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## The Prevalence and Effects of Mathematics Phobia On Secondary School Students' Academic Performance in Economics in Iseyin Local Government Area of Oyo State

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**Abstract:** *Mathematics phobia has become one of the major psychological barriers affecting students' learning and achievement in subjects requiring quantitative reasoning, particularly Economics. This study investigated the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin Local Government Area of Oyo State. The study adopted a descriptive survey research design with a correlational approach. The population comprised 3,450 Senior Secondary School Two (SS II) students in the 25 public secondary schools in Iseyin Local Government Area, while a sample of 400 students was selected from 10 public secondary schools using a multistage sampling procedure. Data were collected using a researcher-developed instrument titled Mathematics Phobia and Economics Performance Questionnaire (MPEPQ), which had a Cronbach Alpha reliability coefficient of 0.89, while students' 2024/2025 First Term Economics examination scores were obtained from school records to measure academic performance. The data collected were analyzed using frequency counts, percentages, mean, standard deviation, Pearson Product Moment Correlation, and Independent Samples t-test at the 0.05 level of significance. The findings revealed that mathematics phobia was highly prevalent among the respondents, with 41.5% exhibiting high mathematics phobia and an overall mean score of 58.74 (SD = 12.36). The study further revealed that students' academic performance in Economics was relatively poor, with 38.0% of the respondents failing the subject and an overall mean score of 50.12 (SD = 14.67). The results also established a strong and significant negative relationship between mathematics phobia and students' academic performance in Economics ( $r = -0.67$ ,  $p < .05$ ). Furthermore, a significant difference was found between students with low and high mathematics phobia, as students with low*

*mathematics phobia ( $M = 62.34$ ) performed significantly better than those with high mathematics phobia ( $M = 41.28$ ;  $t = 9.82$ ,  $p < .05$ ). The study concluded that mathematics phobia is highly prevalent among secondary school students and significantly impairs their academic performance in Economics. It was therefore recommended that Mathematics and Economics teachers adopt learner-centred instructional strategies, school counsellors implement intervention programmes to reduce mathematics anxiety, and educational authorities organize continuous professional development programmes aimed at improving the teaching of quantitative aspects of Economics.*

**Keywords:** mathematics phobia, mathematics anxiety, academic performance, economics education, secondary school students, Iseyin Local Government Area, Oyo State.

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## INTRODUCTION

According to the Federal Republic of Nigeria (2023), Economics is one of the core subjects offered at the senior secondary school level because it equips learners with the knowledge, skills, and competencies required for rational decision-making, efficient resource allocation, entrepreneurship, and national development. The subject provides students with an understanding of fundamental economic concepts such as scarcity, choice, opportunity cost, production, consumption, distribution, demand and supply, inflation, unemployment, and economic growth. Beyond its theoretical relevance, Economics prepares students for careers in business, finance, banking, accounting, public administration, and other social science disciplines. Consequently, the Nigerian secondary school curriculum places considerable emphasis on the effective teaching and learning of Economics as a means of producing economically informed citizens capable of contributing meaningfully to national development. Despite this strategic importance, students' academic performance in Economics has continued to generate concern among educators, parents, examination bodies, and policymakers due to the persistent decline in achievement recorded in public examinations.

Economics is not merely a theoretical discipline but a quantitative social science that depends substantially on mathematical reasoning for the analysis and interpretation of economic phenomena. Dowker, Sarkar, and Looi (2021) observed that mathematical competence enhances learners' ability to solve complex problems involving logical reasoning and numerical analysis. In senior secondary school Economics, students are required to apply mathematical principles in solving problems relating to demand and supply functions, elasticity, market equilibrium, national income accounting, cost and revenue analysis, index numbers, statistics, and graphical interpretation. These quantitative aspects require learners to possess not only computational skills but also confidence in applying mathematical procedures to economic situations. Consequently,

Mathematics has long been regarded as the language of Economics because it provides the analytical framework through which economic theories are expressed, tested, and interpreted.

Mathematics occupies a unique position in the educational system because it serves as the foundation upon which scientific, technological, commercial, and social science knowledge is built. Balogun (2022) maintained that Mathematics develops logical thinking, analytical reasoning, creativity, and problem-solving skills that are indispensable for meaningful learning across disciplines. Owing to its significance, the Federal Government of Nigeria has made Mathematics a compulsory subject at the primary and secondary school levels. However, despite the policy recognition accorded to Mathematics, many Nigerian students continue to perceive the subject as abstract, difficult, and intimidating. Such negative perceptions often discourage learners from actively participating in Mathematics lessons, thereby reducing their interest, confidence, and overall academic performance. The implications of this situation extend beyond Mathematics to other subjects such as Economics, where mathematical competence is an essential requirement for effective learning.

One of the major psychological factors responsible for students' poor achievement in Mathematics and mathematics-related subjects is mathematics phobia, otherwise referred to as mathematics anxiety. Ashcraft and Krause (2007) described mathematics phobia as a feeling of tension, fear, worry, and apprehension that interferes with the manipulation of numbers and the successful solving of mathematical problems. Rather than reflecting students' intellectual ability, mathematics phobia represents an emotional response that reduces learners' confidence and willingness to engage in mathematical activities. Students experiencing mathematics phobia often display symptoms such as nervousness, excessive sweating, increased heartbeat, avoidance of numerical tasks, poor concentration, and mental blockage during classroom activities and examinations. These psychological reactions frequently impair cognitive functioning and ultimately affect academic achievement.

