

**AN ANALYSIS OF TEACHERS' VARIABLES AND STUDENTS' ACADEMIC
PERFORMANCE IN PUBLIC SENIOR SECONDARY SCHOOLS IN EGOR
LOCAL GOVERNMENT AREA IN EDO STATE, BENIN CITY.**

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

DECEMBER, 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
REQUIREMENTS FOR THE AWARD OF A BACHELOR OF SCIENCE (ED)
DEGREE IN EDUCATION BIOLOGY**

DECEMBER, 2025

CERTIFICATION

We, the undersigned, certify that this research work was carried out by JIMOH OLAMILEKAN ISMAILA with the Matriculation number EDU2102021 ,in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City in partial fulfillment of the requirements for the award of a Bachelor of Science(Ed) Degree in Biology.

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DEDICATION

This research work is dedicated to God Almighty for being the source of grace, strength and provisions received throughout the academic pursuits, to the successful completion of this project.

This research work is also dedicated to my beloved father, Late Mr Jimoh Akadri.

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ABSTRACT

This study examined the influence of teachers' variables on students' academic performance in Biology in public senior secondary schools in Egor Local Government Area of Edo State. The study specifically investigated how teachers' qualifications, teaching experience, instructional methodologies, and attitudes affect students' achievement in Biology.

A descriptive survey design was adopted, and data were collected using a structured questionnaire administered to a sample of 30 Biology teachers across 12 public senior secondary schools. The data were analyzed using frequency counts and simple percentages.

The study concludes that teacher-related variables are critical predictors of Biology achievement and recommends improved teacher training, motivation, instructional resources, and professional development to enhance the quality of Biology education in the study area.

CHAPTER ONE

INTRODUCTION

Background to the Study

Education is a fundamental driver of national development, and the quality of teaching significantly influences students' learning outcomes (World Bank, 2018).

In Nigeria, secondary education serves as a critical bridge between basic education and tertiary institutions, equipping students with essential knowledge and skills for future careers. In senior secondary schools, subjects like Biology form the foundation for scientific literacy and career paths in fields such as medicine, agriculture, and environmental science, the academic performance of students in senior secondary schools has been a persistent concern, with national examinations such as the West African Senior School Certificate Examination (WASSCE) and the National Examination Council (NECO) revealing alarmingly low pass rates in key subjects like Mathematics, English, and the Sciences (WAEC, 2023).

The effectiveness of teaching and learning in these subjects often hinges on teachers' variables, which include their qualifications, years of experience, teaching methodologies, attitudes, and personal characteristics (Okebukola, 2015). These variables influence how well students grasp complex Biological concepts like cell division, ecosystems, or genetics, ultimately affecting their performance in examinations such as the West African Senior School Certificate Examination (WASSCE).

In Nigeria, disparities in teacher quality exist between urban and rural schools, with rural institutions often suffering from a shortage of qualified educators (Uche, 2018). Many teachers in these areas are either underqualified or teach subjects outside their specialization, leading to poor instructional delivery (Federal Ministry of Education, 2020).

The Nigeria education system faces numerous challenges, including inadequate teacher training, resource constraints, and large class sizes, particularly in public secondary schools (Obadara, 2014). In Edo State, where this study is situated, these issues are evident in urban centers like Benin City and rural areas alike. For instance, a study by Adeyemi (2017) in Ondo State found that teachers' qualifications and experience significantly correlated with students' performance in science subjects, suggesting a similar pattern may exist in Edo State. Biology, as a core science subject, requires teachers to employ engaging methods, such as practical demonstrations and inquiry-based learning, to enhance student understanding. Anecdotal evidence from schools in Benin City indicates that many Biology teachers rely on traditional lecture methods, which may not adequately address students' learning needs (Eze, 2020).

The role of teachers' variables in shaping academic outcomes cannot be overstated. For example, a teacher with a Bachelor's degree in Biology Education (B.Sc. Ed.) and extensive experience is likely to be more effective in delivering content than an unqualified instructor. Similarly, a positive teacher attitude fosters a conducive learning environment, while negative attitudes may demotivate students (Olatunde, 2019). Given

the persistent gap in students' performance in Biology in Nigerian secondary schools, understanding how these variables impact academic success is crucial for educational reform and policy development in Edo State and beyond.

The declining academic performance of students in Biology at the senior secondary school level in Nigeria has raised concerns among educators, policymakers, and parents. According to the West African Examinations Council (WAEC) reports, the percentage of students achieving credit passes (A1-C6) in Biology in Edo State has fluctuated, with only 45% of candidates attaining this level in the 2023 WASSCE (WAEC, 2023). This trend suggests systemic issues in the teaching and learning process, particularly in public schools where resources are limited and teacher quality varies.

Several factors contribute to this problem, but teachers' variables appear to be a critical determinant. Many secondary schools in Edo State employ teachers with inadequate qualifications, such as non-education degrees or temporary certifications, which may limit their ability to teach Biology effectively (Akinfe, 2018). Inexperienced teachers often struggle to manage large classes or adopt innovative teaching strategies, such as practical experiments, which are essential for Biology education (Ogunleye, 2021). Teachers' attitudes which refers to the way teachers think, feel, and behave towards their students, their subject (Biology), and the teaching profession, including lack of motivation or poor interpersonal skills, further exacerbate the issue, leading to disengaged students and suboptimal academic outcomes (Eze, 2020).

While studies in other Nigerian states, such as Osun and Taraba, have linked teachers' variables to student performance in subjects like Mathematics and English (Olatunde, 2019; Adeyemi, 2017), there is a paucity of research specific to Biology in Edo State. This gap underscores the need to investigate how teachers' qualifications, experience, teaching methods, and attitudes impact students' academic performance in Biology among public Senior Secondary Schools in Egor Local Government Area, Benin City. Without addressing these variables, efforts to improve educational outcomes in Nigeria may remain ineffective.

This study focuses on Senior Secondary Schools analyzing how teachers' variables influence Students' academic performance in Biology.

By exploring these relationships, the study aims to provide insights that can inform teacher training programs, curriculum design, and educational policies in Nigeria's Secondary education system.

Statement of the Problem

Ideally, teachers are expected to possess the right qualifications, adequate teaching experience, positive attitudes, and effective instructional methods to promote meaningful learning and high academic performance in students, especially in core science subjects like Biology. When teachers demonstrate professionalism, motivation, and competence, students are more likely to perform well in both internal and external examinations.

However, the reality in many Nigerian secondary schools particularly in Benin City is quite different. Some teachers lack the required qualifications or adequate experience,

while others show poor attitudes towards students, use ineffective teaching methods, or fail to create an engaging classroom environment. In some cases, teacher motivation is low due to poor remuneration and limited professional development opportunities.

These problems contribute to persistent poor performance of students in external examinations such as WAEC and NECO, where Biology consistently records high failure rates. The consequences of this trend include reduced chances of students gaining admission into science-related courses in tertiary institutions, loss of interest and motivation in science education, and a negative impact on the country's long-term development in science and technology.

