

Availability and adequacy of instructional materials for teaching basic school mathematics

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KEYWORDS	ABSTRACT
Availability Adequacy, Basic Schools Instructional Mathematics Mathematics,	<p>The study examines Availability and Adequacy of instructional material in teaching basic school Mathematic in Ilorin South Local Government Area in Kwara State. Descriptive survey research was adopted for this study. Nine hundred and sixteen teachers in Ilorin South Local Government Area of Kwara State made up the population for the study. Using simple random sampling techniques, a sample of two hundred teachers was selected. Two research questions guided the study. An instrument titled "Questionnaire on Availability and Adequacy of Instructional Materials for Teaching Basic School Mathematics (QAAIMBSM)". was used to collect data with a reliability value of (0.81). The data collected were descriptively analyzed using frequency count, simple percentage, mean and standard deviation to provide answers to researched questions. The findings revealed that four out of the twelve identified instructional materials were generally available and while five were adequately used. Based on the above results, the following recommendations, among others, are made, The State Ministry of Education should provide basic Schools in Ilorin South Local Government Area of Kwara State with mathematical laboratory, computers, mathematical instruments like weight, constructional instruments, charts, compass, parabola, eclipse, overhead projectors in order to enhance quality and sound teaching of mathematics, Supervisors should regularly embark on supervision to enhance steady use of instructional materials in teaching mathematics in senior secondary schools.</p> <p>This is an open-access article under the CC-BY-SA license.</p> 

Introduction

Instructional materials are an essential component of the teaching and learning process. They play a vital role in the effective delivery of knowledge and skills to pupils, especially in the field of mathematics, which requires a lot of practical demonstrations and visual representations. Inadequate and unavailable instructional materials can hinder the teaching and learning process, leading to poor academic performance and low motivation among pupils. In recent

years, there have been concerns about the availability and adequacy of instructional materials for teaching basic school mathematics. The issue has become more pronounced in developing countries where the educational sector is often underfunded and lacks the necessary resources to provide quality education. It is essential to address this issue as it can impact the quality of education and the development of a skilled workforce.

Onivehu, James and Sulaimon (2022) posited that basic education has become an essential part of modern society. It is widely recognized as a vital component of formal education systems that contribute significantly to individual and societal development. Across the world, stakeholders in education have made various efforts to ensure that basic education is effectively implemented. In Nigeria, for example, the 9-3-4 system of education mandates the provision of 9 years of basic education, 3 years of senior secondary education, and 4 years of tertiary education (National Policy on Education, 2013). The 9 years of basic education span through (lower basic one to three, middle basic four to six and upper basic seven to nine).

Basic school mathematics typically refers to the foundational mathematical concepts and skills taught to primary and junior secondary school students. This includes topics such as basic arithmetic operations (addition, subtraction, multiplication, division), fractions, decimals, percentages, measurement, geometry, and basic algebra. The aim of teaching basic school mathematics is to develop the fundamental mathematical skills and problem-solving abilities of students, which will prepare them for more advanced mathematical concepts in higher education (Sulaimon, 2019).

This paper aims to explore the availability and adequacy of instructional materials for teaching basic school mathematics. It will examine the importance of instructional materials in mathematics education, the challenges faced in providing adequate instructional materials, and the implications of inadequate instructional materials on teaching and learning outcomes. Additionally, the study will provide recommendations for improving the availability and adequacy of instructional materials for teaching basic school mathematics.

Several studies have been carried out to investigate the availability of instructional materials in different subjects and levels of Education. Okobia (2011) investigated the availability and teachers' use of instructional materials and resources in the implementation of social studies in junior secondary schools in Edo State, Nigeria. Social studies teachers were

sampled and the findings demonstrated how woefully deficient the instructional tools and resources were. Additionally, it was noted that the use of instructional materials by specialized social studies teachers and non-specialist teachers did not vary. Sephania, Too and Kipng'etich (2017) carried out a study on teachers' perception of the availability of instructional materials and physical facilities in secondary schools of Arusha district, Tanzania. The study adopted a descriptive research approach. While data was generated using questionnaires and interviews, the research comes to the conclusion that the rise in students attending Community Schools has resulted in a lack of textbooks, reference books, maps, and globes in the schools under investigation. Additionally, schools lack appropriate physical facilities like desks, chairs, and classrooms, and the ones that are accessible are poorly built with insufficient spacing.