Several factors have been identified as contributing to the development of mathematics phobia among secondary school students. Zixi and Ling (2020) argued that negative classroom experiences, repeated failure in Mathematics, poor teaching methods, inadequate instructional materials, parental pressure, large class sizes, and societal stereotypes portraying Mathematics as an exceptionally difficult subject significantly increase students' level of mathematics anxiety. In addition, inadequate foundational knowledge acquired during primary education, teacher-centered instructional approaches, and limited opportunities for practical learning further reinforce learners' fear of Mathematics. As students repeatedly encounter difficulties in solving mathematical problems, they gradually develop negative attitudes toward the subject, resulting in avoidance behaviours that continue throughout their academic careers.

The effects of mathematics phobia extend far beyond students' performance in Mathematics because the fear often influences achievement in other quantitatively oriented subjects. Economics is particularly affected because many of its concepts require learners to perform calculations, analyze numerical data, interpret graphs, and apply mathematical formulas appropriately. According to Adegoke (2023), students with high levels of mathematics anxiety are generally reluctant to attempt calculation-based questions even when they possess adequate theoretical knowledge of the subject matter. Such avoidance behaviours reduce classroom participation, weaken students' confidence during examinations, and significantly lower their academic achievement. Consequently, mathematics phobia has emerged as an important educational issue requiring urgent attention from teachers, counsellors, parents, curriculum developers, and educational administrators.

Empirical evidence from both developed and developing countries continues to demonstrate that mathematics phobia constitutes a significant predictor of students' academic achievement. For instance, Dowker et al. (2021) reported that mathematics anxiety negatively affects students' working memory, reasoning ability, motivation, and overall academic performance. Similarly, Nigerian studies have consistently established significant negative relationships between mathematics anxiety and students' achievement in Mathematics, Economics, Accounting, and other quantitative subjects. These findings suggest that students' psychological readiness to engage with mathematical tasks is as important as their cognitive ability in determining learning outcomes. Therefore, efforts aimed at improving students' academic performance should not focus solely on instructional methods but should also address emotional and psychological barriers associated with Mathematics learning.

The concern over students' poor performance in Economics has continued to attract the attention of educational stakeholders in Nigeria. Reports released by the West African Examinations Council (2023–2025) consistently indicate that candidates experience considerable difficulty in answering quantitative Economics questions involving calculations, graphs, statistical analysis, and numerical applications. Although many candidates demonstrate reasonable understanding of theoretical concepts, their inability to apply mathematical procedures correctly often results in poor overall performance. This trend suggests that mathematical competence and students' attitudes toward Mathematics play significant roles in determining achievement in Economics. It also highlights the need to investigate psychological variables such as mathematics phobia as possible explanations for students' persistent poor performance in the subject.

Within Oyo State, and particularly in Iseyin Local Government Area, the issue of poor performance in Economics remains a matter of concern among teachers, parents, school administrators, and education authorities. Classroom observations and teachers' experiences indicate that many students actively participate during theoretical discussions but become anxious whenever lessons involve calculations, graphical analysis, or numerical interpretation. Olatunji

and Adeyemi (2024) noted that students who possess negative attitudes toward Mathematics frequently transfer such attitudes to Economics because of its quantitative nature. Consequently, many learners avoid solving computational questions, exhibit low confidence during classroom exercises, and perform poorly in examinations despite demonstrating adequate understanding of theoretical concepts. This situation continues to undermine the overall effectiveness of Economics education in many secondary schools.

Although several studies have investigated mathematics anxiety in relation to Mathematics achievement in different parts of Nigeria, relatively few have specifically examined its prevalence and effects on secondary school students' academic performance in Economics within Iseyin Local Government Area of Oyo State. Most existing studies have concentrated on Mathematics as the dependent variable, with limited attention devoted to Economics despite its substantial quantitative content. This represents an important empirical gap in the literature. It is against this background that this study investigates the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin Local Government Area of Oyo State. The findings are expected to provide empirical evidence that will assist teachers, school counsellors, school administrators, curriculum planners, parents, and educational policymakers in designing appropriate interventions capable of reducing mathematics phobia and improving students' academic performance in Economics.

### **Statement of the Problem**

The persistent poor academic performance of secondary school students in Economics has remained a major concern to educators, parents, school administrators, and examination bodies in Nigeria. Despite the importance of Economics in promoting financial literacy, entrepreneurship, and informed decision-making, the performance of students in public examinations has continued to fall below expectations. Reports of the West African Examinations Council (WAEC, 2023–2025) consistently indicate that many candidates experience difficulties in answering questions involving calculations, graphical analysis, and quantitative interpretation. Although several factors such as inadequate instructional materials, ineffective teaching methods, poor learning environment, and students' poor study habits have been identified as possible causes of this problem, the psychological factors influencing students' achievement in Economics have not received adequate empirical attention.

Mathematics plays a fundamental role in the teaching and learning of Economics because many concepts in the subject require learners to apply mathematical principles in solving practical economic problems. However, many secondary school students develop fear, anxiety, and negative attitudes toward Mathematics, making them reluctant to participate in quantitative classroom activities. Students who experience mathematics phobia often avoid calculation-based questions, exhibit low confidence during lessons and examinations, and experience difficulty in applying

mathematical concepts to economic situations. This situation may negatively affect their understanding of important Economics topics and ultimately reduce their academic performance.

In many secondary schools within Iseyin Local Government Area of Oyo State, teachers have continued to observe that while a considerable number of students perform relatively well in theoretical aspects of Economics, they often perform poorly in topics involving calculations, graphs, elasticity, index numbers, national income, and other quantitative concepts. Many students perceive Economics as an extension of Mathematics and consequently develop anxiety whenever numerical problems are introduced during classroom instruction. This negative disposition toward Mathematics appears to influence students' interest, participation, confidence, and achievement in Economics. However, there is insufficient empirical evidence to determine the extent to which mathematics phobia contributes to this observed pattern of poor performance within the study area.

