A STUDY ON GENDER DISPARITIES IN MATHEMATICS ACHIEVEMENT AMONG

SECONDARY SCHOOLS STUDENTS IN EGOR LOCAL GOVERNMENT AREA, EDO STATE

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE AWARD OF BSC.ED. DEGREE IN MATHEMATICS

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CERTIFICATION

We the undersigned certify that this research work was carried out by PETER CHUKWUEMEKA OPENE with matriculation number, EDU2005348 in the department of curriculum and instructional technology, Faculty of Education, University of Benin, Benin Nigeria.

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DEDICATION

This research is dedicated to God Almighty, who gave me knowledge, understanding, good health, strength, guidance and His protection during this work and to everyone that has made this four years possible.

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ABSTRACT

This study investigates gender disparities in mathematics achievement among secondary school students in Egor Local Government Area, Edo State, Nigeria. Using a descriptive survey design, data was collected from 154 students (103 males, 51 females) selected through multi-stage sampling from public secondary schools. The research examined four key factors: differences in mathematics achievement between genders, the influence of cultural beliefs and societal expectations, the impact of teacher attitudes and classroom practices, and the effect of parental support. Findings revealed that while respondents perceived differences in mathematics achievement between male and female students, these disparities were primarily attributed to sociocultural factors rather than cognitive abilities. Male students received higher expectations from teachers, greater encouragement from parents, and benefited from cultural norms favoring their participation in mathematics. Independent samples t-tests showed no statistically significant differences between male and female students' perceptions regarding mathematics performance ($p=0.439$) and motivation ($p=0.373$). The study concludes that gender disparities in mathematics achievement stem largely from societal expectations, teacher attitudes, and parental support rather than inherent ability differences. Recommendations include implementing gender-inclusive teaching strategies, teacher training on bias elimination, parental education on equal encouragement, and targeted support programs for female students in STEM fields.

CHAPTER ONE

INTRODUCTION

Background to the Study

Mathematics proficiency has increasingly emerged as a vital criterion for academic success, influencing students' trajectories toward higher education and careers, especially in the expanding STEM (science, technology, engineering, and Mathematics) sectors. Mastering Mathematics is crucial for students' academic and professional trajectories, as mathematical proficiency underpins fields that foster innovation and economic advancement (Akpotor & Egbule, 2020). Nonetheless, mathematical proficiency varies among student demographics. In secondary education, gender-based disparities in Mathematics performance frequently arise, resulting in gaps that profoundly affect educational equity and social advancement. Research has extensively documented these gender-based disparities, indicating systemic issues that restrict equal opportunities for male and female students, especially in societies where gender stereotypes and socio-cultural norms significantly impact education (Awofala, 2017). Worldwide, disparities in Mathematics achievement between genders have been consistently noted; however, the specific factors influencing these disparities differ significantly across cultural, socio-economic, and educational contexts. In Nigerian secondary schools, distinct cultural and economic factors significantly influence gender disparities in Mathematics performance. (Adewale & Oni, 2018). In Nigeria, societal norms and traditional expectations frequently prioritize male proficiency in quantitative disciplines, whereas females are occasionally steered towards fields deemed less demanding (Animasaun & Oyadeyi, 2023). Cultural contexts can intensify disparities in Mathematics achievement, as female students may encounter subtle discouragement from excelling in the subject. Comprehending the particular dynamics within Egor Local Government in Edo State, Nigeria, is essential for formulating strategies that promote gender equity in educational outcomes, guaranteeing that both male and female students are aided in achieving their maximum academic potential.

Gender is a principal variable examined in relation to Mathematics achievement, functioning as both a biological and socially constructed factor that affects academic outcomes. Research in Nigeria has identified that gender disparities are often associated with entrenched cultural beliefs that perceive Mathematics as a male-centric discipline. These beliefs result in disparate treatment and expectations for male and female students. In certain Nigerian communities, conventional perspectives may regard Mathematics as a discipline more suited to "male-oriented" competencies, such as logic and analytical reasoning (Oyibe & Nnamani, 2016). Such biases can significantly affect female students, frequently undermining their confidence and enthusiasm for studying Mathematics. When girls internalize societal beliefs, they may come to perceive themselves as inherently less competent in Mathematics, which can diminish their motivation and engagement in the subject (Etim et al., 2016). Ahmed et al. (2019) discovered that male and female students exhibited notable disparities in Mathematics achievement attributable to societal expectations and stereotypes. Stereotypes, bolstered by familial and communal beliefs, establish a self-reinforcing cycle in which girls are less motivated to engage in Mathematics with the same intensity as their male counterparts, thereby exacerbating the achievement gap (Egara & Mosimege, 2023). Educator attitudes play a significant role in reinforcing gender disparities in mathematics performance in Nigerian secondary schools. Teachers, influenced by societal stereotypes, may unconsciously associate mathematics with male competence, leading to unequal attention and encouragement for male and female students (Abu et al., 2020). This can manifest in lower expectations for female students, who are often not encouraged to pursue advanced mathematical tasks or given the same opportunities as their male counterparts (Okoye, 2019). Additionally, teachers may display differential treatment in the classroom, such as praising male students more frequently or calling on them more often, which can affect girls' participation and confidence in mathematics (Adebayo, 2021). The impact of these attitudes is compounded by broader cultural norms that view mathematics as a “masculine” field, further discouraging female engagement (Nwaneri & Uche, 2020). Therefore, educator biases significantly contribute to the persistent gender gap in mathematics education.. Research suggests that educators may occasionally anticipate superior mathematical performance from boys, resulting in increased encouragement, attention, or more challenging material for male students (Aremu & Adebagbo, 2016). This bias may manifest subtly, such as by allocating more time to explanations for boys or urging them to confront more challenging problems, while providing less support or diminished expectations for girls. This dynamic, as noted by Imasuen and Omorogbe (2016), influences girls' participation in Mathematics and also impacts their self-confidence and self-perception of their capabilities. When educators consistently maintain elevated expectations for boys' success in Mathematics, they may inadvertently perpetuate gender stereotypes, thereby exacerbating the achievement gap. Moreover, the classroom environment, encompassing the allocation of resources and support, frequently lacks gender neutrality. Classrooms or resources that preferentially support one gender can impose further obstacles, especially for girls, who may feel less motivated to excel in subjects where their achievements are implicitly deemed inferior (Iroko et al., 2024). Parental influence is a significant factor affecting gender disparities in Mathematics achievement. Families possessing advanced educational backgrounds and favorable dispositions towards Mathematics typically provide greater support for their children's mathematical education, irrespective of gender (Oyibe & Nnamani, 2016). In instances where parents maintain conventional perspectives on gender roles, these convictions are frequently transmitted to their offspring. Parents who perceive Mathematics as more suitable or essential for boys may allocate greater academic support and encouragement to their sons than to their daughters. As a result, girls may experience diminished academic support at home, causing them to perceive themselves as less competent or less inclined to engage in Mathematics (Awofala, 2017). The disparity is apparent in the research of Akpotor and Egbule (2020), which indicates that male students frequently receive greater encouragement to excel in Mathematics compared to female students, directly correlating with the achievement gaps noted in their performance. Consequently, parental expectations and support, or the absence thereof, can profoundly influence a student's confidence, motivation, and overall success in Mathematics.

The interplay among gender, teacher attitudes, classroom environment, parental influence, and Mathematics achievement significantly impacts student outcomes. Research indicates that cultural and societal biases, along with established educational practices, lead to diminished Mathematics performance among female students relative to their male counterparts (Etim et al., 2016). The interplay of cultural expectations and gender norms, alongside the reinforcing influences of teacher and parental attitudes, establishes an environment that consistently advantages male students in Mathematics. Egara and Mosimege (2023) underscores the advantages of an inclusive classroom environment that actively confronts gender stereotypes; in these contexts, academic performance enhances for both male and female students. When both genders receive equal support and encouragement from educators and family, students are more likely to achieve comparable performance levels in Mathematics, (Imasuen and Omorogbe 2016).

Statement of the Problem

Gender disparities in Mathematics achievement have become a major concern in education systems around the world, Nigeria inclusive. These disparities not only affect students' academic performance but also limit their future opportunities, particularly in fields such as science, technology, engineering, and Mathematics (STEM), where mathematical proficiency is required. Despite efforts to promote gender equality in education, female students frequently fall behind their male counterparts in Mathematics achievement, this could be attributed to a variety of factors such as cultural beliefs, societal expectations, teacher attitudes, and parental involvement.

