

**IMPACT OF TEACHERS' TRAINING ON STUDENTS' ACADEMIC
PERFORMANCE IN SENIOR SECONDARY SCHOOLS IN ADAMAWA STATE,
NIGERIA**

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Abstracts

This study investigated the impacts of teachers' training on the students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria. Three objectives and three hypotheses guided the study and were tested at 0.05 level of significance. The study adopted correlational survey research design. The population of the study comprised of 9,560 respondents comprising of 412 principals, 824 vice principals and 8,324 teachers in 412 Senior Secondary Schools in Adamawa State. The sample size used for the study was 956 comprising of 41 principals, 82, vice principals and 833 teachers in public secondary schools in Adamawa State, Nigeria. Questionnaire was used for data collection. The reliability of the instrument was determined using Cronbach alpha and reliability coefficient index of 0.83 was obtained. Linear regression analysis was used to test the three null hypothesis at 0.05 level of significant. The findings of the study revealed that: There is no significant impact of study fellowship on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria. The null hypothesis was retained, as the regression analysis showed no statistically significant impact ($p = 0.163$). There is no significant impact of conference participation on students' academic performance in Senior Secondary School in Adamawa State, Nigeria.. The null hypothesis is retained, with results indicating no significant relationship ($p = 0.936$) and no explanatory power ($R^2 = 0.000$). There is significant impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria. The study recommended that: Education stakeholders should reevaluate and redesign study fellowships, conferences, seminars, to ensure they are evidence-based, classroom-oriented, subject-specific, and directly aligned with improving teaching practices and student learning outcomes.

Background to the Study

Nigeria, like many other nations of the world, recognizes education as the primary instrument for achieving national development. Education is widely regarded as a catalyst for socio-economic, political, and technological advancement, and the strength of any nation is often reflected in the quality of its educational system. As emphasized in the National Policy on Education (FRN, 2013), education serves as an instrument *par excellence* for national transformation. This recognition underscores the high premium placed on educational quality, standards, and the essential components that sustain them such as quality learning, adequate resource inputs, functional processes, effective school management, monitoring and evaluation, and continuous human resource development. At the senior secondary school level in particular, teachers play a pivotal role in preparing learners with the knowledge, skills, and competencies required to become productive members and future leaders of society.

In this context, the school emerges as the primary institution established to foster learning and skill acquisition. Schools are structured environments where teaching and learning occur under the guidance of trained educators. They provide the physical and intellectual spaces—classrooms, libraries, laboratories, and other facilities—needed to support formal education. Beyond teaching core subjects such as reading, writing, and mathematics, schools are also mandated to nurture critical thinking, problem-solving abilities, and other essential life skills. Formal education systems across the world rely heavily on schools to deliver structured learning, making them central to the educational and developmental goals of any society.

Within these schools, the teacher occupies a uniquely influential position. A teacher is not merely an instructor but an architect of intellect who shapes minds, molds character, and inspires curiosity. Haris and Sass (2021) describe the teacher as a beacon of knowledge and a catalyst for learning one who guides students through the complexities of understanding. The teacher's adaptability, creativity, and sensitivity to learners' needs help cultivate students' potential, enabling them to flourish academically, morally, and socially. The teacher's impact often extends far beyond the classroom, influencing students' values, choices, and long-term developmental trajectories.

Given this influential role, effective teaching becomes critical not only for teacher performance but also for the overall success and survival of society. Adeyemi (2020) emphasizes that the public increasingly demands accountability in education, insisting that teachers justify the value of the resources invested in their training and performance. Adeyemi further argues that teachers' job performance is often a direct reflection of the quality of the training programmes they receive. As Adi et al. (2019) note, even the most motivated teachers cannot perform effectively if they lack the requisite knowledge and skills. It is therefore the responsibility of school management to ensure that teachers are adequately prepared and supported—primarily through well-designed training programmes.

Training, in this regard, refers to a formal and systematic process through which individuals acquire the knowledge, skills, and attitudes necessary to perform specific tasks effectively. Strong (2006) describes training as a structured learning and development activity aimed at enhancing competence and performance.

Similarly, Neo (2010) views training as a set of activities designed to improve job performance and increase expertise. Through training, individuals undergo meaningful and lasting behavioural and skill-based changes that enable them to perform more efficiently. Beyond improving productivity, training serves as a deliberate mechanism for addressing existing deficiencies and strengthening the professional capacity of employees, including teachers.

