

**COMPARATIVE STUDY ON CHEMISTRY STUDENTS PERFORMANCE
TAUGHT IN RURAL AND URBAN AREAS IN EGOR LOCAL GOVERNMENT
AREA OF EDO STATE**

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**DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY,
FACULTY OF EDUCATION, UNIVERSITY OF BENIN
BENIN CITY**

OCTOBER 2025

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND
INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION,
UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE
REQUIREMENT OF THE AWARD OF THE BACHELOR OF SCIENCE (ED)
DEGREE IN CHEMISTRY EDUCATION**

OCTOBER 2025

CERTIFICATION

We the undersigned certified that this research work was carried out by OKEH PRECIOUS OVERERE in the department of curriculum and instructional technology, Faculty of Education, University of Benin, Benin city in partial fulfilment of the requirement of the award of Bachelor of science (Ed) degree in Chemistry Education.

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DEDICATION

This research work is dedicated to God Almighty.

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The researcher expresses sincere appreciation to Jehovah God Almighty for the gift of life and health and for guiding her through the ups and downs of her academic journey in the University of Benin, enabling the successful completion of this project.

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ABSTRACT

The study examined comparative study on chemistry students' performance taught in rural and urban areas in Egor Local Government Area of Edo State. The study adopted the survey design using questionnaire as instrument of data collection. The data was analyzed using percentage table to present the analysis of data sourced from the field survey. The results revealed that there is a significant difference in Chemistry students' performance between rural and urban schools in Egor LGA. Urban students generally outperform their rural counterparts due to better access to qualified teachers, well-equipped laboratories, modern instructional materials, and a more conducive learning environment. Rural students face multiple challenges, including inadequate textbooks, limited parental and peer support, poor classroom environments, and shortages of experienced Chemistry teachers, all of which negatively affect their academic achievement. The findings confirm that school location is a major determinant of student performance in Chemistry, highlighting disparities in educational resources and support systems between rural and urban areas. The study recommends that educational authorities should prioritize upgrading laboratory facilities, classrooms, and instructional materials in rural schools to provide a more conducive learning environment. There should be strategic deployment of qualified and experienced Chemistry teachers to rural schools, along with regular professional development programs to enhance instructional quality. Adequate textbooks, modern teaching aids, and laboratory equipment should be made available to rural schools to reduce the resource gap. Efforts should be made to involve parents and communities in supporting students' learning through motivation, provision of study materials, and encouragement of academic pursuits. Establish mentorship and peer-support initiatives to positively influence student motivation, study habits, and academic engagement in Chemistry.

Keywords: Comparative Study, Chemistry Students, Performance, Rural and Urban Schools and Outperform and Rural Counterparts

CHAPTER ONE

INTRODUCTION

Background to the Study

Education plays a pivotal role in societal development, and the performance of students is often used as an indicator of the quality of education in a given area. In Nigeria, a significant gap in academic performance exists between students in rural and urban areas, driven by numerous socio-economic, infrastructural, and educational factors. Student performance in chemistry is a critical aspect of this study. Academic achievement, as measured through various parameters such as grades, understanding of the subject matter, and the ability to apply knowledge, reflects the effectiveness of educational systems and the quality of instruction. Chemistry, as a core science subject in secondary education, has been identified as one that poses significant challenges to students, particularly in rural areas where there is often a lack of resources and qualified teachers (Akinbode, 2018). Performance in chemistry is typically assessed through written exams, practical examinations, and classroom participation.

Location of the school plays a crucial role in shaping the educational experiences of students. Schools situated in urban areas generally benefit from better infrastructure, more qualified teachers, and access to modern teaching materials, all of which contribute to higher academic outcomes. In contrast, rural schools often face challenges such as inadequate teaching facilities, insufficient access to technology, and lower levels of

teacher qualifications, which can negatively impact student learning outcomes (Igbinosa, 2020).

Rural areas are often characterized by limited access to educational infrastructure, such as laboratories, libraries, and advanced teaching aids, which can hinder students' understanding of complex subjects like chemistry. According to Oni and Arikpo (2021), students in rural areas face challenges such as poor internet connectivity, lack of proper textbooks, and insufficient exposure to practical learning experiences. These factors contribute to lower academic performance when compared to their urban counterparts, where schools are typically better equipped and more connected to educational networks (Okunade & Olaniran, 2018). These resources not only enhance students' understanding of chemistry but also provide a conducive environment for the development of critical thinking and problem-solving skills necessary for mastering the subject.

Furthermore, the socio-economic background of students in urban areas tends to be more advantageous compared to their rural peers. Urban students are more likely to come from families with higher educational expectations, better financial stability, and access to extra lessons or tutoring services (Ogunyemi & Adedeji, 2020). This socio-economic advantage plays a role in improving academic performance by providing students with a supportive learning environment both inside and outside the classroom.

Teacher quality is often higher in urban schools due to better access to professional development opportunities and the ability to attract qualified educators. In rural schools, however, the shortage of trained educators can result in a compromised learning experience. This disparity in teaching quality significantly affects student performance, as the ability of the teacher to explain complex concepts like those found in chemistry directly influences students' understanding and retention of the subject matter (Sulaimon, 2019).

Another important factor is the availability of resources. Urban schools often have better access to teaching aids, textbooks, and laboratory facilities, all of which are essential for teaching chemistry effectively. The hands-on experience in a well-equipped laboratory can significantly enhance students' understanding of the subject. In contrast, the absence of such resources in rural schools can hinder practical learning and limit students' exposure to the experimental aspects of chemistry. This gap in resources contributes to the poor performance of rural students in chemistry assessments (Adeyemi, 2018).

In conclusion, the comparative study of chemistry students' performance in rural and urban areas in Egor Local Government Area will shed light on the significant differences in academic outcomes that result from the varying educational environments. The findings of this study will provide valuable insights into the challenges faced by students

in rural areas and highlight potential areas for improvement in the delivery of education in both settings.

Statement of the Research Problem

Despite continuous reforms in Nigeria's education sector, significant gaps persist in the academic performance of Chemistry students based on school location. Numerous studies, such as those by Idika (2017) and Oladejo et al. (2023), have highlighted a consistent trend of urban students outperforming their rural counterparts in Chemistry. This recurring disparity raises concerns about educational equity and access to quality science education across different geographic regions.

One of the most pressing issues is the unequal distribution of learning facilities and laboratory resources. Urban schools are more likely to have well-equipped laboratories and up-to-date instructional materials, whereas rural schools often rely on outdated, improvised, or insufficient resources (Obikezie et al., 2022). This lack of proper infrastructure negatively impacts the effective teaching and learning of Chemistry in rural settings, thereby limiting students' academic success.

Teacher quality and availability also play a crucial role in widening this gap. Educators in urban schools tend to have higher qualifications, more teaching experience, and better access to training opportunities compared to those in rural areas (Alade, 2014;

Lai & Fong, 2024). This imbalance in teacher distribution compromises the quality of instruction delivered in rural schools, ultimately affecting student outcomes. Additionally, socio-economic and environmental conditions influence students' attitudes and engagement with science subjects. Rural students often face lower motivation levels, limited exposure to academic support, and less stimulating learning environments compared to their urban peers (Cano, 2022; Akinnodei, 2020). These factors collectively contribute to persistent achievement gaps in Chemistry education.