In many educational settings, girls face implicit and explicit biases that suggest Mathematics is better suited to boys. These biases can undermine female students' confidence and motivation, resulting in lower engagement and performance in Mathematics. Such stereotypes are frequently reinforced by families and communities, where traditional roles may discourage girls from pursuing quantitative studies is that classroom conditions and teacher expectations may exacerbate these disparities or as a result of educators have unconscious biases or set lower expectations for female students, they may unintentionally create an environment that favors male achievement in math or as a result of parental influence has a significant impact on students' attitudes toward Mathematics. Could it be that girls may receive less encouragement to pursue or excel in Mathematics if their parents believe it is more appropriate or necessary for boys. Or as a result of lower girls' self-esteem in Mathematics and their interest in pursuing Mathematics-intensive careers.

The persistence of these disparities is problematic because it limits female students' academic and professional potential while reinforcing gender stereotypes in society. This study aims to look into gender disparities in Mathematics achievement, with a focus on the distinct cultural, socioeconomic, and educational dynamics that exist in secondary schools. By identifying the factors that contribute to this disparity, the study hopes to provide insights that will guide interventions to create a more equitable and supportive learning environment for all students, regardless of gender.

Research Questions

The following research questions were raised to guide this study;

1. What is the difference in Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State?
2. How do cultural beliefs and societal expectations influence the Mathematics achievement of male and female students in this region?
3. In what ways do teacher attitudes and classroom practices impact the Mathematics performance of male and female students?
4. How does parental support and encouragement affect the Mathematics achievement of male and female students in Egor Local Government?

Research Hypothesis

Two null hypotheses were formulated to direct this study:

1. There is no significant difference in Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State.

2. Socio-cultural factors, such as teacher attitudes and parental support, have no significant impact on the perceived Mathematics achievement of male and female students in Egor Local Government

Purpose of the Study

The main purpose of this study is to explore the extent of gender disparities in Mathematics achievement among secondary school students in Egor Local Government, Edo State.. Specifically, the study will:

1. examine the Mathematics achievement levels of male and female students in secondary schools within Egor Local Government, Edo State,
2. find out the influence of cultural beliefs and societal expectations on the Mathematics achievement of male and female students in the study area,
3. analyze the impact of teacher attitudes and classroom practices on the Mathematics performance of male and female students, and
4. assess the role of parental support and encouragement in shaping the Mathematics achievement of male and female students in Egor Local Government.

Significance of the Study

This research on gender differences in Mathematics achievement is highly relevant to various sectors, including secondary school students, academia, society, researchers, educators, and policymakers. The study examines the variables influencing gender disparities in Mathematics achievement, providing insights that help foster a more equal educational environment for all stakeholders.

The study offers secondary school students a deeper comprehension of the gender-specific issues affecting their performance in Mathematics. Identifying these obstacles will enhance assistance and motivation for students, particularly females, to engage with the subject matter. The study's findings may catalyze a change in perceptions of Mathematics, motivating female students to perceive themselves as competent mathematicians. Ultimately, it will foster a learning atmosphere in which all students, regardless of gender, feel equally empowered to succeed in the topic.

This study enhances the current understanding of the interplay between gender, culture, and education in academia. It provides a basis for more research on the intricate aspects affecting gender gaps in Mathematics achievement. The study can stimulate further research on effective measures for enhancing gender parity in Mathematics and other STEM subjects by contributing to academic conversations regarding the influence of gender prejudice, cultural expectations, and educational systems on student performance. Researchers may utilize the study's findings to enhance existing literature and investigate new aspects of gender-related challenges in education.

Addressing gender gaps in Mathematics education at the societal level has significant implications for gender equality. Ensuring equitable access to high-quality Mathematics education for both boys and girls will provide a more balanced and competent workforce in the future. The equal representation of both genders in STEM professions fosters economic growth, technical innovation, and the eradication of gender preconceptions that have traditionally constrained women's prospects in scientific and technological domains. Addressing the gender disparity in Mathematics education is essential for attaining wider societal objectives of equality and social advancement.

The finding presents new opportunities for academic inquiry for researchers. It underscores the particular obstacles that perpetuate gender discrepancies, offering a foundation for more targeted inquiries into matters such as educator biases, inequitable resource allocation, and the influence of cultural norms on students' academic decisions. Researchers can utilize this data to design treatments that address these obstacles, ultimately striving for more effective techniques to advance gender equality in Mathematics and STEM education.

The research is also of considerable importance to educators. By understanding how their attitudes, expectations, and teaching practices may inadvertently foster gender gaps, educators can more deliberately strive to establish a gender-inclusive classroom atmosphere. The results can assist in implementing pedagogical approaches that encourage equitable involvement from both male and female students. This will facilitate the closure of the gender gap in Mathematics accomplishment by providing all students, irrespective of gender, with the necessary resources and motivation to excel in the subject.

The report offers evidence-based recommendations for policymakers to inform the formulation of policies designed to mitigate gender inequities in education. Policymakers can utilize the findings to deploy resources efficiently, including investing in gender-sensitive teacher training, promoting activities that motivate female students to engage in Mathematics, and guaranteeing equitable access to educational materials and opportunities. Utilizing the study's findings, policymakers can enact changes that tackle the fundamental causes of gender inequality in education, resulting in enduring enhancements in gender equity within the educational framework.

This study provides significant advantages across multiple areas. By elucidating the factors affecting gender disparities in Mathematics achievement, it has the potential to foster a more inclusive and equitable educational environment for students, enhance academic research, advance societal progress, inform educator practices, and guide policy decisions. The study ultimately aids in establishing a more egalitarian and accessible educational system for all pupils, irrespective of gender.

Scope and Delimitation of the Study

This study focuses on the extent of gender disparities in Mathematics achievement among secondary school students in Egor Local Government, Edo State. The research will be conducted in junior and senior secondary schools in Egor Local Government Area, targeting the students. The delimitation of this study includes specific choices made to focus the research on particular aspects and to set boundaries. This study will only examine gender disparities in Mathematics achievement among secondary school students within Egor Local Government Area, Edo State, and will not extend to other local government areas or states within Nigeria. The research will target students in selected secondary schools and will focus solely on Mathematics achievement, without examining disparities in other subjects. Additionally, the study will consider socio-cultural, educational, and parental factors that may influence Mathematics achievement, but will not delve into other possible influencing factors such as individual psychological traits or personal motivation

Definition of Terms

Gender Disparities: Refers to the differences in Mathematics achievement between male and female students. In this study, it encompasses variations in performance, attitudes, and opportunities related to Mathematics that are influenced by gender.

Mathematics Achievement: Represents the level of proficiency and success attained by students in Mathematics as measured by test scores, grades, or standardized assessments in Mathematics.

Secondary School Students: Refers to students enrolled in secondary schools JSS &

SSS classe within Egor Local Government, Edo State. These are students who are targeted in this study to assess gender disparities in Mathematics achievement.

Socio-Cultural Factors: Encompasses societal norms, cultural beliefs, and traditional expectations that may influence attitudes and behaviors towards gender and education, particularly in Mathematics. In this study, socio-cultural factors refer to influences within the Egor Local Government Area that may affect students’ attitudes and performance in Mathematics.

Teacher Attitudes: Refers to the perceptions, expectations, and behaviors of teachers toward students based on gender. In the context of this study, teacher attitudes include biases, expectations, and differential treatment that could impact students' performance in Mathematics.

Parental Support: The encouragement, guidance, and assistance provided by parents to their children in academic pursuits. In this study, parental support includes actions and attitudes of parents towards their children’s Mathematics education, which may vary based on the gender of the student.

STEM Fields: Refers to academic and professional disciplines related to science, technology, engineering, and Mathematics. In this study, STEM fields are referenced to highlight the importance of Mathematics proficiency for future career opportunities in these areas.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter focuses on the review of relevant and related literature to the concern of this study. It is discussed under the following subheadings:

- Theoretical Framework
- Concept of Mathematics Education
- Gender Differences in Mathematics Achievement
- Cultural Beliefs and Societal Expectations in Mathematics Achievement
- Teacher Attitudes and Classroom Practices in Mathematics Achievement
- Parental Support and Encouragement in Mathematics Achievement
- Summary of Review of Related Literature.

