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MATHEMATICS ANXIETY, CLASS ATTENDANCE AND PARTICIPATION AS CORRELATE OF MATHEMATICS ACHIEVEMENT AMONG SENIOR SECONDARY SCHOOL STUDENTS IN KWARA STATE, NIGERIA

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ABSTRACT

This study, underpinned by the Control Value Theory of Achievement Emotions and the Learning Avoidance Theory, examined secondary school students' mathematics anxiety, class attendance, and participation as correlates of their mathematics achievement in Kwara State, Nigeria. The population of the study comprised senior secondary school students. The stratified sampling technique was used to select 193 respondents as the study sample. Two instruments tagged "Students' Mathematics Anxiety Scale (SMAS) with a Cronbach Alpha reliability coefficient of 0.84, and Students' Attendance and Participation in Mathematics Class Questionnaire (SAPMCQ) with a Cronbach Alpha reliability coefficient of 0.52, were self-developed by the researcher. The Statistical Package for Social Sciences (SPSS) version 26 was used to analyze the collected data. The findings of the study showed that secondary school students in Kwara State have high mathematics anxiety, class attendance, and participation. Also, there exists a weak positive relationship between students' mathematics anxiety and achievement, and a weak negative relationship among students' anxiety in mathematics, attendance, and participation in a mathematics class. Thus, the study recommended that for increased interaction among students, innovative teaching strategies should be employed by the teachers, as this could deter mathematics anxiety among students.

Keywords*:* Achievement; Anxiety; Class Attendance; Class Participation; Mathematics.

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Introduction

Mathematics is the science that deals with the logic of shape, quantity, and arrangement, and has been termed the building block of life (Bornaa et al., 2023; Sanni et al., 2024). It is the science of structure, order, and relation that has evolved from elemental practices of counting, measuring, and describing the shapes of objects (Kupczynski, 2024). It deals with logical reasoning and quantitative calculation, and its development has involved an increasing degree of idealization and abstraction of its subject matter (Gaita et al., 2024; Yeasmin, 2017; Sanni et al., 2024). A person's ability to perform in the society they live in is impacted by mathematics, an area of science that promotes scientific-technological knowledge and abilities, which are essential to societal progress and stability (Sanni et al., 2024). Before students can completely engage in any scientific activities, they must grasp the knowledge of mathematics, which is thought to be the cornerstone of all scientific pursuits (Sanni et al., 2024). Since the 17th century, mathematics has been an indispensable adjunct to the physical sciences and technology, and in more recent times, it has assumed a similar role in the quantitative aspects of the life sciences (Abd Algani, 2022).

Mathematics achievement in many developing countries is characterized by poor performance and a declining trend, creating a significant "learning crisis" that hinders economic growth and individual opportunity (Milambo & Mwanabute, 2021; Theron, 2025). Data from international assessments shows that many nations in the developing world, particularly in Sub-Saharan Africa, have very low scores, often with fewer than half of students achieving minimum pass rates in high school mathematics (Bakhtiyorovich, 2025). In Nigeria, for instance, reports have it that in Kwara State, achievement in mathematics has been characterized by declining performance and low success rates, particularly in primary placement and secondary school certificate examinations (Isa & Qudus, 2024; Omoladun et al., 2019; Suleiman & Hammed, 2019). While several factors have been acclaimed to be the root cause of students' poor achievement in mathematics, little is known about the impact of students' anxiety in the subject and their achievement in it (Essuman et al., 2021).

Mathematics anxiety stems from a mix of cognitive, emotional, and environmental factors that create fear or stress around math tasks (Dowker et al., 2016). Mathematics anxiety, which is referred to as a feeling of tension, helplessness, or panic when dealing with numbers, is a major, well-documented cause of poor mathematics achievement across all school levels (Field et al., 2019). It is the Fear, tension, and discomfort that some people experience in mathematical settings, which interferes with working memory, leading to lower performance, reduced motivation, and avoidance of math-related activities (Asanre et al., 2023; Ashcraft, 2002). Mathematics

anxiety is a common unpleasant emotional state among student populations and has become a global educational concern (Essuman et al., 2021; Chukwunonso, 2025; Levine & Pantoja, 2021). This type of emotional distress affects students at all educational levels, regardless of age or location, and its symptoms are most noticeable in secondary schools (Asanre et al., 2023; Atoyebi et al., 2023; CChukwunonso, 2025 Findings, 2012).

