

Effects of Afternoon Classes on Junior Secondary School Students' Academic Achievement in Mathematics in Mubi North and South Local Government Areas, Adamawa State, Nigeria

Marcel P. AGAH¹ & Patrick VANDI²

Department of Science Education, Faculty of Education, Adamawa State University, Mubi, Adamawa State, Nigeria.

*Corresponding Author: Marcel P. AGAH

DOI: <https://doi.org/10.5281/zenodo.22972282>

Article History	Abstract
Original Research Article	<i>This study examined the effect of afternoon classes on Junior Secondary School Students' Academic Achievement in Mathematics in Mubi North and South Local Government Areas, Adamawa state, Nigeria. The research adopted descriptive survey and quasi experimental research designs. The population for the study was all the junior secondary schools two (JSS 2) in Morning and Afternoon schools in Mubi North and South Local Government Area of Adamawa State. The sample size of the study was 158 students obtained from eighth (8) Junior Secondary Schools through simple random and purposive sampling techniques. Three research questions were raised and three research hypotheses were formulated to guide the study. Two research instruments were used for data collection: A structured questionnaire titled "Effects of Afternoon Classes on Students Academic Achievement in Mathematics (EACSAAM). The questionnaire has four sections, labeled Section A – d and it was based on a modified 4-point Likert's scale of strongly agreed, agreed, disagreed and strongly disagreed and Mathematics Achievement Test (MAT) based on the Junior Secondary School curriculum topics. The data collected were analysed using mean, standard deviation and t-test all tested at 0.05 level of significance. Findings from hypotheses one revealed that there is significant effects of time factor on students' academic performance based on students gender ($P < 0.05$); findings from hypotheses two shows that there is no significant difference between attendance and participation of junior secondary school students in mathematics classes based on age ($p > 0.05$); finding from hypotheses three revealed that there is no significant difference among factors hindering students' readiness and confidence based on Local Government Area ($p > 0.05$). It was recommended that; government should ensure that enough structures are put in place in order to accommodate all students' in the morning classes; conducive environment needs to be put in place that will encourage and facilitates good learning atmosphere among students; government should enforce close monitoring policy on teachers and students in places where afternoon classes must be introduced.</i> Keywords: Afternoon classes and Timing, Academic achievement, Mathematics, Readiness, Gender.
Received: 05-07-2026	
Accepted: 30-08-2026	
Published: 26-09-2026	
Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited. Citation: Marcel P. AGAH & Patrick VANDI. (2026). Effects of afternoon classes on junior secondary school students' academic achievement in mathematics in Mubi North and South Local Government Areas, Adamawa State, Nigeria. UKR Journal of Education and Literature, 2(5), 99-106.	

Introduction

Education is the fundamental aspect of societal development, and its effectiveness relies heavily on various factors including the timing of classes. In recent years, there has been a growing debate about the optimal timing of school hours, particularly concerning afternoon classes for junior secondary school students (Brown & Davis 2024). The effectiveness of afternoon classes on students'

academic performance, particularly in critical subjects like mathematics warrants thorough investigation. Also, in the realm of education the timing of classes can significantly impact students' academic performance. Among various factors influencing students learning outcomes, the scheduling of classes, particularly afternoon session, has capture the attention of researcher in recent years. This

explore the effect of afternoon classes on the academic performance of junior secondary school students, specifically focusing on the subject of mathematics.

The decision to investigate this topic stems from the recognition of the unique challenges that afternoon may pose to students. Afternoon sessions often occur after a long day of academic activities, extracurricular engagements, and personal responsibilities, potentially leading to fatigue and reduced cognitive functioning. Moreover, factors such as circadian rhythms and individual energy level fluctuate throughout the day potentially impacting students' receptiveness to learning during afternoon classes. According to a recent study by Pope (2016); and Smith (2023) the timing of classes significantly impacts students' cognitive abilities and academic performance. While morning classes are traditionally favored for their perceived effectiveness, afternoon classes offer potential benefits such as improved attention and alertness due to circadian rhythms and increased opportunities for extracurricular activities in the mornings. However, empirical evidence on the effect of afternoon classes on academic performance, especially in mathematics among junior secondary school students, remains limited and inconclusive.