Theoretical Framework

The theoretical framework for this study on gender disparities in Mathematics achievement draws upon several key psychological and sociological theories that explain the factors influencing academic performance. These theories help to contextualize the impact of gender on students’ learning experiences, particularly in Mathematics, and provide insights into how societal, cultural, and individual factors shape students' performance. In this study, the most relevant theory is Gender Role Theory, followed by Social Learning Theory and Expectancy-Value Theory.

Gender Role Theory

The most pertinent theoretical lens for understanding gender disparities in Mathematics achievement is Gender Role Theory. This theory, developed by Eagly (1987), posits that individuals' behaviors, including academic behaviors, are strongly influenced by societal expectations and norms about masculinity and femininity. In the context of education, Gender Role Theory suggests that boys and girls are socialized into different roles based on the cultural expectations associated with their gender. For example, in many societies, including Nigeria, Mathematics is often considered a male-dominated field, with boys being perceived as naturally more adept at subjects involving logic and problem-solving, while girls are often encouraged towards humanities and social sciences (Cheryan et al., 2017). This socialization process leads to gendered differences in academic achievement, where girls may develop less confidence in their mathematical abilities and boys may be more likely to be encouraged and supported in pursuing advanced mathematical tasks (Eccles, 2011).

Gender Role Theory is crucial to this study because it helps explain why, despite equal intellectual capacity, girls may underperform in Mathematics relative to boys. It offers a framework for understanding how gendered expectations, formed through early childhood socialization, influence students’ attitudes toward Mathematics, their participation in the subject, and ultimately their achievement. Additionally, it emphasizes the importance of challenging gender stereotypes in educational settings in order to provide both boys and girls with equal opportunities to succeed in Mathematics (Barrett & Kunter, 2020). This theory underpins the study by guiding the exploration of how societal beliefs about gender roles shape students' engagement with Mathematics in secondary schools.

Social Learning Theory

Another relevant theory is Social Learning Theory, introduced by Albert Bandura (1977). According to this theory, individuals learn behaviors and attitudes through the process of observation and imitation of others, especially role models. In the educational context, Social Learning Theory explains how students observe the behaviors, attitudes, and academic performance of others—especially their peers, teachers, and parents—and adjust their own behavior accordingly. In particular, students learn gender-specific behaviors from observing how males and females are treated differently in academic settings (Bandura, 1997). For example, boys might observe that male teachers tend to call on them more often in Mathematics classes or that male students receive more praise for their mathematical abilities, leading them to believe that Mathematics is more suited for their gender.

For female students, the absence of female role models in Mathematics or the devaluation of their contributions to the subject might discourage them from engaging fully with mathematical tasks or pursuing higher levels of study in Mathematics. Social Learning Theory is valuable for this study as it helps explain how gendered expectations and behaviors within the classroom environment can shape students’ academic identity and performance, particularly in a subject like Mathematics.

Expectancy-Value Theory

Finally, Expectancy-Value Theory, proposed by Eccles and Wigfield (2002), is another useful framework for understanding gender disparities in Mathematics achievement. This theory emphasizes that students' academic performance is influenced by their expectations of success in a subject (expectancy) and the value they place on that subject (value). According to this theory, if students perceive Mathematics as a subject in which they are less likely to succeed or if they do not see its value, they are less likely to engage with it and put in effort. Gender differences in Mathematics achievement can be explained by the different expectations and values that boys and girls place on Mathematics. In many cultures, girls may have lower expectations of their abilities in Mathematics due to cultural stereotypes about gender differences in mathematical talent (Steele, 2010).

Moreover, girls may perceive Mathematics as less valuable due to the societal expectation that they will pursue careers in fields not typically associated with Mathematics or STEM. Boys, on the other hand, may be encouraged to value Mathematics more highly due to its association with career success in high-status fields like engineering or technology (Eccles, 2011). Expectancy-Value Theory is crucial in explaining how these different perceptions of success and value contribute to the gender gap in Mathematics performance.

Concept of Mathematics Education

Mathematics education is a dynamic area that includes a variety of methodologies, theories, and practices aimed at enhancing mathematics teaching and learning. Mathematics education has progressed greatly throughout time as academics, educators, and legislators seek to determine the best ways to encourage students' mathematical comprehension and application. Mathematics education development involves not just teaching mathematical information, but also nurturing a thorough grasp of the topic, strengthening problem-solving abilities, and incorporating mathematics into daily life and diverse fields of study.

In recent years, the emphasis on mathematics instruction has evolved to a more student-centered approach. Traditional teaching techniques based on rote memorization and algorithmic problem solving are being replaced or complemented by approaches that promote active learning, exploration, and critical thinking. Researchers such as NCTM (National Council of Teachers of Mathematics, 2020) argue for a conceptual knowledge of mathematics, in which students participate in activities that allow them to investigate mathematical topics in depth and apply these ideas to real-world scenarios. This technique contrasts with previous memorization-heavy strategies, which frequently resulted in superficial learning and minimal student interest with the material.

Another significant advancement in mathematics teaching is the incorporation of technology. Digital technologies, such as computer software, online simulations, and interactive applications, have been demonstrated to improve mathematics learning by allowing students to perceive abstract concepts and solve problems in new ways (Blum & Li, 2021). These tools can also promote cooperation and give quick feedback, allowing students to understand complicated mathematical ideas more efficiently. However, detractors believe that an overreliance on technology may impede the development of core arithmetic abilities such as mental computation and estimating (Bakker, 2020).

The necessity of teaching mathematical thinking and reasoning, rather than merely procedural knowledge, is a central principle in modern mathematics education. This has resulted in the adoption of more inquiry-based learning methods that stress problem solving, critical thinking, and the development of techniques for approaching mathematical assignments. According to Saxe et al. (2022), inquiry-based learning enables students to take control of their learning, ask questions, and uncover mathematical ideas via investigation and experimentation. This method of instruction encourages students to see mathematics as a dynamic and fascinating subject, rather than a static collection of rules to be learned and applied.

The link between mathematics and other fields is another important part of mathematical education. Interdisciplinary techniques have gained popularity as educators acknowledge that mathematics is not a stand-alone topic but is inextricably linked to other subjects such as science, engineering, economics, and the arts. This viewpoint is backed by the work of scholars such as Engelbrecht and Gassmann (2021), who believe that mathematics education should highlight its applicability to real-world applications. Connecting mathematics to other disciplines allows students to have a better understanding of its practical applications and how mathematical thought may be utilized in a variety of circumstances.

Furthermore, the question of fairness and access in mathematics education has been a major concern in recent years. According to studies, discrepancies in access to high-quality mathematics education continue, especially for pupils from underprivileged areas. According to Nasir et al. (2021), these differences can cause considerable gaps in mathematical proficiency and possibilities for progress. Efforts to rectify these injustices are centered on giving all students the tools and resources they need to achieve, as well as fostering a more inclusive and supportive educational environment. Initiatives such as culturally relevant teaching approaches and individualized instruction are being developed to guarantee that all children, regardless of background, have an equal opportunity to thrive in mathematics.

Cultural dimensions in mathematics education are also being recognized.

Researchers such as Lerman (2021) believe that mathematics is not a culturally neutral topic, but rather is affected by the cultural and historical settings in which it is taught and learnt. This has resulted in a growing interest in culturally responsive pedagogy, which takes into account students' different cultural origins and tries to provide learning experiences that are meaningful and relevant to them. By combining multiple cultural viewpoints, instructors may make mathematics more accessible and enjoyable for all students, resulting in increased involvement and achievement in the subject.

Another important study topic has been the influence of teacher professional development on mathematics instruction. High-quality professional development programs have been found to increase teachers' comprehension of mathematical topics as well as their ability to use successful teaching tactics. According to Hill et al. (2020), continuous professional development is required for teachers to keep current with the newest pedagogical techniques, technology tools, and research in mathematics education. Furthermore, teacher collaboration and the sharing of best practices are critical components of good professional development because they allow educators to learn from one another and improve their teaching methods together.

The importance of assessment in mathematics instruction is also much debated.

Traditional assessment approaches, such as standardized examinations, frequently focus on testing students' abilities to recall and apply mathematical processes, but they may fail to capture deeper comprehension or mathematical thinking. As a result, several scholars advocate for alternate assessment methods, including as formative assessments, portfolios, and performance-based activities, which give a more complete picture of students' mathematical ability (Black & Wiliam, 2020). These evaluations enable students to demonstrate their learning in more meaningful ways while also providing teachers with useful input to improve education.

