
Influence of Classroom Dynamics on Students' Academic Performance in Senior Secondary Schools in Gombe State, Nigeria

¹Ayuba Usman, PhD, ²Umar Yahaya, PhD & ³Kamar Oyejide Fayinka, PhD

^{1, 2 & 3} Department of Educational Foundations, Abubakar Tafawa Balewa University, Bauchi

Email: abumursali@gmail.com

ABSTRACT

This study investigated the relationship between classroom dynamics and students' academic performance in senior secondary schools in Gombe State, Nigeria. Four dimensions of classroom dynamics were examined: teacher-student rapport, peer collaboration, classroom management style, and physical/behavioural environment. A descriptive survey and correlational research design were adopted. The target population comprised 45,000 senior secondary school students (SSII) across 120 public secondary schools. Using Yamane's formula, a sample of 440 students was drawn from 40 schools (20 urban, 20 rural) through multi-stage sampling. The Classroom Dynamics Questionnaire (CDQ) containing 30 items on a 4-point Likert scale (Cronbach's $\alpha = 0.85$) and the Academic Performance Proforma (APP) were used for data collection. Data were analyzed using mean, standard deviation, Pearson Product Moment Correlation, and independent samples t-test at 0.05 significance level. Findings revealed that overall classroom dynamics were negative (overall mean = 2.28). Significant positive relationships were found between teacher-student rapport and performance ($r = 0.52$), peer collaboration and performance ($r = 0.44$), and classroom management style and performance ($r = 0.48$). A significant difference was found between urban (mean = 2.60) and rural (mean = 1.96) schools $t(438) = 6.84$, $p < 0.001$, Cohen's $d = 0.91$. The study concluded that classroom dynamics significantly relate to students' academic performance. Recommendations included enforcing maximum class sizes of 40 students, prioritizing rural schools for infrastructure and teacher training interventions, and integrating classroom dynamics modules into pre-service and in-service teacher training programmes.

Keywords: Classroom dynamics, teacher-student rapport, peer collaboration, academic performance

INTRODUCTION

Classroom dynamics refer to the complex interplay of relationships, interactions, behaviours and communication patterns among students and between students and teacher within a learning environment (Fraser, 2015). These dynamics refer to the psychosocial climate, specifically teacher-student rapport, peer collaboration, classroom management style, seating arrangement and student engagement level. The nature of these dynamics can either foster or hinder effective teaching and learning.

Across the world, studies have found that positive classroom dynamics such as cooperative learning, mutual respect and active participation correlated with

improved academic performance. Conversely, negative dynamics such as bullying, authoritarianism by the teacher, poor communication and/or chronic indiscipline tend to demotivate learners, reduce attention and ultimately lower academic outcomes. Hattie (2018) found that teacher-student relationship has an effect size of 0.72 on student achievement, which is among the highest of all educational factors.

In Nigeria, the secondary education system faces numerous challenges, which include limited pedagogical training, overcrowded classrooms, inadequate teaching resources and teacher absenteeism. Adedigba and Ogunyinka (2020) asserted that variables

within the classroom environment significantly predicted academic performance in southwestern Nigerian schools. It is noteworthy however, that similar empirical evidence for northeastern Nigeria remains sparse.

In Gombe State, despite massive government interventions in attempt to improve the quality of education within the state, yet there are concerns about students' academic performance. A report by the State Ministry of Education (2020) indicated that 47% of senior secondary school students scored below credit level in the West African Senior School Certificate Examination (WASSCE) English Language over the past three years. Preliminary observation suggests unfavourable classroom dynamics; large class size, low student participation, poor teacher-student relationship and disruptive behaviour. However, no systematic research has linked these dynamics directly to student performance in the state.

Statement of the Problem

Gombe State has consistently recorded below-expected academic performance in both internal and external senior secondary school examinations over the past decade. Available statistics reveal a concerning trend: in 2019, only twenty-two percent of candidates obtained five credits including English Language and Mathematics in the West African Senior School Certificate Examination (WASSCE), a figure that, despite significant improvement to over seventy percent by 2023, still indicates that nearly thirty percent of students continue to fall below acceptable proficiency standards. NECO results further show persistent disparities between urban and rural schools, with urban candidates consistently outperforming their rural counterparts across all subjects examined.

State education data highlight additional structural challenges. The Gombe State Annual School Census covering 2018 to 2021 identified a troubling upward trend in out-of-school children, with over fifty-five percent at pre-primary level, nearly thirteen percent at primary, and over thirty percent at junior secondary level. Teacher shortages remain acute, particularly in rural areas, with pupil-teacher ratios averaging one to sixty-five in public primary schools and exceeding one to ninety in some local government areas. Inadequate school facilities, teacher absenteeism, and payroll irregularities have further compounded these challenges, undermining instructional delivery and student engagement.