Several forms of training programmes exist for secondary school teachers, such as study fellowships, conferences, seminars, job rotation, induction programmes, in-service training, refresher courses, and mentoring. This study focuses on conferences, seminars, job rotation, study fellowships, induction programmes, and mentoring. Study fellowships, for instance, provide teachers with opportunities to deepen their subject knowledge, acquire new insights, and remain abreast of emerging research and trends (Bright & Innocent, 2015). Hakan (2013) views study fellowships as avenues through which professionals across sectors—including education—enhance their competence and qualifications. Harbau (2014) adds that such programmes help teachers acquire higher academic and professional credentials, thereby improving their contribution to the school system. Study fellowship programmes promote continuous capacity building through activities such as study groups, professional meetings, lectures, and skill-based reforms (Buba et al., 2023).

Furthermore, study fellowship training contributes significantly to teachers' growth and professional commitment. Lawal (2014) stresses its role in supporting continuous improvement, aligning with findings by Okemakinde, Adewuyi, and Alabi (2013), who revealed that teachers' commitment to

the profession increases after participating in study fellowship programmes. Conferences complement these fellowships by offering platforms for knowledge exchange and professional collaboration. Participation in conferences allows teachers to network, learn from experts, and engage in reflective discussions that enhance their professional competence (Buba et al., 2023). As Che (2014) notes, conferences are effective venues for disseminating research, receiving feedback, and engaging with diverse perspectives, all of which contribute to improved teacher performance. Musa (2016) similarly emphasized that conference participation enhances teachers' professionalism and ensures they remain updated on current educational practices.

Conferences foster an environment conducive to learning, sharing ideas, and disseminating best practices across schools and colleges (Okemakinde et al., 2013). Seminars serve similar purposes by integrating institutional goals with the personal development needs of the workforce (Adi et al., 2019). Ajadi and Omotayo (2023) describe seminars as interactive educational gatherings where participants engage deeply with specific subjects through active participation. As Buba et al. (2023) note, seminars promote interactive learning and skill development, often organized at school or cluster levels to support continuous reflection and improvement of teaching practices. Asuke (2012) highlights that seminars, typically involving small groups, encourage active participation and repeated engagement with focused topics.

According to Adi et al., attendance at seminars positively influences teachers' job performance. However, Ajadi and Omotayo (2023) also caution that many educational institutions face challenges in supporting teachers to attend seminars.

Inadequate institutional support limits teachers' access to these professional development opportunities, ultimately affecting their performance. This lack of support disrupts the mentorship and coaching components of seminars, thereby hindering effective knowledge-sharing and professional growth. Consequently, the absence of adequate support structures underscores the critical importance of institutional commitment in ensuring that seminars and other professional development activities achieve their intended purpose.

Statement of the Problem

The survival and success of any educational institution depend largely on the competence, expertise, and commitment of its human resources, especially those operating at managerial and teaching levels. These competencies stem from the quality of knowledge and training teachers receive, which determine their instructional effectiveness. Despite improvements in teachers' academic and professional qualifications, as well as significant government investments in education, many stakeholders including parents, students, and policymakers remain dissatisfied with the quality of teaching and learning in public senior secondary schools. In Adamawa State, as in much of North Eastern Nigeria, efforts to enhance teachers' performance through developmental programs have not yielded the expected results. Public secondary schools continue to produce graduates who are often unable to demonstrate mastery of basic knowledge, raising serious concerns about the overall standard of education in the region.

The persistent decline in educational quality has drawn attention to teachers' effectiveness and professional preparedness. Many observers attribute this problem to inadequate teacher training and poor implementation of

developmental programs, which often prioritize a select few based on favoritism rather than merit. This selective and inefficient approach limits the collective capacity of teachers and hinders systemic improvement. Consequently, many educators lack the practical skills and pedagogical competence required to translate theoretical knowledge into effective classroom practices. This gap between training and application undermines teaching quality and contributes to poor academic performance among students. The situation underscores the urgent need to evaluate how teacher training impacts instructional effectiveness and students' academic performance. Therefore, this study seeks to investigate the impact of teachers' training on senior secondary school students' academic performance in Adamawa State public secondary schools.

Purpose of the Study

The purpose of this study is to examine the impact of teachers' training on Senior Secondary School students' academic performance in Adamawa State public secondary schools. Specifically, the study sought to examine the impact of:

1. Study fellowship on students' academic performance in Senior Secondary Schools in Adamawa State public secondary schools.
2. Conference participation on students' academic performance in Senior Secondary Schools students' academic performance in Adamawa State public secondary schools.
3. Seminar participation on students' academic performance in Senior Secondary Schools in Adamawa state public secondary schools.