To address these challenges, there is a need for targeted interventions such as strengthening teacher training programs, enforcing minimum qualification standards, providing continuous professional development, and promoting positive teacher-student relationships. Analyzing the relationship between teachers' variables and students' academic performance in Biology will provide evidence-based recommendations to guide such interventions.

Research Questions

The following research questions were raised to guide the Study:

1. To what extent does teachers' qualifications influence students' academic performance in Biology in Senior Secondary Schools in Benin City?
2. To what extent does teachers' years of teaching experience affect Students' academic performance in Biology?

3. What are the impact of teachers' methodologies on students' academic performance in Biology?
4. How does teachers' attitudes and personal characteristics influence students' academic performance in Biology?

Purpose of the Study

The primary purpose of this study is to examine the influence of teachers' variables on Students' academic performance in Biology among Senior Secondary Schools in Benin City. The study specifically seeks to:

1. determine the extent of teachers' qualifications influence on Students' academic performance in Senior Secondary School in Benin City.
2. determine the extent of teachers' years of teaching experience on Students' academic performance in Biology.
3. determine the impact of teaching methodologies on Students' academic performance in Biology.
4. investigate teachers' attitudes and personal characteristics influence on Students' academic performance in Biology.

Significance of the Study

The study is of great significance to the following; school administrators, policy Makers, government agencies, teachers, students, parents and researchers.

School Administrators and Education Planners: The findings of this study will assist school administrators in making informed decisions about teacher recruitment,

supervision, and professional development to improve teacher deployment, ensuring that qualified and experienced teachers are assigned to critical subjects like Biology.

The findings of this study can guide Policy makers and government agencies on the National Policy on Education (NPE) and State-level educational reforms in teacher recruitment, training, and retention strategies.

The findings of this study will benefit teachers and encourage self assessment among teachers, prompting them to reflect on how their qualifications, attitudes, and teaching methodologies impact students' learning outcomes, thereby encouraging self-improvement and professional growth.

The findings of this study will improve teacher effectiveness to directly benefit students' learning experiences and performances, leading to better comprehension, retention, and examination performances.

Parents will gain awareness of how teacher quality impacts their children's education, empowering them to demand better standards from schools and policymakers. The study may encourage parent-teacher collaborations, fostering a supportive learning environment at home and in school.

The findings of this study will add to the existing body of knowledge for Academic Researchers and also as a reference material for future studies on teacher-related factors affecting students performance in Biology particularly in Edo State, Benin City.

Scope and Delimitation of the Study

This study is focused on analyzing teachers' variables and their impact on students' academic performance in Senior Secondary Schools. Specifically, the research will be conducted among Biology teachers in selected public Senior Secondary Schools in Egor Local Government Area, Benin City, concentrated on teacher-related factors such as academic qualifications, teaching experience, gender, teaching methodologies, and attitude toward students.

The study is delimited to public Senior Secondary Schools in Egor Local Government Area due to accessibility, uniform curriculum, and government regulation of staff recruitment.

Definition of Terms

The following terms were operationally defined:

- Teachers' Variables: Attributes of teachers, including qualifications, teaching experience, teaching methodologies, and attitudes.
- Academic Performance: Students' scores in Biology examinations and continuous assessments.
- Senior Secondary School: The three-year educational level (SS1-SS3).
- Biology Education: The teaching and learning of Biology concepts.
- Teaching Methods: Instructional strategies employed by teachers.
- Motivation: Teachers' job satisfaction, incentives, and morale in the teaching profession.

- NUT: Nigeria Union of Teachers.
- ASUSS: Academic Staff Union of Secondary Schools.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviews literature on teachers' variables and their impact on students' academic performance. The review of related literature was carried out under the following subheadings:

- Theoretical Framework
- Concept of Biology education.
- Concept of Teachers' Variables
- Concept of Students' Academic Performance
- Teachers' Qualification and Students' Academic Performance
- Teachers' Experience and Students' Academic Performance
- Teachers' Attitude and Students' Academic Performance
- Teachers' Teaching Methods and Students' Academic Performance
- Summary of Review Literature

Theoretical Framework

This study is anchored on the Human Capital Theory, years of experience, attitudes toward teaching, and instructional methods form the foundation upon which effective teaching and learning are built.

Human Capital Theory posits that individuals who acquire more education, professional certification, and work-related experience become more competent and productive in their roles. Applied to the teaching profession, the theory suggests that teachers who are

professionally qualified, adequately experienced, and positively motivated are more likely to deliver high quality instruction, use appropriate teaching methodologies, manage classrooms effectively, and ultimately facilitate better student learning outcomes. This is particularly true in specialized and practical-oriented subjects like Biology, where teacher competence significantly influences students' understanding of scientific concepts, laboratory skills, and examination performance.

Conversely, when teachers lack the necessary academic qualifications, professional training, or emotional commitment to the teaching profession, their instructional output becomes limited. Poor attitudes such as absenteeism, lack of enthusiasm, inadequate preparation, or ineffective communication can hinder the learning process and negatively affect students' performance. Similarly, teachers who rely solely on outdated lecture methods or avoid practical activities due to lack of skills or confidence may impede students' mastery of essential Biology concepts. In Nigeria, the persistent low performance of students in Biology at the Senior Secondary School level as reported in WAEC and NECO examinations has frequently been attributed to deficiencies in these teacher-related variables.

The Human Capital Theory is therefore highly relevant to this study, as it underscores the critical role of teachers in determining students' academic achievement. It emphasizes that improving the quality of Biology education requires sustained investment in teacher education, continuous professional development, in-service training, motivation, and supportive work environments.

In the context of Egor Local Government Area, Benin City, where schools vary significantly in teacher quality, access to resources, and class size, the theory provides a useful lens for explaining differences in student performance. By understanding how teacher qualifications, experience, methodologies, and attitudes influence academic outcomes, this study aligns with the Human Capital Theory's assertion that the quality of teachers' input directly affects educational output of student performance.

Concept of Biology Education

Biology is the scientific study of living organisms and their interactions with the environment. It encompasses the structure, function, growth, evolution, distribution, and classification of all forms of life. As a natural science, Biology helps learners understand the fundamental processes that sustain life, including nutrition, respiration, reproduction, adaptation, and ecological relationships.

In the Nigerian context, Biology occupies a central position in the Senior Secondary School curriculum as outlined by the Nigerian Educational Research and Development Council (NERDC, 2013). It is classified as a core science subject and serves as a gateway to a wide range of science-related disciplines such as medicine, pharmacy, nursing, biotechnology, microbiology, agriculture, food science, environmental science, and other applied sciences.

Biology as a foundational subject to many professional fields, success in the subject is crucial for students aspiring to pursue careers in the health and life sciences. As such, the role of Biology in the national curriculum and development cannot be overstated, since it

contributes to technological advancement, medical innovation, environmental sustainability, and agricultural improvement. It also equips students with scientific literacy and problem-solving skills necessary for daily life and informed decision-making.