Empirical evidences reveal that many Gombe State classrooms are characterized by overcrowding, teacher-centred instruction, low student participation, and frequent indiscipline (Usman & Bello, 2023). While factors such as poor funding, inadequate instructional materials, and teacher qualification have been frequently implicated in poor performance (Adeyemi & Adu, 2019), the influence of classroom dynamics the day-to-day interactions, patterns of communication, seating arrangements, teacher-student relationships, and peer influences remains largely underexplored. Yet, whether and how these specific dynamics affect student performance has not been systematically ascertained. Without this understanding, government interventions may continue to target only structural or resource-based issues, neglecting the relational and behavioural environment where actual learning occurs (Hattie, 2018).

This study therefore sought to ascertain whether and how these specific dynamics relate to student performance in Senior Secondary Schools in Gombe State, Nigeria

by providing answers to the research questions.

Research Objectives

The main objective of the study is to determine the extent to which classroom dynamics relate to students' academic performance in senior secondary schools in Gombe State.

Specifically, the study sought to:

- i. Find out the nature of classroom dynamics in senior secondary schools in Gombe State.
- ii. Determine the extent to which teacher-student rapport relates to students' academic performance.
- iii. Examine the relationship between peer collaboration and students' academic performance.
- iv. Examine the relationship between classroom management style and students' academic performance.
- v. Determine whether classroom dynamics differ significantly between urban and rural senior secondary schools.

Research Questions

The following research questions guided the study:

- i. What is the nature of classroom dynamics in senior secondary schools in Gombe State?
- ii. To what extent does teacher-student rapport relate to students' academic performance?
- iii. How does peer collaboration relate to students' academic performance?
- iv. What is the relationship between classroom management style and students' academic performance?
- v. Do classroom dynamics differ significantly between urban and rural senior secondary schools in Gombe State in relation to students' performance?

Research Hypotheses

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

H₁: There is no significant relationship between teacher-student rapport and students' academic performance in senior secondary schools in Gombe State.

H₂: There is no significant relationship between peer collaboration and students' academic performance in senior secondary schools in Gombe State.

H₃: There is no significant relationship between classroom management style and students' academic performance in senior secondary schools in Gombe State.

H₄: There is no significant difference in classroom dynamics between urban and rural senior secondary schools in Gombe State with respect to students' performance.

Conceptual Framework

The study was anchored on Lewin's Field Model which asserted that behaviour is a function of the person and the environment ($B = f(P, E)$). The framework for this study presents a simple independent (predictor)-dependent (outcome) variable model. The independent variables were teacher-student rapport, peer collaboration, classroom management style, and physical/behavioural environment. The dependent variable was students' academic performance (measured by English Language and Mathematics scores).

METHODOLOGY

Research Design

The study adopted the descriptive survey and correlational research design. The descriptive survey design was found to be appropriate for collecting data on classroom dynamics as they naturally exist without manipulation. The correlational aspect enabled the researcher to determine the

direction and magnitude of the relationship between the independent and dependent variables.

Area of the Study

The study was conducted in Gombe State, north eastern Nigeria. Created in 1996, the state has 11 Local Government Areas (LGAs), grouped into three educational zones namely: Gombe, Billiri and Kaltungo zones. According to the State Ministry of Education (2022), the state has 120 public senior secondary schools with an estimated population of 45,000 students in SSS I-III.

Population of the Study

The population of this study comprised all senior secondary school students in public secondary schools in Gombe State, spread around 45,000 students in 120 schools. The study purposely focused on SSII students because they have completed one full year of senior secondary education and have become familiar with classroom dynamics, and thus more mature and reliable in responding to questionnaire compared to the younger SSI students. Furthermore, they are at the mid-point of senior secondary school education and are not yet pre-occupied with external examination preparation, unlike the SSIII students.

Sample and Sampling Technique

Taro Yamane formula $n = N / (1 + N e^2)$ was used to determine the sample size. Using 0.05 margin of error and a population of 45,000, the calculated sample size was 397. To make up for potential non-response, an additional 10% was added, which resulted in a final sample of 440 students.

Multi-stage sampling procedure was adopted to select participants for the study. The schools were stratified into urban and rural. Using simple random sampling, 20 urban schools and 20 rural schools were selected (total 40 schools), representing equal

proportions of 50% each. From each selected school, 11 SSII students were randomly selected ($40 \times 11 = 440$ students).

