANOVA from linear regression, assessed the relationship between the use of instructional materials and the academic success of students in Adamawa State's Basic schools. The findings indicated a notable relationship, with an F-statistic of (F (1, 371) = 164.679) and a p-value less than 0.05. The extremely low p-value of 0.000, well below the alpha threshold of 0.05, leads to the rejection of the null hypothesis. Consequently, it established that instructional materials significantly relate with students' achievement in these schools.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.555[a]	.308	.306	.99169

a. Predictors: (Constant), instructional material

Table 4b presents a summary of the model, illustrating the extent to which the independent variable accounts for the variability in the dependent variable. Additionally, it details the strength of the association between the variables. It is evident from the results that instructional material accounts for 30.6% of the variation in the academic performance of students. Furthermore, the data indicates a robust and significant link between the use of instructional material and the academic success of students' in Basic Schools within Adamawa State, as reflected by an R-value of 0.555.

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.165	.175		6.654	.000
	Instructional material	.686	.053	.555	12.833	.000

a. Dependent Variable: Students' academic performance

The results presented in Table 4c from the regression analysis reveal that there is a significant relationship between the use of instructional materials and the academic performance of students. The beta value is reported as **0.555** with a significance level of $p < 0.05$, underscoring the substantial impact of instructional resources on students' achievement.

Findings of the Study

The following are the findings of the study.

1. The finding also reveals a statistically significant correlation between school infrastructural facilities and students' academic achievement in basic schools in Adamawa State, with $F(1, 371) = 103.303$, $p < 0.05$, r – value = 0.467, r – square = .218, r – square adjusted = .216, $\beta = 0.467$.
2. Furthermore, the finding reveals that there is a significant correlation between instructional materials and students' academic achievement in basic schools in Adamawa State, with an F-statistic of ($F(1, 371) = 164.679$) and a p-value less than 0.05, r – value = 0.555, r – square =

.308, r – square adjusted = .306, β = 0.555.

Discussion of Findings

The study examined implementation of Universal Basic Education Programme as correlate students' academic achievement in Basic schools in Adamawa State. The following are the discussions of findings of the study.

The first finding reveals a statistically significant correlation between school infrastructural facilities and students' academic achievement in Basic Schools in Adamawa State. This implies that adequate and well-maintained infrastructure, such as classrooms, libraries, laboratories, and sanitation facilities, are fundamental for creating a conducive learning environment. These facilities not only support the delivery of quality education but also contribute to students' overall well-being and motivation. In many educational settings, including those in Adamawa State, insufficient infrastructure has been a long-standing challenge, often leading to overcrowded classrooms, inadequate resources, and poor learning conditions. This situation can have a detrimental effect on students' ability to concentrate, engage effectively with the curriculum, and achieve their full academic potential. Therefore, the positive correlation found in this study highlights the importance of investing in infrastructure to enhance educational outcomes and support students' academic success. The finding of this study agrees with that of Nunnery, John and Ross (2017) who found out that school facilities have a moderate impact on student achievement, highlighting the importance of investing in infrastructure to support learning. Furthermore, the finding is consistent with that of Bifulco etal. (2017) who found that students in schools with better facilities tended to have higher academic achievement levels. The finding also collaborates that of Suleiman (2014); Etuk (2017) and Benjamin, Udumo, Usang and Anthony (2019), whose studies found out that there is significant relationship between school infrastructural facilities and students' academic achievement. Additionally, the finding agrees with that of Odeh, Oguche and Ivagher (2015) who reported that physical facilities have significant influence on academic achievement of secondary school students.

Furthermore, the finding indicated that there is a significant correlation between instructional materials and students' academic achievement in Basic Schools in Adamawa State. This finding suggests that the availability and effective use of instructional materials are associated with higher academic achievement among students in Basic Schools In Adamawa State. It highlights the importance of using diverse and appropriate teaching aids, such as visual aids, models, and interactive materials, to enhance the learning experience and outcomes of students. Instructional materials can help make abstract concepts more concrete, engage students in active learning, and cater to different learning styles, thereby improving overall academic achievement. Additionally, this finding underscores the need for schools and educators to prioritize the use and development of instructional materials as a key strategy for improving educational outcomes. This finding aligns with previous research. The finding agrees with that of Cheung and slavin (2018) who found that the use of effective instructional materials, particularly interactive ones that provide feedback, leads to significant improvements in student achievement. The finding also aligns with that of Nunnery and Ross (2017)

who discovered that multimedia instructional materials in science education were associated with higher student achievement scores. Moloi (2020) also found that the availability and accessibility of instructional materials impact students' motivation and interest in learning, both crucial factors in academic success.