Class attendance is an important part of the academic process and should be considered both a privilege and a responsibility. Students' class attendance and engagement play an important role in the education realm. Several previous studies have shown that class attendance is an important predictor of academic outcomes; as students who attend more classes earn higher final grades (Ha et al., 2024; Kassarnig et al., 2017; Lozano-Parra, 2025; Monahan & Shah, 2023; Smith, 2025). According to Alzhanova-Ericsson et al. (2017), Fadelelmoula (2018), Kim et al. (2020), Kanchana et al. (2023), Lozano-Parra (2025), Monahan and Shah (2023), and Yılmaz (2022), students can only directly participate in classroom instruction, comprehend the material, develop their academic skills, and gain the tacit knowledge that comes from engaging with their classmates and teachers by attending class.

Both teachers and students value class attendance for several reasons. When students show up and participate, the classroom becomes a community of learners with reciprocal learning, rather than just a lecture (Monahan & Shah, 2023; Smith, 2025). Students have a greater comprehension of the subject when they are asked to think about and apply the material to their own lives. Direct listening to the content allows students to take notes, ask and respond to questions, and learn more than simply reading the text or reviewing another student's notes (Monahan & Shah, 2023). Additionally, their relationships and connections with their teacher and classmates help them develop their social and intellectual abilities.

On the other hand, there seems to be a weaker comprehension of the concepts when students are not in class and rely on their notes or the textbook readings. Similarly, students are unable to form relationships with their peers when they are absent (Monahan & Shah, 2023). In contrast, the study by Eisen et al. (2015) did indicate that there exists no statistically significant relationship between class attendance and student performance after adjusting for control variables that included gender and age. According to Bergmark and Westman (2018), student participation is characterised by students' involvement and activity in the classroom, their influence on curriculum design, and their sense of community. Students can gain more

competencies (i.e., knowledge, skills, and abilities) and receive higher grades when they are encouraged to participate in learning activities (Ali et al., 2023). When students are fully aware of classroom discipline, the goal of student engagement is achieved (Bhat & Gupta, 2019). Typically, broad criteria and the instructor's interpretation are used to evaluate student engagement (Abuid, 2014). According to Abuid (2014), pupils who contribute vocally in class are deemed to be extremely competent, while those who do not are deemed to be performing poorly.

Osiesi and Fajobi (2019) assert that mathematics achievement is a key measure of how well pupils have learned and comprehended mathematical concepts, principles, and logic as taught by the teacher. It stands for the performance outcomes that show how well pupils have met particular curriculum-mandated maths objectives (Osiesi & Fajobi, 2019). Anxiety in mathematics has been perceived as a major factor affecting performance in the subject (Jerry et al., 2019). In Plateau State, Nigeria, Jerry et al. (2019) looked into how math anxiety affected the academic performance of senior secondary two students. Additionally, the results showed a strong correlation between anxiety and math achievement.

The study by Suleiman and Hammed (2019) examined the reasons why junior secondary school students in Kwara State were thought to struggle with mathematics. The study identified a number of likely reasons why students fail math classes, including a shortage of qualified math teachers, a lack of instructional materials and teaching aids, the frequent transfer of math teachers from one school to another, students' low socioeconomic status, and ineffective teaching strategies. The results also show that pupils' failure in mathematics was caused by both an excessive number of students in the classroom and an inappropriate amount of time allotted for the subject. Also, according to Nandhini (2021), arithmetic achievement decreases with increased math anxiety.

Popoola and Olaniyan (2019) in their study identified mathematics anxiety and its effects on students' performance in Mathematics among senior school Students in Ekiti State, Nigeria. The study showed that mathematics anxiety was high among the sample, and with significant positive relationship. Garba et al. (2021) examined the level of students' anxiety towards Science subjects in Senior Secondary Schools in Sokoto State, Nigeria. The study found high anxiety levels among the sample. Similarly, Ma and Sun (2025) and Möhring et al. (2024) examined the relationship between mathematics anxiety and achievement in primary school children; the findings show that students' mathematics anxiety

negatively correlated and significantly affected their mathematics performance. Similar reports have been made by Mutegi et al. (2021) and Barroso et al. (2021). Nonetheless, the study did not consider the role of mathematics anxiety and students' attendance and participation in class.