Hypotheses

The following null hypotheses were formulated to guide the

study and will be tested at 0.05 level of significance.

H0₁: There is no significant impact of study fellowship on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

H0₂: There is no significant impact of conference participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

H0₃: There is no significant impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

Methodology

This study adopted a correlational research design to examine the relationship between teachers' training programs and senior secondary school students' academic performance in public secondary schools in Adamawa State, Nigeria. The correlational design was appropriate because it enabled the researcher to analyze how the independent variable; teachers' training programs, with sub-variables such as study fellowship, conference participation and seminar participation to the dependent variable, which is students' academic performance. The study was conducted in Adamawa State, located in North Eastern Nigeria, bordered by Borno, Gombe, Taraba, and Cameroon. Created in 1991 from the former Gongola State, Adamawa is known for its cultural diversity with over 100 ethnic groups and Yola as its capital. The population of the study comprised 9,560 respondents, including 412 principals, 824 vice principals, and 8,324 teachers across 412 public secondary schools spread across the five education zones of Yola, Mubi, Gombi, Ganye, and Numan. A sample of 956 respondents was selected using the Krejcie and Morgan (1970) sampling table,

representing 41 principals, 82 vice principals, and 833 teachers. Simple random sampling was used to ensure fair representation from all five zones.

Two self-developed instruments were used to collect data: the Teachers' Training Programs Questionnaire (TTPQ) and the Students' Academic Performance Questionnaire (SAPQ). Each instrument contained two sections Section A for demographic information and Section B structured into six clusters reflecting the study's sub-variables. Each cluster contained five items, totaling 30 items structured on a five-point Likert scale ranging from Very High Level (5) to Very Low Level (1). The instrument items were derived from the reviewed literature in Chapter Two and aligned with the study's objectives. To ensure reliability, a pilot test was conducted in Taraba State, which shares similar characteristics with Adamawa but was excluded from the main study. Cronbach's Alpha was used to determine internal consistency, yielding a reliability coefficient of 0.83, indicating high reliability as suggested by Adeyemi (2015). This confirmed that the instruments were consistent and effectively measured the intended constructs.

Data collection was conducted personally by the researcher with the assistance of five trained research assistants, one from each education zone. The administration of the questionnaires was supported by an official introductory letter from the Department of Educational Foundations, Faculty of Education, National Open University of Nigeria, Yola Study Centre. Respondents were assured of confidentiality and the academic purpose of the research. The entire data collection process was completed within ten days, and all questionnaires were successfully retrieved. For hypothesis testing, simple linear regression was used for

Hypotheses 1-3, all tested at the 0.05 level of significance. This analytical approach ensured accurate interpretation of the strength and direction of relationships between teachers' training programs and students' academic outcomes in Adamawa State.

Results

The results of the study are presented in accordance with the hypotheses

H₀₁: There is no significant relationship between the study fellowship and students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Table 1a: Model Summary of Regression Analysis between the impact of study fellowship and students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.141 ^a	.020	.010	18.580
<p>The regression analysis of table 1a reveals a weak positive relationship between the level of study fellowship and students' academic performance, as indicated by a correlation coefficient (R) of 0.141. The R Square (R^2) value is 0.020, which means that only 2% of the variance in students' academic performance can be explained by the level of study fellowship. The Adjusted R Square is even lower at 0.010,</p> <p>suggesting that after adjusting for sample size and the number of predictors, the model explains just 1% of the variation. The standard error of the estimate is 18.580, indicating that the actual academic performance scores tend to deviate from the predicted scores by about 18.6 units on average. This relatively large error margin suggests the model has limited predictive accuracy.</p>				

Table 1b: ANOVA Summary of Linear Regression Analysis between the impact of study fellowship and students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	682.319	1	682.319	1.977	.163 ^b
	Residual	33830.191	954	345.206		
	Total	34512.510	955			

The result of the simple linear regression analysis indicates that there is no significant relationship between study fellowship and senior secondary school students' academic performance in public secondary schools in Adamawa State. This conclusion is supported by the ANOVA summary, which shows an F-value of 1.977 with a p-value of 0.163, exceeding the conventional significance threshold of 0.05. This means that the variation in students' academic performance explained by the level of study fellowship is not statistically meaningful. Additionally, the R Square value of 0.020 suggests that only 2% of

the variation in academic performance can be attributed to study fellowship, indicating a very weak explanatory power.