Conclusion

Based on the findings of the study, it can be concluded that there is a strong relationship between school infrastructural facilities, instructional materials and students' academic achievement in Basic Schools in Adamawa State. including These factors are not only individually correlated with students' academic achievement but are also interrelated, suggesting that improvements in one area could potentially lead to positive outcomes in others. This highlights the importance of investing in enhancing school infrastructure, and providing adequate instructional materials, to improve students' academic achievement in Basic Bchools in Adamawa State.

Based on the findings of this study, the following recommendations were made:

1. Government should allocate resources and prioritize the improvement and maintenance of school infrastructural facilities such as classrooms, laboratories, libraries, and playgrounds. Ensure that schools have adequate space, proper lighting, ventilation, and sanitation facilities to create a conducive learning environment that promotes student engagement and academic success.
2. Ministry of Education should provide schools with sufficient and up-to-date instructional materials, including textbooks, workbooks, audio-visual aids, and teaching resources aligned with the curriculum. Enhance access to technology tools and resources to facilitate interactive and experiential learning experiences that cater to diverse learning styles and promote deeper understanding of subject matter concepts.

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Relationship Between School Related Gender Based Violence and Female Students' Academic Performance in Colleges of Education in Borno State, Nigeria

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Abstract

The study investigated the relationship between school related gender based violence among female students' academic performance in Colleges of Education in Borno State, Nigeria. The study had three objectives, two research questions and three null hypotheses. Correlational research design was adopted for this study. The target population for this study was 5,524 students who have registered 2021/2022 academic session in Colleges of Education in Borno State, Nigeria. The sample size for this study was 357 respondents, 230 students from college of Education WakaBiu, and 127 from Umar Ibn Ibrahim college of Education Science and Technology Bama Borrno state. The instruments for data collection was a structured questionnaire developed by the researcher tagged "Gender Based Violence Questionnaire" (GBVQ) and Profoma of Academic Performance of the Female Students assessed based on their Cumulative Grade Point Average (CGPA) in the following subjects; English, Chemistry, Physics, and Computer Science. The reliability of the instrument and the reliability coefficients were 0.76. Data collected were analyzed using descriptive Statistics of Mean and Standard deviation to answer the research questions. Simple linear regression and multiple regression analysis were used in testing the null hypotheses. The findings indicate a statistically significant relationship among school related gender based violence factors (physical & psychological gender-based violence) and the academic performance of female students in the Colleges of Education in Borno State, with an F(2,356) value of 198.419 and a p-value less than 0.05. It was recommended that management of colleges of education should implement a confidential reporting mechanism and support services for victims of physical gender base violence, and pscychological gender based violence to ensure they receive appropriate assistance and protection.

Keywords: School Related Gender Based Violence, Physical Gender-Based Violence, Psychological Gender-Based Violence, Academic Performance of Female Students and, Colleges of Education in Borno State, Nigeria.

Introduction

Education is the bedrock of any meaningful development of any nation. **Aristotle** opined that education is the process of training man to fulfill his aim by exercising all the faculties to the fullest extent as a member of society (Exam, Planning, 2021). Education is believed to play a vital role in reducing gender-Based Violence, and the access to quality education is a fundamental right of all children, and a prerequisite for socio-economic development and poverty reduction (Mwasya, 2015). Children's education and protection rights are neither respected nor fulfilled by States when school-based violence and abuse put young boys' and girls' physical and psychological well-being at risk. Gender-Based Violence in and around school has been recognized in recent years as a serious global phenomenon that have been ignored for too long in the school environment. Educational institutions, often perceived as safe havens for learning and growth, are unfortunately not always child-friendly places as presumed (Mwasya, 2015).

The root causes of gender-based violence (GBV) lie in deeply ingrained gender inequalities and discrimination, reflecting historical power imbalances between men and women (Beyene *etal*., 2021). GBV encompasses various harmful acts, stemming from powerr disparities and social norms, affecting both men and women. It manifests in forms like sexual harassment, battery, rape, and intimidation. The author defines GBV as any act directed at a person due to their gender, causing physical, sexual, psychological, or mental harm. Sadly, economic challenges exacerbate the problem, making higher institutions breeding grounds for such violence, especially against females (World Bank, 2018). Reports from World Health Organization (WHO, 2014) and World Bank (2018) reveal that 35% of females globally have experienced GBV, with incidents prevalent in African countries, including Nigeria.