Educational systems worldwide have undergone significant transformations to adapt to evolving societal needs and educational theories. One notable change has been the implementation of afternoon classes in junior secondary schools, aiming to optimize students' learning experiences. However, the impact of such scheduling adjustments, particularly in subjects like mathematics, remains a subject of debate among educators, policymakers, and parents. Mathematics stands as a cornerstone of academic development, fostering critical thinking, problem-solving skills, and logical reasoning abilities. Junior secondary schools' students, in particular, undergo crucial cognitive and intellectual growth during this period, making it imperative to explore factors that may influence their academic performance in this subject.

The scheduling of classes throughout the day has been a topic of interest in educational research, particularly in relation to its impact on students' academic performance. In recent years, there has been a growing concern about the effect of afternoon classes on students' ability to learn and perform well in academic subjects, particularly in mathematics (Patel & Johnson, 2023). As students progress through the school day, factors such as fatigue, attention span, and motivation may fluctuate, potentially influencing their academic performance in afternoon classes.

Afternoon classes, often introduced to accommodate varying students' schedules or to enhance learning opportunities beyond regular school hours, present a unique environment for learning mathematics. Factors such as fatigue, attention

span and extra-curricular commitments may influence students differently during these later hours, potentially affecting their academic performance in mathematics. Also, the reason for establishing afternoon schools is because of the growing numbers in population in the urban area of society, which has led to an increase in the number of students in various schools in Mubi North and South Local Government Areas, most of which are located in the urban area of the local government. Afternoon schools are very important in this system of education; they reduce overcrowding in their classes. In most of the various morning sessions, there is an overpopulation of students in their classes, with this afternoon schools were introduced in order to minimize the number of students in the classes. Also, afternoon programmes of school bring more advantages in understanding the ability of students learning difficulties and in order to find out ways to address them. Silas (2016), in examining interventions designed to improve the academic performance of students attending afternoon classes, described afternoon schooling as an educational arrangement in which different groups of pupils share the same school facilities and follow a common curriculum but attend lessons during the afternoon period. This form of school organisation has been adopted in several developing and emerging countries, including Mexico, India, Brazil, Zimbabwe, Russia, and Bulgaria (Smith, 2023). The primary rationale for introducing afternoon classes is to expand access to education while reducing pressure on available financial and infrastructural resources. From a policy standpoint, operating schools in multiple shifts enables existing classrooms, buildings, and other facilities to accommodate a larger number of learners. Nevertheless, this arrangement may have certain educational implications. The reduced instructional time associated with shift-based schooling can restrict opportunities for extracurricular programmes and other activities beyond regular classroom instruction. There are also concerns regarding its possible effects on students' learning outcomes. Students attending afternoon sessions may experience reduced concentration or fatigue during lessons, while declining teacher productivity later in the day may also affect instructional effectiveness. In view of these concerns, the present study investigates the effects of afternoon classes on the academic achievement of junior secondary school students in mathematics in Mubi North and Mubi South Local Government Areas.

Several studies have examined the relationship between class timing and academic performance. For example, a study by Smith and Jones (2018), found that students' performance in mathematics was significantly lower in afternoon classes compared to morning classes. Similarly, a study by Brown et al (2019) reported that students' attention and engagement in mathematics decreased as the

day progressed, particularly in the afternoon. Furthermore, research by Johnson (2020) suggested that the timing of classes can impact students' cognitive functioning, and with afternoon classes potentially leading to decreased cognitive performance in complex subjects such as mathematics. These findings highlight the potential influence of class timing on students' academic performance in mathematics. Danish et al (2022) reported a statistically significant relationship between time-of-day and students' performance in mathematics, emphasizing that students learn more effectively when taught at their preferred or optimal time. Lei et al (2021) reported that active classroom participation significantly improves students' understanding and academic achievement, particularly in subjects like mathematics that require continuous engagement and practice.

Statement of the Problem

Mathematics is one of the key subjects in schools and is very important in fostering students' thinking and logical reasoning. Despite the importance of mathematics in schools including Junior Secondary schools, students' performance in this subject remains an issue of concern. Recent trends indicate that students' performance in mathematics is influenced by various factors such as the timing of classes, fatigue, students' attendance and participation and also the gender factor.