Therefore, the null hypothesis, which states that there is no significant impact of study fellowship on academic performance, is retained. While study fellowship may offer professional development benefits for teachers, this analysis suggests that it does not have a measurable or direct influence on student academic outcomes in this context. Other factors not captured in this model are

likely contributing more significantly to

student performance.

Table 1c: Summary of Regression Coefficient between the impact of study fellowship and students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	53.520	11.243		4.760	.000
Level of study fellowship in Public Secondary schools	-4.601	3.273	-.141	-1.406	.163

The regression coefficient summary shows that the unstandardized coefficient (B) for study fellowship is -4.601, with a standard error of 3.273. This means that for every one-unit increase in the level of study fellowship, there is a predicted decrease of 4.601 units in students' academic performance, although this effect is not statistically significant. The t-value is -1.406 with a corresponding p-value of 0.163, which is greater than the standard alpha level of 0.05. This confirms that the observed relationship is not statistically meaningful. The standardized coefficient (Beta) is -0.141, further indicating a weak and negative relationship between the variables.

Given these results, we conclude that study fellowship does not significantly impact senior secondary school students' academic performance in the study area. The negative coefficient, though not significant, suggests a possible inverse relationship; however, due to the lack of statistical significance, this finding should be interpreted with caution. The null hypothesis is therefore retained.

H₀₂: There is no significant impact of conference participation on students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Table 2a: Model Summary of Regression Analysis between impact of study fellowship and students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Model	R	R Square	Adjusted R Square	R	Std. Error of the Estimate
1	.008 ^a	.000	-.010	18.766	

The model summary of the regression analysis reveals that there is virtually no relationship between conferences and senior secondary school students' academic performance in public secondary schools in Adamawa State. The correlation coefficient (R) is 0.008, indicating an extremely weak and negligible positive relationship. The R Square value is 0.000, which means that conferences explain 0% of the variance in students' academic performance. Moreover, the Adjusted R Square is -

0.010, suggesting that the model performs worse than a model with no predictors at all.

The standard error of the estimate is 18.766, indicating a high level of variability in academic performance that is not explained by the level of conference participation. Overall, this model demonstrates that conferences have no predictive value on student academic outcomes in this context. Further analysis (e.g., ANOVA and regression coefficients) would be needed

to confirm if this relationship is statistically significant, but the model

summary already strongly suggests no meaningful impact.

Table 2b: ANOVA Summary of linear Regression between the impact study fellowship and students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.250	1	2.250	.006	.936 ^b
Residual	34510.260	954	352.146		
Total	34512.510	955			

The ANOVA summary for the regression analysis between the impact of conferences and senior secondary school students' academic performance in public secondary schools in Adamawa State shows that the relationship is not statistically significant. The F-value is 0.006 with a corresponding p-value (Sig.) of 0.936, which is much greater than the 0.05 threshold typically used to determine significance. This means that the inclusion of "conferences" as a predictor does not significantly improve the model's ability to explain the

variation in academic performance compared to a model with no predictors.

The regression sum of squares is 2.250, while the residual sum of squares is 34,510.260, indicating that nearly all of the variation in academic performance is due to other factors not accounted for in the model. Therefore, based on this ANOVA result, the null hypothesis is retained, confirming that conferences have no statistically significant impact on senior secondary school students' academic performance in the study area.

Table 2c: Summary of Regression Coefficient Between the impact of study fellowship and students' academic performance in Senior Secondary Schools in Adamawa, Nigeria.

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	36.95	12.353		2.991	.004
Level of conference in Public Secondary Schools.	.286	3.583	.008	.080	.936

The regression coefficient summary indicates that the impact of conferences on senior secondary school students' academic performance in Adamawa State public secondary schools is not statistically significant. The unstandardized coefficient (B) for conferences is 0.286, with a standard error of 3.583, suggesting that for every one-unit increase in the level of conference participation, academic

performance is predicted to increase by only 0.286 units. However, this effect is extremely small and practically negligible.

The t-value is 0.080 and the p-value (Sig.) is 0.936, which is far above the 0.05 threshold for statistical significance. This means that the observed relationship is likely due to chance. The standardized coefficient (Beta) is also very low at

0.008, confirming that the strength of the relationship is virtually nonexistent. Based on this result, we retain the null hypothesis, concluding that conferences have no significant impact on senior secondary school students' academic performance in the study area.

