



Analysis of Mass Failure in General Mathematics in Some Selected Secondary Schools from Three (3) Senatorial Zones in Zamfara State, Nigeria

Muhammad Abdulrahman¹, Abubakar Sulaiman², Salisu Saleh³, Lawal Anas Maishanu⁴

^{1,3} Department of Mathematics Faculty of Science, Zamfara State University Talata Mafara (Nigeria)

² Department of Science Education Federal University Gusau (Nigeria)

⁴ Department of Education Foundations, Faculty of Education Zamfara State University, Talata Mafara, Zamfara State, (Nigeria)

Email: abdulmarere@gmail.com

ABSTRACT

It is obvious that there is continuous failure of secondary school students in mathematics, despite the facts that, mathematics is a compulsory and most important subject and is a prerequisite for admission into tertiary institutions in Nigeria. Therefore, this study investigated the factors contributing to mass failure in General Mathematics in some selected secondary schools across three Senatorial Zones in Zamfara State, Nigeria. It Specifically focused on identifying the key factors contributing to the high failure rates in mathematics, the effectiveness of teaching methodologies employed in the subject and assessing the availability of resources for teaching mathematics. The study used quantitative research design. Data was collected from 37,209 students and teachers across the three Senatorial Zones. A sample of 270 students and 90 teachers participated in the study, with data gathered through structured questionnaires. Reliability of the instrument was established with a Cronbach's alpha of 0.82. Data were analyzed using mean scores and standard deviation. The study found out that, gaps in foundational knowledge, negative attitudes, limited resources, lack of management support, ineffective teaching methods, general dislike of mathematics, lack of syllabus coverage, large class sizes, and the absence of remedial classes are major causes of mass failure in mathematics. The study concludes that improving mathematics performance in Zamfara State requires enhanced management support, better teaching practices, targeted student interventions, and the provision of sufficient resources. Recommendations include increasing administrative support for the mathematics department, implementing remedial programs for struggling students, adopting more student-centered teaching approaches, ensuring complete syllabus coverage before exams, and offering additional tutorial sessions.

Keywords: Analysis, Mass, Failure, Mathematics, Education and Secondary

Introduction

All over the world mathematics as a subject is seen as the most important one in school curriculum. Mathematics serves in many of the branches of science, it is the bedrock of all science and technologically based subjects. Science and technology have direct correlation with mathematics (Suleiman and Hammed, 2019). It is a core subject in primary school, secondary and as well in higher institutions. It's abstract in nature as such perceived by students as the most difficult subject in school. Majority of students has phobia for mathematics because of the impression that mathematics is naturally difficult. According to Aisha (2021) mathematics is a language of human being and is without a doubt one of the most magnificent languages created by humankind. It reduces complex statements through the use of symbols because it is verbosity-free, facilitates the expression of ideas in a precise form and allows one to understand and value its clarity, detail, precision, and logical beauty. Mathematics in addition fulfills educational values such as intellectual, aesthetic, social, vocational, inter-disciplinary, etc. In order to fully appreciate mathematics' educational values and instructional objectives, mathematics must be taught in classrooms using a combination of traditional method, educational innovations, and technological advancements. In Nigeria, it is stated in its National Policy of Education (Federal Republic of Nigeria, 2013) and should be taught at primary and secondary levels of education in order to give students a solid foundation for scientific and reflective thinking and prepare them for the next level of education. Mazana, et al. (2020) the study of mathematics is considered as the key to science and technology which are essential to a nation's social and economic advancement. In order to prepare new and creative workers in the sciences and technology industries, mathematical skills are essential for understanding other disciplines like science, technology, and engineering.

