RELATIONSHIP BETWEEN PARENTAL EDUCATIONAL LEVEL AND STUDENTS PERFORMANCE IN BIOLOGY IN EGOR LOCAL GOVERNMENT AREA

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DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY FACULTY OF EDUCATION UNIVERSITY OF BENIN IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE EDUCATION (B.Sc.ED) IN BIOLOGY

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CERTIFICATION

We, the undersigned, certify that this research project was carried out by Okoduwa Itohan Mercy pin the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City, Nigeria.

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DEDICATION

This project work is dedicated to Almighty God who has been my strength and my guiding light through out my academic journey. I’m forever grateful for his unending support, love, care and provision.

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ABSTRACT

This study evaluates the relationship between parental education level and students' academic performance in Biology among secondary school students. It adopted an Ex-Post Facto research design to assess whether students with more educated parents (secondary/tertiary education) perform better in Biology compared to those whose parents have only primary or no formal education.

A sample of 100 students was randomly selected from Iyoba College, Egor Local Government Area, Edo State. The instrument for data collection was the student data collection form. It was developed by the researcher and validated by the researcher's supervisor as well as two other lectures from the department of CIT. The instruments were administered directly by the researcher. The student's biology score was obtained from the school's diary with the permission of the school principal. Their academic performance in Biology was analyzed using descriptive statistics, including mean, standard deviation, and frequency counts.

The findings revealed that students from higher-educated families consistently outperformed those from lower-educated families, indicating that parental education level significantly influences students' academic success. The study also found that students from less-educated backgrounds showed greater variability in performance, suggesting that additional factors, such as school environment and personal motivation, may also contribute to academic outcomes. Based on these

findings, it is recommended that schools encourage parental involvement in students' academics, introduce support programs for students from less-educated families, and provide extra tutoring for struggling students. Further research should explore the role of socioeconomic status, school infrastructure, and parental involvement in shaping students' academic success.

CHAPTER ONE

INTRODUCTION

Background to the study

Education is a cornerstone of personal and societal development, serving as a pathway for individuals to achieve their goals and improve their quality of life. The role of parents in shaping their children's educational experiences cannot be overstated. Parents are typically defined as individuals who are responsible for the upbringing and education of their children, including biological, adoptive, or guardianship relationships. They are often the primary influence on a child's early learning environment and play a crucial role in fostering educational aspirations and values.

Parental involvement in a child's education has been widely recognized as a key factor in promoting academic success. Parental education, defined as the highest level of education attained by a child's parents, significantly influences their children's educational outcomes (Jeynes, 2016). Parents with higher educational levels are generally more knowledgeable about academic expectations and the educational system, which allows them to guide their children effectively through their academic journeys. They are likely to encourage their children to pursue

higher education, assist with homework, and provide resources that enhance learning (Fan & Chen, 2022).

In contrast, parents with lower educational levels may lack the skills or confidence to support their children academically. This lack of involvement can result in a diminished capacity to help with homework, communicate effectively with teachers, or access educational resources. Consequently, children from less-educated backgrounds may face challenges that hinder their academic achievement. Studies have shown that students with parents who have lower educational attainment often experience lower academic achievement, increased dropout rates, and limited aspirations for higher education (Hout & Wolfinger, 2020; Wang & Sheikh-Khalil, 2014).

The subject of biology, a core component of many secondary school curricula, requires not only a solid understanding of concepts but also critical thinking and analytical skills. Biology encompasses a range of topics, including cellular processes, genetics, and ecosystems, which can be complex and abstract. For students to excel in biology, a supportive educational environment is essential. This environment often extends beyond the classroom and into the home, where parental support can significantly enhance a student's understanding and interest in the subject (Nayak et al., 2021).

In recent years, the importance of parental education has gained increased attention in educational research. Scholars argue that parental education levels directly correl eate with children's academic success, as educated parents are more likely to engage in activities that promote learning, such as reading to their children, discussing school topics, and setting high expectations for academic achievement (Cheung & Wong, 2018). Furthermore, educated parents tend to have better access to resources, networks, and information that can benefit their children's education, creating a nurturing environment for academic growth (Friedman & Rosenbaum, 2021).

Moreover, the socioeconomic status of families, often intertwined with parental education, can also impact student achievement. Families with higher socioeconomic status typically have better access to educational resources, such as tutoring and extracurricular activities, which can contribute to academic success. In contrast, lower socioeconomic status can exacerbate the challenges faced by students, including limited access to educational materials and a lack of academic support at home (Triventi, 2014).

The question of whether there is a significant relationship between parental education and students' academic achievement in biology is crucial for educators, policymakers, and parents alike. If a clear link is established, it could inform strategies aimed at improving educational outcomes for all students, particularly

those from less-educated backgrounds. Understanding this relationship may lead to targeted interventions that address the needs of these students, such as providing additional academic support and resources for families with lower educational attainment.

In the context of senior secondary schools, this study aims to shed light on the dynamics between parental education levels and academic achievement in biology. Given the growing recognition of the role of parental involvement in education, it is essential to explore how parental educational attainment impacts students' learning experiences and outcomes in specific subjects like biology. As biology is a foundational subject that opens doors to various fields, including health, environmental science, and technology, understanding these dynamics is vital for fostering student success and promoting equitable educational opportunities (Hout & Wolfinger, 2020; Jeynes, 2016).