Another study was carried out by Dahar and Faize (2011) on the effect of the availability and the use of instructional material on the academic performance of students in Punjab (Pakistan). The student population comprises of teachers and secondary school students in the study location. The research found that there is a serious lack of educational resources available and being used. The research came to the conclusion that insufficient use of instructional materials, improper resource allocation, and a lack of availability of such materials waste resources and result in poorer academic achievement. Also, Tuimur and Chemwei (2015) carried out a study on the availability and use of instructional materials in the teaching of conflict and conflict resolution in primary schools in Nandi North District, Kenya. The findings of the study showed that many of the primary school Social Studies teachers had not attended any in-service courses to induct them on how to teach emerging issues like Conflict and Conflict Resolution in the current primary curriculum. The teachers also lacked sufficient instructional materials for effective teaching of the topic.

Albarico, Tagura, Visitacion, Zabala, Magnetico, and Ramayan (2014) carried out a study on the adequacy of instructional materials used by teachers in teaching technology and livelihood education. The study reveals that the instructional materials used to teach TLE were adequate. Additionally, there was enough room in the classroom and other spaces to accommodate the placement of instructional tools, machines, and apparatus. However, the overall mean of 2.36 indicates that the amount of instructional material is insufficient for the number of enrolled pupils. Similarly, Manjale and Abel (2017) investigated the significance and adequacy of instructional media as perceived by primary school pupils and teachers in Kinondoni District, Tanzania. The teachers and primary school pupils posited that chalkboards,

textbooks and supplementary books are available and adequate. However, pieces of wood (slates), learning corners, reading cards, bulletin boards, video clips, voice recorders, and Braille machines are inadequate.

These studies reviewed were not executed in Ilorin South Local government, Kwara State, Nigeria. More so, there is a dearth of related literature on the availability and adequacy of instructional materials for teaching basic school mathematics. To the best of the researcher's knowledge, no study had viewed availability and adequacy of instructional materials for teaching basic school mathematics in Ilorin South Local government, Kwara State, Nigeria. As a result of this gap identified, the present study investigates availability and adequacy of instructional materials for teaching basic school mathematics in Ilorin South Local government, Kwara State, Nigeria.

Objectives of the study

The general purpose of the study is to investigate availability and adequacy of instructional materials for teaching basic school mathematics in Ilorin South Local government, Kwara State, Nigeria. Specifically, the study attempted to determine:

1. The current available instructional materials for teaching basic school mathematics in Ilorin South
2. The current adequate instructional materials for teaching basic school mathematics in Ilorin South

Research Questions

1. What are the current available instructional materials for teaching basic school mathematics in Ilorin South?
2. What are the current adequate instructional materials for teaching basic school mathematics in Ilorin South?

Method

The research design adopted for this study is a descriptive survey research. According to Orodho (2012), descriptive survey research designs are used in preliminary and exploratory studies to enable researchers to collect data, summarize it, present it, and then analyze it in order to generalize its findings. In order to determine the context, structure, and procedure by

which instructional materials are available and adequate in basic school, a thorough study of the literature was also required. The design is appropriate because the study explores the availability and adequacy of instructional materials in teaching basic school mathematics. The population for this study consists of all public and private school primary school teachers in Ilorin South. While Simple random sampling techniques were used to select a total of two hundred (200) teachers from both public and private primary schools in Ilorin South Local Government Area of Kwara State.

A researcher self-constructed instrument titled Questionnaire on Availability and Adequacy of instructional materials for teaching basic school mathematics (QAAIMBSM) was used to collect data. (AAIMBSM) consisted of A and B. Section A contained the demographic distribution data of the respondent (Teaching experience and gender), while section B consist of 12 items that generate information on Available instructional materials and also 12 items that generate information on Adequacy instructional materials. Specifically, a 2 response format was used for the research instrument, the highest and the lowest score for each item in section B were 2 and 1 respectively.