A significant issue affecting Nigeria's educational system is the poor performance of students in public exams, especially in secondary education. The current situation is so critical that those involved cannot help but question why society's desires and expectations have not been consistently fulfilled by this level of schooling (Suleiman and Hammed 2019). Mercy (2021) the purpose of public exams is to evaluate all candidates equally, regardless of how they were exposed to a particular curriculum. Standard scores are used by the IX councils, who are responsible for administering this test, to report on

the candidates' performance. Candidates in the terminal courses for certification—primary six, junior secondary, and senior secondary schools—take public exams in Nigeria. According to the National Policy on Education (FGN, 2004), secondary school education in Nigeria strives to educate each student for two things: (a) a useful life in society; and (b) a higher education. Exams for the senior secondary school certificate are administered to pupils upon completion of their six-year secondary school education. Of particular relevance are the school certificate exams, which determine where Nigerian pupils are placed in higher education and/or employment. WAEC Chief Examiner's Report (2018-2022) indicated that students' failure in mathematics is real. He further mentioned among the causes of the failure to be teachers' attitudes towards students learning mathematics and socioeconomic background of the students towards the nature of learning mathematics. This present study therefore, will attempt to analyze causes of the students' mass failure in general mathematics in some selected secondary schools from three (3) senatorial zones in Zamfara State.

Objectives of the Study

The study is guided by the following objectives;

1. To identify the factors contributing to mass failure of students in general mathematics in some selected secondary school schools from three (3) senatorial zones in Zamfara State.
2. To evaluate teaching methodology in general mathematics in Zamfara State.
3. To examine resource availability in teaching mathematics in Zamfara State.
4. To determine the extent at which the teacher's qualification is a contributing factor towards student's failure.

Research Questions

From the stated objectives of study, the following research questions are formulated for the study.

1. What are the factors contributing to mass failure of students in general mathematics?
2. Are the teaching methodologies employed in teaching mathematics in Zamfara State suitable and appropriate for learners' development?
3. Are there adequate resources in teaching mathematics in Zamfara State?
4. To what extent is the teachers' qualification a contributing factor towards students' success or failure?

Research Methodology

The researcher employed a descriptive survey design for the purpose of this study. This method of gathering data involves asking respondents or particular people, questions in order to get information from them. Data from a significant number of cases are gathered using the survey method at a specific moment in time. The focus is on generic statistics that arise from abstracting data from multiple individual examples, rather than particular features (NOUN, 2011).

The population of this study is the entire SS III students of Government Senior Secondary Schools in Zamfara State, Nigeria. According to Zamfara State Ministry of Science and Technical Education, there are Fourteen Thousand Five Hundred and Seventy Seven (14,577) male students and Twenty Two Thousand Six Hundred and Thirty Two (22,632) female students. Giving a total of 37,209. Based on the Research Advisor's (2009) guidelines, a population of 37,209 requires a sample size of 270. Consequently, the researchers employed two questionnaires, distributed 90 questionnaires to students in each of the three senatorial zones and 30 questionnaires to teachers in each zone as well. Three experts—two from the Department of Science Education and one from the Department of Mathematics validated the questionnaire items. The reliability was established using Cronbach Alpha which was found to be 0.82.

Research Findings

A total of 270 students' questionnaire were distributed to students across the three senatorial zones in Zamfara State, along with 30 teachers per zone, summing up to 90 teachers. The data were processed using mean and standard deviation to analyze the data. An agreement threshold was set at a mean score of 2.5 and above, indicating consensus while a score below 2.5 signified disagreement.

Teachers' Responses

Table 4.2.1 Research Question 1: What are the factors contributing to mass failure of students in general mathematics?

S/No	Items	SA	A	D	AD	Mean	Stad Dev	Decision
1	School Managements negligently avoid problems in Department of Mathematics.	32	42	10	6	3.11	2.70	Accepted
2	Most students dislike mathematics because of assignments and exercises given in the classroom.	25	51	11	3	3.09	2.64	Accepted
3	Lack of interest in mathematics by the students due to poor background affects students' performance.	62	15	11	2	3.52	3.08	Accepted
4	Students believe mathematics is a difficult subject in nature.	51	32	7	0	3.49	3.01	Accepted
5	Students' peer groups influence performance in mathematics.	22	16	32	20	2.44	2.17	Rejected

Table 4.2.1 shows that items 1 to 4 were accepted while item 5 was rejected.