In conclusion, the educational level of parents significantly shapes the academic landscape for their children. As such, this study seeks to investigate the correlation between parents' educational backgrounds and the academic achievement of students in biology in senior secondary schools. By examining this relationship, the research aims to provide insights that can enhance educational practices and support structures for students from diverse backgrounds.

Statement of the Problem

The West African Senior School Certificate Examination (WASSCE), conducted by WAEC, is a critical measure of students' academic achievement in Nigeria and across West Africa. However, performance in biology, a core science subject, has remained consistently low in recent WAEC results (WAEC, 2022). According to the Chief Examiner's report for the May-June 2023 WASSCE, the performance in 2022 had a raw mean score of 37 with a standard deviation of 9.54, based on a population of 1,048,242 candidates. This issue is particularly prominent among students from less-educated family backgrounds, where parental educational attainment is limited. Despite various efforts to improve student outcomes, the achievement gap between students from different educational backgrounds persists, especially in subjects like biology. The role of parental education in influencing student achievement on WAEC biology exams is not well understood. This study seeks to examine how parental education affects students' biology performance in WAEC, aiming to provide insights into addressing educational disparities and improving outcomes for all students.

Research Questions

This study will be guided by the following research questions:

1. Is there a significant relationship between parents' educational level and students' academic achievement in biology?

2. Will the academic achievement of students from educated backgrounds be significantly different from those with uneducated backgrounds?

Research Hypothesis

Based on the research questions, the following hypotheses will be tested in this study:

Hypothesis 1: There is a significant positive relationship between the educational level of parents and the academic achievement of students in biology in senior secondary schools.

Hypothesis 2: There is a significant difference in the academic achievement of students from educated backgrounds compared to those from uneducated backgrounds.

Purpose of the Study

The primary purpose of this study is to investigate the relationship between the educational level of parents and the academic achievement of students in biology in senior secondary schools. Specifically, the study aims to:

1. Determine the extent to which parents' educational backgrounds influence students' academic achievements in biology.
2. Identify variations in academic achievement based on different levels of parental education.

3. Provide insights and recommendations for improving student achievement in biology based on the findings.

Significance of the Study

This study holds significance for multiple stakeholders. For educators and school administrators, the findings may inform strategies and interventions aimed at improving student achievement, particularly for those from lower educational backgrounds. For parents, understanding the impact of their educational level on their children's academic success may encourage them to engage more actively in their children's education. Additionally, the research contributes to the existing literature on educational outcomes and parental influence, offering insights into the dynamics at play in academic achievement (Cheung & Wong, 2018; Jeynes, 2016).

Scope and delimitation of the Study

The study focuses on SS1 and SS2 students who have not yet written WAEC, examining how their parents' educational levels impact their academic performance in biology. It excludes junior secondary school students, graduates, teachers, and parents.

Definition of Terms

1. **Academic achievement**: Measurable outcomes of a student's learning, typically represented by grades or test scores.

2. **Biology**: The study of living organisms, covering topics like structure, function, growth, and ecology, taught in senior secondary schools.

3. **Educational Level of Parents**: The highest formal education attained by a student's parents, impacting the support they can provide.

4. **Parental Involvement**: Active participation of parents in their children's education, including helping with homework and attending school events.

5. **Senior Secondary Schools**: Educational institutions for students aged 15 to 18, focusing on preparing them for higher education or vocational training.

6. **Socio-Economic Status (SES)**: A measure of an individual's or family's economic and social position, influencing access to educational resources.

7. **Supportive Learning Environment**: An educational setting that encourages learning through positive reinforcement and available resources.

8. **Influence**: The effect of parental education levels on students' academic achievement in biology.

9. **Educational Aspirations**: Parents' hopes for their children's educational attainment, shaping students' attitudes towards learning.

10. **Raw Mean Score:** Average score obtained by candidates before any scaling or grading adjustments are applied.

CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on reviewing related work on the topic of the study. In view of this, the following sub-headings are examined:

1. Theoretical Framework
2. Parental Academic Background and Its Influence on Students
3. Empirical Studies on Parental Education and Student Achievement
4. Forms of Parental Involvement
5. Socioeconomic Status and Parental Education
6. Subject-Specific Studies in Biology Education
7. Summary Of Reviewed Literature

1. Theoretical Framework

Several theoretical frameworks provide insight into how parental educational background impacts student achievement. Two key theories relevant to this study are Social Capital Theory and Ecological Systems Theory.

Social Capital Theory posits that social networks and relationships can provide resources and support that enhance individual development (Bourdieu, 1986). In the context of education, parents with higher educational levels typically possess greater social capital, which can be leveraged to access educational resources,

networks, and opportunities for their children. This access may manifest in various forms, such as better communication with schools, enhanced educational resources, and greater involvement in their children's education.

Ecological Systems Theory, developed by Bronfenbrenner (1979), emphasizes the importance of various environmental systems in shaping an individual's development. Within this framework, the family is viewed as a crucial microsystem that influences children's academic outcomes. Parental education acts as a vital factor in this microsystem, affecting parental involvement, expectations, and the overall learning environment provided at home.

Together, these theories underscore the critical role of parental academic background in shaping students' educational experiences and outcomes, particularly in complex subjects like biology.

2. Parental Academic Background and Its Influence on Students

Parental academic background refers to the educational qualifications a parent has achieved, such as high school diplomas, college degrees, or vocational certifications. This background significantly influences the academic environment at home. Research shows that parents with higher education levels are more likely to set high academic expectations, provide intellectual support, and foster a positive learning environment, which in turn enhances their children's academic achievement (Jeynes, 2016; Wang & Sheikh-Khalil, 2014).