Despite its prevalence, GBV often goes unreported due to social stigma and fear of repercussions (Mahlori *et al.,* 2018). Victims, particularly female students, remain silent, perpetuating a cycle of invisibility and shame. According to WHO (2022), gender-based violence has far reaching consequences that affects not only the individual survivor but also families, communities, and societies leading to severe consequences such as increased suicide risk and negative impacts on human development outcomes (World Bank, 2018). Victims are blamed and unsupported, and the prevailing attitude towards GBV, coupled with a lack of skills to handle the issue effectively, contributes to its persistence (Perrin *etal*., 2019). Moreover, campus environments, expected to be safe, become perilous for female students, hindering their freedom and academic pursuits.

Encouraging survivors to report incidents without fear of reprisals and implementing awareness programs are crucial steps (McDonald, 2015). Additionally, legal protection and effective redress mechanisms are essential in curbing this menace.Gender-based violence against women, especially within educational institutions, is a pervasive but often unreported issue worldwide (McDonald, 2015). Many incidents go unnoticed or are trivialized, with blame often placed on the victims, who are accused of inviting violence through their behavior or dressing (Chironda, 2017). According to European commission (2023), this problem is particularly prevalent in

tertiary institutions, where there is a lack of effective response mechanisms from school management and relevant departments. Such violence encompasses physical, sexual, and psychological forms, causing severe health issues, mental distress, and hindering educational opportunities. Physical, and psychological violence are two different forms of violent behavior that can be exhibited by individuals or groups (Andere, 2018). Each form of violence has unique characteristics and consequences that can impact both the victim and the perpetrator. This study focused on physical and psychological gender-based violence as sub-variables of school related gender based violence. If a person is suffering from any physical harm cause by members or group, then that person is experiencing physical violence. Physical violence in intimate relationships, often referred to as domestic violence, **continues to be a widespread phenomenon** in every country.

According to European commission (2023), physical violence is **an act attempting to cause**, or resulting in **pain and/or physical injury**. As with all forms of violence, the main aim of the perpetrator is not only – or may not always be – to cause physical pain, but also to limit the other's self-determination. Physical violence is the intentional use of force against another person that results in physical harm, injury, or death. This can include hitting, punching, slapping, kicking, choking, and other forms of physical assault. Physical violence can also involve the use of weapons, such as guns or knives, to inflict harm on the victim. According to Obilor and Miwari (2021) is any behaviour that involves the intentional use of intimidation or force against the body of another person that risks physical injury, harm ,or pain including psychological pains. Physical violence in school, family, or group includes pushing, hitting, slapping, choking, twisting of a body part, forcing the ingestion of an unwanted substance and use of weapon on another member. This pain can be experienced at different levels including depression, anxiety, post traumatic stress disorder, suicide, increased risk of cardiovascular disease and premature mortality. W**itnessing the abuse of one parent by another leads to serious psychological harm in children**. Often, children and young people who are present during an act of spousal abuse will also be injured, sometimes by accident and **sometimes because they try to intervene** (Obilor & Miwari, 2021).

Psychological violence is a reality that affects million of female students around the world,leaving profound consequences on their mental and emotional health (Obilor & Miwari, 2021). Psychological violence includes verbal and emotional abuse; isolating, rejecting, ignoring, insults, spreading rumors, making up lies, name calling, ridicule, humiliation and threats and psychological punishment which are not physical but they humiliate, denigrate, scapegoat, threaten, scare or ridicule a child or adolescent (Johnson, 2021). Psychological violence or abuse, often called emotional abuse, is a form of abuse, characterized by a person subjecting or exposing another person to behavior that may result in psychological trauma, including anxiety, chronic depression, or post-traumatic stress disorder. Young men sometimes commit criminal offences against the abusive parent (mostly fathers), in order to protect their mother and siblings, and **children regularly become victims of an act of revenge** by the abuser against the mother. In fact, for many mothers a prime motivation to stay in an abusive relationship is that the abuser threatens to harm or kill

the children if she tries to leave unfortunately violence can happen anywhere, to anyone either physical or psychological.

United Nations 'Office for the Coordination of Humanitarian Affairs' (OCHA, 2021) (2021) reported that some 297 people were convicted for sexual and gender-based violence (SGBV) from 2020 to 2021 in Borno State out of about 774 cases reported. Due to the rising cases of GBV, the state Primary Healthcare Development Agency trained 60 participants across the 27 Local Government Areas (LGA) to prevent a further spike in cases. The capacity-building effort is expected to increase awareness of SGBV, detection of victims and suspects, reporting of suspects, and the management of victims undergoing trauma related to SGBV in communities across the state. The NEEM Foundation, a Civil Society Organisation (CSO) said over 1,172 people suffered sexual gender-based violence in the Federal Capital Territory -Abuja and Borno State in twelve months (OCHA, 2021). Said sexual and gender-based violence is not only a consequence of gender inequality but also a constant reminder of women's low status in society and the multiple disparities between the male and female genders. According to the National GBV dash board, 513 GBV incidents were reported in the Federal Capital Territory, within the period of January 2021 to June 2022. In Borno State from January 2021 to May 2022, 759 cases have been reported from the 27 LGAs in Borno State with Chibok, Damboa, Gwoza, Bama and Kondugareported the highest incidents.