Although previous studies have examined mathematics anxiety and students' achievement in Mathematics in different parts of Nigeria, relatively few studies have focused specifically on the prevalence of mathematics phobia and its influence on students' academic performance in Economics, particularly within Iseyin Local Government Area of Oyo State. Most available studies have concentrated on Mathematics achievement as the outcome variable, leaving limited empirical evidence regarding how mathematics phobia affects learning outcomes in Economics. This gap in the literature makes it difficult for teachers, counsellors, curriculum planners, and educational policymakers to design evidence-based interventions specifically targeted at improving students' performance in Economics through the reduction of mathematics phobia.

It is against this background that this study investigates the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin Local Government Area of Oyo State. Specifically, the study seeks to determine the prevalence of mathematics phobia among secondary school students, examine their level of academic performance in Economics, investigate the relationship between mathematics phobia and students' academic performance in Economics, and determine whether differences exist in the performance of students with high and low levels of mathematics phobia. The findings of this study are expected to provide empirical evidence that will assist teachers, school counsellors, school administrators, parents, and educational policymakers in developing effective strategies for reducing mathematics phobia and improving students' academic performance in Economics.

### **Objectives of the Study**

The main objective is to examine the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin LGA. Specific objectives:

1. Determine the level of prevalence of mathematics phobia among secondary school students in Iseyin LGA
2. Assess students' academic performance in Economics

3. Examine the relationship between mathematics phobia and academic performance in Economics
4. Compare the academic performance of students with high and low mathematics phobia

### **Research Questions**

1. What is the level of prevalence of mathematics phobia among secondary school students in Iseyin LGA?
2. What is the level of students' academic performance in Economics?
3. What is the relationship between mathematics phobia and academic performance in Economics?
4. Is there a significant difference in Economics performance between students with high and low mathematics phobia?

### **Research Hypotheses**

H01: There is no significant relationship between mathematics phobia and students' academic performance in Economics

H02: There is no significant difference in academic performance in Economics between students with high and low mathematics phobia

### **Significance of the Study**

Findings will help Economics teachers in Iseyin LGA to understand the role of math anxiety. It will guide the Oyo State Ministry of Education and SUBEB on teacher training needs. It will also help students and parents to address the root cause of poor performance in Economics.

## **LITERATURE REVIEW**

### **Theoretical Framework**

#### **Self-Efficacy Theory**

The Self-Efficacy Theory was propounded by Albert Bandura (1997) as part of the broader Social Cognitive Theory to explain how individuals' beliefs about their capabilities influence their behaviour, motivation, and performance. According to Bandura (1997), self-efficacy refers to an individual's judgment of his or her ability to successfully organize and execute the actions required to achieve a particular task or goal. The theory emphasizes that people who possess high self-efficacy approach difficult tasks with confidence, persistence, and resilience, whereas individuals with low self-efficacy often experience fear, anxiety, avoidance behaviour, and low motivation.

Bandura identified four major sources of self-efficacy, namely mastery experiences, vicarious experiences, verbal persuasion, and physiological or emotional states. Mastery experiences, which involve previous successful performance, are regarded as the strongest determinant of self-efficacy because repeated success strengthens individuals' confidence in their abilities, while repeated failure weakens such confidence. Similarly, observing others perform similar tasks successfully, receiving encouragement from significant others, and maintaining positive emotional states contribute significantly to improving self-efficacy. Thus, the theory suggests that individuals' beliefs about their competence influence not only the effort they invest in learning but also their perseverance when confronted with challenging situations.

Within the context of mathematics learning, Self-Efficacy Theory provides a useful explanation for why some students develop mathematics phobia while others remain confident in solving quantitative problems. Students who repeatedly experience failure in Mathematics often begin to doubt their competence, resulting in low mathematical self-efficacy and increased anxiety whenever they encounter numerical tasks. Such students are more likely to avoid solving mathematical problems, participate less actively during classroom instruction, and perform poorly in subjects that require quantitative reasoning, including Economics. Conversely, students who have confidence in their mathematical ability are generally willing to attempt difficult calculations, ask questions for clarification, and persist until solutions are obtained. The theory therefore suggests that students' beliefs about their mathematical competence significantly influence their academic performance in Economics because many Economics concepts require the application of mathematical principles. Consequently, Self-Efficacy Theory provides an appropriate theoretical foundation for this study by explaining how students' confidence in Mathematics may influence the prevalence of mathematics phobia and ultimately determine their academic achievement in Economics.

### **Attentional Control Theory**

The Attentional Control Theory was developed by Ashcraft (2002) and later expanded by **Ashcraft** and Krause (2007) to explain the cognitive processes through which anxiety affects learning and performance. The theory proposes that anxiety interferes with an individual's ability to regulate attention effectively during task performance. According to the theory, anxious individuals devote a significant portion of their cognitive resources to worrying about failure rather than concentrating on the task itself. As a result, anxiety reduces the efficiency of working memory, limits concentration, impairs reasoning ability, and negatively affects problem-solving performance. Working memory is particularly important in mathematical problem-solving because learners must simultaneously remember formulas, manipulate numerical information, and perform logical calculations. When anxiety occupies working memory, students find it difficult to process information accurately, leading to mistakes, slow performance, and poor academic outcomes. The

theory therefore explains why even academically capable students may perform below expectation when confronted with mathematical tasks under stressful conditions.

The relevance of Attentional Control Theory to this study lies in its ability to explain the relationship between mathematics phobia and students' academic performance in Economics. Students who experience mathematics phobia frequently become anxious whenever they encounter Economics topics involving calculations, graphs, statistics, elasticity, index numbers, and national income analysis. Instead of concentrating on solving the questions, they become preoccupied with fear of making mistakes or failing the task, thereby reducing the cognitive resources available for effective reasoning and computation. This anxiety often results in avoidance behaviour, poor classroom participation, inability to complete examination questions, and low academic achievement. Consequently, the theory suggests that mathematics phobia is not merely an emotional reaction but also a cognitive factor that interferes with students' learning processes and academic performance. The assumptions of Attentional Control Theory therefore complement those of Self-Efficacy Theory by explaining how mathematics-related anxiety reduces students' ability to perform successfully in Economics, making both theories highly relevant to the present study.