Relevance of Biology to Education

Biology plays a crucial role in education, particularly at the Senior Secondary School level, due to the following reasons:

Preparation for Science-Related Careers

Biology serves as a prerequisite for numerous professional fields such as medicine, nursing, pharmacy, agriculture, biochemistry, public health, and environmental management. Students who excel in Biology have enhanced academic pathways to these careers.

Development of Scientific Literacy

Biology equips learners with the ability to observe, analyze, experiment, and interpret scientific information. These skills contribute to informed decision-making in health, diet, hygiene, disease prevention, and environmental conservation.

Contribution to National Development

As a science discipline, Biology supports national development goals in agriculture, food security, healthcare, biotechnology, and conservation. Producing students with strong biological knowledge helps address issues like food production, disease control, and environmental degradation.

Promotion of Critical Thinking and Problem-Solving

The investigative nature of Biology encourages inquiry-based learning and enhances students' ability to think critically, formulate hypotheses, and draw conclusions from evidence. These skills are essential for higher education and research.

Understanding of Life Processes and Human Health

Biology helps students understand how their bodies function, how diseases spread, and how to maintain healthy lifestyles. This knowledge improves public health awareness and community wellbeing.

Cultivation of Environmental Awareness

Through Biology, students learn the importance of environmental protection, biodiversity conservation, and sustainable use of natural resources. This is highly relevant in Nigeria, where issues like deforestation, pollution, and climate change are major concerns.

Challenges in Biology Education in Nigeria

Despite its immense importance, students' performance in Biology at the Senior Secondary School level in Nigeria has remained consistently below expectation. Trends in public examination results such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO) reveal persistent low pass rates, especially in topics that require analytical reasoning, practical skills, and conceptual understanding. Several WAEC Chief Examiners' Reports have highlighted weaknesses in students' grasp of genetics, ecology, human physiology, and experimental procedures areas that require strong teachers' guidance.

A number of factors have been identified as contributing to this poor performance. First, ineffective teaching methods such as exclusive reliance on the lecture method limit students' ability to engage actively with scientific concepts. Biology is a practical and inquiry-based subject that requires observation, experimentation, and hands-on activities. When teachers fail to adopt learner-centered instructional strategies, students struggle to develop the scientific skills necessary for success.

Second, insufficient numbers of qualified Biology teachers in many public secondary schools reduce the quality of instruction. Some teachers lack the required academic preparation, professional training, or pedagogical competence to deliver the subject effectively. This challenge is especially evident in developing educational environments such as Egor Local Government Area, where disparities in teacher qualification and classroom resources exist.

Third, poor teacher student relationships may negatively affect students' motivation and attitudes toward Biology. A teacher who is unapproachable, impatient, or poorly motivated can discourage learners, leading to anxiety, loss of interest, or disengagement from classroom activities. Positive teacher attitudes such as enthusiasm, empathy, encouragement, and effective communication have been found to significantly influence students' performance and interest in science subjects.

Therefore, understanding the concept of Biology within the school setting requires not only recognizing it as a scientific discipline but also acknowledging the human factors such as teachers' variables that influence how it is taught and learned. Improving

students' performance in Biology depends greatly on addressing teacher-related variables such as qualification, teaching experience, instructional methods, and professional commitment.

These factors collectively shape the quality of Biology education in Nigeria, particularly in the context of Public Senior Secondary Schools in Egor Local Government Area, Benin City.

Concept of Teachers' Variables and Their Impact on Students' Academic Performance

Teachers' variables comprise the personal qualities, professional competencies, and teaching behaviors that, collectively or individually, influence students' learning outcomes. These variables include teacher qualification, teaching experience, instructional strategies, subject mastery, and attitudes toward teaching and learners. In secondary school Biology, these characteristics significantly affect how well students understand abstract concepts, participate in practical activities, and develop scientific reasoning skills (Okoye and Okecha, 2021). Because Biology requires both theoretical explanation and hands-on experimentation, the effectiveness and efficiency of the teacher is central to students' academic progress.

Teacher Qualification

Teacher qualification refers to the academic and professional credentials a teacher possesses, including degrees, certifications, and specialized training in education and science. A teacher who has formal training in Biology and pedagogy is better equipped to

design meaningful lessons, conduct experiments, and relate biological concepts to real-life situations. Professional qualifications such as TRCN certification ensure that teachers are familiar with appropriate teaching standards, ethics, and instructional best practices.

Qualified teachers tend to demonstrate better classroom management, clearer explanations, and improved ability to simplify complex topics such as genetics, evolution, and cell physiology. Conversely, teachers without appropriate training may rely heavily on rote teaching or avoid practical activities, thereby limiting students' engagement and achievement.

Teaching Experience

Teaching experience reflects the duration and depth of classroom practice a teacher has accumulated. Experience helps teachers develop strong lesson-planning skills, better anticipate areas where students typically struggle, and select suitable methods for different learning contexts. In Biology, experienced teachers are more likely to identify student misconceptions, use practical demonstrations effectively, and manage laboratory sessions with confidence.

With increased experience, teachers generally become more skilled at class control, assessment procedures, and differentiation of instruction to meet the needs of gifted and struggling learners. In contrast, novice teachers may experience challenges with pacing, managing practical sessions, and maintaining student interest, which can negatively affect learning outcomes.

Teachers' Attitudes and Motivation toward Teaching and Learning

Teachers' attitudes consist of their values, dispositions, motivation, enthusiasm, and interpersonal behaviors in the teaching-learning process. Positive attitudes such as patience, punctuality, empathy, and genuine interest in learners create a supportive environment that encourages student participation. When Biology teachers show enthusiasm for the subject, students become more curious and motivated to learn.

Negative attitudes, such as hostility, indifference, absenteeism, or lack of preparation, can discourage students and reduce their confidence. Students often interpret a teacher's attitude as an indication of the importance of the subject, meaning that a teacher who appears unmotivated can inadvertently lower students' interest and performance levels.

Subject Mastery

Subject mastery refers to a teacher's depth of understanding of Biology content, concepts, and processes. A teacher who possesses strong subject knowledge can explain complex ideas with clarity, integrate practical examples, and relate scientific theories to everyday life. Mastery enables the teacher to answer students' questions confidently, provide accurate information, and design meaningful laboratory experiences.

In Biology education, subject mastery is crucial because many topics such as ecosystem dynamics, reproduction, genetics, and evolution require precise explanations. Teachers with limited content knowledge may oversimplify concepts, provide incorrect information, or skip vital components of the curriculum. This can lead to misconceptions and poor academic performance among students.

Teaching Methodologies

Instructional methodologies refer to the strategies teachers use to deliver lessons. These may include lecture, discussion, inquiry-based learning, demonstration, cooperative learning, problem-solving, or ICT-supported teaching. In Biology, practical-based and student-centered techniques tend to produce better outcomes because they encourage active participation, critical thinking, and hands-on experience.

For example, laboratory activities help students develop observational skills, while visual aids such as charts, models, and videos enhance conceptual understanding. Teachers who rely solely on lecture methods, especially in large classes, may struggle to engage students or address individual learning needs. Effective instructional variety is therefore essential for improving performance in Biology.