Table 4.2.2 Research Question 2: Are the teaching methodologies employed in teaching mathematics in Zamfara State suitable for learners' development?

S/No	Items	SA	A	D	AD	Mean	Stad Dev	Decision
6	Use of wrong teaching methodology discourages students from learning mathematics.	16	42	28	4	2.78	2.36	Accepted
7	Allocation of periods for mathematics is often inadequate for effective teaching and learning of mathematics.	3	15	44	28	1.92	1.54	Rejected
8	Non-challant attitudes by parents or guardians towards students' performance in mathematics encourages students' failure.	5	9	61	15	2.04	1.62	Rejected
9	Lack of professional development opportunities for mathematics teachers affects their teaching performance.	11	20	35	24	2.20	1.89	Rejected
10	Unfriendly attitudes of most mathematics teachers towards their students.	15	15	42	18	2.30	1.98	Rejected

Table 4.2.2 shows that only item 1 was accepted and item 1 to 10 were rejected.

Table 4.2.3: Research Question 3: Are there adequate resources in teaching mathematics in Zamfara State?

S/No	Items	SA	A	D	AD	Mean	Stad Dev	Decision
11	Failure of government to supply adequate instructional materials to schools causes students to fail mathematics.	19	21	33	17	2.47	2.16	Rejected
12	Mathematics teachers are readily available in our schools.	20	22	25	23	2.43	2.17	Rejected
13	Frequent transfer of teachers affects students learning of mathematics.	5	9	72	4	2.17	1.69	Rejected
14	Insufficient collaboration between mathematics teachers and other subject teachers hinders students' overall academic success.	7	5	60	18	2.01	1.61	Rejected

15	The absence of remedial classes for struggling students contributes to their failure in mathematics.	22	43	16	9	2.87	2.48	Accepted
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Table 4.2.3 shows that items 11 to 14 were rejected and only item 15 was accepted.

Table 4.2.4: Research Question 4: To what extent is the teachers' qualification a contributing factor towards students' success or failure?

S/No	Items	SA	A	D	AD	Mean	Std Dev	Decision
16	Most mathematics teachers are overloaded with the number of periods.	25	38	22	5	2.92	2.52	Accepted
17	Students' irregular practice of mathematics results in poor performance.	52	29	8	1	3.47	3.01	Accepted
18	Non-challant attitudes by parents on students' performance in mathematics encourage failure.	5	9	61	15	2.04	1.62	Rejected
19	Lack of interest in mathematics by students due to poor background affects performance.	62	15	11	2	3.52	3.08	Accepted
20	Students' socioeconomic background influences performance in mathematics.	8	21	42	19	2.20	1.84	Rejected

Table 4.2.4 shows that items 16, 17, and 19 were accepted and item 18 and 20 were rejected.

Students' Responses

Table 4.2.5: Research Question 1: What are the factors contributing to mass failure of students in general mathematics?

S/No	Items	SA	A	D	AD	Mean	Std Dev	Decision
1	Students believe mathematics is a difficult subject in nature.	85	142	23	20	3.08	2.67	Accepted
2	Lack of interest in mathematics by the students due to poor background affects students' performance.	43	183	25	19	2.93	2.48	Accepted
3	Lack of motivation from parents affects students' interest in learning mathematics.	5	24	192	49	1.94	1.48	Rejected
4	Students' negative attitude towards mathematics discourages active participation in the subject.	53	143	38	36	2.79	2.41	Accepted
5	Mathematics assignments and homework are often too difficult for students to complete.	65	143	25	37	2.87	2.50	Accepted

Table 4.2.5 shows that items 1, 2, 4 and 5 were accepted while item 3 was rejected.

Table 4.2.6: Research Question 2: Are the teaching methodologies employed in teaching mathematics in Zamfara State suitable for learners' development?