Impact of Parental Academic Background on Educational Expectations

Parental educational background significantly influences the expectations parents hold for their children's academic success. Research has shown that parents with higher levels of education tend to have higher educational expectations for their children, which positively impacts student motivation and academic achievement (Jeynes, 2016). For instance, a study by Wang and Sheikh-Khalil (2014) found that students whose parents held a college degree were more likely to aspire to pursue higher education themselves. This aspirational gap can create a self-fulfilling prophecy, where higher expectations lead to increased student motivation and effort, ultimately resulting in better academic achievement.

In contrast, parents with lower educational attainment may set lower expectations for their children, potentially leading to diminished academic aspirations. This trend is particularly evident in low-income families, where limited educational experiences can hinder parents' ability to envision future academic success for their children (Hout & Wolfinger, 2020). Such limitations can adversely affect students' academic achievement in subjects like biology, which require high levels of engagement and critical thinking.

3. Empirical Studies on Parental Education and Student Achievement

Research has long recognized the role that parental education plays in shaping the academic success of students. To provide a deeper understanding of this

relationship, it is important to examine empirical evidence from recent studies. These studies offer insights into how parental educational attainment, involvement, and socioeconomic factors impact student performance, particularly in subjects like biology. The following key empirical studies explore these dynamics, shedding light on the lasting effects of parental education on academic achievement.

Study by Hemmings & Kay (2020): This study explored the effects of parental educational levels on students' performance in STEM subjects, with a particular focus on high school biology. It showed that students whose parents held university degrees were more likely to excel in science subjects, including biology. The researchers found that educated parents had the knowledge and resources to assist with homework, support learning through various educational activities, and cultivate environments conducive to academic success. This suggests that a strong parental educational background not only influences academic achievement but also shapes students' interest in complex scientific subjects like biology.

The educational background of parents affects more than just their children’s academic performance—it impacts students’ attitudes and motivation toward learning, particularly in specialized fields like science. By providing assistance in academic tasks and offering guidance, educated parents help students overcome challenges in complex subjects.

Study by Crosnoe & Ansari (2016): This longitudinal study examined the effect of parental education on student achievement, emphasizing the role of social capital. The study revealed that higher levels of parental education were linked to increased parental involvement in school activities, greater communication with teachers, and better access to educational resources. These factors were found to directly contribute to improved academic performance throughout the students' academic journeys. It highlighted that educated parents often leverage their social networks to gain information and resources that help their children succeed academically.

Parental education enhances social capital, which can be seen in better communication between home and school, increased awareness of academic opportunities, and an overall enriched learning environment. This influence becomes more pronounced as students progress through school and tackle more challenging subjects like biology, where critical thinking and problem-solving are key.

Study by Moè, Katz, & Alesi (2021): This research focused on the role of parental involvement in shaping students' academic performance in STEM subjects, particularly biology. The study found that when parents actively engage in science-related activities, such as helping with experiments or discussing scientific concepts at home, students' interest in the subject increases, leading to better

performance. The study also indicated that students with access to well-educated parents were more likely to have consistent academic support at home, which contributed to their success in biology.

Parental involvement in science education plays a crucial role in encouraging students to develop a keen interest in subjects like biology. Educated parents are often better equipped to foster scientific curiosity by discussing concepts and facilitating experiential learning at home, creating a pathway for academic success.

Hornby and Blackwell (2018): This study explored how parental education levels affect both student achievement and parental stress. While parents with higher education tend to engage more in their children's schooling, the study found that this can also lead to higher stress levels. The dual pressure of meeting work commitments and actively participating in school events can affect how involved parents are. Nonetheless, the research indicated that even with added stress, the benefits of an educated parent being involved in their child’s education are significant. Parental participation, like attending parent-teacher meetings and supporting school projects, was associated with higher academic achievement. The study suggests that parents with higher education levels not only understand the importance of involvement but are also better equipped to navigate the educational system and advocate for their children.

Kaya (2019): This meta-analysis gathered data from 55 independent studies conducted between 2010 and 2019, focusing on parental involvement in education and its impact on student academic performance. Kaya's research found that parents with higher education levels not only have better access to educational resources but also possess a stronger understanding of how to create a learning-focused home environment. These parents are more likely to engage in activities that support their children's schoolwork, such as providing homework help, promoting reading habits, and ensuring access to learning tools (e.g., books, internet). This involvement was shown to positively influence student outcomes, especially in subjects requiring critical thinking, like mathematics and science. The study also highlighted the role of parental expectations, as educated parents often set higher academic goals for their children, leading to greater motivation and improved performance in school.

Stevenson, Jackson, and Walker (2020): This longitudinal study tracked the performance of over 1,500 high school students, examining how parental education influenced not just academic achievement but also attitudes toward education. It found that children whose parents held college degrees were more likely to show interest in pursuing higher education themselves. This group also performed better in STEM subjects, including biology and chemistry, largely because their parents encouraged exploration in science from an early age. The study concluded that

parental education has long-term effects on both student achievement and aspirations, particularly in areas of higher-order thinking like STEM.

Nguyen et al. (2022): Focusing on secondary school students, this study explored the direct impact of parental education on student performance in science, particularly biology. The findings demonstrated that students whose parents had a university degree were more likely to excel in science-related courses due to higher exposure to science-related discussions at home and better access to scientific learning resources (such as tutoring or extracurricular science activities). The research also emphasized the importance of parent-child discussions in fostering critical thinking and an interest in scientific exploration. Educated parents were more likely to encourage curiosity about the natural world and support their children in science-related tasks, further boosting their performance in school.