Inter-relationship between Teachers' Variables

Although each teacher variable influences learning differently, they often interact in complex and dynamic ways to influence students' academic performance. While each variable – qualification, experience, attitude, subject mastery, and instructional methods has distinct effects, their combined impact ultimately determines the quality of teaching and the effectiveness of learning in the Biology classroom.

A teacher may possess strong academic qualifications but may fail to achieve desired learning outcomes if they have a poor attitude toward teaching or lack motivation. In such cases, the teacher's professional competence is undermined by ineffective classroom behaviors, resulting in reduced learner engagement. Likewise, a teacher with several

years of teaching experience but weak subject mastery may struggle to explain abstract biological concepts such as genetics, evolution, or ecosystem dynamics. The interplay of these variables highlights that a teacher's overall effectiveness is not determined by a single characteristic, but by the synergy of multiple attributes working together.

Theoretical perspectives such as Human Capital Theory emphasize that developing teachers holistically not just academically produces higher-quality instruction (Becker, 1993). This means that improvement in teacher education must address pedagogical skills, content knowledge, emotional intelligence, and attitudes toward continuous professional development.

In Biology education, this combined influence is particularly significant. Biology is both a theoretical and practical subject, requiring teachers to demonstrate competence in laboratory management, experiment demonstration, and scientific explanation. A teacher with strong subject mastery but ineffective instructional methods may fail to engage students in practical investigations, while another with good methodological competence but weak content knowledge may be unable to correct students' misconceptions.

In public senior secondary schools within Egor Local Government Area of Edo State, the need for this synergy is even more pronounced. Many schools in the area face challenges such as large class sizes, limited laboratory equipment, and irregular teacher training. In such environments, a teacher who combines strong qualification, experience, positive attitude, and effective methodology is better positioned to manage these constraints and still deliver quality Biology instruction.

For instance:

- A qualified and experienced teacher can effectively improvise laboratory materials.
- A teacher with high subject mastery and a positive attitude can motivate learners even when facilities are inadequate.
- A teacher using diverse methodologies can accommodate different learning styles despite overcrowded classrooms.

The combined effect of these variables therefore shapes the learning climate, influences students' interest in Biology, and determines their academic performance. Schools with teachers who possess a balanced blend of these qualities tend to show better outcomes in both internal and external examinations such as WAEC and NECO.

Ultimately, high-quality teaching produced through the harmonious interaction of all teacher-related variables is essential for addressing persistent challenges in Biology performance and improving student achievement in Egor Local Government Area and similar educational contexts.

Students' Academic Performance

Students' academic performance is the measurable outcome of the teaching and learning process, often assessed through classroom tests, assignments, and external examinations.

In Nigeria, performance in Biology has been a concern due to persistent mass failures.

This indicates the need to examine how teacher-related variables are identified as strong determiners of Biology achievement as a core subject, highlighting the centrality of teacher qualities in shaping learning outcomes (Nwagbo, 2018).

Nature and Measurement of Academic Performance

Students' Academic Performance are typically measured and determined using:

- **Cognitive Achievement:** Mastery of content knowledge, concepts, and problem-solving ability.

Examples include test scores, examination results, and practical performance in Biology.

- **Affective Outcomes:** These include their attitudes, interest, motivation, and emotional readiness toward learning.

Students who enjoy Biology tend to perform better (Nwachukwu, 2018).

- **Psychomotor Skills:** Especially important in Biology, where students must demonstrate practical and manipulative skills in laboratory experiments, specimen identification, and data interpretation.

In Nigeria, WAEC Chief Examiners' Reports often emphasize that students' poor performance in Biology stems from weak practical skills, inability to explain biological principles, and poor application of knowledge to real-life situations.

Factors Influencing Students' Academic Performance

Students' Academic Performance are shaped by multiple interrelated factors:

- **Teacher Related Variables**

These include qualifications, teaching experience, instructional methods, classroom management, and attitudes. Numerous studies in Nigeria and West Africa have shown that effective teachers significantly improve student achievement, especially in science subjects (Adeyemi, 2018; Adebule and Aborisade, 2020).

- Student Characteristics

Interest, motivation, study habits, prior knowledge, and self-discipline influence learning. Students with strong motivation and proper study habits tend to achieve higher academic scores.

- School Environment

Availability of science laboratories, instructional materials, class size, and administrative support impact performance. Schools with better learning facilities often produce better results (Omoregie, 2019).

- Home Background

Parental support, socio-economic status, and home learning environment significantly shape students' academic achievement.

Students' Academic Performance in Biology

In Biology, academic performance encompasses the student's ability to understand life processes, conduct experiments, analyze data, classify organisms, and apply biological principles to everyday life. Despite its importance, students' performance in Biology in Nigeria has been consistently low. WAEC (2022) reports indicate that many students struggle with genetics, ecology, physiology, and practical examination components.

Studies attribute poor Biology performance to factors such as:

- Inadequate practical activities
- Lack of qualified Biology teachers
- Overdependence on lecture method

- Poor teacher-student interaction
- Limited exposure to laboratory equipment
- Poor foundational knowledge of basic science

However, teacher related variables are repeatedly identified as strong predictors of Biology achievement, highlighting the centrality of teacher quality in shaping learning outcomes (Nwagbo, 2018).

Relevance of Academic Performance in Educational Research

Understanding academic performance is crucial because:

- It serves as an indicator of whether educational objectives and goals are being achieved.
- It provides feedback to teachers, parents, and policymakers and concerned stakeholders at all levels.
- It helps identify gaps in teaching methods and school resources.
- It guides curriculum planning and development, instructional improvement, and policy decisions.

Students' academic performance is a multidimensional construct that reflects the outcome of teaching and learning processes. It is influenced by teacher-related factors, school conditions, and learner characteristics. In Biology education, the teacher plays a pivotal role in shaping students' understanding and performance. Examining students' academic performance thus provides valuable insight into the effectiveness of Biology teaching in public senior secondary schools in Egor Local Government Area.

Teachers' Qualification and Students' Academic Performance

Teacher qualification encompasses academic degrees, professional certifications, subject specialization, and pedagogical training. According to Darling-Hammond (2017), teacher qualification is one of the strongest predictors of student achievement because qualified teachers demonstrate deeper subject knowledge, better instructional planning, and improved classroom management. In Nigeria, the Teachers Registration Council of Nigeria (TRCN) emphasizes that certified and professionally trained teachers produce more effective learning outcomes (TRCN, 2019).

Studies conducted in West Africa show that students taught by qualified science teachers consistently outperform those taught by unqualified or underqualified teachers (Adebule and Aborisade, 2020). For instance, Olarewaju (2020) found that Biology students in schools with properly qualified teachers recorded significantly higher pass rates in WAEC examinations than students in schools staffed with non-specialist teachers.

In addition, The National Policy on Education (2013) mandates that secondary school teachers should possess a Bachelor's degree in Education(B.Ed) or a Postgraduate Diploma in Education (PGDE) in their subject area. However, due to teachers' shortages especially in many rural areas, some schools employ teachers with only National Certificate in Education (NCE) or degree holders without the pedagogical training. Adeyemi (2016) found that students taught by qualified teachers with certified degrees in education performed significantly better in WAEC Biology examinations than those taught by unqualified teachers.