However, existing literature such as Akinnodei (2020); Idika (2017) and Lai et al., (2024) have documented rural-urban performance differences and general challenges in science education, few studies have comprehensively examined the interrelationship between performance outcomes, availability of resources, teacher quality, and student motivation specifically within the context of public secondary schools in Egor Local Government Area of Edo State, this study seeks to fill that gap by providing a localized, evidence-based understanding of the factors influencing Chemistry performance across rural and urban schools, with the aim of informing targeted interventions and educational policies.

Research Questions

This study is guided by the following research questions aimed at understanding the differences in Chemistry education across rural and urban schools:

1. Is there a significant difference in Chemistry students' academic performance between rural and urban schools in Egor Local Government Area of Edo State?
2. What are the key factors influencing Chemistry performance in both settings in Egor Local Government Area of Edo State?
3. Are there differences in the availability of laboratory facilities and learning resources of chemistry in Egor Local Government Area of Edo State?
4. What is the difference in the qualification and experience of Chemistry teachers in rural and urban schools in Egor Local Government Area of Edo State?

Hypotheses of the Study

The following hypothesis will guide the study, which is stated in null and alternative form.

1. H_{01} : There is no significant difference in Chemistry students' academic performance between rural and urban schools in Egor Local Government Area of Edo State.
2. H_{02} : There is no significant difference in the qualification and experience of Chemistry teachers in rural and urban schools in Egor Local Government Area of Edo State.

Purpose of the Study

The purpose of this study is to explore the comparative study on chemistry students' performance taught in rural and urban areas in Egor Local Government Area of Edo State.

The specific objectives are:

1. To find the significant difference in Chemistry students' academic performance between rural and urban schools in Egor Local Government Area of Edo State.
2. To examine the key factors influencing Chemistry performance in rural and urban schools in Egor Local Government Area of Edo State
3. To evaluate the differences in the availability of laboratory facilities and learning resources of chemistry in Egor Local Government Area of Edo State.
4. To determine the difference in the qualification and experience of Chemistry teachers in rural and urban schools in Egor Local Government Area of Edo State.

Significance of the Study

This study is significant as it provides critical and data-driven insights into the disparities in academic performance of Chemistry students between rural and urban schools in Edo State, Nigeria. It identifies and unpacks the systemic and situational challenges unique to each educational setting ranging from inadequate laboratory facilities and insufficient instructional materials to differences in the qualification, experience, and availability of teachers. These issues, often more pronounced in rural

areas, contribute to the widening academic achievement gap between students from different geographical locations.

By bringing these challenges to light, the study serves as a foundational tool for education stakeholders such as policymakers, school administrators, curriculum planners, donor agencies, and non-governmental organizations who are in positions to effect change. The evidence-based findings will help these stakeholders to make informed decisions when formulating policies, designing intervention programs, or allocating resources. For instance, state education boards may use the findings to prioritize the construction and equipping of science laboratories in rural schools or initiate training programs to upgrade the skills of underqualified teachers.

Additionally, this study contributes meaningfully to the ongoing discourse on achieving equity in science education by aligning with both national educational objectives and global frameworks such as the United Nations Sustainable Development Goal 4, which emphasizes inclusive and equitable quality education for all. It emphasizes the importance of narrowing the rural-urban divide, not just as a matter of fairness, but as a critical step toward national development, scientific innovation, and social cohesion.

Ultimately, the significance of this study lies in its potential to influence educational reform and foster a more balanced and inclusive science education system. By improving the learning conditions of underrepresented and underserved students

particularly those in rural areas the study seeks to elevate the overall standard and accessibility of Chemistry education in Edo State and similar contexts across Nigeria.

Scope and Delimitation

This study is limited to public secondary schools in Egor Local Government Area (LGA) of Edo State, focusing on SS2 and SS3 students offering Chemistry. It examines how school location (rural vs. urban) influences performance by considering factors such as laboratory facilities, instructional materials, teacher qualifications, and student motivation. The study excludes private schools, junior secondary students, other science subjects, and external factors like socio-economic background, parental involvement, or peer. Delimitations of the study include the exclusion of private schools, junior secondary students, and other science subjects outside of Chemistry.

Definition of Terms

Comparative Study of Chemistry: A comparative study of Chemistry is a research approach that examines and analyzes similarities and differences in chemistry-related factors such as teaching methods, resources, performance, or applications across different groups, settings, or conditions.

Academic Performance: Refers to the level of achievement of Chemistry students as measured by their examination results or grades over the past two academic sessions.

Urban Schools: Secondary schools located within densely populated, developed, and infrastructural advanced areas of Egor Local Government Area.

Rural Schools: Secondary schools situated in less developed, sparsely populated areas of Egor LGA, often characterized by limited educational resources and infrastructure.

Senior Secondary Students (SS2 and SS3): Students in the second and third years of senior secondary school in Nigeria's 6-3-3-4 education system, typically aged between 15 and 18 years, who are eligible for standardized Chemistry assessments.

Instructional Materials: Teaching and learning aids used in Chemistry instruction, such as textbooks, charts, models, laboratory equipment, and multimedia tools.

Laboratory Facilities: Physical and functional science laboratories equipped with apparatus, chemicals, and other resources necessary for conducting practical Chemistry lessons.

Teacher Qualification: The academic credentials and professional certifications held by Chemistry teachers, which may include degrees in Chemistry or Science Education and relevant teaching licenses.

Teacher Experience: The number of years a teacher has been actively involved in teaching Chemistry at the secondary school level.

Student Motivation: The level of interest, enthusiasm, and commitment displayed by students towards learning Chemistry, influenced by both intrinsic and extrinsic factors.

Educational Disparity: The gap in the quality, accessibility, and outcomes of education between students in rural and urban schools, particularly in the context of science education.

Chapter Two

Literature Review

This chapter comprises of the literature review, which is made up of relevant literatures subdivide into following headings:

- Theoretical Framework
- Concept of Comparative Study among Chemistry Students
- Chemistry Students' Academic Performance in Rural and Urban Schools
- Factors Influencing Chemistry Performance in Rural and Urban Schools
- Availability of Laboratory Facilities and Learning Resources in Chemistry
- Qualification and Experience of Chemistry Teachers
- Empirical Literature
- Summary of Literature

Theoretical Framework

This study is underpinned by three interrelated theories: Educational Inequality Theory, Constructivist Learning Theory, and Bronfenbrenner's Ecological Systems Theory. Together, these frameworks help to explain the observed differences in Chemistry students' academic performance across rural and urban schools.

Educational Inequality Theory

The Educational Inequality Theory does not have a single founding "proponent" like some other theories (e.g., Piaget for Cognitive Development), but it is grounded in the works of several key scholars and sociologists who have studied how education systems reproduce social inequality, such as Pierre Bourdieu (1930–2002), Bowles & Gintis (1976) and Kozol (1991). Bourdieu argued that educational systems tend to reinforce existing social structures. Educational Inequality, Bowles & Gintis (1976) proposed the correspondence theory, which states that schools reflect and perpetuate the social and economic inequalities found in capitalist societies and Kozol exposed vast disparities in funding, facilities, and educational outcomes between schools in affluent and poor areas, particularly in the U.S.

This theory emphasizes how disparities in access to quality education, teaching resources, and socio-economic support contribute to variations in student achievement. According to this theory, students in urban schools often enjoy better infrastructure, qualified teachers, and access to laboratory facilities, which significantly enhances their academic performance. Conversely, rural students may be disadvantaged due to under-resourced schools, poorly equipped laboratories, and limited access to experienced science educators (Akinodi, 2020; Oladejo et al., 2023). This theory provides a basis for investigating how school location, availability of resources, and instructional quality create performance gaps between urban and rural Chemistry students.

Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner developed the Ecological Systems Theory in 1979, which explains how a child's development is influenced by different layers of environmental systems, ranging from immediate surroundings (family, school) to broader societal and cultural contexts. Bronfenbrenner's theory views a student's development and academic performance as influenced by several environmental systems ranging from the immediate school environment (microsystem) to broader societal influences (macrosystem). This theory is useful for understanding how family background, community resources, school type, and educational policies affect Chemistry learning outcomes.

Urban students often benefit from stronger microsystems (supportive parents, peers, and well-resourced schools), while rural students may struggle due to systemic neglect and socio-economic disadvantages (Idika, 2017). The model thus provides a comprehensive lens for evaluating how environmental contexts shape academic performance

The theoretical foundation for this study rests on understanding how inequalities in educational resources (Educational Inequality Theory), the role of experiential learning (Constructivist Learning Theory), and contextual environmental factors (Ecological Systems Theory) interact to influence Chemistry students' performance in rural and urban

settings. These theories guide the study in identifying specific factors responsible for the disparities observed and inform practical interventions to bridge the academic gap.

Concept of Comparative Study among Chemistry Students

A comparative study refers to a systematic approach to analyzing and evaluating the differences and similarities between two or more groups, variables, or conditions. In Chemistry education, this research design is used to explore how different contextual factors such as school location, teaching resources, socio-economic background, and gender affect students' academic performance and learning experiences. Comparative educational research allows for the investigation of how Chemistry students in varying environments perform, thereby revealing crucial educational trends. It typically focuses on comparing student outcomes between urban and rural schools, public and private institutions, or male and female students (Lai & Fong, 2024).

When applied specifically to Chemistry students, comparative studies often examine several key areas. These include disparities in academic performance between rural and urban schools, availability and quality of instructional resources such as laboratories and teaching materials, variations in teaching methodologies, influence of socio-economic background, and gender-based differences in comprehension and engagement with Chemistry content (Oladejo et al., 2023; Alade, 2014).

The significance of conducting comparative studies in Chemistry education lies in their ability to identify existing gaps and inequalities. For instance, such research helps highlight how students in rural areas may underperform due to limited access to laboratory facilities or qualified teachers (Akinodi, 2020). Moreover, comparative analyses inform educational policy by providing empirical data to support targeted interventions aimed at improving instructional quality and resource distribution (Cano, 2022). Consequently, comparative studies contribute to curriculum development and teaching improvement by identifying which educational environments and strategies yield better outcomes (Mustapha, Omwirhiren, & Madaki, 2021). Ultimately, these studies promote educational equity by fostering an understanding of how to provide all students, regardless of their background or school type, with equal opportunities for success in Chemistry.

Several empirical studies reinforce the relevance of comparative research in Chemistry education. Akinodi (2020), in a study conducted in Ondo State, found that students in urban schools outperformed their rural counterparts, primarily due to better access to resources. Similarly, Idika (2017) revealed that urban students generally exhibited a more positive attitude toward Chemistry, attributed to better exposure and teaching environments. Obikezie, Eke, and Abumchukwu (2022) further demonstrated that the use of standard instructional materials significantly enhanced students' retention

compared to improvised alternatives, emphasizing the importance of teaching tools in shaping academic outcomes. The concept of comparative study among Chemistry students is instrumental in assessing how various socio-educational factors influence academic success. By providing critical insights into disparities and effective practices, such studies offer a foundation for educational reform aimed at achieving equity and excellence in Chemistry education across diverse settings (Asabe et al., 2024).

Chemistry Students' Academic Performance in Rural and Urban Schools

Faisal et al., (2016) established that urban students performed better in pharmacology examinations due to enhanced learning environments and greater exposure to academic resources. This finding aligns with Idika (2017), who emphasized that students' attitudes towards Chemistry at the introductory level were more positive among urban learners, often due to better classroom engagement, peer competition, and parental support. Alade (2014) did a comparative study of chemistry students' learning styles preferences in selected public and private schools in Lagos Metropolis. Descriptive research survey design was adopted for this study. The sample consisted of two hundred (200) SS 2 Chemistry students. The participants were selected using hat and draw and disproportionate stratified sampling methods. Instruments used to collect data were the Chemistry Achievement Test (CAT) and the VAK Learning style Test (VLST). The reliability measures of CAT and VLST were 0.66 and 0.70 respectively. Four research

questions and corresponding hypotheses were tested at 0.05 level of significance. Data collected were analysed using Chi-square statistics. The result showed that there is a significant relationship between learning style preferences of students and their performance in the chemistry achievement test in both public and private schools. Visual learning style was the predominant preference among students in both school types. The researcher recommends that chemistry teachers should use a variety of teaching styles to accommodate the various learning styles of their students. An alignment between teaching and learning styles will improve the teaching, learning and performance of students in Chemistry.

Similarly, Oladejo et al. (2023) explored the intra-play of gender, school location, and school type in understanding Chemistry concept difficulty. Their findings revealed that students in urban schools found Chemistry concepts less difficult, which was attributed to the availability of well-equipped laboratories and trained Chemistry teachers. These advantages are often absent or insufficient in rural schools, where infrastructural deficits and under-resourced science departments limit practical learning experiences.

Moreover, Olojo et al., (2022) conducted a comparative analysis in Ekiti State and found that urban schools had higher performance in science subjects across the board. Their work indicated that school environment and teacher quality were significant determinants of academic achievement. Akinnodei (2020) made similar observations in

Ondo State, confirming that urban students benefit from greater educational support and better learning conditions, which contribute to their improved performance in science disciplines including Chemistry.

The disparity is also partly rooted in socioeconomic contexts. Hou and Li (2022) found that educational expectations and aspirations were higher among urban students due to better family and community support systems. These expectations can positively influence student motivation and academic engagement, especially in demanding subjects like Chemistry. Additionally, Obikezie, Eke, and Abumchukwu (2022) revealed that teaching with standard instructional materials more accessible in urban schools led to significantly better academic retention in Chemistry compared to the use of improvised materials, which are more common in rural settings due to funding limitations.

Mancera (2023) further highlighted the unique challenges faced by science teachers in rural schools, such as lack of professional development opportunities, limited laboratory access, and high teacher-student ratios, all of which negatively impact the quality of instruction and student performance. These studies collectively point to a structural inequality in education delivery that influences Chemistry performance. Addressing this performance gap requires targeted interventions such as improved funding for rural schools, teacher training programs, and equitable distribution of instructional resources.

Factors Influencing Chemistry Performance in Rural and Urban Schools

Performance in Chemistry among secondary school students is significantly influenced by multiple interrelated factors, including environmental context, socio-economic conditions, instructional quality, and student engagement. These factors manifest differently in rural and urban schools, leading to observed disparities in academic performance.

Learning Environment: Urban schools generally provide better-equipped learning environments that enhance the teaching and learning of Chemistry. Oladejo et al. (2023) and Olojo et al. (2022) found that urban schools tend to have more stable electricity, modern laboratory facilities, and conducive classroom conditions all critical for effective Chemistry instruction, which requires practical demonstrations and consistent learning schedules. In contrast, rural schools often contend with infrastructural deficits, overcrowded classrooms, and poorly maintained laboratories, which hinder hands-on experiments and reduce students' conceptual understanding.

Socio-Economic Background: Socio-economic status has a profound impact on students' academic outcomes. Hou and Li (2022) emphasized that students in urban areas are more likely to come from families that can afford private tutoring, internet access, and educational resources. These students also benefit from parental guidance and high educational expectations. In rural areas, economic hardship often compels students to

participate in labor-intensive family activities, reducing their academic focus and availability for study. Mancera (2023) also highlighted the role of limited community and parental support in diminishing rural students' engagement in science subjects.