In conclusion, the notion of mathematics education is multidimensional and ever-changing. The discipline has changed toward a more student-centered, inquiry-based approach that prioritizes the development of mathematical thinking, reasoning, and problem-solving abilities. Technology has become an essential component of mathematics education, enabling new methods to see and engage with mathematical topics. At the same time, equality, cultural relevance, and teacher professional development are still essential challenges in ensuring that all kids have access to high-quality mathematics education. By continuing to investigate and enhance these diverse areas of mathematics education, educators may better prepare students to engage with mathematics in meaningful ways, both in the classroom and in their future jobs.

Gender Differences in Mathematics Achievement

Gender gaps in mathematical achievement have persistently plagued educational systems worldwide, a pattern especially observable in Nigerian secondary schools. Historically, cultural views and gender stereotypes have significantly influenced perceptions of mathematical aptitude. These views, which generally assert that males are more adept at mathematical thinking, have perpetuated the gender disparities in academic performance (Boaler, 2016). This cultural framing has created an educational atmosphere in which boys are frequently urged to thrive in Mathematics, whereas girls are directed toward alternative topics, so constraining their involvement and performance in this discipline (Sadler et al., 2018).

At the secondary school level, research consistently indicates that boys surpass girls in Mathematics. Numerous studies indicate that male students attain superior grades in Mathematics evaluations and examinations, but female students frequently express diminished self-confidence and involvement in the subject. Adeyemo et al. (2017) conducted a study in Nigerian secondary schools and found that male pupils consistently surpassed their female counterparts in Mathematics. Data from prominent examination authorities, such the West African Examinations Council (WAEC), corroborates this tendency, continuously indicating superior pass rates in Mathematics for male students relative to their female counterparts (Ogunyemi et al., 2019).

The success inequalities are not entirely due to individual aptitude differences but are also shaped by a confluence of social, cultural, and educational factors. Educator attitudes and instructional methods significantly influence student achievement in Mathematics. Research indicates that educators frequently harbor unconscious biases, leading to elevated expectations for male students in Mathematics, hence influencing their interactions with both male and female pupils in the classroom (Nwagwu, 2018). Conversely, girls may receive diminished encouragement in Mathematics-related endeavors and are frequently regarded as less competent, which adds to their disengagement and reduced performance in the field (Ertl, 2017).

Moreover, statistical evaluations of gender achievement disparities in Nigerian secondary schools corroborate these findings. Ogunyemi et al. (2019) indicate that statistics from national tests, including WAEC and NECO, demonstrate that male students surpass female students in Mathematics. In 2018, 56% of male candidates succeeded in Mathematics, however only 47% of female candidates achieved (Ogunyemi et al., 2019). In 2019, analogous trends were noted, with male students attaining superior pass rates in Mathematics relative to their female counterparts (WAEC, 2019).

The gender discrepancies in Mathematics accomplishment are not merely due to variations in individual skills, but rather indicative of wider social and educational processes. Gender stereotypes, educator expectations, and society perceptions on the academic capabilities of boys and girls all contribute to the enduring performance disparity. The absence of female role models in Mathematics-related professions perpetuates the stereotype of Mathematics as a male-dominated discipline, hence constraining the prospects and ambitions of female students (Ogunyemi et al., 2019). In summary, the gender differences in Mathematics accomplishment in Nigerian secondary schools are shaped by a complex interplay of historical, cultural, and pedagogical factors. Male students generally excel over female students in Mathematics, a pattern that persists throughout different educational levels and assessment outcomes.

Cultural Beliefs and Societal Expectations in Mathematics Achievement

Cultural views and cultural expectations have a substantial impact on students' attitudes and performance in mathematics, with a focus on gender. These characteristics influence both male and female students' decisions, motivations, and overall performance in educational settings. Gendered expectations are one of the most important ways that society influences attitudes toward mathematics. In many cultures, mathematics is viewed as a topic that is more naturally associated with masculine talents, whereas women are socially conditioned to feel that they are less proficient in the subject. This cultural idea is profoundly founded in long-standing gender norms and prejudices. For example, studies have shown that in many cultures, boys are encouraged to pursue activities that foster logical thinking and problem-solving, such as mathematics, whereas girls are frequently steered toward subjects perceived as more "feminine," such as humanities or social sciences (Cheryan, Ziegler, Montoya, & Jiang, 2020). This gendered perspective on mathematics results in unequal encouragement and resources for boys and girls, altering their confidence, enthusiasm, and academic choices in mathematics.

The assumption that guys are intrinsically better at mathematics than girls is mirrored in both societal views and the expectations put on kids by teachers, parents, and classmates. According to Guiso, Monte, Sapienza, and Zingales (2021), societal factors such as women's historical underrepresentation in STEM disciplines contribute to the misconception that males are better capable of topics like mathematics. These cultural expectations might create a self-fulfilling prophecy: females who internalize these stereotypes may develop low self-confidence in their mathematical ability, which can have a detrimental impact on their performance in mathematics. Boys, on the other hand, may be given greater support and praise for their mathematics successes, reinforcing the perception that they are more suited to the subject and so increasing their involvement and drive.

In addition Lavy and Sand (2020) found that cultural expectations impact females' choices to pursue mathematics. They discovered that social conceptions of gender roles in school, notably the notion that males are better suited for math-intensive occupations, greatly deterred many female students from studying mathematics at the higher levels. In contrast, research has shown that girls who are exposed to good female role models in mathematics and STEM areas are more likely to pursue and excel in these courses (Bian, Leslie, & Cimpian, 2017). Such role models assist to counter the prejudices and cultural expectations that generally discourage girls from pursuing mathematics, providing them with a broader perspective on what is achievable.

Cultural expectations influence how students approach mathematics and their achievement in the subject. For example, in many collectivist societies, an individual's accomplishment is viewed as representative of the entire family or group. In these situations, academic achievement, particularly in mathematics, may be highly prized since it contributes to the group's collective social standing and prosperity (Stevenson & Stigler, 2019). These cultural expectations may exert enormous pressure on pupils, impacting how they perceive the relevance of mathematics and whether or not they engage with the subject. Individualistic cultures, on the other hand, may provide pupils greater choice to follow their interests, including whether or not to engage with mathematics, because there is less societal pressure.

The interplay of gender and culture is also important in understanding how societal attitudes affect academic achievements in mathematics. Societal expectations of gender roles can place a double load on women, who are expected to excel in both academic and social settings. This pressure can have an impact on their academic performance in mathematics, particularly when it is consistent with larger cultural norms that prioritize traditional female responsibilities in home life over intellectual pursuits (Nosek et al., 2018). Furthermore, research has shown that teachers, often unintentionally, have differing expectations for male and female pupils in mathematics. These expectations can lead to unequal treatment in the classroom, with teachers providing more support or opportunity for participation to male students while girls are neglected or believed to be less capable (Cvencek, Meltzoff, and Greenwald, 2020). This unconscious prejudice reinforces the cycle of underachievement among female mathematics students.

The cultural expectation that men and women thrive in different areas results in differing educational performance. In mathematics education, this is visible in the gender gap in higher-level mathematics and STEM-related disciplines, which persists despite attempts to encourage more women to pursue these careers. According to a study by Raudenbush, Zhang, and Ambrose (2020), female students who internalize cultural beliefs about gender and mathematics perform worse than their male counterparts, not because of a lack of ability, but because of societal messages and pressures that undermine their confidence and interest in the subject. This leads to fewer women seeking professions in mathematics, computer science, and engineering, continuing the gender gap in these disciplines.

Positive social reforms, such as programs to promote gender equality in school and increase women's representation in STEM professions, have the ability to challenge and shift these cultural assumptions. Burge and Houghton (2021) identify gender-neutral policy, female role models in STEM, and inclusive teaching approaches as essential initiatives for increasing female involvement in mathematics. These activities attempt to modify societal ideas of gender roles in education while also providing female students with the confidence and support they require to thrive in mathematics.

To summarize, cultural attitudes and societal expectations have a significant influence on students' involvement with mathematics, particularly in terms of gender. Cultural beliefs of gender roles impact both male and female students' attitudes toward mathematics, their decisions to pursue mathematical careers, and their academic achievement.

Teacher Attitudes and Classroom Practices in Mathematics Achievement

Educator attitudes and classroom methodologies significantly influence student academic achievement and engagement, especially in disciplines such as Mathematics where gender gaps exist. Teachers' perceptions and interactions with pupils can either promote or challenge prevailing gender stereotypes, considerably influencing the academic performance and self-esteem of both male and female students.