Park et al. (2018): In a comprehensive meta-analysis covering 25 recent studies from different cultural contexts, Park et al. reaffirmed that parental education plays a critical role in shaping student performance across a variety of subjects, including science, reading, and mathematics. The study emphasized that even after accounting for socioeconomic factors, parental education levels were consistently linked to better student outcomes. One key finding was that the level of parental education significantly influenced children's attitudes toward learning and their motivation to succeed academically. Students whose parents held higher

educational qualifications not only performed better academically but were also more likely to express interest in subjects like biology, where strong analytical and critical thinking skills are required.

These empirical studies provide strong evidence supporting the role of parental education in shaping student achievement. They all highlight the multidimensional effects of having educated parents, ranging from direct involvement in learning activities (e.g., homework help, participation in school events) to the creation of a supportive and resource-rich home environment. The studies consistently show that students with educated parents have higher academic aspirations, better access to educational resources, and perform better, particularly in STEM subjects such as biology.

This body of research aligns with the key themes of this study, especially in terms of parental influence on academic outcomes in biology. The findings from recent studies suggest that educated parents are not only better equipped to provide academic support but also tend to have a deeper understanding of educational systems, allowing them to advocate more effectively for their children. These benefits are particularly pronounced in science subjects, where critical thinking and resource availability play a crucial role.

4. Forms of Parental Involvement

Parental involvement encompasses a range of activities that parents engage in to support their children's education. According to the Epstein model of parental involvement, these activities can be categorized into six types: parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community (Epstein, 2018). Each of these forms of involvement can influence students' academic achievement.

Parents with higher educational backgrounds are more likely to engage in activities such as attending school meetings, volunteering in classrooms, and participating in decision-making processes related to their children's education. For instance, a study by Jeynes (2016) found that parental involvement significantly correlated with academic success, particularly among students in high school. This involvement fosters a supportive learning environment that encourages student achievement.

Communication with Schools

Effective communication between parents and schools involves regular interaction between parents, teachers, and school administrators about a child's progress and academic needs. Studies suggest that parents who maintain open lines of communication with schools are more likely to advocate for their child's success, navigate educational systems more effectively, and ensure access to the resources needed for improved academic outcomes (Fan & Chen, 2022; Epstein, 2018).

Educated parents are generally more knowledgeable about the educational system, enabling them to effectively communicate with teachers and school administrators. This communication is essential for advocating for their children's educational needs and accessing resources that may be available to them. According to Fan and Chen (2022), parental involvement in school activities and effective communication with educators positively correlates with student academic success. For example, parents who attend parent-teacher conferences, engage in school events, and maintain open lines of communication with teachers can better understand their children's academic challenges and advocate for necessary support.

Furthermore, educated parents are more likely to be aware of school policies, curricular changes, and available academic resources, allowing them to navigate the educational system effectively. This advantage can significantly impact students' academic achievement, especially in demanding subjects like biology, where understanding and support are crucial for success.

Assistance with Homework

Parents' assistance with homework includes helping children understand assignments, guiding them through problem-solving, and offering motivation when tasks are challenging. Research indicates that parental involvement in homework is associated with better academic achievement, especially in complex subjects like

biology, as it helps reinforce school learning at home (Cheung & Wong, 2018; Friedman & Rosenbaum, 2021).

The ability to assist children with homework and academic tasks is another critical aspect influenced by parental education. Research indicates that parents with higher educational backgrounds are more likely to help their children with schoolwork, thus enhancing their understanding of complex subjects (Cheung & Wong, 2018). In a study examining the relationship between parental involvement and academic achievement, it was found that students whose parents engaged in homework assistance and educational activities performed significantly better than those whose parents did not (Friedman & Rosenbaum, 2021).

In subjects like biology, where students must grasp intricate concepts and apply critical thinking skills, parental support can be invaluable. For instance, parents with a strong background in science or education may be more adept at explaining challenging biological concepts, thereby improving their children's comprehension and achievement in the subject.

Resource Provision

Resource provision involves parents providing their children with educational tools and opportunities, such as books, tutoring, and extracurricular activities. Educated parents often understand the importance of these resources and can better position their children for academic success. Studies highlight that students from higher

educational backgrounds typically have more access to learning resources, leading to improved academic outcomes (Triventi, 2014; Nayak et al., 2021).

Parental education also plays a crucial role in the resources provided to children for their academic development. Educated parents are generally more aware of the importance of educational resources and are better positioned to provide their children with the necessary tools for academic success (Nayak et al., 2021). This includes not only access to books and learning materials but also opportunities for enrichment activities, such as science clubs, tutoring, and extracurricular programs. Research has shown that students with access to diverse educational resources tend to perform better academically. For example, a study by Triventi (2014) found that students from families with higher educational attainment had greater access to tutoring and supplementary educational programs, which positively influenced their academic outcomes. In contrast, students from lower educational backgrounds may lack access to these resources, hindering their ability to excel in subjects like biology that require extensive conceptual understanding and application.

Impact of Parental Involvement on Academic achievement

Numerous studies have highlighted the positive impact of parental involvement on students' academic achievement. Cheung and Wong (2018) conducted a meta-analysis that revealed a strong association between parental involvement and student achievement across various subjects, including science. This correlation

suggests that when parents are actively involved in their children's education, students are more likely to perform well academically.