In college and higher institution today some lectures who are expected to play the roles of fathers, uncles, and brothers, to the students end up having carnal knowledge of them thus defiling them. In this multicultural and multi-ethnic environment, young adult students, aged 20 and above, are expected to develop technical competence and uphold values of discipline, respect, and integrity. However, many students face significant challenges due to disparities between the gender norms prevalent in their homes and those in their academic institutions.

Consequently, students grapple with social and economic pressures, including the need to maintain their social status, adapt to campus life, and overcome economic hardships. These challenges often lead students to adopt risky behaviors, driven by the desire to meet financial needs, which can result in involvement in criminal activities and engagement in gender-based violence.In present scenario, female students from both the two colleges facing many problems that obstruct their potential and disturb their professional and personal development, which include gender discrimination at home were the female child is considered as uninvited and unwanted child, which is devoid of proper love and care in comparison to the male child.

In some society in Borno state, some tradition demand that female students education end in kitchen were female are consider subservient committed home maker, obedient daughter in-law and sacrificing mother she is expected soft spoken, shy ,docile, tolerant to her husband and his family and any kind of atrocities. Another problem of the female students is the social problem where the female students education is generally negative and considered as unimportant, because one day the female child will be marry out, and some parents also face economy problem where

the parents can not send their female daughter to further their education.

In the context of Borno State, Nigeria, the pervasiveness of school-related gender-based violence remains a significant concern. Despite sporadic media coverage, there is a pressing need to comprehensively understand the factors contributing to this issue and its impact on the academic performance of female students in colleges of education. Addressing this problem requires a nuanced exploration of the socio-cultural dynamics, economic pressures, and institutional factors that contribute to gender-based violence in educational settings. By delving into these complexities. Hence, this study investigated the relationship between school related gender based violence among female students' and their academic performance in Colleges of Education in Borno State, Nigeria.

Purpose of the Study

The study investigated the relationship between school related gender based violence among female students' and their academic performance in Colleges of Education in Borno State, Nigeria. Specifically, the study determined the relationship between:

1. Physical gender based violence and academic Performance of female students' in Colleges of Education in Borno State.
2. Psychological gender based violence and academic performance of female students' in Colleges of Education in Borno State.
3. School related gender based violence (physical gender-based violence, psychological gender-based violence) and female students' academic performance in Colleges of Education in Borno State, Nigeria.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of physical gender-based violence on female students' in Colleges of Education in Borno State?
2. What is the level of psychological gender-based violence on female students' in Colleges of Education in Borno State?

Hypotheses

The following hypotheses were formulated to guide the study and tested at 0.05 level of significance:

H_{O1}: There is no significant relationship between physical gender-based violence and academic performance of female students' in college of Education in Borno State.

H_{O2}: There is no significant relationship between psychological gender-based violence and academic performance of female students' in college of Education in Borno State.

H_{O3}: There is no significant relationship between school related gender based violence (physical gender-based violence, psychological gender-based violence) and female students' academic performance in Colleges of Education in Borno State, Nigeria.

Methodology

Correlational research design was adopted for this study. The study was carried out in Borno State, Nigeria. The population for this study is 5,524 students who have registered for 2021/2022 academic session in Colleges of Education in Borno State. The institutions are; Umar Ibn Ibrahim College of Education

Science and Technology Bama with 1820 students, and College of Education, Waka Biu with 3704 students which sum up the total population to be 5524. The sample size for this study is 357. This was gotten by Krejcie and Mongan (1970) sample size determination table. Multi stage sampling technique was adopted for the study. A stratified sampling technique was employed to select 230 students from College of Education waka Biu and 127 from Umar Ibn Ibrahim El-Kanemi college of Education Science and Technology Bama, Borno State.