Table 3a: Model Summary of Regression Analysis between the impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.254 ^a	.065	.055	18.151

The model summary of the regression analysis between the impact of seminars and senior secondary school students' academic performance in Adamawa State public secondary schools indicates a weak but noticeable positive relationship. The correlation coefficient (R) is 0.254, suggesting a low positive correlation between seminars and academic performance. The R Square (R^2) value is 0.065, which means that seminars account for approximately 6.5% of the variation in students' academic performance.

H₀₃: There is no significant impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria.

The Adjusted R Square is slightly lower at 0.055, which adjusts for the number of predictors and the sample size. Although modest, this indicates that seminars have a small explanatory power regarding academic performance. The standard error of the estimate is 18.151, indicating a moderate level of variability in the predicted academic scores. Overall, while the relationship is weak, this summary suggests that seminars may have a limited but positive influence on academic outcomes.

Table 3b: ANOVA Summary of linear Regression between the impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2226.927	1	2226.927	6.760	.011 ^b
	Residual	32285.583	954	329.445		
	Total	34512.510	955			

The ANOVA summary for the regression analysis examining the impact of seminars on senior secondary school students' academic performance in Adamawa State public secondary schools shows that the relationship is statistically significant. The F-value is 6.760 with a p-value (Sig.) of 0.011, which is less than the 0.05 threshold for significance. This indicates that the regression model explains a meaningful portion of the variance in academic performance and that the impact of seminars is unlikely due to chance.

The regression sum of squares is 2,226.927, showing the variation in students' academic performance that can be attributed to seminar participation, while the residual sum of squares is 32,285.583, representing the unexplained variation. Since the p-value is significant, we reject the null hypothesis and conclude that seminars have a statistically significant impact on senior secondary school students' academic performance in public secondary schools in Adamawa State.

Table 3c: Summary of Regression Coefficient Between the impact of seminar participation on students' academic performance in Senior Secondary Schools in Adamawa State, Nigeria

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	64.077	10.219		6.270	.000
Level of seminar in colleges of education	-7.814	3.006	-.254	-2.600	.011

The regression coefficient summary shows a statistically significant relationship between the level of seminars and senior secondary school students' academic performance in Adamawa State public secondary schools. The unstandardized coefficient (B) is -7.814, with a standard error of 3.006, indicating that for every one-unit increase in seminar activity, students' academic performance is predicted to decrease by 7.814 units. This negative relationship is confirmed by the t-value of -2.600 and a p-value of 0.011, which is less than 0.05, indicating statistical significance.

Interestingly, the standardized coefficient (Beta) is -0.254, reflecting a moderate negative effect size. Although seminars are often expected to enhance teacher effectiveness and thus improve student outcomes, this result suggests the opposite: higher levels of seminars are associated with lower student academic performance in this context. This unexpected finding could be due to factors such as poor seminar quality, lack of relevance to classroom practice, or ineffective implementation. Based on this result, the null hypothesis is rejected, confirming that seminars have a significant though negative impact on academic performance in the studied schools.

Summary of Major Findings

The results revealed the following major findings:

1. There is no significant impact of study fellowship on senior

secondary school students' academic performance in Adamawa State public secondary schools($p = 0.163$).

2. There is no significant impact of conferences on senior secondary school students' academic performance in Adamawa State public secondary schools. ($p = 0.936$)
3. There is significant impact of seminars on senior secondary school students' academic performance in Adamawa State public secondary schools($p = 0.011$).

Discussion of the Findings

The finding of the study revealed that study fellowships have no statistically significant impact on senior secondary school students' academic performance in public secondary schools in Adamawa State. The regression analysis produced a p-value of 0.163, which is above the 0.05 threshold of significance. As a result, the null hypothesis was retained. This suggests that access to or provision of study fellowships does not significantly influence students' academic achievement within the study context. This finding contradicts several previous studies reviewed in the literature. For example, Chen, Zhang and Wang (2020) in their study conducted in Beijing, China, found that study fellowships significantly increased research productivity among faculty members by reducing financial stress and providing essential academic resources. Similarly, Johnson, Williams and Patel (2018) in

Lagos, Nigeria, reported that study fellowships positively impacted academic performance among graduate students by offering financial aid and valuable research opportunities. Likewise, Martinez, Sanchez and Garcia (2018) discovered that induction programs, which include elements like fellowships, significantly enhanced job performance among lecturers in private universities in Mexico City. These studies uniformly demonstrated that fellowships and similar development opportunities play a significant role in boosting academic and professional outcomes.