S/No	Items	SA	A	D	AD	Mean	Std Dev	Decision
6	Most mathematics teachers employ ineffective instructional strategies in the classroom.	56	120	73	21	2.78	2.39	Accepted
7	Most mathematics teachers do not usually cover the syllabus before examination.	83	136	42	9	3.09	2.65	Accepted
8	Students' irregular practice of mathematics results in poor performance.	80	175	9	6	3.22	2.74	Accepted

9	The absence of extra coaching sessions or tutorials affects students' performance in mathematics.	54	170	20	26	2.93	2.52	Accepted
10	Mathematics periods are very insufficient in our school.	25	16	201	28	2.14	1.72	Rejected
11	The large class size in mathematics lessons affects students' understanding and performance.	85	152	16	17	3.13	2.70	Accepted

Table 4.2.6 shows that, items 6, 7, 8, 9 and 11 were accepted while item 10 was rejected

Table 4.2.7: Research Question 3: Are there adequate resources in teaching mathematics in Zamfara State?

S/No	Items	SA	A	D	AD	Mean	Stad Dev	Decision
12	There are inadequate instructional materials in the mathematics laboratory.	82	152	25	11	3.13	2.68	Accepted
13	Failure of government to supply instructional materials to schools causes students to fail mathematics	76	160	19	15	3.10	2.66	Accepted
14	Mathematics teachers do not like using the mathematics laboratory for teaching.	11	30	158	71	1.85	1.44	Rejected
15	There are inadequate mathematics teachers in my school.	43	185	34	8	2.97	2.50	Accepted
16	Use of instructional materials in teaching mathematics increases teachers' interest in teaching mathematics.	55	182	25	8	3.05	2.58	Accepted

Table 4.2.7 shows that items 12, 13, 15 and 16 were accepted and item 14 was rejected.

Table 4.2.8: Research Question 4: To what extent is the teachers' qualification a contributing factor towards students' success or failure?

S/No	Items	SA	A	D	AD	Mean	Stad Dev	Decision
17	Most mathematics teachers are unfriendly in the classroom.	34	89	120	27	2.48	2.09	Rejected
18	Mathematics teachers are very often transferred to another school.	10	10	178	72	1.84	1.41	Rejected
19	Students' socioeconomic background influences performance in mathematics.	19	15	206	30	2.09	1.64	Rejected
20	Mathematics teachers do not like using the mathematics laboratory for teaching.	75	120	35	40	2.85	2.50	Accepted

Table 4.2.8 shows that items 17, 18 and 19 were rejected and only item 20 was accepted.

Discussion of Findings

Teachers' Questionnaire

A mean score of 3.11 shows that most teachers agree that school management neglects issues within the mathematics department, impacting student performance. Ajayi & Ekundayo (2018) emphasize that school management involvement can improve student outcomes by addressing departmental challenges and providing resources. A mean of 3.09 suggests that teachers believe students' dislike for mathematics stems from difficult assignments, which aligns with Obodo's (2021) study that found poorly structured assignments discourage engagement. The highest mean score, 3.52, indicates strong teacher agreement that poor foundational knowledge in mathematics reduces student interest and performance. Similarly, with a mean of 3.49, many teachers note that students perceive mathematics as difficult, creating a psychological barrier to learning. Idowu (2022) supports this, stating that the perception of difficulty lowers performance.

Most teachers (mean 2.78) feel that ineffective teaching methods reduce students' interest in mathematics. However, with a mean of 1.92, they disagree that insufficient class periods are a key issue. Adamu & Johnson (2023) suggested that instructional quality within existing periods is more impactful than the number of sessions. Additionally, with a mean of 2.04, teachers do not view parental indifference as a major factor in student failure. They also believe that insufficient professional development and teacher attitudes are not primary contributors to poor performance in mathematics, as shown by Musa & Lawal (2021), who found that factors like instructional clarity play a more significant role.