Instrumentation

Two main instruments were used for data collection. These are: Classroom Dynamics Questionnaire (CDQ) and Academic Performance Profoma (APP). The CDQ was developed by the researcher based on extensive literature review. The instrument has 30 items distributed across four sections viz: Teacher-Student Rapport (8 items), Peer Collaboration (7 items), Classroom Management Style (8 items), and Physical/Behavioural Environment (7 items). The CDQ used a 4-point Likert Scale response format structured as Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

The other instrument was the Academic Performance Profoma (APP), which was a structured form used to collect students' academic records, capturing English Language and Mathematics scores from the most recent term examination.

Validity of the Instrument

For the purpose of validation, face and content validity were established by submitting the initial draft of the CDQ to three experts in Educational Psychology, Measurement and Evaluation, and Curriculum Studies. Construct validity was confirmed through a pilot study with 50 SSII students, followed by Exploratory Factor Analysis. The analysis yielded a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.82, and Bartlett's test of sphericity was significant ($p < 0.05$). Factor loadings ranged from 0.52 to 0.79 across the four dimensions, with extraction method of Principal Component Analysis accounting for 58.4% of the total variance explained.

Reliability of the Instrument

The reliability index of the CDQ was established through Cronbach's Alpha Coefficient analysis. The overall instrument yielded $\alpha = 0.85$. The subscale reliability coefficients were: Teacher-Student Rapport ($\alpha = 0.78$), Peer Collaboration ($\alpha = 0.74$), Classroom Management Style ($\alpha = 0.76$), and Physical/Behavioural Environment ($\alpha = 0.72$). Test-retest reliability after a two-week interval was $r = 0.82$.

Method of Data Collection

Permission was sought and obtained from the State Ministry of Education. Thereafter, the questionnaire was directly administered by the researcher to the sampled students during regular class periods (20-25 minutes). Academic performance scores were obtained from school records using the Academic

Performance Profoma (APP). The data collection process spanned over four weeks.

Method of Data Analysis

Data obtained were analyzed using IBM SPSS Statistics version 25. Mean and Standard Deviation were used to answer research questions 1 and 5. Inferential statistics—Pearson Product Moment Correlation (PPMC) and independent samples t-test—were used to test the hypotheses at 0.05 level of significance.

RESULTS

For the analysis of the demographic characteristics of the respondents, 440 questionnaires were fully completed and analyzed, which signifies 100% response rate. Table 1 presents the demographic characteristics of the respondents.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	210	47.7
	Female	230	52.3
	Total	440	100
School Location	Urban	220	50.0
	Rural	220	50.0
	Total	440	100
Class Size	Less than 30	45	10.2
	30-50	110	25.0
	51-70	185	42.1
	More than 70	100	22.7
	Total	440	100

Source: Field Study (2006)

The table shows that 52.3% of respondents were female, while 47.7% were male. The sample was equally balanced between urban and rural schools (50% each). For class size,

42.1% of the students reported class sizes between 51-70 students, while 22.7% reported class sizes exceeding 70 students.

Research Question 1: Nature of Classroom Dynamics

Table 2: Mean and Standard Deviation of Classroom Dynamics Dimensions

Dimension	Mean	SD	Interpretation
Teacher-Student Rapport	2.45	0.78	Low (negative)
Peer Collaboration	2.18	0.82	Low (negative)
Classroom Management Style	2.52	0.75	Moderate (positive)
Physical/Behavioural Environment	1.95	0.71	Low (negative)
Overall Classroom Dynamics	2.28	0.77	Low (negative)

Source: Field Study (2006)

The overall mean score of 2.28 indicates that classroom dynamics in Gombe State Senior Secondary Schools are generally negative. The Physical/Behavioural Environment

dimension scored lowest (1.95), while Classroom Management Style scored highest (2.52).

Testing of Hypotheses

H₁: There is no significant relationship between teacher-student rapport and students' academic performance.

Table 3: Pearson Correlation between Teacher-Student Rapport and Academic Performance

Variable	N	Mean	SD	r	P-value	Decision
Teacher-Student Rapport	440	2.45	0.78	0.52	<0.001	Rejected
Academic Performance	440	54.30	12.45			

Source: Field Study (2006)

The correlation coefficient ($r = 0.52$, $p < 0.001$) indicates a moderate, positive and significant relationship between teacher-

student rapport and academic performance. Therefore, the null hypothesis is rejected.

H2: There is no significant relationship between peer collaboration and students' academic performance.