A study by Udo and Udofia (2018) examined 45 public secondary schools in Akwa Ibom State and reported that teacher qualification had a significant effect on students' performance in Biology, particularly in practical components. The researchers concluded that professionally trained Biology teachers were more capable of demonstrating laboratory techniques, guiding students during experiments, and utilizing scientific models effectively.

Similarly, Akinyele (2017) conducted a study across Lagos and Ogun States and found that schools employing graduate teachers with subject specialization (Biology or Integrated Science) recorded higher mean achievement scores compared to schools where non-specialist teachers were assigned to teach Biology due to staffing constraints.

Teachers' Experience and Students' Academic Performance

Teaching experience refers to the number of years a teacher has spent in classroom practice. Experienced teachers develop better instructional skills, classroom management techniques, and awareness of students' learning difficulties (Rivkin, Hanushek, and Kain, 2005). They are also often more confident and resourceful at lesson delivery and adapting to students needs (Akinsolu, 2010). Studies have shown that students taught by experienced teachers perform better than those taught by inexperienced teachers (Ogunleye, 2020).

Over the years, experienced Biology teachers become familiar with common misconceptions in difficult topics such as genetics, evolution, and human physiology, enabling them to use effective strategies to address these challenges.

In the Nigerian education context, research by Adeyemi (2018) revealed that students taught by teachers with more than ten years' experience performed better in science subjects compared to those taught by early-career teachers. Experience enables teachers to adapt their lessons to suit diverse learners and manage large class sizes commonly found in public schools, including those in Egor Local Government Area.

A study by Nwosu and Okeke (2018) in Anambra State secondary schools found that Biology teachers with longer teaching experience were more effective in conducting practical lessons and ensuring that students developed strong laboratory skills. Students taught by teachers with more than eight years' experience scored significantly higher in Biology practical tests compared to those taught by less experienced teachers.

Similarly, Adebayo (2019) examined 600 students in Oyo State and reported that experienced teachers were better at using varied teaching methods such as group work, inquiry-based learning, and project methods which in turn improved students' academic performance in Biology.

Umeh and Eze (2020) also found that experienced teachers demonstrated greater mastery of WAEC examination trends, enabling them to better prepare students for external examinations, especially in topics repeatedly flagged as problematic by WAEC Chief Examiners.

Teachers' Attitudes and Motivation and Students' Academic Performance

Teachers' attitudes encompass enthusiasm, motivation, punctuality, interpersonal relationships, empathy, and emotional commitment to students' progress. Positive teacher

attitudes positively shape students' academic behavior, classroom engagement, and overall interest in learning (Ofoegbu, 2020). In Biology, as one of the core science subjects that requires student participation through practicals and inquiry-based learning, the teacher's enthusiasm can significantly stimulate students' curiosity and creativity.

Conversely, negative attitudes such as impatience, absenteeism, lack of preparation, and harsh communication have been found to lower students' confidence and reduce academic performance (Amina & Okonkwo, 2019). WAEC Chief Examiners' Reports consistently highlight poor teacher attitude and insufficient teacher-student interaction as major causes of low performance in Biology.

Motivation, whether intrinsic (passion for teaching) or extrinsic (salary, promotion), influences teachers' commitment to duty. Inadequate motivation remains a major issue in Nigerian secondary schools due to poor remuneration and limited recognition (Oni, 2018).

Empirical studies conducted in different parts of Nigeria reinforce the importance of teacher attitudes and motivation in determining academic performance.

A study by Olatoye and Ogunsanya (2018) found that students taught by teachers who exhibited high levels of enthusiasm, friendliness, and supportive communication achieved significantly better scores in Biology tests than students taught by teachers described as authoritarian or indifferent.

Similarly, Uzoechi (2020) examined teacher attitudes in 20 public schools in Imo State and reported that teachers who regularly engaged in student-centered practices, such as

providing feedback and encouraging questions, contributed to higher academic performance in Biology. The study concluded that emotional support and encouragement help students build interest and confidence in science subjects.

Another study by Mohammed (2019) in Kano State found that teachers' punctuality and consistent classroom presence were significantly related to improved student performance. Biology teachers who frequently missed classes or arrived late were associated with lower student achievement and poor mastery of practical skills.

Teaching Methodologies and and Students' Academic Performance

Instructional methods refer to the teaching strategies and techniques employed by the teacher to facilitate learning. Effective instructional methods in Biology include:

- Inquiry-based learning
- Demonstrations and experiments
- Use of ICT and multimedia
- Group discussions and cooperative learning
- Field trips and project-based learning

Research across Nigeria shows that schools where teachers use varied and interactive teaching methods record better student performance in Biology examinations (Okoye, 2019).

According to Nwagbo (2018), the method a teacher adopts significantly influences students' understanding of biological concepts. Learner-centered approaches encourage

active participation and critical thinking, while teacher-centered methods such as rote lecturing often lead to superficial learning.

Afolabi (2019) and Adedoyin (2021) demonstrated that practical-based and ICT supported teaching methods improved students' performance in Biology compared to traditional lecture methods that encourage rote memorization.

Olanrewaju (2020) examined the effect of inquiry-based learning on senior secondary school students' achievement in Biology in Kwara State. The findings revealed that students exposed to inquiry-based methods performed significantly better than those taught with conventional lecture techniques. The study concluded that inquiry promotes curiosity and deeper cognitive engagement.

Similarly, Idowu and Elegbeleye (2019) found that collaborative learning strategies, such as group discussions and peer teaching, improved students' achievement in ecology and genetics. The study emphasized that group work helps students clarify their thinking and correct misconceptions through peer interaction.

In Rivers State, Chukwu and Ofoedu (2021) investigated the role of demonstration and laboratory activities in improving students' performance. Their results showed that students who participated in frequent experiments developed better analytical skills and retained information longer than those who only learned through verbal instruction.

Summary of Review of Literature

The reviewed literature has provided a clear understanding of how teachers' variables influence students' academic performance in senior secondary schools. Teachers have

been identified as the most significant school-based factor affecting student achievement, and their personal and professional characteristics determine the quality of instruction delivered in the classroom (Akinyele, 2019; Olatunji, 2019).

The conceptual and empirical reviews indicate that key teacher variables such as qualification, teaching experience, teaching methods, motivation, attitude, and classroom management skills are closely related to students' learning outcomes. In the teaching of Biology, where practical and conceptual understanding is essential, the teacher's expertise and instructional approach have been shown to directly affect how well students grasp scientific concepts (Nwosu, 2021). Teachers who possess professional qualifications in Education tend to demonstrate better pedagogical skills and classroom control than those without such credentials (Akpan and Etuk, 2021).

Furthermore, the literature reveals that teachers' motivation and positive work attitudes are crucial for enhancing students' performance. Studies conducted across Nigeria and other West African countries show that when teachers are adequately motivated through fair remuneration, recognition, and opportunities for professional growth, their level of commitment to students' learning increases (Lawal, 2020; Oni, 2018). Conversely, a lack of motivation and limited access to professional development programs often lead to teacher burnout and poor instructional quality (Bassey, 2020).