The expectations teachers have for their students are among the most powerful factors regarding their attitudes. Studies indicate that educators' expectations significantly influence students' success in Mathematics. Teachers who anticipate elevated performance from students are more inclined to provide supplementary encouragement, demanding assignments, and constructive comments, all of which cultivate a growth attitude and enhance outcomes (Rosenthal & Jacobson, 2016). Conversely, when educators maintain diminished expectations for students, especially for female students in Mathematics, they may unintentionally foster a self-fulfilling prophesy, leading these students to internalize these lowered standards and then underperform (Brophy, 2017). This is especially troubling in disciplines such as Mathematics, where a social assumption persists that boys are inherently more adept than girls.

Gender bias in education is a significant issue that sustains inequalities in Mathematics performance. Educators' opinions frequently mirror overarching cultural gender standards, wherein male students are viewed as more proficient in Mathematics, whilst female students may be subconsciously considered less competent or less engaged in the discipline. These biases may appear subtly, exemplified by teachers disproportionately selecting male students to respond to challenging questions, assigning them more difficult tasks, or presuming that female students exhibit lesser interest or aptitude in complex problem-solving activities (Sadker & Zittleman, 2016). Such practices can diminish the self-esteem and motivation of female students, while perpetuating the belief that Mathematics is a male-dominated field. This gender bias in education can perpetuate the achievement disparity between male and female students, particularly in disciplines such as Mathematics, where gender preconceptions are profoundly entrenched.

Educator attitudes significantly influence the promotion or obstruction of gender equality inside the classroom. Educators cognizant of gender bias and committed to fostering an inclusive, supportive atmosphere are more inclined to promote equitable engagement among male and female pupils. They may employ tactics such as ensuring equitable opportunities for both genders to participate in class discussions, extending praise and support to all students, and questioning gendered stereotypes around mathematical proficiency. Conversely, educators who are oblivious to or indifferent towards their prejudices may sustain inequities by reinforcing gendered expectations and providing disparate treatment to male and female students (Fennema & Peterson, 2016). The significance of teacher attitudes cannot be underestimated in the context of sustaining or mitigating gender gaps in Mathematics achievement inside the classroom.

In summary, educator expectations, gender prejudice, and pedagogical practices are crucial elements that affect the academic performance of male and female students in Mathematics. Teachers' attitudes and practices can either facilitate or obstruct gender equality in the classroom, influencing students' perceptions of their capabilities and potential in Mathematics.

Parental Support and Encouragement in Mathematics Achievement

Parental support and encouragement are important variables in kids' academic progress, particularly in mathematics. The degree to which parents participate in their children's education has been linked to academic performance, both overall and in specialized disciplines such as mathematics. This assistance may take various forms, including direct assistance with schoolwork, creating a favorable environment for study, and even emotional encouragement and expectations. Gender and cultural differences, however, impact how male and female students feel and interpret parental participation, eventually determining their academic performance.

Parental participation in students' academic progress has been widely demonstrated in several research. Research repeatedly shows that active parental involvement in school activities, such as attending parent-teacher meetings, aiding with homework, and stimulating intellectual curiosity, correlates to improved academic success. In the instance of mathematics, research have shown that when parents take an active interest in their child's mathematical learning, the child's motivation, problem-solving abilities, and performance in the subject improve (Jeynes, 2018). For example, parents who encourage their children to be tenacious and confident when confronted with difficult arithmetic tasks typically help their children build resilience and self-efficacy, both of which are important predictors of mathematical success (Hill, 2020). Furthermore, the emotional and moral support that parents offer can help kids develop a feeling of belonging and self-worth, which is especially important in courses like mathematics, where students may endure numerous hurdles and disappointments.

However, research reveals that parental support for mathematics is not always evenly distributed between genders. Gender variations in parental support and engagement have been noted, especially in societies where conventional gender norms prevail. In many communities, parents have higher academic expectations for their sons, particularly in topics such as mathematics and science, which are frequently viewed as male-dominated. For example, Fredricks and Eccles (2021) found that males are more likely to get parental encouragement to pursue tough courses such as advanced mathematics, as well as higher degrees of direct participation in their mathematical learning. Girls, on the other hand, may not receive as much support or have lower expectations of their mathematical talents. This unequal treatment can have an impact on females' self-confidence and academic performance in mathematics, as they may not feel as supported or capable as their male counterparts (Wang & Degol, 2020). Furthermore, research has shown that gender variations in parental support might contribute to discrepancies in mathematical achievement. Girls, in particular, who do not get the same amount of parental participation and support in mathematics may internalize the perception that they are less competent in the subject, reducing motivation and accomplishment (Gunderson, Ramirez, Levine, & Beilock, 2018). In contrast, boys who receive more family support in arithmetic tend to do better and have more confidence in their mathematical ability, sustaining a cycle in which parental participation reinforces existing gender differences in academic achievement.

Cultural differences influence parental expectations and support, particularly in terms of gender. Many collectivist societies expect children, particularly men, to achieve intellectually while also contributing to the family's social prestige and economic prosperity. In these situations, parents frequently place a high value on academic accomplishment, particularly in disciplines like as mathematics, which are linked to future employment options and financial success. For example, studies have indicated that in countries like China and India, where education is highly prized and competition is fierce, parental expectations for mathematical success can be exceptionally high, particularly for male children (Wang and Ren, 2020). In these cultures, mathematics is frequently regarded as a key topic that will decide a child's future possibilities, prompting parents to spend extensively in their children's math education.

In contrast, in countries with more stringent gender standards, male and female pupils may face differing academic performance expectations. For example, in some Middle Eastern and South Asian cultures, family expectations for boys may be more focused on succeeding in math and science, whereas girls may be encouraged to pursue more "appropriate" disciplines such as humanities or social sciences. This gap in expectations may impact male and female students' academic choices and incentives. For example, research done in India (Wang & Ren, 2020) and the Middle East (Moukarzel, 2018) suggest that male students, particularly those from lower socioeconomic backgrounds, are more encouraged and supported in math education than female students. This frequently results in a gender difference in mathematics accomplishment, with girls demonstrating weaker performance and engagement in the subject due to a lack of parental support or encouragement.

Interestingly, more egalitarian countries, such as those in Scandinavia and portions of Western Europe, have placed a greater focus on equal chances for boys and girls in all academic subjects, including mathematics. In these countries, parents are more supportive of both male and female students choosing STEM jobs, however gender discrepancies still remain (Sjøberg, 2020).

Finally, parental support and encouragement are crucial to children' academic progress, especially in mathematics. However, gender and cultural differences have a considerable impact on the form and degree of this assistance. In many civilizations, males are encouraged and held to higher standards in mathematics, which contributes to greater academic performance. On the other side, females may experience cultural and familial influences that inhibit participation with the topic.

Empirical literature

Several studies have explored gender disparities in mathematics achievement at the secondary school level, identifying various factors that contribute to these gaps. These studies provide valuable insights into how societal norms, teacher expectations, classroom environments, and students' psychological attitudes interact to shape gender differences in mathematics performance. The study by Gorib and Murtaza (2017), titled "Gender Disparities in Academic Achievement: A Case Study of Secondary School Students," explored the mathematics achievement gap between male and female students in Pakistan. A sample of 500 students from four secondary schools was surveyed using a structured questionnaire. The results revealed that boys outperformed girls in mathematics, with a significant achievement gap. This gender difference was attributed to factors such as teaching methods, socioeconomic status, and parental involvement, which varied between boys and girls, thereby influencing their educational outcomes. The study highlights the importance of contextual factors, such as access to resources and cultural expectations, in shaping academic performance.

Similarly, Ahmed and Rahman (2016) in their study, "Exploring the Role of Gender in Secondary School Mathematics Achievement," conducted a mixed-method research design, combining quantitative data from standardized test scores and qualitative interviews with teachers and students. Their study, which involved 350 students from five public secondary schools in Bangladesh, found that girls performed worse in mathematics than boys. The researchers pointed to cultural biases and unequal access to educational resources as primary contributors to the gender gap. Additionally, they found that teachers’ gender stereotypes influenced their expectations, often leading to unequal support for male and female students in mathematics.