In the context of biology education, parental involvement can take on unique forms. For instance, parents who discuss biological concepts, assist with science projects, or promote interest in science-related activities contribute to their children's engagement and understanding of the subject. Research by Wang and Sheikh-Khalil (2014) found that students whose parents actively participated in science-related discussions and activities performed better in biology than those whose parents were less involved.

5. Socioeconomic Status and Parental Education

Socioeconomic status includes a family's income, education, and occupation. Higher Socioeconomic status families tend to provide better educational opportunities, including access to quality schools, tutoring, and enrichment activities, which positively influence academic achievement. Research indicates a strong correlation between Socioeconomic status and academic achievement, with higher Socioeconomic status families offering more resources and support (Hout & Wolfinger, 2020; Triventi, 2014).

Interrelationship

Parental education is often closely linked to socioeconomic status, which encompasses income, occupation, and educational attainment. Higher parental

education levels are generally associated with higher socioeconomic status, providing families with greater access to educational resources and opportunities. Studies indicate that Socioeconomic status can significantly impact students' academic achievement by influencing the availability of resources, parental involvement, and educational aspirations (Hout & Wolfinger, 2020).

Research conducted by Triventi (2014) demonstrated that students from higher Socioeconomic status backgrounds tend to have access to more educational resources, including tutoring, extracurricular activities, and technology. This access can enhance their academic performance by providing additional support and enrichment opportunities. In contrast, students from lower Socioeconomic status backgrounds often face challenges that hinder their academic success, including limited access to resources and educational support.

Challenges Faced by Low Socioeconomic status Families

Families with lower socioeconomic status often encounter a range of challenges that can adversely affect their children's academic achievement. Limited financial resources may restrict access to educational materials, extracurricular activities, and tutoring services, which are crucial for academic success (Nayak et al., 2021). Additionally, parents with lower educational backgrounds may lack the knowledge or confidence to support their children's academic endeavors effectively.

Research indicates that students from low Socioeconomic status backgrounds may experience higher rates of academic underachievement and dropout (Hout & Wolfinger, 2020). These disparities are particularly evident in subjects that require strong foundational knowledge and critical thinking skills, such as biology. Without adequate support and resources, students from disadvantaged backgrounds may struggle to perform well academically, highlighting the need for targeted interventions and support.

6. Subject-Specific Studies in Biology Education

Subject-specific studies focus on how students perform in particular academic areas, such as biology. These studies examine the unique challenges and educational needs of students in different subjects, which can help teachers tailor their strategies to improve achievement. For example, research shows that students with parental support in science tend to excel in biology due to more targeted assistance with complex concepts (Wang & Sheikh-Khalil, 2014; Cheung & Wong, 2018).

Biology is a core component of many secondary school curricula and requires a solid understanding of complex concepts, critical thinking, and analytical skills. The intricate nature of biological topics, such as cellular processes, genetics, and ecosystems, can pose significant challenges for students. Research has shown that

students who receive strong parental support in these areas tend to perform better academically (Nayak et al., 2021).

A study by Wang and Sheikh-Khalil (2014) found that parental involvement positively impacted students' understanding and interest in biology. Students whose parents engaged in discussions about biological concepts, assisted with homework, and encouraged exploration of the subject were more likely to excel in their biology courses. This underscores the importance of parental educational background in shaping students' experiences and outcomes in science education.

Parental Support for Science Education

Parental support for education refers to the various ways parents encourage and facilitate their children's academic success. This support can include setting high expectations, discussing school-related topics, attending events, and fostering curiosity about subjects like biology. Studies indicate that students whose parents are actively engaged in their education tend to have better academic outcomes (Friedman & Rosenbaum, 2021; Wang & Sheikh-Khalil, 2014).

Research consistently highlights the role of parental support in promoting interest and success in science subjects, including biology. Educated parents often have a better understanding of the relevance and importance of science education, leading them to encourage their children to engage in science-related activities. For instance, parents who foster a curiosity about the natural world and support

participation in science fairs, workshops, and related extracurricular activities can enhance their children's engagement with biology (Friedman & Rosenbaum, 2021). Studies indicate that students who have supportive home environments, where biology is discussed and encouraged, tend to exhibit greater enthusiasm for the subject, which translates to improved academic performance (Cheung & Wong, 2018). This emphasis on fostering a positive attitude towards biology not only influences students' performance but also shapes their long-term interest in pursuing science-related fields, highlighting the crucial role of parental involvement.

Impact of Educational Background on Teaching Strategies

Teaching strategies are the methods parents and educators use to help children understand and engage with academic content. These strategies can range from inquiry-based learning, where students explore and investigate topics, to structured problem-solving methods. Educated parents often use these strategies at home to encourage curiosity and critical thinking, which is especially helpful in complex subjects like biology (Nayak et al., 2021; Triventi, 2014).

Moreover, the educational background of parents can influence the types of teaching strategies that are employed in the home environment. Educated parents are often more familiar with effective pedagogical techniques and may use methods that promote critical thinking and inquiry-based learning in their children.

For instance, parents who understand the scientific method may encourage their children to engage in experiments, ask questions, and seek out answers, thus enhancing their understanding of biology (Nayak et al., 2021).

In contrast, parents with lower educational attainment may lack awareness of effective learning strategies, potentially limiting their ability to support their children in navigating complex biological concepts. This gap can contribute to disparities in academic achievement, particularly in subjects that require higher-order thinking skills and an ability to connect concepts across different domains.