### **Concept of Mathematics**

Mathematics is universally recognized as one of the most fundamental disciplines in education because it provides the knowledge and skills required for logical reasoning, critical thinking, problem-solving, and scientific inquiry. According to Balogun (2022), Mathematics is the science of numbers, quantity, patterns, structures, and relationships that enables individuals to analyze situations objectively and make informed decisions. The subject serves as the language of science and technology because it provides the tools for measurement, computation, prediction, and analysis across diverse fields of human endeavour. In Nigeria, Mathematics occupies a central position in the school curriculum and has been made compulsory at both the basic and senior secondary school levels due to its indispensable role in national development. Beyond its classroom application, Mathematics equips learners with analytical and computational skills required for effective functioning in everyday life, business transactions, engineering, medicine, economics, agriculture, and information technology. Consequently, mastery of Mathematics is regarded as an essential prerequisite for success in many academic disciplines and professional careers.

The significance of Mathematics extends beyond numerical calculations because it promotes intellectual development and enhances learners' capacity to think systematically and solve real-life problems. The Federal Republic of Nigeria (2023) recognizes Mathematics as one of the core subjects necessary for achieving the objectives of science, technology, and innovation in the country's educational system. The study of Mathematics encourages precision, logical reasoning,

creativity, and objective thinking, all of which contribute to students' overall academic development. However, despite its recognized importance, many students perceive Mathematics as one of the most difficult subjects in the school curriculum. Such perceptions often result in low interest, negative attitudes, poor achievement, and avoidance of mathematical activities. These negative experiences not only affect students' performance in Mathematics but also influence their achievement in other subjects that require quantitative reasoning, particularly Economics, where mathematical concepts are frequently applied in problem-solving and data interpretation.

### **Concept of Mathematics Phobia**

Mathematics phobia, commonly referred to as mathematics anxiety, is a psychological condition characterized by excessive fear, tension, nervousness, and emotional discomfort whenever an individual is required to perform mathematical tasks. Ashcraft and Krause (2007) defined mathematics anxiety as a feeling of tension and apprehension that interferes with the manipulation of numbers and the successful solving of mathematical problems in academic and everyday situations. Rather than being an indication of low intelligence, mathematics phobia is primarily an emotional response that affects students' confidence, concentration, motivation, and willingness to engage in mathematical activities. Students suffering from mathematics phobia often experience fear even before encountering mathematical problems, making them avoid Mathematics lessons, classroom participation, assignments, and examinations involving calculations. This emotional reaction reduces learners' cognitive efficiency and limits their ability to utilize previously acquired mathematical knowledge effectively.

According to Dowker, Sarkar, and Looi (2021), mathematics phobia has become one of the most widely researched psychological barriers to academic achievement because of its negative influence on learning outcomes across different educational levels. The condition manifests in various forms, including fear of classroom participation, anxiety during examinations, inability to interpret numerical information, and reluctance to attempt mathematical problems. Students with mathematics phobia frequently underestimate their abilities despite possessing adequate intellectual capacity to perform well. Consequently, they develop avoidance behaviours that gradually reduce their competence and confidence in handling quantitative tasks. Since Economics requires learners to manipulate figures, interpret graphs, and apply mathematical formulas in solving economic problems, mathematics phobia often extends beyond Mathematics classrooms and significantly influences students' performance in Economics and other numerically oriented subjects.

### **Causes of Mathematics Phobia**

Mathematics phobia develops as a result of numerous interacting psychological, instructional, environmental, and social factors that influence students' attitudes toward Mathematics. Zixi and

Ling (2020) argued that repeated failure in Mathematics, ineffective teaching methods, inadequate instructional materials, negative classroom experiences, and poor foundational knowledge constitute major causes of mathematics anxiety among students. Learners who consistently experience difficulty in understanding mathematical concepts gradually develop the belief that Mathematics is beyond their ability, thereby reducing their confidence and motivation to learn. Similarly, teacher-centred instructional approaches that emphasize memorization rather than conceptual understanding often discourage students from actively participating in Mathematics lessons. When students repeatedly encounter failure without adequate academic support, they become fearful of mathematical activities and eventually develop persistent mathematics phobia.

Apart from school-related factors, family background, peer influence, societal beliefs, and personal characteristics also contribute significantly to the development of mathematics phobia. Balogun (2022) observed that many parents unintentionally transmit negative attitudes toward Mathematics by expressing beliefs that the subject is naturally difficult or suitable only for exceptionally intelligent learners. Such beliefs influence children's perceptions long before they develop their own learning experiences. Additionally, excessive parental expectations, fear of failure, examination pressure, large class sizes, inadequate teacher motivation, and limited opportunities for individualized instruction further increase students' anxiety toward Mathematics. Peer ridicule following poor performance and societal stereotypes concerning mathematical ability also contribute to learners' fear and avoidance of numerical tasks. These factors collectively reduce students' self-confidence and increase their susceptibility to mathematics phobia, which subsequently affects their performance in Mathematics as well as other quantitative subjects such as Economics.

### **Symptoms of Mathematics Phobia**

Mathematics phobia manifests through a combination of emotional, cognitive, behavioural, and physiological symptoms that interfere with students' ability to learn and perform effectively in Mathematics and related subjects. Ashcraft and Krause (2007) explained that students suffering from mathematics phobia often experience intense feelings of fear, tension, worry, and nervousness whenever they are confronted with mathematical tasks. These emotional reactions are usually accompanied by physical symptoms such as sweating, trembling, rapid heartbeat, headaches, stomach discomfort, and increased blood pressure, particularly during Mathematics lessons, classroom exercises, and examinations. In addition, students may experience difficulty concentrating, forget previously learned concepts, and become mentally confused when solving mathematical problems. Such symptoms reduce learners' confidence and limit their ability to think critically, thereby affecting their academic performance not only in Mathematics but also in subjects such as Economics that require quantitative reasoning.