Two instruments were used for data collection. The first instrument for data collection was a self-structured questionnaire tagged "Gender Based Violence Questionnaire"(GBVQ). The instrument has two sections with 10 items measuring level of physical violence, and 10 items measuring level of psychological violence, totaling 20-items. The items were structured on a five -point Likert type rating scale of Very High Level (VHL) 5 points, High Level (HL) 4 points, Moderate Level (ML) 3 points, Low Level (LL) 2 points and Very Low Level (VLL) 1 points respectively. The second instrument is a Profoma of Academic Performance of the Female Students assessed based on their Cumulative Grade Point Average (CGPA) in the following subjects; English, Chemistry, Physics, and Computer Science. "Gender Based Violence Questionnaire"(GBVQ) was validated by three experts from the Department of Physical Sciences Education, Faculty of Education, Modibbo Adama University, Yola for face and content validity. The reliability was determine using Cronbach Alpha Method. The reliability index for the Gender Base Violence Questionnaire (GBVQ) is 0.76. The direct delivery approach was adopted for this study. Descriptive statistics mean and standard deviation were used to answer the research questions. While, inferential statistics of simple linear regression and multiple regression analysis were used to test hypotheses 1-3.

Results

Research Question One: What is the level of physical gender-based violence on female students' in college of Education Borno State?

Table 1: Mean and Standard Deviation of Respondents on Level of Physical Gender-Based Violence on Female Students' in College of Education Borno State

S/N	Item (n = 357)	Mean	S. D	Remarks
	Level at which			
1	students intimidate you	4.07	0.77	HL
2	lecturer inappropriate staring at you that make you feel scare	4.01	0.79	HL
3	students threatening you with weapon	3.99	0.83	HL
4	you received verbal abuse from your fellow students	4.00	0.85	HL
5	students at time slap you on your face or ear	3.99	0.90	HL
6	lecturer make offensive remarks about your private life	4.01	0.89	HL
7	Students threatened to harm you in a way that frightened you	3.94	0.94	HL

8	lecturer used force against you that hurt you by holding you	3.98	0.93	HL
9	students degrading or humiliate you	3.97	0.88	HL
10	students threatened to used substance against you	3.95	0.91	HL
	Grand Mean	**3.99**	**0.87**	**HL**

Source: Field Work, 2024

From the above table 1 above shows that the level of physical gender violence on female students' in colleges of education Borno State with grand means score of 3.99 which indicate high level. The standard deviations accompanying each mean provide information about the variability or dispersion of the responses. The standard deviations range from 0.77 to 0.94, indicating a moderate level of variable the respondents' perceptions. The consistency in the standard deviations across the items suggests a relatively uniform distribution of responses. The "HL" remark in the table signifies that the mean scores fall within the "High Level" category. This implies that, on average, the female students perceive a substantial degree of physical gender-based violence, as reflected in various aspects such as intimidation, inappropriate staring by lecturers, verbal abuse, threats with weapons, physical harm, offensive remarks, and more.

Research Question Two: What is the level of physical gender-based violence on female students' in college of Education Borno State?

Table 2: Mean and Standard Deviation of Respondents on Level of Psychological Gender-Based Violence on Female Students' in College of Education Borno State

S/N	Item (n = 357)	Mean	S. D	Remarks
	Level at which			
1	lecturers criticized you	3.95	0.87	HL
2	you don't have a sense of belonging at school.	3.94	0.89	HL
3	you often feel depressed.	4.00	0.84	HL
4	you are desperate or feelings powerless	3.91	0.89	HL
5	You are often afraid to interact with other students.	3.97	0.97	HL
6	Sometimes you feel frustrated at school.	4.10	0.83	HL
7	you are unable to concentrate on your studies.	4.01	0.83	HL
8	lecturer threatened to disgrace you	3.94	0.89	HL
9	lecturer don't like you	3.77	0.85	HL
10	lecturer insist on knowing where you are in a controlling way	3.74	0.93	HL
	Grand Mean	**3.93**	**0.88**	**HL**

Source: Field Work, 2024

From the above table 2 above shows that the level of psychological gender-Based violence on female students' in colleges of education Borno State with grand means score of 3.93 which indicate high level. This means that most of the respondents experienced high levels of PGBV from lecturers in various forms. The standard deviation of 0.88 shows that there is some variation in the ratings, but not too much. This means that the respondents' ratings are relatively consistent and close to the mean.

The item means range from 3.74 to 4.10, which are high level. This means that none of the items had a low level of PGBV. The highest item mean is 4.10, which corresponds to the level at which the respondents sometimes feel frustrated at school. This suggests that frustration is the most common and intense form of PGBV that the respondents face. The lowest item mean is 3.74, which corresponds to the level at which the lecturers insist on knowing where the respondents are in a controlling way. This suggests that this form of PGBV is the least common and intense among the items.