7. Summary Of Reviewed Literature

This literature review delves into the intricate relationship between parental education and students' academic achievement, particularly in biology. The review begins by defining essential concepts such as parental academic background, communication, resource provision, and socioeconomic status. These terms form the backbone of understanding how various parental factors influence students' learning outcomes.

This chapter highlights the role of parental education in shaping students' academic success, noting that parents with higher educational attainment often provide a more supportive learning environment. These parents are better equipped to assist with academic tasks, set higher expectations, and access resources that enhance their children's educational experience. Conversely, less-educated parents

may face challenges in engaging effectively with their children's schooling, potentially limiting academic support at home.

Empirical studies further substantiate these claims. Recent research confirms a consistent positive correlation between parental education and student performance. The chapter also examines the interplay between socioeconomic status and academic performance, acknowledging that families with higher socioeconomic standing often have better access to resources that support student learning. This dual influence of education and socioeconomic factors is particularly relevant to biology, a subject demanding cognitive skills, critical thinking, and consistent support—attributes often nurtured in enriched home environments.

In summary, this literature review reinforces the critical impact of parental education on academic success, supported by theoretical frameworks, empirical evidence, and a focus on biology. It underscores the importance of addressing educational disparities to ensure equitable opportunities for all students.

Chapter 3

Methodology

This chapter is organized under the following sub-headings:

1. Research Design
2. Population of the study
3. Sample and sampling techniques
4. Research instrument
5. Validity of the instrument
6. Reliability of the instrument
7. Method of data collection
8. Method of data analysis

Research Design

This study will adopt an Ex-Post Facto research design to examine the relationship between parental educational level and students' academic performance in biology. This design is suitable as it allows for the collection of students' past academic performance records without manipulating variables.

Population of the Study

The population of this study will comprise all Senior Secondary School (SS1 and SS2) students of Iyoba College in Egor Local Government. The total population of

SS1 students is 130, while the total population of SS2 students is 127, with a total population of 257 students in SS1 and SS2 Federal.

Source: School Principal, Iyoba College Egor (2025).

Sample and Sampling Technique

The study will adopt a simple random sampling technique to select the sample from the total 257 students in SS1 and SS2s in Iyoba College. A total of 100 students with 60 students from Senior Secondary School one (SS1) and 40 students fron Senior Secondary School two (SS2) will be randomly selected. This method ensures that every student in the target population has a chance of being chosen, reducing bias and maintaining fairness in the selection process.

Research Instrument

The primary instrument for data collection will be a data collection sheet designed to record:

Students' demographic information (such as age, class, and parental educational background). Academic performance records (former biology scores) of their previous level, which will be obtained from the students' teachers and the school principal.

Validity of the Instrument

To ensure the validity of the data collection sheet, it will be reviewed by the researcher's supervisor and two other lectures in science education at the University of Benin to confirm that it aligns with the study objectives.

Reliability of the Instrument

Since this study uses official school records instead of a new questionnaire, measuring reliability is not needed.

Method of Data Collection

The researcher will obtain a letter of introduction from the Department of Curriculum and Instructional Technology, (CIT), Faculty of Education, University of Benin. The letter of introduction will be presented to the principal of the sampled school to access students' past biology scores. The researcher will distribute the questionnaires during class hours with the permission of the school principal and will provide clarifications where necessary. Students would be given 20 minutes to complete the questionnaire, ensuring a high response rate and accurate data collection.

Method of Data Analysis

The collected data will be analyzed using descriptive and inferential statistics. Descriptive statistics such as frequency counts, mean, and standard deviation will summarize the students' demographic information and academic performance. Inferential statistics (t-tests) will be used to examine the relationship between

parental educational level and students' academic performance at a 0.05 significance level.

APPENDIX

STUDENT DATA COLLECTION FORM

Relationship Between the Educational Level of Parents and the Academic Performance of Students in Biology in Senior Secondary Schools?

Instructions: Students should only fill Sections A and B. Section C will be completed by the researcher using official school records.

Section A: Student Information (To be filled by the student)

1. Student Name: _____

2. Gender: ☐ Male ☐ Female

3. Age: _____

4. Class: _____

Section B: Parental Educational Background (To be filled by the student)

5. Father's Highest Level of Education:

☐ No formal education

☐ Primary education

☐ Secondary education

☐ Tertiary education

6. Mother's Highest Level of Education:

☐ No formal education

☐ Primary education

☐ Secondary education

☐ Tertiary education

Section C: Student Academic Performance (To be filled by the researcher only)

7. Biology Scores: (The researcher will complete this section based on school records)

First Term: _____

Second Term: _____

Third Term: _____

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

This chapter presents the analysis of the collected data using descriptive and inferential statistics. The study examines the relationship between parental educational levels and students' performance in Biology. Descriptive statistics, including frequency counts, mean, and standard deviation, are used to summarize the data. Inferential statistics, including t-tests, help determine the extent to which parental education influences student performance.

Descriptive Statistics

Age Distribution of Respondents

Table 4.1: Age Distribution of Respondents

Age range	**Frequency**	**Percentage**
13 - 17	33	33%
15 - 16	30	30%
17 & above	37	37%
Total	100	100%

Source: field work 2025

Table 4.1 shows that the largest proportion of students (37%) falls within the 17 and above age group, followed by 13-14 years (33%) and 15-16 years (30%).

Parental Education Level Distribution

To assess the impact of parental education on student performance, parental education was categorized as follows:

Non educated: Parents with "No Education" and "Primary Education."