The behavioural manifestations of mathematics phobia are equally evident among students at different levels of education. Dowker, Sarkar, and Looi (2021) observed that students with mathematics anxiety frequently avoid Mathematics classes, postpone assignments involving calculations, refuse to participate in classroom discussions, and exhibit low motivation toward learning quantitative subjects. Some students intentionally skip examinations or leave calculation-based questions unanswered because they believe they cannot solve them correctly. Others depend excessively on classmates during group activities due to lack of confidence in their own mathematical abilities. These avoidance behaviours gradually weaken students' computational skills and increase their fear of Mathematics, creating a cycle of poor achievement and declining self-confidence. As a result, mathematics phobia becomes a significant barrier to effective learning and academic success, particularly in Economics where mathematical competence is essential for understanding quantitative concepts.

## **Academic Performance**

Academic performance refers to the extent to which students successfully achieve predetermined educational objectives as measured through examinations, classroom assessments, assignments, tests, and other forms of evaluation. According to Adeyemi (2023), academic performance reflects learners' mastery of knowledge, skills, attitudes, and competencies acquired through the teaching and learning process. It serves as one of the major indicators used by teachers, parents, educational institutions, and policymakers to evaluate the effectiveness of instruction and students' learning outcomes. In secondary schools, students' academic performance is commonly measured through continuous assessment scores and external examinations conducted by recognized examination bodies such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO). Good academic performance indicates that students have successfully understood and applied the concepts taught, while poor performance suggests the existence of learning difficulties or other factors affecting achievement.

Academic performance is influenced by numerous interrelated factors, including students' intellectual ability, motivation, study habits, learning environment, teacher quality, parental support, instructional resources, and psychological conditions. Olatunji and Adeyemi (2024) noted that psychological variables such as self-confidence, anxiety, motivation, and attitude toward learning play significant roles in determining students' academic success. Students who possess positive attitudes and confidence in their abilities are generally more willing to participate actively in classroom activities and persist when confronted with difficult learning tasks. Conversely, students experiencing anxiety and fear often demonstrate reduced concentration, poor classroom participation, and lower academic achievement. In the context of Economics education, mathematics phobia may significantly influence students' academic performance because many Economics concepts require mathematical reasoning, computations, graphical interpretation, and quantitative analysis for successful understanding and application.

## **Economics Education**

Economics education refers to the systematic process of teaching and learning economic principles, concepts, theories, and practical applications aimed at equipping learners with the knowledge and skills required for informed economic decision-making. The Federal Republic of Nigeria (2023) emphasizes Economics as an important component of the senior secondary school curriculum because it prepares students to understand the efficient allocation of scarce resources, production, consumption, exchange, and national economic development. The subject also promotes entrepreneurship, financial literacy, critical thinking, and responsible citizenship by enabling learners to appreciate economic issues affecting individuals, businesses, and governments. Through the study of Economics, students develop analytical abilities that prepare them for further education and careers in business administration, banking, accounting, public finance, and other related disciplines.

The effective teaching of Economics requires the integration of theoretical knowledge with quantitative analytical skills because many concepts are explained using mathematical models, statistical techniques, and graphical presentations. WAEC Chief Examiners' Reports (2023–2025) consistently indicate that students encounter greater difficulties in answering quantitative Economics questions than theoretical ones. Topics such as demand and supply analysis, elasticity, national income accounting, cost and revenue analysis, index numbers, and market equilibrium require learners to perform calculations accurately and interpret numerical data correctly. Consequently, students who possess strong mathematical competence generally perform better in Economics than those who experience fear and anxiety toward Mathematics. This underscores the importance of addressing mathematics phobia as part of broader efforts to improve students' academic performance in Economics.

## **Mathematics and Economics**

Mathematics and Economics are closely interconnected disciplines because mathematical techniques provide the analytical foundation for understanding, explaining, and predicting economic behaviour. Dowker et al. (2021) argued that mathematical competence enables learners to represent economic relationships through equations, graphs, tables, and statistical models, thereby making abstract economic concepts easier to understand and apply. At the senior secondary school level, students are expected to apply mathematical knowledge in solving problems involving demand and supply functions, elasticity coefficients, national income calculations, price indices, depreciation, simple and compound interest, and graphical analysis. These quantitative competencies are essential for developing deeper conceptual understanding and improving students' problem-solving abilities in Economics.

The relationship between Mathematics and Economics implies that students' attitudes toward Mathematics are likely to influence their learning outcomes in Economics. Adegoke (2023) reported that learners who possess confidence in Mathematics generally demonstrate greater interest, participation, and achievement in Economics than students with high levels of mathematics anxiety. Conversely, students suffering from mathematics phobia often perceive Economics as an extension of Mathematics and consequently avoid quantitative topics, participate less actively during classroom instruction, and perform poorly in examinations involving calculations. This relationship suggests that improving students' mathematical confidence and reducing mathematics phobia could contribute significantly to enhancing their academic performance in Economics. Therefore, understanding the interaction between Mathematics and Economics is fundamental to identifying effective strategies for improving students' learning outcomes and overall academic achievement.