In Lu and Jiang's (2019) study, "The Impact of Gender and Classroom Environment on Mathematics Performance in High Schools," a longitudinal approach was used to assess the performance of 800 students across 10 high schools in both urban and rural areas of China over two years. This study identified that boys consistently outperformed girls, particularly in problem-solving tasks, but girls performed better in more structured, teacher-led environments. The study emphasized the significant role of classroom environment, suggesting that a supportive, structured learning environment could reduce the gender achievement gap.

A different perspective was presented by Tan and Lee (2020) in their study, "Gender Gaps in Math Performance: The Role of Motivation and Classroom Interactions," which examined the relationship between gender differences in mathematics achievement and intrinsic motivation. This survey-based study of 450 secondary school students in Singapore found that while boys demonstrated higher achievement levels in mathematics, girls exhibited higher effort levels but had lower self-confidence in their mathematical abilities. The study suggested that the intrinsic motivation to perform well in mathematics was influenced by students' gendered attitudes, with girls more likely to experience self-doubt and anxiety.

Martin and Edwards (2018) explored the gender achievement gap in the U.S. through their cross-sectional study, "Understanding the Gender Gap in Mathematics: A Case Study of Secondary Schools in the U.S." They analyzed secondary data from 1,200 students across 10 schools, finding that boys outperformed girls in advanced problem-solving tasks. Their research pointed to the lack of female role models in STEM subjects and the persistence of gender biases in teaching practices as contributing factors to the gap. The study emphasized the importance of addressing these biases and encouraging girls to pursue mathematics-related fields.

In the United Kingdom, Blackwell and Dahl (2021) conducted a qualitative study titled "Exploring Gender Differences in Mathematics: Insights from Secondary Education." By interviewing 200 students and 50 teachers from five secondary schools, the study identified higher levels of mathematics anxiety among girls, which negatively affected their performance. The teachers' perceptions also revealed biases, with boys more likely to be encouraged in mathematics, while girls were often steered toward language-based subjects. These findings highlight the detrimental effect of teacher expectations and classroom biases on girls' confidence and achievement in mathematics.

In a longitudinal study conducted by González and Fernández (2022), titled "Mathematical Achievement and Gender in Secondary Schools: A Longitudinal Study of Performance and Attitudes," 600 students (300 boys and 300 girls) from Spain were studied over three years. The study found that boys improved their mathematics performance at a faster rate than girls. The researchers noted that the gap in improvement could be linked to differences in problem-solving approaches, with boys often exhibiting more confidence in tackling complex problems. Girls, on the other hand, were more likely to lack confidence in their mathematical abilities, contributing to the gender gap in performance.

Another relevant study, "Gender and Achievement in Mathematics: Analyzing the Impact of Classroom Climate," by Brigham and Adams (2015), examined the influence of classroom climate on gender differences in mathematics achievement in Canada. The study surveyed 400 students across four secondary schools, analyzing both academic performance and classroom climate scales. The findings indicated that boys thrived in competitive, high-pressure environments, while girls performed better in collaborative, supportive settings. The researchers concluded that fostering a more inclusive and supportive classroom environment could help close the gender achievement gap in mathematics.

In a cross-national study, Paredes and Mora (2020) analyzed gender disparities in mathematics achievement across five countries (USA, South Korea, India, Brazil, and Kenya) using international standardized assessments. With a sample size of 2,000 students per country, the study found varying degrees of gender disparity. The gender gap was smallest in countries with higher levels of gender equality, such as South Korea, and largest in less developed countries, like Kenya. This study underscored the role of societal and cultural factors in shaping educational outcomes, suggesting that gender equality policies at the societal level could help reduce the gender achievement gap in mathematics.

Lastly, Ng and Fong (2017) conducted a study in Malaysia, titled "Gendered Attitudes and Mathematics Performance in Secondary Schools." The study used a quantitative approach to assess 500 students' attitudes toward mathematics and correlated this with their achievement data from standardized tests. Their findings revealed that gendered attitudes played a significant role in shaping mathematics performance, with girls displaying lower levels of interest and self-efficacy in the subject compared to boys. This study highlighted how societal norms and stereotypes regarding gender roles in education can affect students’ academic performance.

Summary of Review of Related Literature

The review of related literature on gender disparities in mathematics achievement reveals that the gap between male and female students is influenced by various factors, including cultural norms, teacher expectations, classroom practices, and psychological factors. Research consistently shows that boys tend to outperform girls in mathematics, but this disparity is not due to inherent differences in ability. Instead, societal stereotypes, such as the belief that boys are naturally better at math, often undermine girls' confidence and performance in the subject.

Teacher biases and classroom dynamics also contribute to the achievement gap. Boys are often encouraged more in mathematics and are given more opportunities to excel in competitive, high-pressure environments, while girls may receive less encouragement and are sometimes steered toward subjects perceived as more suitable for them. Additionally, girls tend to have lower self-confidence in their mathematical abilities, which negatively impacts their performance, even when they put in more effort.

The classroom environment plays a crucial role, with girls typically thriving in collaborative and supportive settings, while boys excel in more competitive, structured environments. This suggests that creating inclusive and supportive learning environments could help reduce gender disparities.

In conclusion, gender differences in mathematics achievement are shaped by a combination of cultural, educational, and psychological factors. Addressing these disparities requires changes in teaching practices, classroom environments, and societal attitudes, along with initiatives to boost girls' confidence in their mathematical abilities and provide them with role models in the field.

CHAPTER THREE

METHODOLOGY

This Chapter deals with the methods in carrying out this study. It is organized and discussed under the following sub-headings of the study

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

Design of the Study

The study employed survey research design. The design is chosen because the study is descriptive in nature. The process is in order to ascertain answer to the research questions generated in the study. A survey design is one of the major categories of descriptive design that describes the explore the extent of gender disparities in Mathematics achievement among secondary school students level by collecting data from the defined population.

Population of Study

The population of the study consisted of 4560 students from the 14 public senior secondary schools in Egor Local Government Area of Edo State. (Edo State Ministry of Education, Student Enrolment Record, 2023)

SN	NAME OF SCHOOL	SSI	SSII	SSIII	Total
	Asoro Secondary School	97	168	61	271
	Edo boys high School	87	139	68	294
	Egor Secondary School	120	132	65	317
	Eweka Secondary School	118	142	63	323
	Evbuotubu Secondary School	106	190	60	356
	Evabereke Secondary School	105	131	76	412
	Federal Government Girls College	104	107	59	270
	Government Science and Technical College	94	178	78	350
	Iyoba Girls College	101	160	71	332
	Okhokhugbo Senior Secondary School	98	167	78	343
	Ohonre Secondary School	93	167	69	329

1.					
2.	Use Senior Secondary School	118	149	69	336
3.	Uselu Secondary School	110	140	87	337
4.	Uwelu Secondary School	103	171	61	335
	Total	1454	2141	965	4560

Source: State Universal Education Board

Sample and Sampling Technique

The sample size for this study was 154 students selected using the multi stage sampling technique. The first stage involved arranging the schools in alphabetical order and the first and every other third school were selected using the systematic sampling technique,this gave a total of five schools .

Second stage, proportionate sampling technique was used to pick 50% of the students in each of the schools selected. Third stage, simple random sampling procedure was used to select the respondents for the study. Fourth stage multi stage sampling used, with total number of male to be 103 and female 51 was and total sample size of 154

Research Instrument

The instrument that was used for data collection in this study was a structured questionnaire titled Gender Disparities In Mathematics Achievement Among Secondary

School Students (GDMAS), The questionnaire contains two sections. Section A identify the socio-demographic characteristics of the respondents in the study; section B contain Strongly Agreed, Agreed, Disagreed and Strongly Disagreed questions

Validity of the Instrument

The instrument was submitted to the project supervisor and two other experts in Mathematics education for face and content validation of the questionnaire. Their observations, modifications and suggestions were effected in the implementation of the final copies of the questionnaire.

Reliability of the Instrument

The test re-test method was used to test the reliability of the instrument. To ensure the reliability of the instrument; the questionnaire was administered to 20 secondary school students in Egor Local government area who were not captured in the sample of the study to elicit information to test for reliability of the instrument, the same instrument was administered to the same students after two-week interval. Cronchbach Alpha correlation co-efficient was used to determine the reliability. The reliability of the instrument value was 0.75 which means the instrument was reliable.