The item standard deviations range from 0.83 to 0.97, which are all close to the grand .

standard deviation of 0.88. This means that there is not much difference in the variation of the ratings across the items. The highest item standard deviation is 0.97, which corresponds to the level at which the respondents often afraid to interact with other students. This means that this item has the most variation in the ratings, indicating that some respondents are more afraid than others. The lowest item standard deviation is 0.83, which corresponds to the level at which the respondents often feel depressed and the level at which they are unable to concentrate on their studies. This means that these items have the least variation in the ratings, indicating that most respondents have similar levels of depression and concentration problems

H_{O1}: There is no significant relationship between physical gender-based violence and academic performance of female students' in college of Education in Borno State.

Table 3a: Summary of ANOVA of Linear Regression of Relationship between Physical Gender-Based Violence and Academic Performance of Female Students' in Colleges of Education in Borno State

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	138.950	1	138.950	763.031	.000[b]
	Residual	64.646	355	.182		
	Total	203.596	356			

a. Dependent Variable: Academic Performance of female students
b. Predictors: (Constant), Physical Violence

The ANOVA of linear regression in Table 3a was used to examine if physical gender-based violence affects the academic performance of female students' in Colleges of Education in Borno State. The result showed a significant relationship of physical gender-based violence on academic performance of female students' in Colleges of Education in Borno State, $F(1,356) = 763.031$, $p < 0.05$. The p – value (0.000) was lower than the 0.05 alpha level, so we rejected the null hypothesis. This means that physical gender-based violence and academic performance of female students in Colleges of Education in Borno State are significantly related.

Table 3b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.682	.682	.42673

a. Predictors: (Constant), Physical Violence

The model summary in Table 3b displays the correlation coefficient and how the variance in the dependent variable is accounted for by the independent variable. The result indicates that physical gender-based violence and academic performance of female students' in Colleges of Education in Borno State are strongly related, as shown by r – value of 0.826. The results also reveal that 68.2% of the variation in female students' academic performance is due to physical violence.

Table 3c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.058	.141		-7.486	.000
	Physical Violence	.962	.035	.826	27.623	.000

a. Dependent Variable: Academic Performance of female students

The result in Table 3c indicates the Beta coefficient of the regression analysis of relationship between physical gender-based violence and academic performance of female students' in Colleges of Education in Borno State. The result shows a beta coefficient of 0.826 at t = 27.623, $p<0.05$. This indicates that there is strong, positive and significant relationship between physical gender-based violence and academic performance of female students' in Colleges of Education in Borno State.

H_{O3}: There is no significant relationship between psychological gender-based violence and academic performance of female students' in Colleges of Education in Borno State.

Table 4a: Summary of ANOVA of Linear Regression of Relationship between Psychological Gender-Based Violence and Academic Performance of Female Students' in Colleges of Education in Borno State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	127.465	1	127.465	594.370	.000[b]
	Residual	76.131	355	.214		
	Total	203.596	356			

a. Dependent Variable: Academic Performance of female students

b. Predictors: (Constant), Psychological Violence

The results of analysis presented in Table 4a provide a summary of the ANOVA for linear regression, employed to assess whether a statistically significant relationship exists between psychological gender-based violence and the academic performance of female students' at the Colleges of Education in Borno State. The outcome indicates a statistically significant relationship between psychological gender-based violence and academic performance, with $F(1,356) = 594.370$, and $p < 0.05$. Given that the p-value (0.000) is below the 0.05 alpha level, we reject the null hypothesis, signifying a statistically

significant association between psychological gender-based violence and the academic performance of female students' in the Colleges of Education in Borno State.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791[a]	.626	.625	.46309

a. Predictors: (Constant), Psychological Violence

The results displayed in Table 4b provide a model summary, illustrating the correlation coefficient and outlining how the independent variable elucidates the variability in the dependent variable. The outcome indicates a robust association between psychological gender-based violence and the academic performance of female students' at the Colleges of Education in Borno State, as evidenced by an r-value of 0.791. Moreover, the results demonstrate that psychological violence accounts for 62.5% of the variance in the academic performance of female students'.

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.595	.141		-4.211	.000
	Psychological Violence	.882	.036	.791	24.380	.000

a. Dependent Variable: Academic Performance of female students

The outcome in Table 4c reveals the Beta coefficient derived from the regression analysis examining the correlation between physical gender-based violence and the academic performance of female students at the Colleges of Education in Borno State. The findings exhibit a Beta coefficient of 0.791 at $t = 24.380$, with a significance level of $p<0.05$. This suggests a robust, positive, and statistically significant relationship between physical gender-based violence and the academic performance of female students in the Colleges of Education in Borno state.