Teacher Quality and Teaching Methods: The quality of teachers and their teaching methods are central to student performance. Alade (2014) noted significant differences in learning outcomes between public and private school students in Lagos due to variations in teaching approaches and educator competency. Lai and Fong (2024) further reinforced that Chemistry education benefits when educators use comparative and innovative methodologies practices more common in urban settings where teacher recruitment is more competitive and resources for professional development are readily available. In contrast, rural schools face challenges such as teacher shortages, frequent transfers, and less exposure to modern pedagogical training (Adeyemi, 2005).

Student Motivation and Engagement: Student interest and psychological engagement also play crucial roles. Cano (2022) observed that urban students performed better in both traditional and online learning due to higher levels of motivation, access to academic networks, and exposure to career prospects in STEM. Akinodi (2020) and Mustapha et al. (2021) further observed that rural students often experience lower academic motivation stemming from poor learning environments, a lack of competitive academic

settings, and limited science mentorship opportunities. This contributes to lower achievement levels in Chemistry among rural learners.

Instructional Materials and Teaching Aids: Another significant factor is the availability and use of instructional materials. Obikezie et al. (2022) demonstrated that students taught with either standard or improvised instructional materials retained Chemistry concepts better than those taught with traditional methods alone. Unfortunately, access to such materials remains limited in many rural schools due to funding gaps and logistical barriers.

The disparities in Chemistry performance between rural and urban schools are not merely academic but are deeply entrenched in systemic inequalities. As supported by studies such as those by Oladejo et al. (2023), Olojo et al. (2022), and Idika (2017), closing this gap requires targeted interventions especially in rural areas such as improving school infrastructure, training and retaining qualified teachers, increasing access to instructional materials, and boosting students' motivation through mentoring and exposure to STEM career pathways.

Availability of Laboratory Facilities and Learning Resources in Chemistry

A critical determinant of student achievement in Chemistry is the availability and quality of laboratory facilities and instructional resources. Urban schools, often better funded and more closely monitored, tend to possess well-equipped laboratories that allow

for comprehensive hands-on experimentation. These laboratories are furnished with standard apparatuses, reagents, and safety measures, enabling students to engage in practical exercises that reinforce theoretical concepts and foster deeper learning.

In contrast, rural schools frequently face significant resource limitations. Many lack dedicated science laboratories, relying instead on makeshift setups or theoretical instruction without any practical component. According to Obikezie et al. (2022), the use of improvised or inadequate instructional materials in rural schools significantly impairs the delivery of science education, particularly in Chemistry. Students in such settings are unable to fully engage in experiments, which are essential for building procedural knowledge and improving retention of scientific principles.

Oladejo et al. (2023) and Olojo et al. (2022) also observed that the scarcity of practical resources in rural areas translates into poorer student outcomes in both internal assessments and national examinations like WAEC and NECO, where practical knowledge is tested. These challenges are compounded by irregular power supply, lack of laboratory technicians, and minimal budget allocations for science departments in many rural secondary schools.

Moreover, the presence of modern instructional aids such as multimedia tools, molecular models, and interactive simulations is more common in urban schools, further widening the performance gap. These resources not only simplify complex topics but also

cater to diverse learning styles, making Chemistry more accessible and engaging. Disparities in laboratory and instructional resource availability are a major contributor to the differences in Chemistry performance between rural and urban students. Bridging this divide will require strategic investments in science infrastructure, particularly in rural areas, and the provision of adequate learning materials to ensure all students have equal opportunities to excel in science education.

Qualification and Experience of Chemistry Teachers

The qualification and experience of Chemistry teachers significantly shape students' academic performance and interest in the subject. Studies have consistently highlighted disparities in the distribution of skilled science educators between rural and urban schools, contributing to the academic achievement gap in Chemistry. Urban schools are typically more successful in recruiting and retaining qualified and experienced Chemistry teachers due to favorable living conditions, career advancement opportunities, and access to professional development programs. As noted by Alade (2014) and Lai & Fong (2024), teachers in urban areas often possess strong academic credentials, deeper subject mastery, and are more likely to adopt innovative, learner-centered teaching approaches that enhance conceptual understanding. These teachers also benefit from exposure to continuous training and peer collaboration, allowing them to remain current with scientific advancements and pedagogical trends.

Obikezie et al., (2022) examined comparative effects of teaching with improvised instructional materials and standard instructional materials on secondary school students' academic retention in chemistry. It covered the topics; acids, bases and acid- base reactions. The study was carried out in Awka education zone in Anambra State. The population of the study consists of 8,583 SS1 Chemistry students in the zone. The sample size for the study comprised of 192 SS1 Chemistry students. The study adopted

quasiexperimental design. Four purposively selected co-educational schools were used for the study of which students of chemistry in two schools were assigned to experimental group which received treatment of involvement in teaching Chemistry using improvised instructional materials and the other two schools were assigned to control group which were taught using standard instructional materials. Twenty- five (25) Chemistry Retention Test (CRT) was used as the instrument. The instrument was validated by experts in science education department and education foundation (measurement and evaluation) CRT reliability was established using Kuder Richardson 20 (KR-20) which yielded reliability coefficient of 0.81. Mean and standard deviation were used to answer the research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at .05 level of significance. The findings of the study revealed that, there was high knowledge retention when Chemistry students were taught using improvisation instructional material than those taught with standard instructional material and gender has no influence on use of improvised instructional material and standard instructional material. Based on the findings of the study, recommendations were made.

In contrast, rural schools face persistent challenges in staffing qualified Chemistry teachers. Oladejo et al. (2023) and Mustapha et al. (2021) report that rural schools frequently rely on less experienced, underqualified teachers, and in some cases, individuals teaching outside their subject specialization. This mismatch between teacher

expertise and subject demands leads to ineffective instruction, minimal practical engagement, and lower academic outcomes. Many rural teachers lack access to refresher courses or mentorship, reducing their confidence in delivering Chemistry content accurately and engagingly.

The impact of this disparity is profound. According to Adeyemi (2005), teacher competence defined by both qualification and years of experience is one of the most critical determinants of students' academic achievement, especially in science subjects. In rural contexts, the lack of exposure to hands-on training and collaborative teaching communities further hampers the professional growth of science teachers, leaving them isolated and under-resourced.

Consequently, students in rural schools may receive instruction that is theory-heavy, outdated, and detached from practical application. This not only weakens students' grasp of key concepts but also diminishes their enthusiasm and confidence in pursuing science-related careers. The unequal distribution of qualified Chemistry teachers between rural and urban schools underscores the need for equitable education policies. Bridging this gap requires strategic interventions, such as offering rural teaching incentives, facilitating regular in-service training, and investing in mentorship programs that enhance teacher competency across all locations.

Summary of Literature

A comparative study of urban and rural undergraduate medical students revealed a significant difference in academic performance in pharmacology exams, with urban students generally performing better. While multiple-choice questions showed no significant difference, short essay questions did. Another study investigated underperformance in chemistry across Anglophone West African countries and found that school type and location significantly influenced students' perceptions of difficult concepts, with phobia for calculations noted as a major issue. An analysis of student attitudes toward chemistry at the introductory level showed no significant difference between urban and rural students, although attitudes were generally positive. A separate study in Ekiti State examined student performance across science subjects and found that students performed best in Chemistry, followed by Physics and Biology, though performance trends were inconsistent over time.