### **Empirical Review**

Adegoke (2023) conducted a study on mathematics anxiety and academic achievement in Economics among senior secondary school students in Ibadan, Oyo State. The study adopted a descriptive correlational research design involving 420 Senior Secondary School Two (SS II) students selected through multistage sampling techniques from twelve public secondary schools. Data were collected using the Mathematics Anxiety Scale (MAS) and students' Economics achievement scores obtained from school records. Descriptive statistics and Pearson Product Moment Correlation were used for data analysis. The findings revealed that a considerable proportion of the students experienced moderate to high levels of mathematics anxiety. The study further established a significant negative relationship between mathematics anxiety and students' academic performance in Economics ( $r = -0.61, p < .05$ ), indicating that students with higher levels of mathematics anxiety consistently recorded lower achievement scores in Economics. The researcher concluded that mathematics anxiety constitutes a major psychological barrier to effective learning in Economics and recommended that teachers adopt learner-centred instructional approaches capable of reducing students' fear of Mathematics.

Similarly, Olatunji and Adeyemi (2024) investigated the influence of mathematics anxiety on students' academic achievement in Economics among senior secondary school students in Osun State. A descriptive survey design was adopted, while 360 respondents were selected through stratified random sampling techniques from selected public secondary schools. Data were collected using structured questionnaires and Economics achievement tests, while Pearson correlation and multiple regression analyses were employed to test the hypotheses. The findings indicated that mathematics anxiety significantly and negatively predicted students' academic performance in Economics. The study also revealed that students with positive attitudes toward Mathematics demonstrated greater confidence during Economics lessons and performed significantly better than their counterparts experiencing mathematics anxiety. The researchers

therefore recommended continuous professional development programmes for teachers to enable them to implement classroom strategies that minimize mathematics anxiety among learners.

Outside Nigeria, Dowker, Sarkar, and Looi (2021) conducted a comprehensive review of six decades of research on mathematics anxiety across different educational contexts. The review synthesized findings from numerous empirical studies involving learners from primary schools to universities. The authors reported that mathematics anxiety negatively influences working memory, cognitive processing, motivation, classroom participation, and academic achievement. They further established that students experiencing high levels of mathematics anxiety frequently avoid mathematical tasks, resulting in reduced learning opportunities and persistent poor performance. The review emphasized that mathematics anxiety is a global educational challenge requiring collaborative interventions involving teachers, parents, school counsellors, and curriculum developers. The findings remain highly relevant to the present study because they demonstrate the widespread influence of mathematics anxiety on learners' academic outcomes.

A study by Namkung, Peng, and Lin (2023) synthesized findings from numerous international studies through a meta-analysis examining the relationship between mathematics anxiety and mathematics achievement. The researchers found a consistent moderate-to-strong negative relationship between mathematics anxiety and students' academic performance across different countries and educational levels. The study further revealed that learners experiencing high mathematics anxiety exhibited lower problem-solving ability, reduced persistence, and poor academic confidence. The researchers concluded that reducing mathematics anxiety could substantially improve students' academic performance in Mathematics and other quantitative disciplines.

## **METHODOLOGY**

This study adopted a descriptive survey research design with a correlational approach to examine the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin Local Government Area of Oyo State. The descriptive survey design was considered appropriate because it enabled the researcher to collect data from a representative sample of students regarding their level of mathematics phobia and determine its relationship with their academic performance in Economics without manipulating any of the study variables. The correlational aspect of the design was employed to establish the nature and strength of the relationship between mathematics phobia and students' achievement in Economics. The population of the study comprised 3,450 Senior Secondary School Two (SS II) students in the 25 public secondary schools in Iseyin Local Government Area, as reported by the Oyo State Teaching Service Commission (2025). A sample of 400 students was selected from 10 public secondary schools using a multistage sampling procedure involving simple random sampling for school selection and proportionate sampling for the selection of respondents. Data were collected using a

researcher-designed instrument titled Mathematics Phobia and Economics Performance Questionnaire (MPEPQ). The instrument consisted of Section A, which elicited respondents' demographic information, and Section B, which contained 20 items measuring students' mathematics phobia on a four-point Likert rating scale ranging from *Strongly Agree (4)* to *Strongly Disagree (1)*. Students' 2024/2025 First Term Economics examination scores obtained from school records served as the measure of academic performance.

To ensure the quality of the instrument, the questionnaire was subjected to face and content validation by experts in Educational Psychology, Measurement and Evaluation, and Economics Education at Emmanuel Alayande University of Education, Oyo. Their observations and recommendations were incorporated before the final administration of the instrument. The reliability of the Mathematics Phobia Scale was established through a pilot study conducted among students outside the study area using the Cronbach Alpha reliability method, which yielded a reliability coefficient of 0.89, indicating that the instrument possessed high internal consistency and was suitable for the study. Prior to data collection, permission was obtained from the selected school authorities, while respondents were adequately informed about the purpose of the study and assured of the confidentiality of the information provided. The completed questionnaires were retrieved immediately after administration to ensure a high response rate. The data collected were analyzed using both descriptive and inferential statistics. Frequency counts, percentages, mean, and standard deviation were used to answer the research questions, while Pearson Product Moment Correlation (PPMC) was employed to test the relationship between mathematics phobia and students' academic performance in Economics. In addition, the Independent Samples t-test was used to determine whether a significant difference existed between the academic performance of students with high and low levels of mathematics phobia. All hypotheses were tested at the 0.05 level of significance using Statistical Package for the Social Sciences (SPSS) version 27.

**RESULTS****Demographic Characteristics of Respondents****Table 1: Demographic Distribution of Respondents**

| Variable        | Category | Frequency  | Percentage   |
|-----------------|----------|------------|--------------|
| Gender          | Male     | 208        | 52.0         |
|                 | Female   | 192        | 48.0         |
| <b>Total</b>    |          | <b>400</b> | <b>100.0</b> |
| School Location | Urban    | 240        | 60.0         |
|                 | Rural    | 160        | 40.0         |
| <b>Total</b>    |          | <b>400</b> | <b>100.0</b> |

Table 1 presents the demographic characteristics of the respondents who participated in the study. The result indicates that 208 respondents (52.0%) were male, while 192 respondents (48.0%) were female, indicating that both genders were adequately represented in the study. The table further reveals that 240 respondents (60.0%) were selected from urban secondary schools, whereas 160 respondents (40.0%) were drawn from rural schools within Iseyin Local Government Area of Oyo State. The balanced distribution of respondents across gender and school location provided sufficient representation for investigating the prevalence of mathematics phobia and its effects on students' academic performance in Economics.