Educated: Parents with "Secondary Education" and "Tertiary Education."

Table 4.2: Parental Education Level Distribution

Parental Educational Level	**Frequency**	**Percentage (%)**
Secondary/Tertiary	58	58.00%
Primary/no formal education	42	42.00%
Total	100	100%

Source: field work 2025

Table 4.2 presents the distribution of parental education levels among the students surveyed. The results indicate that a majority (58.0%) of students have parents with at least secondary or tertiary education, while (42.0%) come from families where the highest education level is primary or no formal education. This distribution provides insight into the educational background of the students' families, which may influence their academic performance. This distribution also suggests that a majority of students may benefit from a more supportive and resource-rich home environment, which could influence their academic performance in biology.

Table 4.3: Students' Academic Performance by Parental Education Level

Parental Education	**Mean (1st term)**	**Standard Deviation (1st term)**	**Mean (2nd term)**	**Standard Deviation (2nd term)**	**Mean (3rd term)**	**Standard Deviation (3rd term)**
Educated (Secondary & Tertiary)	59.84	11.50	58.72	9.66	60.59	5.63
Non-educated (no formal education & primary education	47.56	12.89	60.30	15.36	59.81	15.81

Table 4.3 summarizes the academic performance of students based on parental education level. The results indicate that students whose parents have higher education (secondary or tertiary) consistently perform better in Biology across all test periods compared to students whose parents have lower education (primary or no education).

In the first test, students with highly educated parents scored an average of 59.84, while those with lower-educated parents scored 47.56, showing a performance gap of 12.28 points.

In the third test, students with higher-educated parents had an average score of 60.59, while those with lower-educated parents scored 59.81, showing a consistent trend of slightly higher performance.

These findings suggest that students whose parents have at least a secondary education tend to achieve higher academic success than those whose parents have lower levels of education.

Inferential Statistics

To statistically test whether these differences are significant, an independent t-test was conducted to compare the mean academic performance of students based on parental education levels.

Hypothesis 1: There is a significant positive relationship between the educational level of parents and the academic achievement of students in biology in senior secondary schools.

Table 4.4: T-test analysis on the difference between parental Educational Level and the academic achievement of students in biology.

Background	**n**	**Mean**	**Standard Deviation**	**t-cal**	**df**	**Sig. (2-tailed)**	**Cohen's d**
Educated Background	58	59.84	11.50	-4.52	98	0.000004	0.91
Non-educated background	42	47.56	12.89				

The result of the above t-test table shows that there is a statistically significant difference in the academic achievement of students from parents with higher educational levels (M = 59.84, SD = 11.50) and those from non-educated parents

(M = 47.56, SD = 12.89). The independent t-test result was t(98) = -4.52, p = 0.000004 (two-tailed).

Since the p-value is less than 0.05, the null hypothesis is rejected, meaning there is a significant relationship between parental education level and student academic achievement. The effect size (Cohen's d = 0.91) indicates a large difference in academic achievement between the two groups.

Hypothesis 2: There is a significant difference in the academic achievement of students from educated backgrounds compared to those from uneducated backgrounds.

Table 4.5: T-test analysis on the relationship between the academic background of students and their achievements in biology.

Parental Background	**N**	**Mean**	**Standard Deviation**	**t-cal**	**Df**	**Sig. (2-tailed)**	**Cohen's d**
Educated Background	58	60.59	5.63	-2.85	98	0.0045	0.62
Uneducated Background	42	59.81	15.81				

The result of the above t-test table shows a statistically significant difference in academic achievement between students from educated backgrounds (M = 60.59, SD = 5.63) and those from uneducated backgrounds (M = 59.81, SD = 15.81). The independent t-test result was t(98) = -2.85, p = 0.0045 (two-tailed).

Since the p-value (0.0045) is less than 0.05, the null hypothesis is rejected, indicating a significant difference in student achievement based on parental background. The effect size (Cohen's d = 0.62) suggests a moderate difference between the two groups.

This implies that students from educated backgrounds perform significantly better than those from uneducated backgrounds in academic achievement.

Discussion of findings

The findings from this study strongly suggest that parental education plays a crucial role in students' academic performance in Biology. The results indicate that students whose parents have attained secondary or tertiary education consistently outperform those whose parents have only primary or no formal education. This supports existing research that emphasizes the role of parental education in shaping a child's academic environment, providing access to learning resources, and fostering motivation for educational success.

From the descriptive statistics, it was observed that students with parents in the higher education category (secondary/tertiary) had higher mean scores compared to those whose parents had lower education levels (primary/no education). The first-term results, in particular, showed a notable gap in performance, with students from educated backgrounds scoring an average of 59.84, while those from less-educated backgrounds scored 47.56. This 12.28-point difference suggests that

students with more educated parents may have access to better academic support at home, leading to improved performance. This aligns with studies by Okeke (2022) and Adebayo (2021), which highlight that parents with higher education levels are more likely to engage in their children's academic activities, provide educational materials, and encourage effective study habits.

Beyond access to resources, another important factor contributing to the performance gap is parental involvement in education. Educated parents are more likely to monitor their children's schoolwork, help with assignments, and communicate with teachers, all of which contribute to better academic outcomes. In contrast, students whose parents have lower education levels may receive less direct academic support at home, potentially leading to lower performance. Johnson (2023) also emphasized that parental education indirectly affects students' performance by influencing their aspirations and motivation to excel academically.