A performance comparison between fresh and carryover chemistry students revealed that fresh students consistently outperformed those retaking courses, highlighting the need for varied teaching strategies. In another study, students taught with improvised instructional materials retained knowledge better than those taught with standard materials, and gender had no effect on retention outcomes. Lastly, an investigation into chemistry students' learning style preferences in public and private schools indicated that visual learning was the most common style and significantly

correlated with academic performance. The study emphasized the importance of aligning teaching strategies with students' preferred learning styles to enhance academic achievement.

Despite numerous studies comparing academic performance based on school location, instructional materials, learning styles, and student demographics, there remains a gap in understanding the nuanced interplay between these factors particularly how they collectively influence students' academic achievement in Chemistry across different regions in Nigeria. Most existing research focuses on isolated variables such as gender, school type, or teaching methods, with limited exploration of how these elements intersect in rural versus urban settings. Additionally, while several studies have assessed performance outcomes and perceptions, few have investigated the long-term effects of these factors on the performance of students in chemistry, especially in the context of modern educational challenges like curriculum reforms, digital learning integration, and teacher preparedness. This calls for a more holistic and integrative approach in comparative study on chemistry students' performance taught in rural and urban areas in Egor Local Government Area of Edo State.

Chapter Three

Methodology

This chapter describes the method and procedure employed in carrying out the study under the following headings:

Design of the Study,

Population of the Study,

Sample and Sampling Techniques of the Study,

Instrument of Study,

Validity of the Study,

Reliability of the Study,

Method of Data Collection and

Method of Data Analysis

Design of the Study

The study adopted the descriptive survey research design. This design was adopted because the study sought to describe an already existing phenomenon:- comparative study on chemistry students' performance taught in rural and urban areas in Egor Local Government Area Of Edo State.

Population of Study

The population of the study will be made up of all the Senior Secondary School Students all the four thousand four hundred and ninety seven (4,497), which is made up 13 Senior Secondary schools in the Egor Local Government Area.

Sample and Sampling Techniques of the Study

The sample of the study consist of one hundred thirty (130) 3% of 4497 students drawn from five (5) randomly selected schools in Egor Local government Area. The students were selected through the use of purposive random sampling technique.

Instrument of the Study

The research instrument used in generating data for this study was questionnaires. The questionnaires which writes by the researcher herself was closed ended questions in which the respondents' will be expected answer yes or no (agree or disagree). The questionnaire was made up of two sections: (A&B). Section A consisted of questions on respondents, Biodata, and demographic information, while section B, will be drawn to cover the four (4) research questions raised to guide the study.

Validity of the Instrument

In order to ensure the validity of the instrument, the questionnaire will be given to the researcher's supervisor and two other experts in measurement and evaluation for scrutiny, suggestions and corrections. The corrections and suggestions made by them

were incorporated into the final draft of the instrument. This was done to be sure that the instrument will be validated both in face and content

Reliability of the Instrument

In order to establish the internal consistency of the instrument, the questionnaire was subjected to the split half reliability test. The instrument was administered to a group of thirty (30) respondents selected from the population of the study but who was not part of the sample of the study. After administration the responses was grouped into two groups of even and odd numbers. The data generated from both groups were compared with the use of Pearson product moment correlation coefficient test and coefficient of 0.56 was achieved meaning that the instrument was valid.

Method of Data Collection

Copies of the questionnaire were administered to the respondents after explaining the content and purpose of the instrument to them. The respondents will be given enough time to read through, understand and respond to the questions after which the questionnaires will be retrieved on the spot. This was done to reduce the mortality rate of the instrument.

Method of Data Analysis

The data generated from the administration of the instrument was analyzed with the use of descriptive statistics (frequency tables and percentages). The choice of this

method of analysis was predicated on the fact that the instrument used in generating the analyzed data was the yes or no (agree or disagree) type.

Chapter Four

Presentation and Analysis of Data

Introduction

The data presentation in this chapter is based on field surveys conducted in Egor Local Government Area of Edo State. The study used Secondary Schools in Egor Local Government Area of Edo State as a case study. The study examined "Comparative Study on Chemistry Students Performance Taught in Rural and Urban Areas in Egor Local Government Area of Edo State". A sample of 130 questionnaires was administered using convenience technique. One hundred thirty completed questionnaires were distributed and returned after being distributed throughout the survey.

Table 4.1 Demographic of Respondents

	Frequency	Percentage (%)
SS I	58	44.62
SS II	45	34.62
SS III	27	20.76
Total	130	100
Sex	Frequency	Percentage (%)
Male	78	60.00
Female	52	34.44
Total	130	100

Source: Field survey, 2025

The distribution of respondents by class shows that the majority of participants are in SS I, accounting for 44.62% of the total respondents. SS II students make up 34.62%, while SS III students constitute the smallest group at 20.76%. This distribution suggests that the

survey captured more students from the lower secondary classes, with participation decreasing as the class level increases. Regarding the sex of respondents, the survey indicates a higher representation of male students. Out of the 130 respondents, 78 (60%) are male, while 52 (34.44%) are female. This shows a noticeable gender imbalance, with male students forming the majority of the sample.

Analysis of Respondents Characteristics

Research Objective I: To find the significant difference in Chemistry students'

ITEM S/N	Rural and urban schools QUESTIONS	OPTION			
		SA	A	SD	D
1.	Students in urban schools generally perform better in Chemistry than those in rural schools.	49 (37.69%)	55 (42.31%)	13 (10%)	13 (10%)
2.	Rural students face more challenges that negatively affect their Chemistry results.	57 (43.85%)	38 (29.56%)	15 (11.54%)	20 (15.38%)
3.	Urban students have greater access to study support, which improves their Chemistry performance.	32 (24.62%)	70 (53.85%)	20 (15.38%)	8 (6.15%)
4.	Poor academic performance in Chemistry is more common among rural students.	67 (51.54%)	46 (35.38%)	10 (7.69%)	7 (5.38%)
5.	Differences in school location (urban/rural) significantly influence Chemistry achievement.	65 (50)	40 (30.77%)	15 (11.54%)	10 (7.69%)

academic performance between rural and urban schools.

Source: Field survey, 2025

The data presented in the table highlight the respondents' views on how school location affects students' performance in Chemistry. From the first item, a majority of the respondents agreed that students in urban schools generally perform better in Chemistry than those in rural schools, with 49 (37.69%) strongly agreeing and 55 (42.31%) agreeing, making a total of 80% in agreement. Only a small percentage (20%) disagreed or strongly disagreed. This suggests that respondents widely believe that urban students outperform their rural counterparts in Chemistry.

Similarly, for the second item, 57 respondents (43.85%) strongly agreed and 38 (29.56%) agreed that rural students face more challenges that negatively affect their Chemistry results. This indicates that most participants acknowledge the disadvantages rural students face, such as lack of resources, poor facilities, and limited exposure, which may hinder their academic performance. On the third statement, a large portion of respondents, 32 (24.62%) strongly agreed and 70 (53.85%) agreed, believed that urban students have greater access to study support, such as qualified teachers, better laboratories, and learning materials, which enhance their performance in Chemistry. Only 21.53% of respondents disagreed with this statement, further reinforcing the idea that urban environments provide more conducive learning conditions. In the fourth item, 67

respondents (51.54%) strongly agreed and 46 (35.38%) agreed that poor academic performance in Chemistry is more common among rural students. This strong consensus (nearly 87%) highlights a clear perceived disparity in performance levels between rural and urban students. Finally, in the fifth item, half of the respondents (50%) strongly agreed and 40 (30.77%) agreed that differences in school location significantly influence Chemistry achievement. Only a small percentage disagreed (11.54%) or strongly disagreed (7.69%).