Table 4: Pearson Correlation between Peer Collaboration and Academic Performance

Variable	N	Mean	SD	r	P-value	Decision
Peer Collaboration	440	2.18	0.82	0.44	<0.001	Rejected
Academic Performance	440	54.30	12.45			

Source: Field Study (2006)

The correlation coefficient ($r = 0.44$, $p < 0.001$) indicates a moderate, positive and significant relationship between peer collaboration and academic performance. Therefore, the null hypothesis is rejected.

H3: There is no significant relationship between classroom management style and students' academic performance.

Table 5: Pearson Correlation between Classroom Management Style and Academic Performance

Variable	N	Mean	SD	r	P-value	Decision
Classroom Management Style	440	2.52	0.75	0.48	<0.001	Rejected
Academic Performance	440	54.30	12.45			

Source: Field Study (2006)

The correlation coefficient ($r = 0.48$, $p < 0.001$) indicates a moderate, positive and significant relationship between classroom management style and students' academic performance. Therefore, the null hypothesis is rejected.

H4: There is no significant difference in classroom dynamics between urban and rural senior secondary schools.

Table 6: Independent Samples t-test for Urban vs Rural Classroom Dynamics

School Location	N	Mean	SD	df	t-value	P-value	Decision
Urban	220	2.60	0.72	438	6.84	<0.001	Rejected
Rural	220	1.96	0.69				

Source: Field Study (2006)

The calculated t-value (6.84) exceeded the critical t-value at $df = 438$ (approximately 1.96). The p-value (less than 0.001) was less than 0.05. Therefore, the null hypothesis was rejected. The effect size (Cohen's $d = 0.91$) indicated a large practical difference, with urban schools showing significantly more favourable classroom dynamics than rural schools.

Summary of Findings

1. Overall classroom dynamics in Gombe State senior secondary schools were negative (overall mean = 2.28). The Physical/Behavioural Environment dimension scored lowest (1.95), while Classroom Management Style scored highest (2.52).
2. There was a moderate, positive and significant relationship between teacher-student rapport and academic performance ($r = 0.52$, $p < 0.001$).
3. There was a moderate, positive and significant relationship between peer collaboration and academic performance ($r = 0.44$, $p < 0.001$).
4. There was a moderate, positive and significant relationship between classroom management style and academic performance ($r = 0.48$, $p < 0.001$).
5. There was a significant difference in classroom dynamics between urban (mean = 2.60) and rural (mean = 1.96) schools $t(438) = 6.84$, $p < 0.001$. The effect size (Cohen's $d = 0.91$) indicated a large practical difference favouring urban schools.

DISCUSSION

The finding that overall classroom dynamics in Gombe State are negative (mean = 2.28) aligns with earlier reports from the State Ministry of Education (2022) suggesting unfavourable learning environments. The

particularly low score for Physical or Behavioural Environment (1.95) is consistent with Adeyemi and Adu (2019), who found similar inadequate conditions in Ondo State. This persistent pattern across different Nigerian states suggests a systemic challenge in the physical infrastructure of public secondary schools, particularly in rural areas. The low score may be attributed to years of underfunding, rapid population growth without corresponding infrastructure expansion, and inadequate maintenance culture in public schools. From a Lewinian perspective (Lewin, 1936), the physical environment constitutes a critical component of the educational field that shapes student behaviour and learning outcomes. When the physical environment is suboptimal, it creates a psychological field that is not conducive to learning, thereby impeding academic engagement and performance.

The moderate positive correlation between teacher-student rapport and academic performance ($r = 0.52$) supports Cornelius-White's (2017) meta-analysis, which found that positive teacher-student relationships are associated with significantly higher achievement. This finding also aligns with Adebayo and Oladele (2022) in Oyo State, who reported a similar correlation ($r = 0.58$). The strength of this relationship suggests that improving teacher-student rapport should be a priority intervention. This finding can be explained through the lens of Bandura's (1977) Social Learning Theory, which posits that students learn not only through instruction but also through observation and interaction with significant others. Teachers who establish positive rapport serve as credible models whose approval and encouragement motivate students to invest greater effort in academic tasks. In the Nigerian socio-cultural context, where the teacher traditionally occupies a position of authority and respect, positive

rapport may be particularly influential in shaping student attitudes toward learning. When students perceive their teachers as approachable, caring, and supportive, they are more likely to participate actively in class, seek clarification when confused, and persist through academic challenges—all behaviours that contribute to improved performance.