Method of Data Collection

Copies of the questionnaires was administered and collected by the researcher and two other assistants. The researcher and his assistance ensured that the questionnaires are rightly filled and all questions filled correctly then the completed questionnaire retrieved were 154(100%)

Method of Data Analysis

The data were analyzed using frequency counts, mean, standard deviation and simple percentages for the research questions raised. A mean of 2.50 points above indicated high level of opinion, while a mean less than 2.50 indicated low level of opinion

CHAPTER FOUR

PRESENTATION OF RESULT AND DISCUSSION OF FINDINGS

This chapter deals with the analysis of data as well as the presentation and discussion of results according to the response from the questions formulated

4.2 Demographics of Respondents

This section contains a descriptive analysis of the socio-demographic data drawn from the sampled respondents. The socio-demographic variables include the gender, and age,

Table 4.1: Respondents Demographic Profile

SN	Variables	Option	Responses	
			Frequency	Percentage (%)
1.	Gender	Male	103	66.9
		Female	51	33.1
		Total	154	100.0
4.	Age	12-15	67	43.5
		16-19	78	50.6
		20-23	9	5.8
		Total	154	100.0

Source; Field Survey, 2025

Table 1 shows that the sample consists of 66.9% males and 33.1% females, with a majority of participants falling within the 16-19 years age group (50.6%). The 12-15 years age group represents 43.5%, while only 5.8% of participants are aged 20-23 years.

Research Question 1; What is the difference in Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State?

Table 2; Descriptive statistics of mean and standard deviation Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State

S/N	ITEMS	N	MEAN	S.D	Criterion Mean	DECISION
1	I believe male students perform better in mathematics than female students.	154	2.44	.775	2.5	Disagreed
2	Female students face more challenges in understanding mathematical concepts compared to male students.	154	2.40	.691	2.5	Disagreed
3	Male students are more motivated to excel in mathematics than female students.	154	2.60	1.111	2.5	Agreed
4	Teachers tend to have higher expectations for male students in mathematics compared to female students.	154	3.31	.681	2.5	Agreed
5	Female students actively participate in mathematics class discussions as much as male students.	154	2.99	1.048	2.5	Agreed
	GRAND MEAN = 2.75					

Source; Field Survey 2025

From Table 2, the results shows the mean of 2.75 which means that respondents agreed that there is difference in Mathematics achievement between male and female students in secondary schools

Research Question 2; How do cultural beliefs and societal expectations influence the Mathematics achievement of male and female students in this region?

Table 3; Descriptive statistics of mean and standard deviation showing cultural beliefs and societal expectations influence on Mathematics achievement of male and female students

S/N	ITEMS	N	MEAN	S.D	Criterion Mean	DECISION
6	Cultural beliefs in this region consider mathematics as a subject more suitable for male students than female students.	154	2.99	1.048	2.5	Agreed
7	Societal expectations place greater emphasis on male students excelling in mathematics than female students.	154	2.84	1.079	2.5	Agreed
8	Female students are discouraged from pursuing mathematics due to traditional gender roles.	154	2.92	1.108	2.5	Agreed
9	Parents in this region are more likely to support male students in mathematics than female students.	154	2.97	.918	2.5	Agreed
10	Female students face societal pressure to focus on non-mathematical subjects instead of mathematics.	154	3.08	.980	2.5	Agreed
	GRAND MEAN = 2.96					

Source; Field Survey 2025

From Table 3, the results shows the mean of 2.96 which means that respondents agreed that cultural beliefs and societal expectations influence Mathematics achievement of male and female students

Research Question 3; In what ways do teacher attitudes and classroom practices impact the Mathematics performance of male and female students?

Table 4; Descriptive statistics of mean and standard deviation showing how teacher attitudes and classroom practices impact the Mathematics performance of male and female students

S/N	ITEMS	N	MEAN	S.D	Criterion Mean	DECISION
11	Teachers give more attention to male students in mathematics classes than female students.	154	2.86	.957	2.5	Agreed
12	Teachers provide equal encouragement to both male and female students in mathematics.	154	2.71	1.071	2.5	Agreed
13	Female students are often overlooked by teachers during mathematics problem-solving sessions.	154	2.95	1.015	2.5	Agreed

14	Teachers believe that male students are naturally better at mathematics than female students.	154	2.98	.953	2.5	Agreed
15	Classroom practices in mathematics favor male students over female students.	154	2.00	.950	2.5	Disgreed
	GRAND MEAN = 2.7					

Source; Field Survey 2025

From Table 4, the results shows the mean of 2.7 which means that respondents agreed that teacher attitudes and classroom practices impact the Mathematics performance of male and female students

Research Question 4; How does parental support and encouragement affect the Mathematics achievement of male and female students in Egor Local Government?

Table 5; Descriptive statistics of mean and standard deviation showing how parental support and encouragement affect the Mathematics achievement of male and female students

S/N	ITEMS	N	MEAN	S.D	Criterion Mean	DECISION
16	Parents provide more encouragement to male students to excel in mathematics than	154	2.69	1.063	2.5	Agreed

	female students.					
17	Female students receive the same level of support from parents as male students for mathematics-related studies.	154	2.74	1.065	2.5	Agreed
18	Parents are more likely to hire private mathematics tutors for male students than female students.	154	2.81	1.214	2.5	Agreed
19	Parental expectations for high performance in mathematics are greater for male students than for female students.	154	2.77	1.026	2.5	Agreed
20	Female students feel less motivated in mathematics due to a lack of parental encouragement.	154	2.58	1.040	2.5	Agreed
	GRAND MEAN = 2.72					

Source; Field Survey 2025

From Table 3, the results shows the mean of 2.72 which means that respondents agreed that parental support and encouragement affect the Mathematics achievement of male and female students

Hypotheses One

There is no significant difference in Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State.

Independence sample T test

	GENDER	N	Mean	Std. Deviation	Std. Error Mean	df	Sig. (2-tailed)
I believe male students perform better in mathematics than female students.	MALE	103	2.48	.752	.074	152	.439
	FEMALE	51	2.37	.824	.115	92.105	.454
Male students are more motivated to	MALE	103	2.66	1.168	.115	152	.373
	FEMALE	51	2.49	.987	.138	115.978	.347

The independent samples t-test was conducted to examine whether there is a significant difference in mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State. The analysis focused on two key perceptions: the belief that male students perform better in mathematics than female students and the perceived motivation of male students to excel in mathematics.

For the first perception, "I believe male students perform better in mathematics than female students," the results showed that the mean score for male students was 2.48, while female students had a mean score of 2.37. The t-test yielded a p-value of 0.439, which is greater than the threshold of 0.05. This indicates that there is no statistically significant difference between male and female students regarding the belief that males perform better in mathematics.

Similarly, for the second perception, "Male students are more motivated to excel in mathematics than female students," the mean score for male students was 2.66, while female students had a mean of 2.49. The t-test yielded a p-value of 0.373, which is also greater than 0.05. This again suggests that there is no significant difference in the perceived motivation to excel in mathematics between male and female students.

In conclusion, both analyses show that there are no statistically significant differences between male and female students concerning their beliefs about mathematics performance and motivation. These findings suggest that gender, in this study, does not appear to play a significant role in shaping students' perceptions of their performance or motivation in mathematics.

Discussion of Findings

The findings from this study provide valuable insights into various factors influencing mathematics achievement among male and female students in secondary schools within Egor Local Government, Edo State. The findings reveal significant perceptions regarding gender differences, cultural beliefs, teacher attitudes, and parental support, all of which contribute to shaping students’ mathematics performance.

The first research question examined whether there is a difference in mathematics achievement between male and female students. The results, with a grand mean of 2.75, indicate that respondents agree that such a difference exists. However, they do not believe that male students inherently perform better than female students (Mean = 2.44) or that females face greater difficulties in understanding mathematical concepts (Mean = 2.40). This contradicts traditional stereotypes that suggest male students have a natural advantage in mathematics. Interestingly, male students were perceived as more motivated to excel in mathematics (Mean = 2.60), which could contribute to the perceived performance gap. Teachers were also reported to have higher expectations for male students (Mean = 3.31), reinforcing societal influences that push boys toward STEM-related fields. These findings align with the study by Ajai and Imoko (2015), which found that while teacher expectations and student motivation differed by gender, actual mathematics performance showed minimal differences when both genders were given equal opportunities. Similarly, Reilly et al. (2019) found that gender disparities in mathematics were largely a result of sociocultural factors rather than cognitive differences.