Research Objective II: To examine the key factors influencing Chemistry performance in rural and urban schools.

ITEM	Key factors influencing Chemistry performance	OPTION			
S/N	QUESTIONS	SA	A	SD	D
1.	Lack of adequate textbooks negatively affects Chemistry performance in schools.	62 (47.69%)	43 (33.08%)	15 (11.54%)	10 (7.69%)
2.	Students' interest and motivation strongly influence their Chemistry performance.	46 (35.38%)	38 (29.23%)	26 (20%)	20 (15.38%)

3.	Parental support contributes significantly to students' achievement in Chemistry.	67 (44.45%)	50 (33.33%)	18 (12.22%)	15 (10%)
4.	Peer influence affects how well students perform in Chemistry.	57 (43.85%)	51 (38.46%)	17 (13.08%)	5 (3.85%)
5.	Poor classroom environment reduces students' ability to perform well in Chemistry.	87 (66.92%)	40 (30.77%)	3 (2.31%)	- -

Source: Field Survey, 2025

The data presented in the table reveal the major factors that affect students' performance in Chemistry across rural and urban schools. From the first item, a significant number of respondents agreed that a lack of adequate textbooks negatively affects Chemistry performance. Out of the total respondents, 62 (47.69%) strongly agreed and 43 (33.08%) agreed, totaling 80.77% in agreement. Only a small percentage (19.23%) disagreed or strongly disagreed. This indicates that inadequate access to relevant textbooks is a major challenge limiting students' academic success in Chemistry.

In the second item, 46 respondents (35.38%) strongly agreed and 38 (29.23%) agreed that students' interest and motivation strongly influence their performance in Chemistry. However, 26 (20%) strongly disagreed and 20 (15.38%) disagreed, showing that while most respondents recognize motivation as a crucial factor, a smaller proportion believe that external factors may play a stronger role. Nonetheless, the majority opinion

emphasizes that a student's personal drive and enthusiasm are vital to their success in Chemistry.

The third item shows that 67 respondents (44.45%) strongly agreed and 50 (33.33%) agreed that parental support contributes significantly to students' achievement in Chemistry. Only a small fraction disagreed (22.22% combined). This finding implies that parental involvement such as providing learning materials, encouragement, and a supportive home environment positively influences students' academic performance.

In the fourth statement, 57 respondents (43.85%) strongly agreed and 51 (38.46%) agreed that peer influence affects how well students perform in Chemistry. This suggests that the attitudes, habits, and study behaviors of peers play an important role in shaping students' academic outcomes. Positive peer influence can motivate students to study harder, while negative influence may discourage effective learning. Consequently, in the fifth item, the majority of respondents, 87 (66.92%) strongly agreed and 40 (30.77%) agreed, believed that a poor classroom environment reduces students' ability to perform well in Chemistry. Only a few respondents (2.31%) strongly disagreed, while none disagreed. This overwhelming response (97.69% agreement) highlights the critical importance of having a conducive learning environment such as well-equipped laboratories, adequate ventilation, and proper lighting for effective Chemistry learning.

Research Objective III: To evaluate the differences in the availability of laboratory facilities and learning resources.

ITEM	Differences in the availability of laboratory facilities	OPTION			
S/N	ITEMS	SA	A	SD	D
1.	Urban schools have better Chemistry laboratory facilities than rural schools.	70 (53.85%)	45 (34.62%)	5 (3.85%)	10 (7.69%)
2.	Lack of laboratory facilities limits students' understanding of Chemistry concepts.	72 (55.38%)	50 (38.46%)	3 (2.31%)	5 (3.85%)
3.	The availability of modern instructional materials improves Chemistry performance.	45 (34.62%)	65 (50%)	13 (10%)	7 (5.38%)
4.	Rural schools are disadvantaged due to inadequate laboratory equipment.	80 (61.54%)	42 (32.31%)	5 (3.85%)	3 (2.31%)
5.	Access to functional laboratories enhances students' interest and performance in Chemistry.	77 (59.23%)	43 (33.08%)	5 (3.89%)	5 (3.89%)

Source: Field Survey, 2025

The data presented in the table highlight respondents' views on the differences in the availability of laboratory facilities and learning resources between rural and urban schools. From the first item, a large number of respondents agreed that urban schools have better Chemistry laboratory facilities than rural schools. Specifically, 70 (53.85%) strongly agreed and 45 (34.62%) agreed, giving a total of 88.47% in agreement, while

only 11.54% disagreed or strongly disagreed. This suggests that most respondents perceive a clear disparity in laboratory facilities, with urban schools being better equipped than rural ones.

In the second item, 72 respondents (55.38%) strongly agreed and 50 (38.46%) agreed that a lack of laboratory facilities limits students' understanding of Chemistry concepts. Only a small minority (6.16%) disagreed. This strong consensus indicates that practical learning environments play a crucial role in helping students grasp Chemistry concepts effectively, and their absence can significantly hinder comprehension.

The third item reveals that 45 respondents (34.62%) strongly agreed and 65 (50%) agreed that the availability of modern instructional materials improves Chemistry performance. This means that 84.62% of respondents believe access to up-to-date teaching aids such as multimedia tools, demonstration kits, and laboratory apparatus enhances students' learning and overall achievement in Chemistry.

Similarly, the fourth item shows that 80 respondents (61.54%) strongly agreed and 42 (32.31%) agreed that rural schools are disadvantaged due to inadequate laboratory equipment. Only 6.16% disagreed or strongly disagreed. This reflects a strong perception that rural schools lack the necessary laboratory infrastructure, putting their students at a disadvantage compared to those in urban settings.

However, in the fifth item, 77 respondents (59.23%) strongly agreed and 43 (33.08%) agreed that access to functional laboratories enhances students' interest and performance in Chemistry. A minimal number (7.78%) disagreed or strongly disagreed. This overwhelming agreement (92.31%) emphasizes the positive impact of hands-on learning experiences on student engagement and academic performance.

Research Objective IV: To determine the difference in the qualification and experience of Chemistry teachers.

ITEM	Difference in the qualification and experience of Chemistry teachers	OPTION			
S/N	ITEMS	SA	A	SD	D
1.	Teachers in urban schools are generally more qualified in Chemistry than those in rural schools.	58 (44.62%)	37 (28.46%)	13 (10%)	22 (16.92%)
2.	Experienced Chemistry teachers are more concentrated in urban schools than in rural areas.	47 (36.15%)	63 (48.46%)	11 (8.46%)	9 (6.92%)
3.	Rural schools often employ less qualified teachers to handle Chemistry.	45 (34.62%)	67 (51.54%)	12 (9.23%)	6 (4.62%).
4.	The level of teacher training significantly influences students' Chemistry performance.	80 (61.54%)	42 (32.31%)	5 (3.85%)	3 (2.31%)
5.	Teacher shortages in rural schools negatively affect students' Chemistry achievement.	74 (49.33%)	42 (32.31%)	2 (1.54%)	2 (1.54%).

Source: Field Survey, 2025

The data presented in the table examine respondents' opinions regarding the qualification and experience of Chemistry teachers in both rural and urban schools. From the first item, a majority of the respondents agreed that teachers in urban schools are generally more qualified in Chemistry than those in rural schools. Specifically, 58 (44.62%) strongly agreed and 37 (28.46%) agreed, making a total of 73.08% in agreement, while 16.92% disagreed and 10% strongly disagreed. This indicates that most respondents perceive a significant difference in teacher qualifications, with urban schools having a higher concentration of well-trained Chemistry teachers.