Three experts from the faculty of Education established the face and content validity of the instrument. The test-retest method and Pearson's Moment Correlation Coefficient were used to determine the instrument's reliability. It was approved for the instruments to undergo a two-week pre-test with 30 teachers. These teachers were chosen for the pilot study because they have similar traits to the survey's actual responders. A reliability value of 0.81 (AAIMBSM) was obtained, which deem the instrument reliable for the study

Result and Discussion

Table 1: Demographic distribution of s based on Gender and Teachers Experience

Variable	Frequency	Percentage (%)
Gender		
Male	119	59.0
Female	81	41.0
Total	200	100.0
Teachers Experience		
0 – 5 years	83	41.5
6 – 10 years	72	36.0
11years - Above	45	22.5
Total	200	100.0

Table 1 reveals respondents' gender and teachers years of experience distribution. Thus, out of the 200 teachers, 119 (59.0%) of the respondents were males while 81 (41.0 %)

of the respondents were females. This indicates that the study covered more male teachers than their female counterparts. The table above also reveals that 83 (41.5%) of the respondent had 0 – 5 years of experience, 72 (36.0%) of the respondent had 6 – 10 years of experience while 45 (22.5%) of the respondent had 11 years – above years of experience. This indicates that the study covered 0 – 5 years of experience teachers.

Research Question One: *What are the current available instructional materials for teaching basic school mathematics in Ilorin South?*

In order to answer this research question, frequency and percentage of responses of the teachers to each item on the questionnaire that addressed the available instructional materials for teaching basic school mathematics were calculated.

Table 2: Frequency and Percentage distribution of availability of instructional materials for teaching basic school mathematics

S/N	Instructional Materials	Available N (%)		Not Available N (%)	
1	Chalkboard	200	(100%)	0	(0%)
2	Printed materials (pictures, newspapers, magazines)	121	(61%)	79	(39%)
3	2d,3d shapes	118	(59%)	82	(41%)
4	Mathematics laboratory	80	(40%)	120	(60%)
5	Computer sets	60	(30%)	140	(70%)
6	weight and height measuring instruments	70	(35%)	130	(65%)
7	construction instruments	86	(43%)	114	(57%)
8	Charts	90	(45%)	110	(55%)
9	Parabola	75	(38%)	125	(62%)
10	Eclips	122	(61%)	78	(39%)
11	Cardboard paper	150	(75%)	50	(25%)
12	Overhead projectors	0	(0%)	200	(100%)

Table 2 reveals available instructional materials for teaching of basic school mathematics. It can be deduced from the table above that the available instructional materials like chalkboard, Printed materials (pictures, newspapers, magazines), 2d, 3d shapes, Eclips and Cardboard paper with the following frequency and percentage of 200 (100%), 121 (61%), 118 (59%), 122 (61%) and 150 (75%) respectively, while Mathematics laboratory, Computer sets,

weight and height measuring instruments, construction instruments, Charts, Parabola and Overhead projectors with the following frequency and percentage of 120 (60%), 140 (70%), 130 (65%), 114 (57%), 110 (55%), 125 (62%) and 200 (100%) were not available.

Research Question Two: *What are the current adequate instructional materials for teaching basic school mathematics in Ilorin South?*

In order to answer this research question, frequency, and percentage of responses of the teachers to each item on the questionnaire that addressed the adequacy of instructional materials for teaching basic school mathematics were calculated.

Table 2: Frequency and Percentage distribution of adequacy of instructional materials for teaching basic school mathematics

S/N	Instructional Materials	Adequacy N (%)		Not Adequate N (%)	
1	Chalkboard	200	(100%)	0	(0%)
2	Printed materials (pictures, newspapers, magazines)	120	(60%)	80	(40%)
3	2d,3d shapes	88	(44%)	112	(56%)
4	Mathematics laboratory	80	(40%)	120	(60%)
5	Computer sets	30	(15%)	170	(85%)
6	weight and height measuring instruments	60	(30%)	140	(70%)
7	construction instruments	56	(28%)	144	(72%)
8	Charts	80	(40%)	120	(60%)
9	Parabola	55	(28%)	145	(72%)
10	Eclips	120	(60%)	80	(40%)
11	Cardboard paper	130	(75%)	70	(25%)
12	Overhead projectors	0	(0%)	200	(100%)