The review also identified teaching experience as a vital factor that enhances a teacher's ability to manage classrooms effectively, apply appropriate teaching methods, and adapt lessons to suit students' abilities (Uche and Enemuo, 2018). However, it was also noted

that continuous in-service training is essential to ensure that long-serving teachers remain updated with current educational practices (Owoeye, 2020).

From a theoretical standpoint, the Human Capital Theory (Becker, 1964) forms the foundation of this study. The Human Capital Theory posits that investment in teacher education and professional development enhances the productivity of the education system therefore justifying the need to strengthen teacher qualities as a pathway to improving student performance.

Empirical studies conducted in different parts of Nigeria including Edo State affirmed that teacher variables play a critical role in shaping student outcomes in science subjects. However, relatively few studies have examined this relationship within Egor Local Government Area of Edo State, a rapidly developing educational hub in Benin City. Public Senior Secondary Schools in Egor LGA often face challenges such as teacher shortages, large class sizes, limited laboratory facilities, and inconsistent professional development opportunities. These contextual issues make it essential to analyze how teacher characteristics influence students' academic performance in this specific area.

In summary, the reviewed literature establishes a strong connection between teachers' variables and students' academic performance. It also highlights the need for localized research to understand how these variables interact within specific educational environments. Therefore, this study seeks to fill this gap by conducting an in-depth analysis of the impact of teachers' variables such as qualification, experience, motivation, and teaching methods on students' academic performance in Biology among Senior

Secondary Schools in Egor Local Government Area, Edo State, Benin City. The findings will provide evidence based recommendations for improving teacher effectiveness and enhancing academic outcomes within the local school system.

CHAPTER THREE

METHODOLOGY

This chapter presents the methods and procedures with which the study was conducted.

They are discussed under the following subheadings:

- Design of the Study
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Design of the Study

This study employed the descriptive survey research design. This design is appropriate because it enables the researcher to collect quantitative data directly from Biology teachers regarding their personal and professional variables such as qualifications, teaching experience, attitude toward teaching, and instructional practices, and then analyze how these variables influence students' academic performance. The choice of this design is based on the fact that it provides a systematic and accurate description of a population without manipulation of variables.

Population of the Study

The population of this study consists of 35 Biology teachers in the 13 Public Senior Secondary Schools in Egor Local Government Area of Edo State, Benin City.

Table 1: Population Distribution of Biology Teachers in Public Senior Secondary Schools in Egor Local Government Area.

S/N	Name of schools	Male teachers	Female teachers	Total
1.	Asoro Grammar School	2	1	3
2.	Egor Secondary School	1	2	3
3.	Evbareke Senior Secondary School	2	1	3
4.	Evbotubu Grammar School	1	1	2
5.	Uselu Secondary School	2	1	3
6.	Use Senior Secondary School	1	1	2
7.	Iyoba Girls' Grammar School	0	3	3
8.	Ohonre Secondary School	2	1	3
9.	Uwelu Senior Secondary School	2	1	3
10.	Government Science & Technical College	2	1	3
11.	Iguosa Senior Secondary School	1	1	2
12.	Ekheuan Grammar School	0	2	2
13.	Edo Boys High school	1	2	3
Total		17	18	35

Source : Field survey(Office of the C.I.E , Egor Local Government)

Sample and Sampling Technique

The sample size for this study consists of 30 Biology teachers in 12 Public Senior Secondary Schools of Egor Local Government Area, representing the entire population of the Study. This approach, known as a census survey, ensures that every Biology teacher

is represented in the study, thereby eliminating sampling error and improving the reliability of findings.

Table 2: Sample Distribution of Biology Teachers selected from Public Senior Secondary Schools in Egor Local Government Area.

S/N	Name of schools	Male teachers	Female teachers	Total
1.	Asoro Grammar School	2	1	3
2.	Egor Secondary School	1	2	3
3.	Evbareke Senior Secondary School	2	1	3
4.	Evbotubu Grammar School	1	1	2
5.	Uselu Secondary School	2	1	3
6.	Use Senior Secondary School	1	1	2
7.	Iyoba Girls' Grammar School	0	3	3
8.	Ohonre Secondary School	2	1	3
9.	Uwelu Senior Secondary School	2	1	3
10.	Government Science & Technical College	2	1	3
11.	Iguosa Senior Secondary School	1	1	2
12.	Ekheuan Grammar School	0	2	2
Total		16	14	30

Sampling Technique: Simple Random Sampling Technique

Sample Size: 30 Teachers

Research Instrument

The instrument used for the data collection of this study was a structured questionnaire tagged “Teachers’ Variables and Students’ Academic Performance Questionnaire (TVSAPQ)”.

The Instrument was carefully prepared by the researcher and it comprises two sections.

Section A constitutes the demographic data of teachers eliciting information on their gender, qualification, teaching experience while Section B constitutes items raised to the research questions with a total of 20 items that elicit information from the respondents.

The instrument was designed using a 4-point Likert scale made up of Strongly Agree(SA), Agree(A), Disagree(D), Strongly Disagree(SD) .

Validity of the Instrument

The research instrument was validated by the researcher’s supervisor and two other competent lecturers from the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City, thereby face and content validation ensured. Their observations and corrections were appropriately incorporated to refine the instrument for clarity and relevance.

Reliability of Instrument

The reliability of the instrument was subjected to a pilot test study involving 10 Biology teachers in a nearby local government area outside Egor LGA. The data collected was then analyzed using the Cronbach Alpha method and a reliability coefficient of 0.73 was obtained indicating that the instrument is reliable and considered acceptable for the study.

Method of Data Collection

The researcher personally administered the copies of questionnaires to Biology teachers in the selected schools prior to their permission and the purpose of the research was explained to the respondents as adequate time was given to fill the questionnaires and retrieved immediately. This direct approach minimized non-response bias and ensured that accurate and complete data are collected for analysis.

Method of Data Analysis

The data collected from all sections of the research instrument were analyzed using simple percentages and frequency count.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter presents the analyzes of data, interpretation of the results and discussion of the findings. The Data were analyzed using descriptive statistics, specifically frequency counts and percentages.

Percentage mean = 50%

Research Question 3: To what extent does teachers' qualification influence students' academic performance in Biology in Senior Secondary Schools in Benin City?

Table 3: Extent of teachers' qualification on students' academic performance in Biology.

S/N	ITEMS	SA FQ %	A FQ %	D FQ %	SD FQ %	DECISION
1.	Qualified teachers explain complex Biology concepts better.	18 60%	10 33.3%	2 6.7%	0 0%	Accepted
2.	Higher qualifications enable better resource use	17 56.7%	10 33.3%	3 10%	0 0%	Accepted
3.	Unqualified teachers skip practicals	15 50%	11 36.7%	2 6.7%	2 6.7%	Accepted
4.	TRCN certification improves assessment ability.	5 16.7%	4 13.3%	7 23.3%	14 46.7%	Rejected
5.	Qualifications aid classroom management.	14 46.7%	8 26.7%	4 13.3%	2 6.7%	Rejected

Percentage Mean Value of 50%

From table 3 Item 1 to item 3 were accepted above the percentage mean of 50% , indicating that teachers' qualifications influence student performance. However Items 4 and 5 were rejected as qualification alone (e.g. TRCN certification) were not guaranteed for better assessment or classroom management.