**Research Question One**

**What is the level of prevalence of mathematics phobia among secondary school students in Iseyin Local Government Area of Oyo State?**

**Table 2: Level of Prevalence of Mathematics Phobia among Secondary School Students**

| Level        | Score Range | Frequency  | Percentage   |
|--------------|-------------|------------|--------------|
| Low          | 20–39       | 86         | 21.5         |
| Moderate     | 40–59       | 148        | 37.0         |
| High         | 60–80       | 166        | 41.5         |
| <b>Total</b> |             | <b>400</b> | <b>100.0</b> |

**Overall Mean = 58.74   SD = 12.36**

The findings presented in Table 2 reveal that 166 respondents (41.5%) exhibited a high level of mathematics phobia, 148 respondents (37.0%) demonstrated a moderate level, while only 86 respondents (21.5%) reported a low level of mathematics phobia. The overall mean score of 58.74 with a standard deviation of 12.36 indicates that mathematics phobia is highly prevalent among secondary school students in Iseyin Local Government Area. The implication of this finding is that a considerable proportion of students experience fear, anxiety, and lack of confidence whenever they are required to perform mathematical tasks, thereby posing a significant challenge to effective learning of Economics and other quantitative subjects.

### **Research Question Two**

**What is the level of students' academic performance in Economics in Iseyin Local Government Area?**

**Table 3: Students' Academic Performance in Economics**

| Performance  | Score Range | Frequency  | Percentage   |
|--------------|-------------|------------|--------------|
| Excellent    | 70–100      | 42         | 10.5         |
| Good         | 50–69       | 120        | 30.0         |
| Pass         | 40–49       | 86         | 21.5         |
| Fail         | 0–39        | 152        | 38.0         |
| <b>Total</b> |             | <b>400</b> | <b>100.0</b> |

**Overall Mean = 50.12   SD = 14.67**

Table 3 shows that only 42 respondents (10.5%) obtained excellent grades in Economics, while 120 respondents (30.0%) achieved good grades. In contrast, 86 respondents (21.5%) obtained ordinary pass grades, whereas 152 respondents (38.0%) failed the subject. The overall mean score of 50.12 with a standard deviation of 14.67 suggests that the general level of students' academic performance in Economics was relatively low. The high failure rate observed among the respondents indicates that many students experienced considerable difficulty in mastering Economics, particularly its quantitative components.

Hypothesis One

**There is no significant relationship between mathematics phobia and students' academic performance in Economics.**

**Table 4: Pearson Product Moment Correlation between Mathematics Phobia and Academic Performance in Economics**

| Variables                         | N   | Mean  | SD    | r    | p-value |
|-----------------------------------|-----|-------|-------|------|---------|
| Mathematics Phobia                | 400 | 58.74 | 12.36 | -.67 | .000    |
| Academic Performance in Economics | 400 | 50.12 | 14.67 |      |         |

**Significant at  $p < .05$**

The result presented in Table 4 reveals a strong negative relationship between mathematics phobia and students' academic performance in Economics ( $r = -0.67$ ,  $p = .000$ ). Since the obtained probability value is less than the 0.05 level of significance, the null hypothesis is rejected. This finding implies that mathematics phobia significantly influences students' academic performance in Economics. Specifically, as students' level of mathematics phobia increases, their academic performance in Economics decreases significantly.

### Hypothesis Two

**There is no significant difference in the academic performance of students with high and low mathematics phobia.**

**Table 5: Independent Samples t-test Showing Difference in Academic Performance by Mathematics Phobia Level**

| Group                   | N   | Mean  | SD    | df  | t    | p-value |
|-------------------------|-----|-------|-------|-----|------|---------|
| Low Mathematics Phobia  | 86  | 62.34 | 11.23 |     |      |         |
| High Mathematics Phobia | 166 | 41.28 | 12.45 | 250 | 9.82 | .000    |

### Significant at $p < .05$

The result in Table 5 indicates that students with low mathematics phobia obtained a higher mean score ( $M = 62.34$ ) than students with high mathematics phobia ( $M = 41.28$ ). The calculated t-value of 9.82 with a p-value of .000 is statistically significant at the 0.05 level. Therefore, the null hypothesis is rejected. This result demonstrates that a significant difference exists in the academic performance of students based on their level of mathematics phobia. Students with lower mathematics phobia performed significantly better in Economics than those with higher mathematics phobia.

## DISCUSSION OF FINDINGS

The study revealed that mathematics phobia is highly prevalent among secondary school students in Iseyin Local Government Area, with more than three-quarters of the respondents exhibiting moderate to high levels of mathematics phobia. This finding suggests that fear, anxiety, and lack of confidence toward Mathematics remain common among students and continue to constitute

major barriers to effective learning. The result agrees with the findings of Adegoke (2023), who reported that a large proportion of Nigerian secondary school students experience moderate to high mathematics anxiety, which negatively influences their classroom participation and academic achievement. Similarly, Dowker, Sarkar, and Looi (2021) concluded that mathematics anxiety has become a widespread educational challenge affecting learners across different countries and educational levels. The high prevalence observed in the present study may be attributed to poor foundational mathematical knowledge, ineffective instructional methods, repeated failure in Mathematics, examination pressure, and students' negative perceptions of the subject.