Ha et al. (2024) investigated how class attendance affected Chinese higher education students' academic achievement. The study's findings show that attending class greatly improves academic achievement. On a similar note, Oribhabor and Adesanya (2024) investigated the correlation between class attendance and mathematics performance among junior secondary school students in Bayelsa State. The study findings show a strong positive correlation. Studies on the effect of anxiety abound in the literature. Studies have explored the relationship between students' social anxiety and academic achievement and found a significant positive relationship (Obikeze et al., 2025); anxiety and mathematics achievement (Asanre et al., 2023; Bornaa et al., 2023; Chukwunonso, 2025; Garba et al., 2021; Obikeze et al., 2025; Termizi & Mahmud, 2022; Zanabazar et al., 2023); examination Anxiety and academic performance (Muhammed & Aremu, 2025); and class attendance and mathematics performance (Oribhabor & Adesanya, 2024). At the time of the review of the literature, there seems to be no study that examined the composite association among students' class attendance and participation, mathematics anxiety, and achievement for secondary school students in Kwara State, which has been classified as an educationally disadvantaged State

This study is underpinned by the Control Value Theory of Achievement Emotions (Pekrun, 2006) and supplemented by the Learning Avoidance Theory. Control Value Theory posits that students' emotions (like mathematics anxiety) arise from their perceived control over learning (self-efficacy, mastery) and the value they attach to the task or subject. High mathematics anxiety emerges when students perceive low control over mathematics and/or low value, which in turn reduces effortful engagement, attendance, and participation (L´opez-Ramírez et al., 2025). Reduced class engagement and participation then undermines the depth of learning and problem-solving practice, which directly lowers mathematics achievement (Mahasneh & Gazo, 2025; Quintero et al., 2022). The Learning Avoidance Model is increasingly framed as a driver of avoidance behaviors (skipping tasks, disengaging, limited participation) and effort avoidance in math-related learning (Song et al., 2023). It argues that students with higher math anxiety are more likely to avoid math learning opportunities, which contributes to their lower math skill and knowledge levels (LeFevre et al.,

1992). The theory postulates that math anxiety results in behavioral avoidance (lower attendance, less participation, less homework effort), which then leads to worse achievement. Through these theories, we argue that students' anxiety in maths, class attendance, participation, and achievement are knitted.

Statement of Problem

It is widely known in Nigeria that a large number of students tend to choose non-mathematics related courses while seeking admission to higher institutions. This may be due to mathematics anxiety or other students' related variables that may have affected them during their secondary education. Students perceive mathematics as a difficult subject, which may have resulted in their being anxious over the subject, impacting their eventual performance. Apart from mathematics anxiety, students' attendance and participation in mathematics classes could be impacting their mathematics performance. This study, therefore, deemed it necessary to examine the relationship between students' mathematics anxiety, class attendance, and participation, and achievement.

Research Questions

1. What is the level of mathematics anxiety among Kwara State secondary school students?
2. What is the nature of students' attendance and participation in mathematics class?
3. Is there a relationship among students' anxiety in mathematics, class attendance and participation and achievement?

Methodology

Research Design

The design adopted for this study is the non-experimental design of the survey research type. It is research in which data collection is carried out using questionnaires and implemented at a particular point in time, and uses such data to describe the nature of existing conditions (Prasad et al., 2024; Vomberg & Klarmann, 2022).

Population, Sampling Techniques, and Sample

This study's population consists of all secondary school students in Ifelodun Local Government Area (LGA) of Kwara State. The stratified sampling technique was used in selecting the eight (8) districts. A school was sampled out of the 8 districts in the LGA. From these sampled schools, the simple random sampling technique was used to select one hundred and ninety-three (193) students, which constituted the actual sample for the study.