In the second item, 47 respondents (36.15%) strongly agreed and 63 (48.46%) agreed that experienced Chemistry teachers are more concentrated in urban schools than in rural areas. Only 15.38% disagreed or strongly disagreed. This shows a clear consensus that teaching experience a vital factor in effective instruction is more common among teachers in urban settings, possibly due to better incentives, access to professional development, and improved working conditions.

The third item also supports this trend. A majority of respondents, 45 (34.62%) strongly agreed and 67 (51.54%) agreed, that rural schools often employ less qualified teachers to handle Chemistry. Only a small percentage (13.85%) disagreed or strongly disagreed. This suggests that rural schools may face recruitment challenges, resulting in the

employment of teachers with limited subject specialization or insufficient professional training in Chemistry.

In the fourth item, 80 respondents (61.54%) strongly agreed and 42 (32.31%) agreed that the level of teacher training significantly influences students' Chemistry performance. With only 6.16% disagreeing, this overwhelming response underscores the critical importance of teacher competence in achieving positive learning outcomes. Well-trained and knowledgeable teachers are better equipped to use effective instructional strategies, conduct practical lessons, and motivate students toward academic excellence.

Consequently, in the fifth item, 74 respondents (49.33%) strongly agreed and 42 (32.31%) agreed that teacher shortages in rural schools negatively affect students' Chemistry achievement. Only a very small fraction (3.08%) disagreed or strongly disagreed. This suggests that the shortage of qualified teachers in rural areas is a major barrier to effective Chemistry teaching and learning, as it can lead to overcrowded classes, reduced individual attention, and poor student performance.

Discussion of Findings

The result revealed a significant difference in academic performance between rural and urban Chemistry students, with urban students seen as performing better due to greater access to educational resources and support systems, while rural students are perceived to face more challenges that negatively impact their performance. The findings from this study align with the observations of Idika (2017) and Oladejo et al. (2023), who established that students in urban schools consistently outperform their rural counterparts in Chemistry due to better access to learning facilities and qualified teachers. This result is further corroborated by Akinodi (2020), who argued that disparities in educational resources between rural and urban schools significantly influence students' academic performance in science subjects. Similarly, Mancera (2023) confirmed that rural students face numerous challenges such as inadequate laboratories, limited instructional materials, and insufficient teacher support, all of which hinder their learning outcomes. The present findings are also consistent with Adeyemi (2005), who asserted that teacher quality and experience, which are more prevalent in urban areas, have a direct positive impact on students' achievement.

Secondly, the findings indicate that several interrelated factors influence students' performance in Chemistry in both rural and urban schools. These include the availability of textbooks, students' motivation, parental support, peer influence, and the quality of the

classroom environment. Among these, the learning environment and access to instructional materials appear to have the strongest impact on students' Chemistry performance. The findings of this study affirmed with the conclusions of Akinodi (2020) and Obikezie et al. (2022), who established that inadequate instructional materials such as textbooks and laboratory equipment significantly hinder students' performance in science subjects. The influence of students' motivation and interest observed in this study is corroborated by Alade (2014), who argued that learners' enthusiasm and engagement with Chemistry concepts strongly determine their level of academic achievement. Similarly, the role of parental support in enhancing academic success is confirmed by Adeyemi (2005), who emphasized that home encouragement and resource provision positively affect students' learning outcomes. Furthermore, the effect of peer influence and the classroom environment on academic performance is consistent with the findings of Oladejo et al. (2023) and Mancera (2023), who reported that collaborative learning, adequate classroom facilities, and positive peer interactions foster better comprehension and retention in Chemistry.

Thirdly, the findings showed that improving laboratory infrastructure and learning resources especially in rural schools is essential for enhancing students' achievement and interest in the subject. This finding corroborates with those of Akinodi (2020) and Obikezie et al. (2022), who argued that access to adequate laboratory facilities and

instructional materials greatly enhances students' comprehension and performance in Chemistry. This result is further corroborated by Mustapha, Omwirhiren, and Madaki (2021), who confirmed that the lack of laboratory equipment in rural schools limits students' understanding of abstract scientific concepts, thereby widening the performance gap between rural and urban learners. Similarly, Oladejo et al. (2023) found that school location significantly affects the quality of science instruction, as urban schools are generally better equipped with modern facilities that promote effective teaching and learning. The present findings are also consistent with Mancera (2023), who reported that hands-on laboratory experiences increase students' motivation and engagement, ultimately leading to improved achievement in science subjects. Overall, the study confirms that disparities in laboratory facilities and learning resources between rural and urban schools play a crucial role in shaping students' performance in Chemistry, with urban schools having a clear advantage due to better infrastructure and access to instructional materials.

Fourthly, the finding indicated that improving teacher recruitment, training, and retention in rural schools is essential to bridge the educational gap and enhance the overall quality of Chemistry education. The findings of this study are consistent with those of Adeyemi (2005), who established that teachers' qualifications and years of teaching experience have a significant impact on students' academic achievement. This

result is further supported by Mancera (2023) and Oladejo et al. (2023), who argued that experienced and well-trained teachers are more prevalent in urban schools due to better professional development opportunities, improved facilities, and favorable working conditions. Similarly, Akinodi (2020) corroborated that rural schools often face shortages of qualified science teachers, which adversely affects students' academic performance in subjects like Chemistry. The findings also align with Mustapha, Omwirhiren, and Madaki (2021), who confirmed that teacher expertise and content mastery contribute significantly to effective classroom delivery and improved student outcomes. Overall, this study confirms that disparities in teacher qualification and experience between rural and urban schools play a decisive role in determining students' academic performance in Chemistry, with urban schools benefiting from more competent and experienced educators.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter introduces the comparative study of Chemistry students' performance in rural and urban secondary schools within Egor Local Government Area (LGA) of Edo State. It outlines the research problem, objectives, and significance of the study, emphasizing the disparities in educational resources and outcomes between rural and urban schools. The chapter also presents the research questions and hypotheses guiding the investigation.

The literature review examines existing studies on factors influencing Chemistry students' performance, focusing on the availability of instructional materials, teacher qualifications, school infrastructure, and socio-economic factors. It highlights findings from various regions, noting that urban schools often have better resources and facilities, leading to improved student performance. Conversely, rural schools face challenges such as inadequate facilities and limited access to qualified teachers, negatively impacting student outcomes.

This chapter details the research design, population, sampling techniques, and instruments used for data collection. A descriptive survey research design was employed, targeting Chemistry students and teachers in Egor LGA. The study utilized questionnaires

to gather data on factors affecting Chemistry performance, including the availability of instructional materials, teacher qualifications, and school facilities.

The findings reveal significant differences in Chemistry students' performance between rural and urban schools in Egor LGA. Urban schools generally outperform their rural counterparts due to better access to instructional materials, qualified teachers, and conducive learning environments. The study underscores the importance of addressing resource disparities to enhance Chemistry education in rural schools. The study concludes that the location of schools significantly influences Chemistry students' academic performance. It recommends that educational authorities prioritize resource allocation to rural schools, improve teacher training programs, and enhance school infrastructures to bridge the performance gap between rural and urban schools in Egor LGA.

Summary of Findings

The study investigated the comparative study on chemistry students' performance taught in rural and urban areas in Egor Local Government Area of Edo State, key influencing factors, availability of resources, and teacher qualifications between rural and urban schools. The findings indicate a significant difference in Chemistry performance between rural and urban students. The majority of respondents agreed that students in urban schools generally perform better, have greater access to study support, and face fewer academic challenges compared to rural students. Conversely, rural students were

perceived to face more challenges and are more likely to perform poorly in Chemistry. Overall, respondents believe that school location strongly influences students' Chemistry achievement. These findings align with previous studies by (Faisal et al., 2016; Idika, 2017; Oladejo et al., 2023) highlighting disparities in academic outcomes due to school location.