H_{O5}: There is no significant relationship between **s**chool related gender based violence (physical gender-based violence, psychological gender-based violence) and female students' academic performance in Colleges of Education in Borno State, Nigeria.

Table 5a: Summary of ANOVA of Multiple Regression of Relationship between Physical, Sexual, Psychological, Discrimination and Social Exclusion Gender-Based Violence and Academic Performance of Female Students' in Colleges of Education in Borno State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	150.389	2	30.078	198.419	.000[b]
	Residual	53.207	354	.152		
	Total	203.596	356			

a. Dependent Variable: Academic Performance of female students
b. Predictors: (Constant), GBV physical Violence, Psychological Violence.m

\The analysis presented in Table 5a summarizes the results of an ANOVA of linear regression, aiming to examine whether a statistically significant relationship exists among physical, psychological and the academic performance of female students' in the Colleges of Education in Borno State. The findings indicate a statistically significant relationship among these factors (physical & psychological gender-based violence) and the academic performance of female students' in the Colleges of Education in Borno State, with an F(5,356) value of 198.419 and a p-value less than 0.05. The rejection of the null hypothesis is supported by the p-value of 0.000, suggesting a conclusive inference that there is indeed a statistically significant association between physical and psychological gender-based violence, and the academic performance of female students' in the Colleges of Education in Borno State.

Table 5b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859[a]	.739	.735	.38934

a. Predictors: (Constant), GBV Social Exclusion, Physical Violence, Psychological Violence, GBV discrimination, Sexual Violence

The outcomes depicted in Table 5b provide a model summary detailing the correlation coefficient and elucidating how the independent variable accounts for the variability in the dependent variable. The findings highlight a robust connection among physical and psychological gender-based violence and the academic performance of female students' in the Colleges of Education in Borno State, as evidenced by a correlation coefficient (r-value) of 0.859. Additionally, the results reveal that physical and psychological gender-based violence collectively account for 73.5% of the variance in the academic performance of female students' in Colleges of Education in Borno State, Nigeria.

Table 5c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.976	.146		-6.670	.000
	Physical Violence	.942	.079	.809	11.993	.000
	Psychological Violence	.472	.072	.424	6.596	.000

a. Dependent Variable: Academic Performance of female students

Table 5c displays the coefficients derived from a multiple regression analysis, illustrating how each variable in the model contributes to predicting academic performance. Physical Violence, with a beta value of 0.809, explains 80.9% of the variance in academic performance at a t-value of 11.993, $p<0.05$. Conversely, Sexual Violence has a beta value of -0.479, signifying that it accounts for 47.9% of the

variance in academic performance at a t-value of -6.596, $p<0.05$. Psychological Violence is associated with a beta value of 0.424, indicating that it explains 42.4% of the variance in the academic performance of female students at a t-value of - 6.635, $p<0.05$.

In summary, Physical Violence emerges as the most influential factor in explaining academic performance of female students, making the strongest unique contribution compared to other variables in the model, as evidenced by its substantial beta coefficient of 0.809. On the other hand, psychological gender-based violence, with a slightly lower beta value of 0.424, contributes less uniquely to predicting academic performance of female students.

Summary of Findings of the study

The following are the findings of the study:

1. The result indicates a statistically significant relationship between psychological gender-based violence and students academic performance of female students' in Colleges of Education in Borno State, with $F(1,356) = 594.370$, and $p < 0.05$.
2. This indicates that there is strong, positive and significant relationship between physical gender-based violence and academic performance of female students' in college of Education in Borno state.
3. The findings indicate a statistically significant relationship among these factors (physical & psychological gender-based violence) and the academic performance of female students' in the Colleges of Education in Borno State, with an $F(2,356)$ value of 198.419 and a p-value less than 0.05.

Discussion of Findings

The study investigated the predictive Relationship between School Related Gender Based Violence and Female Students' Academic Performance in College of Education in Borno State, Nigeria. The following are the discussion of findings of this study. The finding of this study reveals that female students in the College of Education, Borno State, perceive a significantly high level of physical gender-based violence. The result shows that there is significant relationship between physical gender-based violence and academic performance of female students' in college of Education in Borno State. The findings of the study indicating a significantly high level of physical gender-based violence experienced by female students in Colleges of Education, Borno State, align with previous research in the field. Numerous studies have highlighted the prevalence of gender-based violence, particularly in educational settings, and its detrimental impact on academic performance. For instance, a study conducted by Johnson (2018) found that female students in similar contexts often face various forms of gender-based violence, including physical violence, which can impede their educational progress and overall well-being. Moreover, research by Smith and Jones (2019) emphasized the interconnectedness between experiences of gender-based violence and academic outcomes, suggesting that exposure to such violence can lead to decreased concentration, absenteeism, and poor academic performance among female students. Therefore, the significant relationship identified between physical gender-based violence and academic performance among female students' in Colleges of Education, Borno State, underscores the urgent need for targeted interventions and support mechanisms to

address this pervasive issue and promote a safe learning environment conducive to academic success.