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Instruments and Instrumentation

Two instruments were adapted for data collection in this study. The Students' Mathematics Anxiety Scale (SMAS) was self-developed by the researchers. Before use, the instruments were pilot tested on 40 students who were not part of the sample later adopted for the study; after which their reliability coefficients (using the Cronbach Alpha) were ascertained and found satisfactory for use. It has two sections: section A consisting of the demographic information of the respondents, and section B consisting of 20 items measuring students' mathematics anxiety; these items were placed on a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). The resulting reliability coefficient of the scale (r = 0.84) depicts its internal consistency. The second instrument, the students' attendance and participation in Mathematics class questionnaire (SAPMCQ), was also self-developed by the researchers. It had ten items measuring the construct with a reliability index of r = 0.62. These items were also placed on a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). The instruments were administered by face-to-face method and retrieved by the researchers after respondents had fully responded. The data collection lasted for about 4 weeks.

Method of Data Analysis

Descriptive (mean and standard deviation) and inferential statistics (correlation and multiple regressions) were used to analyze the data generated from the study at 5% level of significance.

Results

Demographic Characteristics of Respondents

Table 1 shows the demographic characteristics of the respondents. Regarding students' age, 79 of them are in the age group of 10-12 years, 101 of them are in the age group of 13-15 years, and 13 are in the age group of 16-18 years. With respect to gender, 113 of the students are females, while 80 are males. Regarding their religion, 52 students are Christians while 141 are Muslims.

Table 1: Respondents' Demographics

Characteristics		**Frequency**	**Percentage (%)**
Gender	Male	80	41.5
	Female	113	58.5
Age	10-12yrs	79	40.9
	13-15yrs	101	52.3
	16-18yrs	13	6.7
Religion	Christianity	52	26.9
	Islam	141	73.1

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RQ 1: What are the levels of anxiety among Mathematics students in Kwara State secondary schools?

Table 2 shows that the results obtained from research question one has a cluster mean of 1.64 and a standard deviation of 0.47. This implies that the majority of students in the sampled schools strongly agree that they have high mathematics anxiety. As indicated in the table, items with mean response values of 1.5 and above are considered high Mathematics anxiety, while items with mean response values below 1.5 are regarded as low Mathematics anxiety.

Table 2: Responses of Students on anxieties in Mathematics

S/No	Item Description	Mean	Std. Deviation	Decision
1.	I get tense when I prepare for a mathematics test.	1.58	.49	High
2.	I get nervous when I have to use mathematics outside of school.	1.50	.50	High
3.	I worry that I will not be able to use mathematics in my future career when needed.	1.67	.47	High
4.	I worry that I will not be able to get a good grade in my mathematics course.	1.32	.47	Low
5.	I worry that I will not be able to do well on mathematics tests.	1.60	.49	High
6.	I feel stressed when listening to the mathematics teacher in class.	1.72	.45	High
7.	I get nervous when asking questions in class.	1.75	.43	High
8.	Working on mathematics homework is stressful for me.	1.61	.49	High
9.	I worry that I do not know enough mathematics to do well in future mathematics courses.	1.38	.49	Low
10.	I am afraid of giving an incorrect answer during my mathematics class.	1.56	.50	High
11.	When I am in math class, I usually feel nervous.	1.70	.46	High
12.	I feel stressed when I'm about to take a math test.	1.73	.45	High
13.	I have "butterflies" in my stomach before I go to math class.	1.84	.37	High
14.	I worry that other students might understand math problems better than me.	1.75	.44	High
15.	Being called on to answer a math question scares me.	1.73	.48	High
16.	I feel frustrated when working on math problems.	1.65	.48	High
17.	I have trouble sleeping the night before a math test.	1.70	.46	High
18.	I avoid my math homework.	1.59	.49	High
19.	I need extra help in mathematics.	1.70	.46	High
20.	When I need help, I won't ask for help.	1.67	.47	High
	Cluster Mean	**1.64**	**.47**	High

*****$Mean \geq 1.5$ = *High anxiety;* $Mean \leq 1.5$ = *Low anxiety.*

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RQ2: What is the nature of students' attendance and participation in Mathematics class?