Table 3 reveals adequacy instructional materials for teaching of basic school mathematics. It can be deduced from the table above that the adequate instructional materials like chalkboards, Printed materials (pictures, newspapers, magazines), Eclips, Cardboard paper, with the following frequency and percentage of 200 (100%), 120 (60%), 120 (60%) and 130 (75%) respectively. While 2d, 3d shapes, Mathematics laboratory, Computer sets, weight and height measuring instruments, construction instruments, Charts, Parabola and Overhead projectors with the following frequency and percentage 112 (56%), 120 (60%), 170 (85%), 140 (70%), 144 (72%), 120 (60%), 145 (72%), 200 (100%) were not adequate.

The findings from Table 2 indicate that while some instructional materials for teaching basic school mathematics are available, others are lacking. The most commonly available instructional materials are chalkboards, printed materials such as pictures, newspapers, and magazines, 2d, 3d shapes, and Eclips, with frequencies and percentages of 200 (100%), 121 (61%), 118 (59%), 122 (61%), and 150 (75%) respectively. This suggests that these materials are commonly used by teachers to aid in the teaching of mathematics. This conforms with the findings of Likoko, Mutsotso, and Nasongo (2013), who investigated the adequacy of instructional materials and physical facilities and their effects on quality of teacher preparation in emerging private primary teacher training. The posited that learning centers have less available instructional materials. Similarly, Kabwos, Moige and Omwenga (2020) investigated the availability and adequacy of learning resources for implementing inclusive education in public preschools in Belgut Sub-County, Kenya. The study confirmed that learning materials, some materials were available while some, like print materials, are not readily available. However, it is concerning to note that the majority of the instructional materials that are not available are essential for effective teaching and learning of mathematics. Mathematics laboratory, computer sets, weight and height measuring instruments, construction instruments, charts, parabolas, and overhead projectors are all important materials for teaching basic school mathematics. The fact that they are not available could have a negative impact on pupils' learning outcomes. It is possible that the lack of availability of these instructional materials could be due to budget constraints or inadequate funding for educational resources. This highlights the need for policymakers and education stakeholders to invest more in educational resources to enhance the quality of teaching and learning in basic school mathematics.

The findings from Table 3 indicate that while all schools had access to some form of instructional materials for teaching basic school mathematics, not all of them were considered adequate. The most adequate instructional materials were chalkboards, printed materials (pictures, newspapers, magazines), Eclips, and cardboard paper, with all of them being reported as adequate by at least 60% of the respondents. This suggests that these materials are widely available and can be effectively used to enhance the teaching of mathematics in basic schools. On the other hand, 2d, 3d shapes, mathematics laboratory, computer sets, weight and

height measuring instruments, construction instruments, charts, parabolas, and overhead projectors were reported as inadequate by a significant percentage of respondents. This indicates that there is a shortage of these materials in most basic schools, which could negatively impact the quality of mathematics instruction. For example, the lack of mathematics laboratory equipment could limit the ability of teachers to effectively demonstrate complex mathematical concepts, while the absence of computers could hinder the use of technology in mathematics instruction.

The findings suggest that there is a need to improve the availability and adequacy of instructional materials for teaching basic school mathematics. This could involve providing more resources to schools, such as mathematics laboratory equipment, computers, and projectors. Additionally, efforts could be made to develop and distribute low-cost instructional materials that can be used in basic schools, such as charts and models. By improving the availability and adequacy of instructional materials, the quality of mathematics instruction in basic schools can be enhanced, which could, in turn, lead to better academic achievement among pupils.

Conclusion

In conclusion, the study investigated the availability and adequacy of instructional materials for teaching basic school mathematics. The findings showed that the available instructional materials for teaching basic school mathematics were chalkboards, printed materials such as pictures, newspapers, magazines, 2d, 3d shapes, Eclips, and cardboard paper. On the other hand, Mathematics laboratory, computer sets, weight and height measuring instruments, construction instruments, charts, parabolas, and overhead projectors were not available.