Engagement of students in afternoon activities make them feel distracted and disturbed to attain the afternoon classes of mathematics, which make some of them stay outside while the classes are going on. Unlike most of the morning sections which use to have sufficient time for classes such as 40 minutes or even double period, the time for afternoon section of Secondary Schools for a lesson is usually 30 minutes without double period. It has been observed that most of the first and second periods in the afternoon schools are for mathematics classes but some students come late to school which could lead to missing some periods per week and lack of coverage of syllabus. However, there is limited research on the specific impact of afternoon classes on junior secondary school students' performance in mathematics. It is because of this that this study aims to investigate whether attending afternoon classes has a positive or negative effect on students' mathematical performance and to identify the underlying factors that contribute to this problem. By exploring this issue, this research seeks to provide insights that can inform teaching practices, scheduling decisions, attendance and participation, gender inequality, students' readiness and confidence and student support strategies to enhance mathematics education for junior secondary school students.

Research Question

1. How does time factor affect Junior Secondary Schools students' academic performance in

Mathematics lesson in Mubi North and South Local Government Areas?

2. How does class attendance and participation affect the academic performance of students in Mathematics classes based on age in Mubi North and South Local Government Areas?
3. What are the factors hindering students' readiness and confidence in Mathematics during afternoon classes in Junior Secondary Schools in Mubi North and South Local Government Areas?

Research Hypotheses

Ho1. There is no significant effects of time factor on students' academic performance in Mathematics in Junior Secondary Schools Area based on gender in Mubi North and South Local Government.

Ho2. There is no significant difference between attendance and participation of junior secondary school students in mathematics classes based on age in Mubi North and South Local Government Area.

Ho3. There is no significant difference among factors hindering students' readiness and confidence in learning of mathematics based on Local Government Mubi North and South Local Government Area.

Methodology

The study employed a descriptive survey research design. The study population consisted of all students enrolled in Government Junior Secondary Schools who offered Mathematics during both morning and afternoon sessions in Mubi North and Mubi South Local Government Areas of Adamawa State, Nigeria, with a total population of 2,746 students. A combination of simple random and purposive sampling techniques was employed to select 158 students from four intact classes across the two Local Government Areas. Data were collected using two research instruments: a structured questionnaire titled "Effects of Afternoon Classes on Students' Academic Achievement in Mathematics" (EACSAAM) and a Mathematics Achievement Test (MAT) developed from topics contained in the Junior Secondary School Mathematics curriculum. The questionnaire consisted of four sections, labelled Sections A to D, and employed a modified four-point Likert scale comprising Strongly Agree, Agree, Disagree, and Strongly Disagree. The instruments were subjected to face and content validation by experts and were subsequently trial-tested with a sample of teachers. The reliability analysis produced a coefficient of 0.83, indicating that the instrument was sufficiently reliable for the study. The data obtained were analyzed using mean, standard deviation, and t-test, with all hypotheses tested at the 0.05 level of significance.

Results

The results obtained based on the research question and hypotheses raised and formulated are presented in Tables 1-6.

Research Question 1. How does time factor affect Junior Secondary Schools students' academic performance in Mathematics lesson in Mubi North and South Local Government Areas?

Table 1. Descriptive statistics on time factors and academic performance among students in mathematics in Mubi North and South

S/N	STATEMENT	N	Mean	Std. Dev.	Remark
1	I allocate enough time daily to study Mathematics.	158	2.16	1.06	Disagreed
2	The time given for Mathematics lessons in school is sufficient.	158	2.77	0.96	Agreed
3	I complete my Mathematics assignments on time.	158	2.17	1.01	Disagreed
4	I revise Mathematics regularly before examinations.	158	2.76	1.03	Agreed
5	I perform better in Mathematics when I manage my time properly.	158	3.15	1.04	Agreed
6	Time spent practicing Mathematics improves my understanding.	158	2.98	1.04	Agreed
7	I often feel I do not have enough time to prepare for Mathematics tests.	158	2.69	1.13	Agreed
8	Extra lessons or additional time in Mathematics improve my performance.	158	2.74	1.14	Agreed
	Grand Mean		2.68		Agreed

Result from Table 1 shows that respondents generally agreed with the items stated in number 2, 4,5,6,7 and 8. The grand mean of 2.68 indicate that time has significant effect on students' achievement in mathematics at junior secondary school level in Mubi North and South Local Government Area.

Research Question 2. How does class attendance and participation affect the academic performance of students in Mathematics class in Mubi North and South Local Government Areas?

Table 2: Result on the class Attendance and Participation of Students in Mathematics Classes in Mubi North and South Local Government.