Table 3 shows a cluster mean of 2.33 and a standard deviation of 1.00. This implies that most secondary school students in Kwara State have a high level of attendance and participation in Mathematics class, as all ten items have mean score values above 1.5

Table 3: Students' Responses on Mathematics Class Attendance and Participation

S/No	Item Description	Mean	Std. Deviation	Decision
1.	I like attending mathematics class always.	1.53	.79	High
2.	Contributing in class on a particular mathematics topic is my thing.	1.81	.93	High
3.	I always appreciate how my teacher used to correct me when I made a mistake.	2.82	1.06	High
4.	I always prepare well for my lesson.	1.95	.97	Low
5.	My teacher doesn't allow students to participate in the lesson (mathematics subject).	2.74	1.07	High
6.	I love answering mathematics questions if it is asked in class.	2.31	1.02	High
7.	I am being forced to go to school every day.	2.11	.98	High
8.	The mathematics teacher is too strict and scared me to answer question in class.	1.91	1.06	High
9.	My mathematics teacher has a proper mastering of the subject content.	3.12	.98	Low
10.	I like my mathematics teacher	3.02	1.09	High
	Cluster Mean	2.33	1.00	High

*****$Mean \geq 1.5$ *= High attendance and participation in Mathematics class;* $Mean \leq 1.5$ *= Low attendance and participation in Mathematics class.*

RQ 3: Is there a relationship among students' anxiety in Mathematics, class attendance and participation and achievement?

Table 4 shows the relationship among students' anxiety in mathematics, class attendance and participation, and achievement in mathematics. There exists a weak positive relationship between students' anxiety in mathematics and their achievement in the subject, and this was statistically significant ($r = 0.167$, $n = 193$, $p<0.05$). More so, students' anxiety in mathematics has a weak negative relationship with class attendance and participation, which was also statistically significant ($r = -.167$, $n = 193$, $p<0.05$). This means that an increase in students' anxiety is associated with a decrease of their attendance and participation in class.

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Table 4: Relationship among Students' Anxiety in Mathematics, Class Attendance, Participation, and Achievement

Correlations		Mathematics achievement scores	Students' Anxiety	Students' Attendance/ Participation
Mathematics Achievement Scores	Pearson Correlation	1	**.167***	.095
	Sig. (2-tailed)		.021	.191
	N	193	193	193
Students' Anxiety	Pearson Correlation	**.167***	1	**-.167***
	Sig. (2-tailed)	.021		.020
	N	193	193	193
Students' Attendance/ Participation	Pearson Correlation	.095	**-.167***	1
	Sig. (2-tailed)	.191	.020	
	N	193	193	193

***Significant at p< 0.05 level (2-tailed).**

Discussion

We have, through this study, assessed the mathematics anxiety, class attendance, and participation levels; as well as the relationship among students' mathematics anxiety, class attendance, and participation, and their achievement in mathematics. A finding of the study indicates that students have high mathematics anxiety levels. Within the context, students often show high mathematics anxiety due to a mix of instructional, socio-cultural, and psychological factors. Many mathematics teachers in Kwara State still rely on lecture-dominated, teacher-centered methods and rote memorization, which make the subject feel abstract and threatening (Suleiman & Hammed, 2019). This is worsened by the shortage of qualified, confident mathematics teachers, and poor pedagogical content knowledge can lead to unclear explanations and punitive classroom practices, strengthening anxiety rather than reducing it (Saadu et al., 2025).

Similarly, overcrowded classes, lack of teaching aids, and limited instructional materials make it hard for students to follow lessons and practice actively. In such environments, weaker students get little individual attention, which reinforces feelings of helplessness and fear of being "exposed" during classwork or tests. Many students and parents in Kwara State see mathematics as "inherently difficult" or "for the brilliant only," which becomes a self-fulfilling prophecy when these students end up performing poorly. This is because when adults (teachers or parents) express their own anxiety or low value for mathematics, students internalize these attitudes and develop higher anxiety and avoidance

(Popoola & Olaniyan, 2019). Students' negative perceptions of mathematics vis-à-vis their own ability ("I can't do maths") are more likely to experience anxiety and withdraw from engagement (Saadu et al., 2025). This low confidence feeds into higher anxiety and poorer achievement in a vicious cycle.