In terms of adequacy, the study found that the chalkboards, printed materials, Eclips, and cardboard paper were considered adequate instructional materials. However, 2d, 3d shapes, Mathematics laboratory, computer sets, weight and height measuring instruments, construction instruments, charts, parabolas, and overhead projectors were inadequate. Therefore, it is important for policymakers and stakeholders to take note of these findings and ensure that adequate and appropriate instructional materials are provided for teaching basic school mathematics. This will help to enhance the quality of education and improve the academic performance of pupils in basic schools. Teachers can also make the most of the

available instructional materials and improvise where necessary to ensure effective teaching and learning of mathematics.

Recommendations

Based on the findings of the study, the following recommendations are suggested to improve the availability and adequacy of instructional materials for teaching basic school mathematics:

1. Provision of necessary instructional materials: The government and school authorities should make adequate provisions for the necessary instructional materials, such as Mathematics laboratory, Computer sets, weight and height measuring instruments, construction instruments, Charts, Parabola and Overhead projectors. These materials should be made available in all schools, especially in basic schools.
2. Regular maintenance and updating of instructional materials: The instructional materials should be regularly maintained and updated to ensure their durability and relevance. The chalkboard, for example, should be repainted regularly, and the computers should be updated with the latest software.
3. Professional development for teachers: Teachers should be given regular training and professional development opportunities to enhance their ability to use instructional materials effectively in the classroom. They should also be trained on how to improvise materials when the necessary ones are not available.
4. Collaboration between teachers and stakeholders: Collaboration between teachers, school authorities, parents, and other stakeholders should be encouraged to ensure the availability and adequacy of instructional materials. This will help to identify areas where materials are lacking and find ways to address the gaps.

Innovative teaching methods: Teachers should be encouraged to adopt innovative teaching methods that can enhance learning outcomes without the use of expensive materials. This could include the use of group work, interactive teaching methods, and the incorporation of real-life examples in the teaching of Mathematics

References

- Albarico, S., Tagura, M. O., Visitacion, R. L., Zabala, V. B., Magnetico, J. A., & Ramayan, A. J. R. (2014, January). Adequacy of instructional materials used by teachers in teaching technology and livelihood education. In *International Conference on Law, Education and Humanities*. 15-19.
- Dahar, M. A., & Faize, F. A. (2011). Effect of the availability and the use of instructional material on academic performance of students in Punjab (Pakistan). *Middle Eastern Finance and Economics*, 11, 15-26.
- Kabwos, C. R., Moige, N. O., & Omwenga, E. N. (2020). Availability and adequacy of learning resources for implementing inclusive education in public preschools in Belgut Sub-County, Kenya. *European Journal of Education Studies*.
- Likoko, S., Mutsotso, S., & Nasongo, J. (2013). The adequacy of instructional materials and physical facilities and their effects on quality of teacher preparation in emerging private `primary teacher training colleges in Bungoma County, Kenya.
- Manjale, N. B., & Abel, C. (2017). Significance and adequacy of instructional media as perceived by primary school pupils and teachers in Kinondoni District, Tanzania. *International Journal of Educational Policy Research and Review*, 4(6), 151-157.
- Okobia, E. O. (2011). Availability and teachers' use of instructional materials and resources in the implementation of social studies in junior secondary schools in Edo State, Nigeria. *Rev. Eur. Stud.*, 3, 90.
- Onivehu, A. O., James, J. T., & Sulaimon, J. T. (2022). Science teachers' attitude towards the use of mother tongue for instruction in basic schools. *Acta Didactica Napocensia*, 15(1), 169-178.
- Sephania, N., Too, J. K., & Kipng'etich, K. J. (2017). Perception of teachers on availability of instructional materials and physical facilities in secondary schools of Arusha District. *Tanzania. Journal of Teachers*, 4(28), 68-102.
- Sulaimon, J.T. (2019). Impact of mother tongue instruction on pupils with low academic performance in Ilorin South Local Government Area, Kwara State. Unpublished Project, Faculty of Education, University of Ilorin.
- Tuimur, H. N. E., & Chemwei, B. (2015). Availability and use of instructional materials in the teaching of conflict and conflict resolution in primary schools in Nandi North District, Kenya. *Online Submission*, 3(6), 224-234.