S/N	STATEMENT	N	Mean	Std. Dev.	Remark
1	I attend Mathematics classes regularly.	158	3.12	0.98	Agreed
2	I arrive on time for Mathematics lessons.	158	3.32	0.91	Agreed
3	I actively participate during Mathematics lessons.	158	3.05	0.88	Agreed
4	I ask questions when I do not understand a topic in Mathematics.	158	1.70	0.74	Disagreed
5	I contribute to discussions during Mathematics class.	158	1.71	0.93	Disagreed
6	I feel encouraged by my teacher to participate in Mathematics lessons.	158	2.81	1.04	Agreed

7	I contribute to discussions during Mathematics class.	158	3.12	0.93	Agreed
8	Frequent absence from Mathematics class affects students' performance.	158	2.99	0.98	Agreed
	Grand Mean		2.73		Agreed

Result from Table 2 shows that the respondent agreed with items stated in number 1, 2,3,6,7 and 8. The grand mean of 2.73 indicate that the class attendance and participation have a significant (positive) effect on students' academic performance in mathematics at the junior secondary school level in Mubi North and South Local Government Area

Research Question 3. What are the factors hindering students' readiness and confidence in afternoon classes of Mathematics in Junior Secondary School in Mubi North and South Local Government Areas?

Table 3. Descriptive Statistics on Factors Hindering Students' Readiness and Confidence in Mathematics in Afternoon Classes in Junior Secondary School in Mubi North and South Local Government Areas

S/N	STATEMENT	N	Mean	Std. Dev.	Remark
1	I come prepared for Mathematics lessons.	158	3.02	0.96	Agreed
2	I complete assigned readings before Mathematics class.	158	1.87	0.87	Disagreed
3	I feel confident solving Mathematics problems on my own.	158	2.92	0.91	Agreed
4	I am comfortable answering questions in Mathematics class.	158	2.89	1.12	Agreed
5	I believe I can achieve good grades in Mathematics.	158	3.01	0.93	Agreed
6	I feel anxious during Mathematics lessons.	158	1.81	0.76	Disagreed
7	I understand most of the topics taught in Mathematics.	158	2.76	1.20	Agreed
8	My previous success in Mathematics increases my confidence.	158	3.00	1.12	Agreed
9	Some house chores hinder my readiness for Mathematics class.	158	1.82	0.81	Disagreed
10	Responsibilities at home hinders my readiness and confidence in Mathematics class	158	1.82	0.91	Disagreed
	Grand Mean		2.63		Agreed

Result from Table 3 shows that there are noticeable challenging or conditions in afternoon classes that are negatively affects students' preparation and confidence in learning mathematics at junior secondary school level. Therefore, students are likely facing issues in afternoon mathematics classes such as fatigue, loss of confidence, hunger, or an uncondusive learning environment which reduce how ready and confidence they feel during lesson.

Testing of Hypotheses.

H₀₁: There is no significant effects of time factor on students' academic performance in

Mathematics in Junior Secondary Schools in Mubi North and South Local Government Area based

Table 4: Summary of t-Test analysis of time Factor on Students' Academic Performance in Mathematics in Junior Secondary Schools based on Gender

Gender	N	Mean	Std. Dev.	df	t-value	p-value	Remark
Male	60	27.78	3.96				
				156	15.84	0.01	Significant
Female	98	15.16	5.85				

Significant; $p < 0.05$.

Results in Table 4 show that the probability of p (0.01) is less than 0.05 level of significance ($p < 0.05$). Therefore, the hypothesis stands rejected at 0.05 level of statistical significance and conclude that the hypotheses there is no significant effects of time factor on students' academic performance in Mathematics in Junior Secondary Schools Area based on gender in Mubi North and South Local Government.

H₀₂: There is no significant difference between attendance and participation of junior secondary school students in mathematics classes based on age in Mubi North and South Local Government Area.

Table 5: Summary of t-Test Analysis of Attendance and Participation of Junior Secondary School Students in Mathematics classes based on Age

Age(years)	N	Mean	Std. Dev.	df	t-value	p-value	Remark
10-12yrs	91	25.44	6.36				
				156	9.69	0.06	Not Significant
13-15yrs	67	17.00	3.74				

Not Significant; $p > 0.05$.

Results in Table 5 show that the probability of p (0.06) is greater than 0.05 level of significance ($p > 0.05$). Therefore, the hypothesis stands to be accepted at 0.05 level of statistical significance and conclude that there is no significant difference between attendance and participation of junior Secondary school students in Mathematics classes based on age in Mubi North and South Local Government Area.

H₀₃: There is no significant difference among factors hindering students' readiness and confidence in learning of Mathematics based on Local Government Area in Mubi North and South Local Government Area.