The study reveals that female students' in the Colleges of Education in Borno State experience high levels of psychological gender-based violence (PGBV) from lecturers, with frustration being the most prevalent and intense form. The finding indicates a statistically significant relationship between psychological gender-based violence and academic performance. The findings of the study on psychological gender-based violence (PGBV) experienced by female students in the Colleges of Education in Borno State echo previous research in several ways. Firstly, the prevalence of psychological gender base violence (PGBV) among female students' aligns with global trends highlighting educational settings as contexts where such violence occurs. Studies by UNICEF (2019) and UNESCO (2020) have consistently shown that educational institutions can be hotspots for various forms of gender-based violence, including psychological violence. Secondly, the identification of frustration as the most prevalent and intense form of PGBV is consistent with prior studies emphasizing the emotional toll of such violence on victims (Smith et al., 2019; Johnson, 2021). Frustration, in this context, might manifest as demeaning remarks, belittlement, or unfair treatment, all of which can adversely affect the psychological well-being of students. Finally, the observed relationship between psychological gender base violence (PGBV) and academic performance corroborates findings from diverse academic contexts (Smith & Jones, 2018; Brown, 2020). The disruptive nature of psychological gender base violence (PGBV) can impede students' ability to concentrate, participate effectively in class, and ultimately succeed academically. Hence, the study's findings underscore the urgent need for interventions to address psychological gender base violence (PGBV) in educational institutions, not only to protect students' well-being but also to safeguard their academic outcomes.

The study reveals that female students' in the College of Education in Borno State consistently perceive moderate to high levels of gender-based violence, including physical and psychological gender-based violence. The findings indicate a statistically significant relationship among these factors (physical & psychological gender-based violence) and the academic performance of female students in the Colleges of Education in Borno State. The findings of the study regarding the prevalence of Gender-Based Violence (GBV) among female students in the Colleges of Education in Borno State align with previous research conducted in similar contexts. Studies such as those by Jewkes et al. (2013) and WHO (2013) have consistently highlighted the pervasive nature of GBV, encompassing physical, sexual, psychological, discriminatory, and social exclusion experiences, particularly within educational settings. Furthermore, these findings resonate with the broader literature on GBV in Nigeria, where cultural norms and societal attitudes often perpetuate violence against women and girls. The study's revelation of a statistically significant relationship between various forms of GBV and the academic performance of female students echoes the findings of previous research by Adegoke, Olagunju and Afolabi (2018); Olawoyin and Onyeneho (2016). For instance, a meta-analysis by Stöckl et al. (2014) and UNESCO (2017) demonstrated that exposure to GBV is associated with adverse educational outcomes, including lower

academic achievement and higher dropout rates. Similarly, studies in diverse settings have shown that GBV can impede students' concentration, self-esteem, and overall well-being, ultimately hindering their academic success.

Conclusion

In light of these sobering findings, it is imperative for educational institutions, policymakers, and communities to take decisive action to address the scourge of gender-based violence. Comprehensive interventions, including awareness campaigns, robust policies, and support mechanisms for victims, must be implemented to create a safe and inclusive learning environment for female students. Only through a concerted effort can we dismantle the barriers posed by GBV and foster an educational landscape where every student, regardless of gender, has an equal opportunity to thrive academically and reach their full potential.

Recommendations

Based on the findings of this study, it was recommended that:

1. Management of colleges of education should implement mandatory training programs for both staff and students on recognizing, preventing, and reporting instances of physical GBV. Additionally, establish a confidential reporting mechanism and support services for victims of PGBV to ensure they receive appropriate assistance and protection..
2. Administrators in colleges of education should establish a confidential counseling service specifically tailored to address the emotional and psychological needs of students who have experienced PGBV. Implement faculty training programs to promote respectful and supportive interactions with students, emphasizing the importance of maintaining professional boundaries.
3. Management of Colleges of Education should implement a confidential reporting mechanism and support services for victims of physical gender base violence, and pscychological gender based violence to ensure they receive appropriate assistance and protection. The management of the colleges of education should create School Related Gender Based Violence Centres (SRGBVC) in order to motivate and encourages the students who are victims of physical and psychological gender-based violence to be fearless and have confident in themselves in order to promote education in the community and in the state at large.

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