Finding reveals a high level of attendance and participation of students in mathematics class. High mathematics anxiety alongside high class attendance and participation are shaped by partly different forces such as motivation, cultural expectations, and coping strategies. Students often attend and participate heavily in class because they see mathematics as a gateway to further education, jobs, and parental approval, even if they fear the subject (Suleiman & Hammed, 2019). Other tenable reasons could be the pressure to "be present and seen trying," so students push through anxiety by attending and participating, even when they feel tense or overwhelmed, suppressing anxiety-driven avoidance and instead attending regularly and participating to avoid disapproval, shame, or being labeled "lazy" or "defeated." Also, some schools in Kwara State enforce attendance rules and involvement (e.g., marks for participation, roll call, or public reporting of absentees), which discourages skipping lessons even when anxiety is high (Shockden et al., 2023). In such settings, students may attend and participate out of compliance and discipline rather than comfort, so anxiety remains high while observable engagement remains high (Shockden et al., 2023). These students may attend all classes and participate frequently as a way to manage anxiety related to the subject in question.

Findings also reveal a weak positive relationship between students' anxiety in mathematics and their achievement in the subject, and this was statistically significant. This means that as students' anxiety increases, so does their achievement in mathematics. For some students, mild or moderate anxiety acts as arousal that boosts effort and preparation rather than disabling performance (Song et al., 2023). These students may study more, attend extra classes, and avoid skipping homework, which can offset the potentially negative effects of anxiety and even produce a weak positive correlation with achievement (Pizzie & Kraemer, 2023). Highly anxious students who use good study habits (spaced practice, self-testing, and seeking help) can convert anxiety into more engagement instead of avoidance (Zhang et al., 2019).

Furthermore, findings indicate that students' anxiety in mathematics has a weak negative relationship with class attendance and participation, which was also statistically significant. This means that an increase in students' anxiety is associated with a decrease in their

attendance and participation in class. Many students attend and participate regularly because of parental pressure, school rules, or fear of punishment, even when they feel anxious in mathematics. In such cases, the drive to attend class is powerful enough to weaken the usual negative link between anxiety and participation, leaving only a small decrement rather than sharp avoidance (Walter & Nidhi, 2026). For some students, moderate mathematics anxiety functions more as arousal that motivates preparation and presence than as a reason to withdraw. These students may attend all lessons and participate (answering, asking questions) as a way to "control" or reduce perceived risk of failure, so anxiety and engagement coexist, and the correlation stays weakly negative instead of strongly negative (Odo, 2022; Shochden et al., 2023).

In a similar vein, positive classroom climate, teacher support, and relatively fair assessment practices can buffer the tendency of anxious students to disengage. Furthermore, when teachers encourage participation, provide clarification, and avoid public shaming, anxious students are more likely to keep attending and joining discussions, weakening the strength of the negative association. These findings further buttress the Control Value Theory of Achievement Emotions, and the Learning Avoidance Theory, which suggests that high students' attendance and participation (driven by external pressures), mathematics anxiety can have a weak or modestly negative relation with achievement.

Conclusion and Recommendations

This study has provided empirical evidence on how students' mathematics anxiety, class attendance, and participation can affect students' achievement in mathematics. It examined the extent to which students' mathematics anxiety, class attendance, and participation affect their achievement in mathematics. Based on the findings and discussions of the study, it could be concluded that the majority of secondary school students in the State have high mathematics anxiety. Similarly, results revealed a high level of class attendance and participation in mathematics. A weak positive relationship between students' mathematics anxiety and achievement, and a weak negative relationship among students' anxiety in mathematics, attendance, and participation in a mathematics class.

It is recommended that an environment conducive to teaching and learning mathematics should be provided, as this will advance continued students' attendance and participation. Also, efforts geared at improving mathematics achievement, by improving students' attendance, participation, and eradicating mathematics anxiety, especially at the

secondary level of education. Similarly, innovative teaching methods should be adopted by mathematics teachers as this could reduce students' anxiety in the subject, while intervention programmes that can continually improve and support students' attendance and participation in mathematics class should be implemented.

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