Table 6: Summary t-Test Analysis of Attendance and Participation of Junior Secondary School Students in Mathematics Classes based on Local Government Areas in Mubi North and South Local Government Area.

Local Gov.	N	Mean	Std. Dev.	Df	t-value	p-value	Remark
Mubi North	90	31.11	4.53				
				156	18.32	0.08	Not Significant
Mubi South	68	16.85	5.23				

Not Significant; $p < 0.05$.

Results in Table 6 show that the probability of p (0.08) is greater than 0.05 level of significance ($p > 0.05$). Therefore, the hypothesis stands to be accepted at 0.05 level of statistical significance and conclude that there is no significant difference among factors hindering students' readiness and confidence in learning of mathematics based on Local Government Area in Mubi North and South Local Government Area.

Discussion

The research was aimed at determining the influence of afternoon classes on junior secondary school students' academic performance in Mathematics in the Areas of Mubi North and Mubi South Local Government Area of Adamawa State, Nigeria. The results pertaining to Research Question One showed that students' achievement in Mathematics at junior secondary school was significantly

affected by the timing of instruction. This finding is in agreement with Muhammad et al (2020), who found that the best performance of students is positively correlated with instruction time (rather than teaching mode) during the morning and early afternoon compared to late afternoon. The authors believed this trend largely resulted from differences in students' attentiveness and cognitive alertness at different times of the day. With respect of Research Question Two, the results demonstrated that class attending and involvement significantly influenced on students' academic achievement in Mathematics as final comments. This finding corroborates with the results of Credé et al. Based on the finding of Giani et al. (2020), which identified class attendance as one of the important academic performance predictors, they argued that attending classes allows students to be continuously exposed to classroom instruction and learning activities.

With respect to Research Question Three, students described specific struggles that occurred in the afternoons that could potentially undermine their preparedness and confidence for learning Mathematics. Research has shown that symptoms of fatigue and mental exhaustion from the school day contribute to students' attention, engagement, and academic self-confidence. Similarly, Opesemowo et al. examines classroom scheduling and found that students who attend classes back-to-back without enough chance to rest were made to think harder, compromising their cognitive faculties, and this might affect learning efficiency and academic performance (2025).

Hypothesis one: There is no significant effect of time factor on students' academic performance in mathematics in Junior Secondary Schools in Mubi North and Mubi South Local Government Areas according to gender. The statistical result generated a p-value equal to 0.01, lower than the cut-off significance value of $p = 0.05$ (i.e., $p > 0.05$). Thus, the null hypothesis was accepted which indicated that there exists no statistically significant difference in students' attendance and participation during Mathematics classes based on age in study area. These finding contrasts that of Lei et al. (2021) mentions that active participation in class is an essential aspect of students understanding and academic success. What they especially noted in their findings was the need for regular participation when it comes to Mathematics, writing that "learning and practicing require reproduction (and repetition).

The third hypothesis read as follows: there is no significant difference in attendance and participation of junior secondary school students in Mathematics classes based on Local Government Area. Results were observed slightly above the 0.05 level of significance with a p-value of 0.051 ($p > 0.05$). As a result, the null hypothesis was retained which means that there is no significant difference in the factors affecting students' readiness and confidence in learning Mathematics between the two Local Government Areas. The comparison with Local Government Areas was not statistically significant according to the analysis, however Carrell et al. (2018) offer considerable contextual evidence that prolonged academic work, lacking in breaks, may enhance sleepiness and boredom while diminishing students' alertness. These conditions may adversely affect students' ability to prepare for and engage in learning activities.

Conclusion

Classes' session plays a major role in determining student's academic performance at junior secondary school especially in mathematics. Students' academic achievement may be influenced due to some factors such as fatigue, attention span, engagement, timing, schedules, motivation, students' attitude, teachers' commitment and

attitude, school environment among others. As this study was carried out to examine the influence of afternoon classes on junior secondary school students' academic performance in mathematics in Mubi North and Mubi South Local Government Area of Adamawa State, Nigeria, the result from this study found out that students' attending morning classes perform better than those attending afternoon classes despite the fact they were engaged with treatment. Such differences could be attributed so many factors.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Government should ensure that enough structures are put in place in order to accommodate all students' in the morning classes.
2. Conducive environment needs to be put in place that will encourage and facilitates good learning atmosphere among students.
3. Government should enforce close monitoring policy on teachers and students in places where afternoon classes must be introduced.

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