A mean of 2.47 shows that teachers do not see a lack of government-provided instructional materials as the primary cause of student failure. Adeoye & Olanrewaju (2023) argue that teacher competence and effective use of existing materials can have a more profound effect. With a mean of 2.87, teachers agree that the absence of remedial classes for struggling students hinders performance. Salawu & Yusuf (2023) found that remedial programs greatly benefit students with foundational gaps in mathematics.

Lastly, with a mean of 2.92, teachers agree that excessive teaching periods impact their effectiveness, often leading to burnout. Owoeye & Adalokun (2023) found that overloading teachers can reduce individual attention to students. A mean of 3.47 indicates that irregular practice affects student performance, as Igwe & Musa (2022) emphasize that consistent practice builds problem-solving skills. High scores for poor foundational knowledge (mean 3.52) reaffirm that a weak background hinders interest and achievement in mathematics, as noted by Olamide & Fadeyi (2022).

Students' Questionnaire

A high mean of 3.08 suggests that students find mathematics inherently challenging, aligning with Lai & Chen (2023), who found that this perception can lead to anxiety and disengagement. A mean of 2.93 indicates that students recognize how a poor foundational background limits their interest and performance. Similarly, with a mean of 2.87, students feel that the difficulty of assignments impacts their ability to complete them. Amadi & Nwosu (2022) found that overly challenging assignments reduce engagement and can lead to gaps in understanding.

The data shows a mean of 2.78, suggesting that most students view the teaching strategies as ineffective, consistent with Uchenna & Bello (2023) found that traditional methods reduce engagement. Furthermore, a mean of 3.22 suggests that irregular practice contributes to poor performance, underscoring the importance of consistency in mathematics. Students agree on the lack of extra coaching sessions, with a mean of 2.93, and indicate that large class sizes impact their understanding (mean 3.13), as noted by Nwankwo & Aliyu (2023), found that smaller classes enhance student-teacher interaction and understanding.

Students also agree (mean 3.13) that inadequate instructional materials in mathematics laboratories hinder learning, and with a mean of 3.10, they point to a lack of government-provided resources as a barrier. Olufunmilayo & Chijioke (2024) assert that a lack of resources limits quality instruction. However, students disagree (mean 1.85) that teachers avoid using laboratories, and a mean of 2.97 highlights a shortage of mathematics teachers in their schools. A mean of 3.05 shows that students feel instructional materials make teaching more effective and engaging.

Lastly, students largely disagree with statements about teacher unfriendliness (mean 2.48), frequent teacher transfers (mean 1.84), and socioeconomic background influencing performance (mean 2.09), indicating these are not major concerns in their experience. However, a mean of 2.85 shows some agreement that teachers may avoid laboratory use, possibly suggesting limited hands-on learning opportunities.

Conclusion

In conclusion, the study reveals that both teachers and students identify foundational knowledge, attitudes towards mathematics, and resource limitations as significant factors affecting mathematics performance in Zamfara State secondary schools. Teachers point to management's lack of support, ineffective teaching methods and insufficient remedial classes as critical issues. They also emphasize the need for consistent practice and manageable workloads but do not consider factors like peer influence, parental attitudes or socioeconomic background as primary influences on performance.

Students similarly recognize foundational gaps and a challenging perception of mathematics as barriers to engagement and success. They express a need for improved instructional strategies, consistent syllabus coverage, additional tutorial support, and smaller class sizes to enhance learning experiences. The limited availability of instructional materials and teaching staff, attributed to government shortcomings, also hinders their ability to excel. Above all, the findings showed the importance of supportive management, effective teaching practices, targeted student support programs and sufficient resources.

Recommendations

The researchers wish to recommend the followings based on the findings;

1. Increase management support for the mathematics department, including provision of necessary resources.
2. Implement targeted remedial classes to assist students struggling with foundational concepts.
3. Adopt student-centered teaching methodologies to make mathematics more engaging.
4. Ensure consistent syllabus coverage before exams and provide additional tutorials as needed.
5. Reduce class sizes to improve teacher-student interaction and individualized support.

6. Address shortages in instructional materials and mathematics teachers through enhanced government funding and recruitment.

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