The second research question explored the influence of cultural beliefs and societal expectations on mathematics achievement. The results (grand mean = 2.96) suggest that cultural norms in the region favor male students in mathematics, with respondents agreeing that mathematics is seen as a subject more suitable for boys (Mean = 2.99). Additionally, societal expectations place more emphasis on male students excelling in mathematics (Mean = 2.84), and female students often face discouragement from pursuing the subject due to traditional gender roles (Mean = 2.92). Parental support was also found to be skewed, with more encouragement given to male students (Mean =

2.97), and female students experiencing societal pressure to focus on non-mathematical subjects (Mean = 3.08). These findings are consistent with the research of Eriksson et al. (2020), who highlighted that cultural values significantly impact gender gaps in academic achievement. Similarly, Wang and Degol (2017) found that gender-math stereotypes held by parents and teachers influenced student motivation and performance, often leading to disparities in mathematics engagement between boys and girls.

The third research question assessed the impact of teacher attitudes and classroom practices on mathematics performance. The findings (grand mean = 2.7) suggest that teachers give more attention to male students (Mean = 2.86) and tend to believe that male students are naturally better at mathematics (Mean = 2.98). However, respondents also agreed that teachers provide equal encouragement to both genders (Mean = 2.71). Despite this, female students are often overlooked during problem-solving sessions (Mean = 2.95). The only area where the respondents disagreed was the notion that classroom practices favor male students over females (Mean = 2.00). This suggests that while biases exist, they may not be explicitly reflected in classroom policies. These findings align with Stoet et al. (2016), who found that teachers' implicit biases and expectations contribute to reinforcing gender gaps in mathematics. Additionally, Lazarides and Watt (2015) found that students’ perceptions of teacher support significantly influenced their motivation and achievement, with male students often receiving more encouragement in STEM-related subjects.

The final research question examined how parental support and encouragement affect students' mathematics achievement. The results (grand mean = 2.72) suggest that parents tend to provide more encouragement to male students (Mean = 2.69), hire private tutors more frequently for boys (Mean = 2.81), and set higher performance expectations for their sons (Mean = 2.77). Although there was agreement that female students receive similar parental support (Mean = 2.74), they still experience a lack of motivation due to less encouragement from parents (Mean = 2.58). These findings are supported by Kung and Lee (2016), who found that parental involvement significantly impacts students' mathematics self-efficacy, with boys often receiving more direct encouragement for STEM subjects. Similarly, Pitsia et al. (2017) found that parental beliefs about gender roles influence the support provided to children, contributing to the gender gap in mathematics achievement.

In conclusion, this study highlights the significant role of sociocultural factors in shaping mathematics achievement among male and female students. While cognitive ability does not appear to be a determinant of performance disparities, factors such as teacher expectations, cultural beliefs, and parental support create an environment that favors male students in mathematics. Addressing these issues requires a conscious effort to challenge traditional stereotypes and provide equal encouragement and opportunities for both genders in mathematics education..

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary, conclusion and the recommendations proffered in view of the findings;

Summary

This research works aims to investigate the extent of gender disparities in mathematics achievement among secondary school students in Egor local government, Edo state. The researcher reviewed literature concept of mathematics education, gender differences in mathematics achievement, cultural beliefs and societal expectations in mathematics achievement, teacher attitudes and classroom practices in mathematics achievement, and parental support and encouragement in mathematics achievement The study employed a descriptive survey design. The study population consisted of 4560 student from the 14 public secondary schools in Egor local government area, Edo state, with a sample size of 154 using multi stage sampling method. The researcher administered the survey instrument to these students, collected data and analysed it using descriptive analysis.

The findings revealed that while there is a perceived difference in mathematics performance between male and female students, this disparity is largely influenced by cultural beliefs, teacher attitudes, and parental support, rather than cognitive ability.

Male students were perceived to be more motivated, and teachers were found to have higher expectations for boys in mathematics. Additionally, cultural norms and parental support tended to favor male students, reinforcing gender-based stereotypes. However, female students actively participated in mathematics discussions, suggesting that when given equal opportunities, they can perform just as well as their male counterparts. There is a perceived difference in mathematics achievement between male and female students. Cultural beliefs and societal expectations favor male students in mathematics.

Teacher attitudes and classroom practices contribute to gender disparities in mathematics achievement. Parental support and encouragement are more directed towards male students in mathematics.

Conclusion

The findings of this study indicate that gender disparities in mathematics achievement among secondary school students in Egor Local Government, Edo State, are primarily driven by societal expectations, cultural beliefs, teacher attitudes, and parental support rather than inherent differences in ability. Male students receive greater encouragement, higher teacher expectations, and more parental support, which may contribute to their perceived advantage in mathematics. However, female students actively participate in mathematics classes and are capable of performing equally well when provided with the necessary motivation and support. Addressing these disparities requires conscious efforts to promote inclusivity and eliminate gender-based biases in mathematics education.

Recommendations

1. Schools should implement gender-inclusive teaching strategies that encourage equal participation of male and female students in mathematics.
2. Regular training programs should be conducted for teachers to help them recognize and eliminate gender biases in classroom interactions.
3. Parents should be educated on the importance of encouraging both male and female students equally in mathematics-related studies and careers.
4. Educational policies should integrate gender-balanced content in mathematics curricula to challenge traditional stereotypes and promote equal opportunities.
5. Government and private organizations should provide scholarships and mentorship programs to support female students in STEM fields.
6. Schools should establish counseling programs to provide guidance and support for female students interested in mathematics and STEM careers.

Suggestions for Further Studies:

1. A comparative study between urban and rural schools to examine how gender disparities in mathematics achievement differ based on

location.

2. A longitudinal study to track the long-term impact of teacher attitudes and parental support on students' mathematics performance.

3. An in-depth qualitative study to explore personal experiences of female students in mathematics and STEM-related subjects.

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APPENDIX

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

THE EXTENT OF GENDER DISPARITIES IN MATHEMATICS ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS IN EGOR LOCAL GOVERNMENT, EDO STATE.

Dear Respondents

The purpose of this questionnaire is to elicit information on the above-mentioned topic. Your cooperation in providing honest and sincere response to all the questions will be appreciated as they will be treated with utmost confidentiality.

Thanks for your co-operation

Instruction, please tick (appropriately in the boxes provided

SECTION A

Demographic Data

Gender : Male ( ), Female ( )

Age: 12-15 ( ) 16 -19 ( ) 20-23( )

Section B

Instruction: Please tick [√] the most appropriate option for each item.

Key: SA – Strongly Agree, A – Agree, D – Disagree, SD – Strongly disagree

S/N	ITEM	SA	A	D	SD
RQ1	What is the difference in Mathematics achievement between male and female students in secondary schools within Egor Local Government, Edo State?				
1	I believe male students perform better in mathematics than female students.				
2	Female students face more challenges in understanding mathematical concepts compared to male students.				
3	Male students are more motivated to excel in mathematics than female students.				
4	Teachers tend to have higher expectations for male students in mathematics compared to female students.				
5	Female students actively participate in mathematics class discussions as much as male students.				
RQ2	How do cultural beliefs and societal expectations influence the Mathematics achievement of male and female students in this region?				
6	Cultural beliefs in this region consider mathematics as a subject more suitable for male students than female students.				
7	Societal expectations place greater emphasis on male students excelling in mathematics than female students.				
8	Female students are discouraged from pursuing mathematics due to traditional gender roles.				
9	Parents in this region are more likely to support male students in mathematics than female students.				
10	Female students face societal pressure to focus on non-mathematical subjects instead of mathematics.				
RQ3	In what ways do teacher attitudes and classroom practices impact the Mathematics performance of male and female students?				
11	Teachers give more attention to male students in mathematics classes than female students.				

12	Teachers provide equal encouragement to both male and female students in mathematics.
13	Female students are often overlooked by teachers during mathematics problem-solving sessions.
14	Teachers believe that male students are naturally better at mathematics than female students.
15	Classroom practices in mathematics favor male students over female students.
RQ4	How does parental support and encouragement affect the Mathematics achievement of male and female students in Egor Local Government?
16	Parents provide more encouragement to male students to excel in mathematics than female students.
17	Female students receive the same level of support from parents as male students for mathematics-related studies.
18	Parents are more likely to hire private mathematics tutors for male students than female students.
19	Parental expectations for high performance in mathematics are greater for male students than for female students.
20	Female students feel less motivated in mathematics due to a lack of parental encouragement.