Research Question 2: To what extent does teachers’ years of teaching experience affect students’ academic performance in Biology?

Table 4: Extent of teachers' experience on students' academic performance.

S/N	ITEMS	SA FQ %	A FQ %	D FQ %	SD FQ %	DECISION
6.	Experienced teachers simplify abstract topics.	15 50%	9 30%	4 13.3%	2 6.7%	Accepted
7.	Experience helps predict student difficulties.	3 10%	4 13.3%	5 16.7%	18 60%	Accepted
8.	Long-term teachers design adaptive strategies.	16 53.3%	6 20%	7 23.3%	1 3.3%	Accepted
9.	Inexperienced teachers rely heavily on textbooks.	5 16.7%	17 56.7%	6 20%	2 6.7%	Accepted
10.	Experience improves lesson time management	13 43.3%	5 16.7%	4 13.3%	8 26.7%	Rejected

Percentage Mean Value of 50%

Table 4 shows that Items 6 to 9 were accepted, agreeing that a teacher's teaching experience significantly influences students' performance through better concept simplification, strategic adaptation, and reduces dependence on rote textbook methods.

Research Question 3: What are the impacts of teachers' methodologies on students' academic performance in Biology?

Table 5: Impact of teaching methodologies on students' academic performance in Biology.

S/N	ITEMS	SA FQ %	A FQ %	D FQ %	SD FQ %	DECISION
11.	Inquiry-based methods improve understanding.	17 56.7%	10 33.3%	2 6.7%	1 3.3%	Accepted
12.	Visual aids enhance performance.	16 53.3%	11 36.7%	3 10%	0 0%	Accepted
13.	ICT integration boosts interest.	14 46.7%	12 40%	3 10%	1 3.3%	Rejected
14.	Poor methodology reduces engagement.	7 23.3%	16 53.3%	5 16.7%	2 6.7%	Accepted
15.	Adaptive styles help slow learners.	8 26.7%	3 10%	6 20%	13 43.3%	Rejected

Percentage Mean Value of 50%

From table indicates that Items 11,12 and 14 were agreed thereby accepting that teaching methodologies especially visual aids and inquiry-based learning are strong determinants of students' academic achievement while items 13 and 15 were however rejected, likely reflecting irregular ICT access and use in schools and inability to inconsistency in adaptive method.

Research Question 4: How do teachers’ attitudes and personal characteristics influence students’ academic performance in Biology?

Table 6: Teachers’ attitudes and personal characteristics on students’ academic performance in Biology.

S/N	ITEMS	SA FQ %	A FQ %	D FQ %	SD FQ %	DECISION
16.	Positive attitudes motivate students	9 30%	15 50%	5 16.7%	1 3.3%	Accepted
17.	Patience and humor improve interaction	8 26.7%	16 53.3%	5 16.7%	1 3.3%	Accepted
18.	Communication skills aid concept clarity.	10 33.3%	18 60%	2 6.7%	0 0%	Accepted
19.	Female teachers comfort students on sensitive topics.	2 6.7%	8 26.7%	7 23.3%	13 43.3%	Rejected
20.	Burnout reduces syllabus coverage	7 23.3%	14 46.7%	5 16.7%	4 13.3%	Rejected

Percentage Mean Value of 50%

Items 16, 17 and 18 were accepted, agreeing that teachers’ attitudes in terms of enthusiasm, patience, and communication significantly influence students’ interest and performance in Biology while items 19 and 20 disagreed thereby rejected.

Discussion of Findings

The findings of this study revealed that teachers’ variables collectively play a decisive and significant role in shaping students’ academic performance in Biology in public senior secondary schools in Egor Local Government Area. First, the analysis showed that teachers’ qualifications significantly influence learning outcomes, as respondents agreed

that qualified teachers are better equipped to explain complex concepts, utilize instructional resources effectively, and minimize the tendency to skip practical work. This aligns with the Human Capital Theory, which argues that investment in teacher education enhances instructional quality and learner outcomes (Becker, 1993; Schultz, 1961). The findings also corroborate earlier studies by Darling-Hammond (2017) and Adebule and Aborisade (2020), which reported that professionally trained and qualified science teachers contribute more positively to students' academic achievements. However, the mixed responses regarding TRCN certification and classroom management imply that formal qualification alone does not automatically translate into instructional effectiveness, echoing Adeyemi's (2016) argument that certification must be accompanied by pedagogical competence and effective teaching practices.

The results further showed that teaching experience significantly affects Biology performance. Respondents indicated that experienced teachers simplify abstract biological concepts better, predict student difficulties, and develop adaptive teaching strategies.

Empirical studies by Adeyemi (2018) and Nwosu and Okeke (2018) similarly reported that experienced teachers are more effective in conducting practical lessons and identifying student misconceptions. However, the disagreement on whether experience improves time management suggests that even long-serving teachers may struggle with challenges such as overcrowded classrooms, limited laboratory resources, and heavy workloads, which are common in public schools across Nigeria.

The study also established that teaching methodologies substantially impact students' academic performance. High acceptance of inquiry-based learning, visual aids, and demonstration methods highlights the value of hands-on and learner-centred approaches in Biology instruction. This agrees with Nwagbo (2018), Okoye (2019), and Afolabi (2019), who emphasized that practical-based and ICT-supported methods improve conceptual understanding and retention. Nonetheless, the rejection of ICT integration and adaptive teaching styles suggests gaps in teachers' digital literacy and limited availability of ICT tools, a challenge widely reported in Nigerian secondary schools (Olanrewaju, 2020). This indicates that although teachers acknowledge the importance of modern and differentiated instructional strategies, they may lack the required training or resources to implement them effectively.

Teachers' attitudes and personal characteristics were also found to significantly influence student performance. Respondents affirmed that positive teacher dispositions such as enthusiasm, patience, humor, and effective communication motivate students, enhance classroom interaction, and promote better learning outcomes. This finding is consistent with Ofoegbu (2020) and Uzoechi (2020), who reported that teachers' positive attitudes enhance students' engagement and achievement in science subjects. However, the rejection of teacher gender influence suggests that students value competence over gender in learning Biology. Similarly, the rejection of burnout as a major factor may indicate that students do not always easily detect signs of teacher fatigue, even though

burnout has been shown in other studies to indirectly affect academic performance (Mohammed, 2019).