The findings further revealed that students' academic performance in Economics was relatively poor, as a substantial proportion of the respondents failed the subject. This outcome indicates that many students continue to experience difficulties in understanding and applying quantitative Economics concepts despite demonstrating some knowledge of theoretical aspects of the subject. The finding corroborates the reports of the West African Examinations Council (2023–2025), which consistently noted that candidates perform poorly in Economics questions involving calculations, graphs, and quantitative analysis. The finding also supports Olatunji and Adeyemi (2024), who found that students' mathematical competence significantly predicts their performance in Economics. The poor achievement recorded in the present study therefore suggests that improving students' mathematical confidence may contribute significantly to better learning outcomes in Economics.

The study established a strong and significant negative relationship between mathematics phobia and students' academic performance in Economics. This implies that students with higher levels of mathematics phobia generally obtained lower scores in Economics than those with lower levels of mathematics phobia. The finding supports Ashcraft and Krause's (2007) Attentional Control Theory, which explains that anxiety consumes working memory resources needed for effective problem-solving and cognitive processing. The finding also agrees with Dowker et al. (2021) and Adegoke (2023), who reported that mathematics anxiety significantly reduces students' confidence, concentration, reasoning ability, and academic performance. The result suggests that mathematics phobia constitutes an important psychological factor affecting students' achievement in Economics because many Economics topics require mathematical reasoning and quantitative analysis.

The findings further demonstrated a significant difference between the academic performance of students with high mathematics phobia and those with low mathematics phobia. Students with lower levels of mathematics phobia achieved significantly higher scores in Economics than their counterparts with high mathematics phobia. This finding supports Bandura's (1997) Self-Efficacy Theory, which emphasizes that students who believe in their academic capabilities are more likely to approach challenging tasks confidently, persist in solving problems, and achieve better learning outcomes. The result is also consistent with the findings of Carey et al. (2022) **and** Namkung,

Peng, and Lin (2023), who concluded that reducing mathematics anxiety improves students' confidence, participation, and academic achievement in quantitative subjects. The implication is that efforts aimed at improving students' performance in Economics should include interventions specifically designed to reduce mathematics phobia through effective teaching strategies, counselling services, and confidence-building activities.

### **Summary**

This study investigated the prevalence and effects of mathematics phobia on secondary school students' academic performance in Economics in Iseyin Local Government Area of Oyo State. The study was guided by four research questions and two hypotheses.

A descriptive survey and correlational research design was adopted. The population consisted of 3,450 SS2 students in 25 public secondary schools in Iseyin LGA. A sample of 400 students was selected from 10 schools using multi-stage sampling technique. Data were collected using a validated instrument titled "Mathematics Phobia and Economics Performance Questionnaire [MPEPQ]" with reliability coefficient of 0.89. Students' 2024/2025 first term Economics scores were also obtained from school records. Data were analyzed using Frequency, Percentage, Mean, Standard Deviation, Pearson Product Moment Correlation and Independent t-test at 0.05 level of significance.

### **CONCLUSION**

Based on the findings of this study, it was concluded that mathematics phobia is highly prevalent among secondary school students in Iseyin Local Government Area of Oyo State and constitutes a major psychological factor influencing their academic performance in Economics. The study established that a substantial proportion of the students experienced moderate to high levels of mathematics phobia, while their overall performance in Economics remained relatively poor. Furthermore, the findings revealed a significant negative relationship between mathematics phobia and students' academic performance in Economics, indicating that increased fear and anxiety toward Mathematics significantly reduce students' ability to perform effectively in Economics. The study also established that students with low mathematics phobia performed significantly better than those with high mathematics phobia. These findings underscore the importance of addressing mathematics phobia through effective instructional strategies, guidance and counselling services, and learner-centred classroom practices. Therefore, reducing mathematics phobia among secondary school students is essential for improving their confidence, enhancing their quantitative reasoning skills, and ultimately promoting better academic performance in Economics.

## **Recommendations**

Based on the findings and conclusion of this study, the following recommendations are made:

Teachers of Mathematics and Economics should adopt learner-centred and activity-based instructional strategies that encourage active participation, collaborative learning, practical problem-solving, and the gradual development of students' confidence in handling quantitative concepts. Teachers should avoid creating classroom environments that generate fear or intimidation and should instead provide continuous encouragement and constructive feedback to students.

School counsellors should organize regular guidance and counselling programmes aimed at helping students overcome mathematics phobia by addressing their fears, building positive attitudes toward Mathematics, and developing effective study habits and examination confidence. Counselling interventions should be targeted particularly at students who consistently demonstrate high levels of mathematics anxiety.

School administrators should organize periodic workshops, seminars, and mathematics enrichment programmes for both teachers and students to improve the teaching and learning of Mathematics and its application in Economics. Schools should also provide adequate instructional materials, technological resources, and conducive learning environments that support effective quantitative learning.

The Oyo State Ministry of Education and the Teaching Service Commission (TESCOM) should organize regular in-service training and professional development programmes for Mathematics and Economics teachers on innovative teaching strategies capable of reducing mathematics anxiety and improving students' learning outcomes in quantitative subjects.

Parents should encourage positive attitudes toward Mathematics by providing emotional support, monitoring their children's academic progress, discouraging negative stereotypes about Mathematics, and creating opportunities for regular practice of mathematical skills at home. Parents should avoid statements capable of increasing learners' fear or anxiety toward Mathematics.

Curriculum planners and educational policymakers should review instructional approaches used in teaching Mathematics and Economics to ensure greater integration of practical, learner-centred, and technology-supported teaching methods that promote conceptual understanding rather than rote memorization. Such reforms will contribute significantly to reducing mathematics phobia and improving students' academic performance in Economics.

Researchers should conduct further studies on mathematics phobia using larger samples, different geopolitical zones, and other educational levels to determine whether similar patterns exist across Nigeria. Future studies should also examine other psychological variables such as academic resilience, motivation, self-concept, and test anxiety that may influence students' academic performance in Economics.

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