Respondents identified key factors influencing Chemistry performance. Inadequate textbooks, low student motivation, lack of parental support, peer influence, and poor classroom environments were recognized as major determinants of academic outcomes. A substantial majority emphasized the critical role of a conducive learning environment, parental involvement, and student motivation. These results corroborate studies such as (Akinnodei, 2020; Alade, 2014; Mancera, 2023) that highlight the impact of educational resources and learner engagement on academic success.

The availability of laboratory facilities and learning resources was found to differ significantly between rural and urban schools. Respondents overwhelmingly agreed that urban schools are better equipped with laboratories and modern instructional materials, while rural schools are disadvantaged. Access to functional laboratories was strongly linked to improved student interest and performance. This confirms previous research of (Akinnodei, 2020; Obikezie et al., 2022; Olojo et al., 2022) indicating that well-equipped laboratories and teaching resources enhance practical learning and academic achievement

Differences in teacher qualifications and experience also influence Chemistry performance. Respondents reported that urban schools employ more qualified and experienced teachers, whereas rural schools often rely on less qualified teachers, and teacher shortages are prevalent. Teacher training and experience were perceived as critical to effective instruction and student performance. These findings are consistent with previous studies such as (Adeyemi, 2005; Mustapha, Omwirhiren & Madaki, 2021; Mancera, 2023) emphasizing the positive relationship between teacher competence and student outcomes.

Across all four objectives, the findings consistently indicate that urban schools have advantages over rural schools in terms of student performance, access to resources, and teacher quality. Rural students face multiple challenges including inadequate facilities, limited study support, and teacher shortages that hinder their achievement in Chemistry. The study underscores the critical role of school location, resource availability, and teacher competence in determining student academic outcomes.

Conclusion

The study concludes that there is a significant difference in Chemistry students' performance between rural and urban schools in Egor LGA. Urban students generally outperform their rural counterparts due to better access to qualified teachers, well-equipped laboratories, modern instructional materials, and a more conducive learning

environment. Rural students face multiple challenges, including inadequate textbooks, limited parental and peer support, poor classroom environments, and shortages of experienced Chemistry teachers, all of which negatively affect their academic achievement. The findings confirm that school location is a major determinant of student performance in Chemistry, highlighting disparities in educational resources and support systems between rural and urban areas.

Recommendations

Based on the findings of this study, the following recommendations are proposed to address the disparities in Chemistry students' performance between rural and urban schools in Egor Local Government Area of Edo State.

1. Educational authorities should prioritize upgrading laboratory facilities, classrooms, and instructional materials in rural schools to provide a more conducive learning environment.
2. There should be strategic deployment of qualified and experienced Chemistry teachers to rural schools, along with regular professional development programs to enhance instructional quality.
3. Adequate textbooks, modern teaching aids, and laboratory equipment should be made available to rural schools to reduce the resource gap. Efforts should be made to

involve parents and communities in supporting students' learning through motivation, provision of study materials, and encouragement of academic pursuits.

4. Establish mentorship and peer-support initiatives to positively influence student motivation, study habits, and academic engagement in Chemistry.

Contributions to Knowledge

This study provides valuable insights into the factors influencing Chemistry students' performance in rural and urban schools, thereby contributing to the existing body of knowledge on educational disparities and resource allocation in Edo State.

1. The study provides empirical evidence confirming that school location significantly affects Chemistry students' academic performance in Egor LGA.
2. It identifies key factors such as laboratory facilities, instructional resources, teacher qualification and experience, classroom environment, and student motivation that influence performance in both rural and urban settings.
3. The research offers a localized perspective on educational inequalities, emphasizing the specific challenges faced by rural schools in Edo State.
4. It highlights the critical role of teacher quality and training in enhancing students' Chemistry performance, providing a framework for targeted educational interventions.

Suggestions for Further Studies

Based on the findings and limitations of this study, further research is recommended to explore additional factors affecting Chemistry students' performance and to extend the investigation to other regions and educational levels.

1. Future research could explore the impact of socio-economic status of students' families on Chemistry performance in rural and urban schools.
2. Comparative studies could be conducted across multiple LGAs or states to generalize findings and examine regional disparities in Chemistry education.
3. Longitudinal studies could investigate the effect of interventions, such as improved laboratory facilities and teacher training, on students' performance over time.
4. Further research could examine the influence of digital learning resources and online platforms on Chemistry performance in rural and urban schools.

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APPENDIX

**DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY
FACULTY OF EDUCATION
UNIVERSITY OF BENIN
BENIN CITY**

QUESTIONNAIRE

I am a 400 level student of the above Department conducting a research on “Comparative Study on Chemistry Students Performance Taught in Rural and Urban Areas in Egor Local Government Area of Edo State”. I request that you provide me reliable and accurate information as relevant policy decisions is dependent on the information given.

I promise to keep whatever information given as strictly confidential. Please tick [√] in the appropriate box that suite your response, thanks.

RESEARCHER

SECTION: A

Gender: Male [], Female [].

Class: SS 1 [], SS II [], SS III [].

SECTION: B

QUESTIONNAIRE ITEMS

Instruction: Please tick (✓) under the column in the option that suits you best.

Where: Strongly Agree SA [], Agree A [], Disagree D [], Strongly Disagree SD [].

SECTION 1

Items S/N	To find the significant difference in Chemistry students' academic performance between rural and urban schools Questions	Responses			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Students in urban schools generally perform better in Chemistry than those in rural schools.				
2.	Rural students face more challenges that negatively affect their Chemistry results.				
3.	Urban students have greater access to study support, which improves their Chemistry performance.				
4.	Poor academic performance in Chemistry is more common among rural students.				
5.	Differences in school location (urban/rural) significantly influence Chemistry achievement.				

SECTION 2

Items S/N	To examine the key factors influencing Chemistry performance in rural and urban schools Questions	Responses			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Lack of adequate textbooks negatively affects Chemistry performance in schools.				
2.	Students' interest and motivation strongly influence their Chemistry performance.				
3.	Parental support contributes significantly to students' achievement in Chemistry.				
4.	Peer influence affects how well students perform in Chemistry.				
5.	Poor classroom environment reduces students' ability to perform well in Chemistry.				

SECTION 3

Items S/N	To evaluate the differences in the availability of laboratory facilities and learning resources Questions	Responses			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Urban schools have better Chemistry laboratory facilities than rural schools.				
2.	Lack of laboratory facilities limits students' understanding of Chemistry concepts.				
3.	The availability of modern instructional materials improves Chemistry performance.				
4.	Rural schools are disadvantaged due to inadequate laboratory equipment.				
5.	Access to functional laboratories enhances students' interest and performance in Chemistry.				

SECTION 4

Items S/N	To determine the difference in the qualification and experience of Chemistry teachers Questions	Responses			
		Strongl y Agree	Agree	Disagree	Strongly Disagree
1.	Teachers in urban schools are generally more qualified in Chemistry than those in rural schools.				
2.	Experienced Chemistry teachers are more concentrated in urban schools than in rural areas.				
3.	Rural schools often employ less qualified teachers to handle Chemistry.				
4.	The level of teacher training significantly influences students' Chemistry performance.				
5.	Teacher shortages in rural schools negatively affect students' Chemistry achievement.				