Overall, the results of this study confirm that teacher-related factors such as qualification, experience, teaching methodology, and attitude are central to students' performance in Biology. The findings align with several Nigerian and international studies that identify teacher quality as the strongest school-based predictor of academic achievement (Darling-Hammond, 2017; Adeyemi, 2018). This reinforces the need for continuous teacher development, improved instructional resources, and supportive school environments to enhance Biology teaching and learning in Egor Local Government Area and beyond.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of the Study

This study examined the influence of teachers' variables on students' academic performance in Biology in Public Senior Secondary Schools in Egor Local Government Area of Edo State. The main purpose was to determine how teachers' qualification, teaching experience, instructional methodologies and attitudes influence students' achievement in performance in Biology.

The study adopted a descriptive survey research design as data were collected using a structured questionnaire from the sample size of 30 teachers and then analyzed using frequency counts and simple percentages

Human Capital Theory, which posits that investment in teachers' knowledge, skills, and professional development enhances educational outcomes (Schultz, 1961; Becker, 1964).

Conclusion

The study concluded that teacher-related variables play a significant and multifaceted role in shaping students' academic performance in Biology. Qualifications and professional training enhance teachers' mastery of subject matter and instructional competence. Teaching experience equips teachers with classroom management skills, pedagogical flexibility, and deeper awareness of students' learning needs.

Additionally, learner-centered and activity-based methodologies positively influence students' engagement, understanding, and performance.

Teachers' attitudes and personal characteristics were equally found to be critical, as supportive and motivated teachers create conducive learning environments that foster students' confidence and curiosity. Conversely, teachers with poor attitudes or limited motivation negatively impact learning outcomes.

Overall, the study affirms the Human Capital Theory by demonstrating that investment in teacher development is essential for improving academic performance in Biology. Strengthening teacher qualifications, providing continuous training, enhancing motivation, and promoting effective teaching methods are vital steps toward raising the standard of science education in Egor Local Government Area and Nigeria at large.

Recommendations

The following recommendations were made:

1. Strengthen Teacher Qualification and Professional Development

The Ministry of Education and school administrators should ensure that only qualified and TRCN-certified teachers handle Biology at the senior secondary level. Regular in-service training, workshops, and professional development programmes should be conducted to update teachers' content knowledge and pedagogical skills.

2. Improve Teacher Motivation and Attitude

Government and school management should provide incentives such as promotions, awards, conducive working conditions, and welfare support to improve teachers' motivation. Positive work attitudes should be encouraged through effective supervision and mentorship systems.

3. Promote Use of Diverse and Effective Teaching Methodologies

Teachers should adopt learner-centered approaches such as inquiry-based learning, group discussions, practical demonstrations, and ICT-supported instruction to enhance students' engagement and understanding of Biology concepts.

4. Enhance School Facilities and Laboratory Resources

The government should equip schools with modern laboratories, instructional materials, and digital learning tools to support effective Biology teaching and learning.

5. Address Teacher Burnout and Classroom Stress

Workload reduction, psychological support, and provision of adequate teaching materials should be implemented to reduce teacher burnout and promote efficiency.

6. Encourage Gender-Sensitive Approaches in Teaching Sensitive Topics

Although findings showed mixed views on the role of female teachers in teaching sensitive topics, teachers of both genders should be adequately trained in handling sensitive Biological concepts with professionalism and empathy.

Suggestions for Further Study

The following suggestions are made for future research:

- A comparative study of teachers' variables in public and private secondary schools in Edo State.
- A larger sample size involving more Local Government Areas in Edo State or other states in Nigeria should be used for broader generalization.

- A study focusing on students' perspectives on teacher variables and their influence on Biology performance should be conducted.
- An experimental study should be carried out to determine the specific effects of instructional methods (e.g., inquiry-based vs. traditional lecture) on Biology achievement.
- A qualitative study exploring teachers' personal experiences, challenges, and coping mechanisms may provide deeper insights into teacher effectiveness.

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APPENDIX
TEACHERS' VARIABLES AND STUDENTS ACADEMIC PERFORMANCE
QUESTIONNAIRE

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

“AN ANALYSIS OF TEACHERS’ VARIABLES AND THEIR IMPACT ON
STUDENTS’ ACADEMIC PERFORMANCE IN BIOLOGY IN PUBLIC SENIOR
SECONDARY SCHOOLS IN EGOR LOCAL GOVERNMENT AREA, EDO
STATE, BENIN CITY. ”

Dear Respondent,

I am a student of the above department and am carrying out research on the analysis of teachers’ variables and their impact on students academic performance in Biology in Senior Secondary Schools, Benin City. I, therefore, solicit your honest and accurate responses crucial for the success of this research as all information provided will be treated with strict confidentiality and used solely for academic purposes.

Please read each item carefully and tick (√) the appropriate box or provide details where required. Thank you for your cooperation.

SECTION A: DEMOGRAPHIC INFORMATION

Gender: [] Male [] Female

Highest Educational Qualification:[]NCE [] B.Sc./B.Ed. [] M.Sc./M.Ed. [] Ph.D.

Professional Certification Status:

Yes (TRCN certified) No

In-Service Training:

Yes (specify number of trainings in last 5 years: _____) No

Class Size Taught: Below 25 30–50 51–70 Above 70

Years of Teaching Experience: 0–5 years 6–10 years 11–15 years Above 16 years

Instructions: Rate the following Section items on how teachers' variables affect Biology teaching and student performance. Use the scale: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree(SD).

Section B

S/N	ITEMS	SA	A	D	SD
	TEACHERS' QUALIFICATION				
1.	Qualified Biology teachers are better equipped to explain complex concepts in Biology.				
2.	Higher qualifications (M.Sc. Ed.) enable teachers to use advanced resources in Biology lessons				
3.	Unqualified teachers often skip practical aspects of Biology, leading to poor student understanding.				
4.	Professional certifications (TRCN) improve teachers' ability to assess student performance accurately				
5.	Qualifications correlate with better classroom management in large Biology classes				

	TEACHER'S YEAR OF EXPERIENCE				
6.	Experienced teachers (5 - 10 years) are more adept at simplifying abstract Biology topics like evolution				
7.	Years of experience help predict student difficulties in Biology exams				
8.	Long-term teachers develop customized strategies for diverse learners in Biology				
9.	Lack of experience leads to over-reliance on textbooks, limiting student engagement				
10.	Cumulative experience improves time management in Biology lessons.				
	TEACHING METHODOLOGIES				
11.	Inquiry-based methods(e.g experiments)improve student understanding of Biology over lectures				
12.	Use of visual aids (charts, models) in Biology enhances academic performance.				
13.	Integrating ICT (videos) in Biology teaching boosts student interest and scores				
14.	Poor methodology choices lead to low engagement in Biology classes				
15.	Adaptive teaching styles accommodate slow learners in Biology.				
	TEACHER'S ATTITUDE AND PERSONAL CHARACTERISTICS				
16.	Positive teacher attitudes (enthusiasm, empathetic, punctuality) motivate students to excel in Biology.				
17.	Personal traits like patience, sense of humor enhance student-teacher interactions in Biology.				

18.	Teachers' communication skills affect clarity in explaining Biology concepts.				
19.	Female teachers impact and comfort students in discussing some Biology topics.				
20.	Burnout from poor attitudes leads to rushed Biology syllabus coverage.				