The disparity between the findings of this study and those of earlier research can be attributed to several contextual and demographic differences. Most of the reviewed studies focused on higher education institutions lecturers, faculty members, or postgraduate students who are more likely to directly benefit from structured study fellowships, often in the form of grants, research sponsorships, or academic exchanges. In contrast, the present study focused on senior secondary school students, a population that typically does not receive or participate in such fellowships. As such, the limited availability or complete absence of fellowship programs for this group may account for the lack of measurable impact. Moreover, while previous research measured outcomes such as research output, job performance, or career advancement, this study measured students' academic performance, a fundamentally different variable that may not respond directly to the presence or absence of fellowships. Additionally, in the context of public secondary schools in Adamawa State, factors such as inadequate infrastructure, poor implementation of development programs, or a lack of exposure to fellowship opportunities may further diminish any potential impact on

students. Thus, the contradiction between this study and previous findings is justifiable based on the different educational settings, target populations, and scope of fellowship opportunities considered.

The finding also revealed that, conferences have no significant impact on senior secondary school students' academic performance in public secondary schools in Adamawa State. The regression results revealed a p-value of 0.936, which is far above the acceptable threshold of 0.05, and an R^2 value of 0.000, indicating that conferences do not explain any variation in students' academic performance. Consequently, the null hypothesis was retained, meaning that participation in or exposure to conferences does not significantly influence academic outcomes at the secondary school level in this context.

This result stands in contrast to numerous previous studies that have highlighted the positive influence of conferences on educational outcomes. For instance, Burhan, Othman, Gardi, Hamza, Sorgul, Mahmood and Anwar (2021) reported a strong positive relationship between conferences and organizational effectiveness, emphasizing their role in professional growth and institutional development. Gupta, Singh and Kaur (2020) also found that international conferences significantly improved the research output and job performance of university lecturers in Delhi, India. Similarly, Eze, Nwankwo and Chukwu (2018) in Enugu State, Nigeria, observed that academic conferences enhanced job performance among polytechnic lecturers by enriching their professional skills and knowledge. Zhang, Wang and Chen (2019) in Beijing, China, concluded that national conferences improved teaching effectiveness through exposure to innovative pedagogical strategies.

The contradiction between these studies and the current finding is likely due to differences in population, level of education, and the nature of the conferences involved. Most of the earlier studies focused on lecturers or higher education professionals who are direct participants in academic and professional conferences. These individuals often benefit from networking, training, and exposure to current academic trends. However, the present study examined secondary school students who are typically not primary beneficiaries or active participants in such conferences. In the secondary school context in Adamawa State, conferences may be targeted more at teachers or administrators, with minimal trickle-down effect on students' academic performance. Additionally, if such conferences are poorly implemented or fail to address issues directly affecting classroom instruction and student learning, their potential impact may not be realized. Therefore, the absence of a significant relationship in this study is understandable, given the limited direct interaction between conferences and student learning experiences at the secondary school level

Conclusion

The study investigated the impact of teachers' training specifically study fellowships, conference participation, and seminar participation on the academic performance of Senior Secondary School students in public secondary schools in Adamawa State. The findings revealed that while study fellowships and conferences did not have a statistically significant impact on students' academic performance, participation in seminars significantly influenced students' learning outcomes. This suggests that not all forms of professional development training equally translate into improved student

performance. Seminars, with their interactive and participatory nature, appear to provide teachers with practical knowledge, skills, and strategies that directly enhance classroom instruction and student learning. Therefore, for professional development programmes to be effective in improving student academic outcomes, emphasis should be placed on training formats that actively engage teachers and equip them with actionable skills.

Therefore, the effectiveness of teachers' training in enhancing students' academic performance depends on the type and quality of the training, highlighting the critical role of targeted, practical, and interactive professional development initiatives in secondary school education.

Recommendations

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

1. Educational authorities should review and redesign study fellowship programmes to ensure they are more practical, context-specific, and directly applicable to classroom teaching.
2. Schools and teacher education bodies should provide more structured and interactive conference formats that focus on actionable teaching strategies to enhance student learning outcomes.
3. Teachers should be encouraged to actively participate in seminars regularly, and school management should support attendance, as these programmes effectively enhance instructional skills and improve students' academic performance.

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