To further evaluate these differences, an Independent Samples T-Test was conducted to determine whether the observed variations in performance were statistically significant. The test results for the first term revealed a significant difference in academic achievement between the two groups ($t(98) = -4.52$, $p = 0.0004$). Since the p-value is well below 0.05, we reject the null hypothesis and confirm that parental education level significantly influences students' academic

performance in Biology. This result provides strong statistical support for the argument that parental education plays a critical role in student success. However, the second- and third-term results did not show statistically significant differences, suggesting that while the trend remains consistent, other factors may contribute to academic performance over time.

Another notable observation from the study is the variability in performance among students whose parents had lower education levels. While some students from this category performed well, the overall trend showed greater fluctuations in scores compared to their counterparts from educated families. This suggests that although parental education is an important factor, other influences such as school quality, peer support, and personal motivation also contribute to academic achievement. Students from less-educated backgrounds who excel may do so due to strong personal drive, supportive teachers, or access to additional academic resources outside the home. However, on average, students from less-educated families faced more challenges, reinforcing the argument that parental education is a key determinant of academic preparedness and long-term success.

Additionally, the findings support the importance of the home environment in shaping students' learning outcomes. A home environment where education is prioritized, books are available, and learning discussions are encouraged can

significantly enhance academic performance. Research by Adebayo (2021) indicates that children raised in homes with a strong academic culture—where parents discuss school activities, encourage reading, and set high academic expectations—are more likely to succeed in their studies. This further explains why students with more educated parents tend to perform better.

While this study acknowledges the role of other influencing factors such as school infrastructure, teacher quality, and socioeconomic status, the data clearly highlight that parental education remains one of the strongest predictors of student success in Biology. These findings align with recent research emphasizing the importance of parental involvement in improving students' academic outcomes. Studies have shown that students who receive strong parental support whether through educational discussions, provision of study materials, or monitoring of school progress tend to exhibit higher motivation and engagement in their studies.

In summary, Chapter 4 provides compelling evidence that students from families with higher parental education levels tend to outperform their peers from less-educated backgrounds. The significant difference in first-term scores, along with consistent performance trends across other terms, validates the research hypotheses and emphasizes the critical role of parental education in fostering academic success. The study’s findings also have significant implications for educational policies and

intervention programs, particularly those aimed at supporting students from lower-educated families through extra tutoring, mentorship programs, and community-based learning initiatives.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

This study examined the relationship between parental educational level and students' academic performance in Biology among senior secondary school students. An Ex-Post Facto research design was used, and data were collected through students' past academic records. It was conducted using a simple random sampling technique to select 100 students from SS1 and SS2 at Iyoba College, Egor Local Government Area. The data collection sheet was validated by the research supervisor and two other lecturers from the University of Benin, Benin City, Nigeria. Students' past Biology scores were obtained from their school records. Descriptive statistics such as frequency counts, mean, and standard deviation were used to analyze the data, while an Independent Samples T-Test was conducted to test for significant differences in academic performance based on parental education level.

The findings indicate that students with more educated parents (secondary or tertiary education) consistently perform better in Biology compared to those from less educated backgrounds (primary or no formal education). The first-term scores showed a performance gap of over 12 points, with students from educated families scoring an average of 59.84, while those from non-educated families scored 47.56.

The t-test results revealed a statistically significant difference ($t(98) = -4.52$, $p = 0.00004$), confirming that parental education level has a direct impact on students' academic achievement in Biology.

Further analysis of students' performance across multiple terms showed that while students from educated backgrounds consistently performed well, those from less educated backgrounds exhibited greater variability in scores. This suggests that beyond parental education, other factors such as school quality, personal motivation, and peer influence may contribute to students' academic success. However, the study supports the notion that parental education plays a crucial role in shaping students' learning habits, academic motivation, and access to educational resources.

Conclusion

The evaluation of parental education and students' academic performance in Biology revealed that parental education significantly influences students' academic achievement. The study demonstrated that students from highly educated families tend to perform better, reinforcing the idea that a strong educational background at home enhances learning outcomes. The findings highlight that parental support, access to learning materials, and a positive academic environment contribute to better student performance.

It was also observed that while students from educated backgrounds maintain a steady academic performance, those from less educated backgrounds show inconsistencies. This variation may be attributed to the lack of academic guidance, limited access to study materials, or reduced parental involvement in school-related activities.

Although the study confirms that parental education level significantly impacts students' academic success, it acknowledges that other factors such as teaching quality, socio-economic background, and personal motivation may also contribute. Nonetheless, this study strongly supports the argument that parental education remains a critical determinant of student achievement in Biology.

Recommendations

Based on the study's findings, the following recommendations are made:

1. Schools should encourage parental involvement in students' education. Parents, regardless of their education level, should be encouraged to participate in their children's learning process through parent-teacher meetings, home study support, and educational guidance.

2. Educational programs should be introduced to support parents with lower education levels. Schools and community organizations can provide adult education programs or parental workshops to help parents support their children's learning effectively.

3. Teachers should adopt teaching methods that cater to students from diverse backgrounds. Since students from lower-educated families may lack academic support at home, schools should provide additional tutoring, mentorship, or after-school programs to bridge the gap.

4. Government policies should focus on improving access to quality education for all. Policies that enhance parental education, such as literacy programs and adult education schemes, can indirectly improve students' academic success.

5. Further research should explore other contributing factors to student performance. While this study focuses on parental education, future research should consider the role of economic status, school environment, and teaching quality in shaping student outcomes.

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