The significant relationship between peer collaboration and performance ($r = 0.44$) supports Johnson and Johnson's (2018) meta-analysis, showing that cooperative learning produces higher achievement than individualistic learning. However, the low mean score for peer collaboration (2.18) indicates that this resource is underutilized in Gombe State classrooms. This finding echoes Usman and Bello (2023) in Kaduna State, who found that 67% of students rarely engaged in collaborative learning. The underutilization of peer collaboration may be attributed to the dominant teacher-centred pedagogy prevalent in Nigerian secondary schools, where students are often passive recipients of information rather than active constructors of knowledge. Additionally, large class sizes and inadequate seating arrangements may physically constrain collaborative activities. Vygotsky's (1978) concept of the zone of proximal development suggests that learning is enhanced through social interaction with more knowledgeable peers. In the Nigerian context, where classrooms often lack sufficient teaching resources, structured peer collaboration could serve as a cost-effective strategy to enhance learning outcomes, particularly in overcrowded classrooms where individual teacher attention is limited. The significant correlation between management style and performance ($r = 0.48$) supports Marzano and Marzano's (2016) conclusion that effective classroom management is critical for learning. The

moderately positive mean score (2.52) suggests that teachers use mixed approaches. This finding aligns with Ogunyemi and Ajayi (2021) in Lagos State, who found democratic management to be most effective. However, the moderate nature of this relationship suggests that while management style matters, it may be less influential than teacher-student rapport in the Nigerian context. The effectiveness of classroom management in Nigerian classrooms may be constrained by contextual factors such as overcrowding and inadequate resources, which limit teachers' ability to implement positive management strategies. Furthermore, the traditional authoritarian culture in Nigerian schools may predispose teachers toward controlling rather than supportive management approaches, potentially undermining the development of positive classroom climates.

The large effect size (Cohen's $d = 0.91$) for urban-rural differences is substantial and practically meaningful. This supports Okoro and Eze (2020) in Abia State, who found that urban schools had more favourable dynamics. The largest gap was in physical environment (+0.70), suggesting that rural schools face severe infrastructure deficits. This disparity likely contributes to the urban-rural achievement gap documented by the National Bureau of Statistics (2022). The urban-rural disparity can be explained by several factors: differential resource allocation favouring urban schools, greater difficulty in attracting and retaining qualified teachers in rural areas, and limited access to professional development opportunities for rural teachers. In the Nigerian socio-cultural context, rural schools often suffer from neglect as political and administrative attention tends to focus on urban centres. Additionally, the cultural and linguistic diversity of rural communities may create communication barriers that

affect classroom dynamics. The large effect size underscores the need for targeted interventions in rural schools to address both infrastructure deficits and pedagogical capacity.

CONCLUSION

Based on the findings of this study, the following conclusions are drawn:

1. Classroom dynamics in Gombe State senior secondary schools are generally negative, with the Physical/Behavioural Environment being the most problematic dimension.
2. Significant positive relationships were found between all four classroom dynamics variables and students' academic performance, with teacher-student rapport showing the strongest relationship ($r = 0.52$), followed by classroom management style ($r = 0.48$), and peer collaboration ($r = 0.44$).
3. Urban schools have significantly better classroom dynamics than rural schools, representing a large practical disparity (Cohen's $d = 0.91$).
4. Significant relationships were found between classroom dynamics variables and academic performance, confirming that improving the classroom environment is a viable pathway to raising student achievement.

RECOMMENDATIONS

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

1. Government should enforce a maximum class size of 40 students per classroom in senior secondary schools. Schools with more than this limit should receive priority attention for infrastructure expansion or teacher deployment.
2. Government should give priority attention to rural schools for

classroom improvement interventions. Given the large urban-rural disparity (Cohen's $d = 0.91$), rural schools should receive priority for classroom improvement initiatives, with emphasis on furniture, lighting, and ventilation.

3. School administrators should conduct termly classroom climate assessments using a simplified version of the Classroom Dynamics Questionnaire to identify classrooms with negative dynamics and provide targeted support.
4. Schools should implement structured peer collaboration programmes such as peer tutoring, subject-based study groups, and cooperative learning structures within regular lesson plans.
5. School administrators should improve physical environment deficits by repairing broken furniture, installing energy-saving bulbs, ensuring windows function properly for ventilation, and arranging seating so all students can see the blackboard.
6. Teachers should deliberately build positive rapport by using students' names, praising effort publicly, and avoiding shouting or sarcasm.
7. Further studies should be undertaken to test the effectiveness of rapport-building training programmes and structured peer collaboration interventions on student academic performance in Gombe State.
8. The study should be replicated across other northeastern states of Nigeria to determine if findings are consistent across the region.

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