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Availability and Utilization of Instructional Materials for Teaching Mathematics in Senior Secondary Schools in Nigeria

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Abstract

This study investigates the availability and utilization of instructional materials for teaching mathematics in senior secondary schools in Saki, Oyo State, Nigeria. Employing a descriptive survey research design, the research includes 127 mathematics teachers from both public and private schools in Saki East and West Local Government Areas. The research instrument, the Availability and Utilization of Instructional Materials Questionnaire (AUIMQ), was adapted from Okobia (2011) and undergoes rigorous validation. The instrument was validated by five experts and had a reliability coefficient of 0.91 using Pearson correlation. The researcher obtained informed consent from the principals and teachers at the sampled schools and ensured ethical issues such as anonymity, privacy, and confidentiality. The data were analysed using frequency, percentage, and chi-square statistics at 0.05 level of significance. Results reveal that 57.1% of the sampled instructional materials are available, emphasizing a notable scarcity. Additionally, 52.4% of the available materials are effectively utilized, highlighting room for improvement in instructional practices. Gender-based disparities among teachers indicate a significant difference in the use of instructional materials. Notably, qualified teachers demonstrate more effective utilization compared to their unqualified counterparts, and experienced teachers outperform less experienced ones in utilizing instructional materials. Recommendations include policy interventions to enhance material availability, targeted professional development for teachers to improve utilization, and strategies to address gender-based disparities. Furthermore, efforts to upgrade the qualifications of teachers and promote knowledge exchange among educators are suggested to ensure uniform and effective use of instructional materials. The study's findings contribute valuable insights for educational stakeholders and policymakers, emphasizing the need for interventions to optimize the impact of instructional materials on mathematics education in the study area.

Keywords: Availability, Mathematics, Mathematics Education, Utilization

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INTRODUCTION

Mathematics is a subject every individual need to effectively function in the society. The history of mathematics demonstrates that societies that highly valued mathematical abilities have achieved remarkable progress, contributing to technological and scientific advancements (Abd Alganİ, 2022). Mathematics is a universal knowledge, not limited by borders, and it represents the collective efforts of humanity. In this context, Mathematics plays a fundamental role in various aspects, including business and economics, as it underpins our understanding of processes and problem-solving (Adu, 2020). Yadav (2019) stated that mathematics is a core subject and a tool for the development of any science-based discipline which includes technology, astronomy, graphics, industry, and analytical reasoning in daily living. According to Maass et al. (2019) mathematics is the foundation on which the whole essence of living revolves and the platform for scientific and technological innovations. Gbolagade et al. (2013) stated that Mathematics is much more than a collection of definitions, theories, and proofs; it is a richly woven fabric of connections that involves visualizing, imagining, manipulating, analysing, abstracting and associating idea. This makes learning of mathematics as important aspect of human existence.

Learning mathematics has numerous cognitive benefits, such as enhancing clarity of thought, analytical thinking, speed of cognition, practicality, and real-life applications, making it a vital skill for individuals and society as a whole (Almanthari et al., 2020). The importance of mathematical literacy cannot be overstated, as it is

an essential quality for individuals to lead more productive, engaged, and thoughtful lives as responsible members of society. Mathematical literacy encompasses fundamental computational proficiency, quantitative reasoning, spatial awareness, and related skills, all of which are integral for everyday functioning and decision-making (International Commission on Mathematical Instruction, 2018).

Suleiman and Sada (2021) stated that the standard of mathematical attainment and creativity determines the line of demarcation between the developed nations and the underdeveloped nations, because mathematics is an undisputed agent of national development as well as wealth creation. Akinoso et al. (2017) stated that the world is rapidly advancing technologically, and that science cannot exist without mathematics, no modern technology without science and, there is no modern society without modern technology. In other words, mathematics is a vital element of science and technology and the single indispensable element in modern societal development. Hence, for the development of any nation, adequate attention needed to be given to the study of science, technology and mathematics at the various levels of her education. In addition, Borba (2021) stated that there is ample evidence indicating that countries that adopt mathematics, science, and technology experience a higher quality of life and exhibit reduced reliance on other nations. These and many are roles of mathematics and mathematics education.

Despite the pervasive role of mathematics in various aspects of life, students' performance has been inconsistent and subpar. Table 1 depicts the trends in student performance in the May/June Mathematics examinations of the West African Senior School Certificate Examinations (WASSCE) from 2011 to 2020. The table showed that the percentage of students obtaining credit and above ranged from 40.35% to 77.85%, with the lowest recorded in 2011 and the highest in 2019. Conversely, the percentage of students who achieved a pass or below ranged from 59.65% to 22.15%, with the worst performance seen in 2011. The trends indicated a gradual improvement in student performance from 2011 to 2019, but a decline in 2020. Overall, 65.07% of students achieved credit or higher, while 19.81% received a pass grade. These findings underscore the persistent challenge in mathematics education, with the need for sustained efforts to improve comprehension and performance in this crucial subject.

Table 1 Trends of Students' Performance in WASSCE in General Mathematics between May/June 2011-2020 in Nigeria

Year	No. of Candidates that sat for Exams	No.&% of (A1-C6) at Credit Level	No.&% of (D7-F9) (Failure)
2011	1,508,875	608,866(40.35%)	900,009(59.65%)
2012	1,658,357	838,879(50.58%)	819,478(49.42%)
2013	1,659,381	899,901(54.23%)	759,480(45.77%)
2014	1,609,197	1,011,608(62.86%)	597,589(37.14%)
2015	1,532,342	1,010,492(65.94%)	521,850(34.06%)
2016	1,544,758	1,056,923(68.42%)	487,835(31.58%)
2017	1,559,162	1,115,736(71.56%)	443,426(28.44%)
2018	1,565,098	1,210,149(77.32%)	354,949 (22.68%)
2019	1,554,431	1,331,280(85.64%)	223,151(14.36%)
2020	1,534,115	1,149,366(74.92%)	384,749(15.08%)

Source: Statistics Section, WAEC Office, Yaba, Lagos (May,2020)

The implication here is that effective teaching and learning of mathematics is yet to take place. In Nigeria, the government is concerned over the poor performance of students in mathematics because without the knowledge of mathematics, the nation's objectives towards technological and industrial development would not be met (Chete et al., 2014). Oghuvbu et al. (2022) stated that the Nigerian government and her people are now placing more emphasis on technological development of the Nation. Moreso, students are being encouraged to take up science related subjects and one subject that cuts across all sciences is mathematics. This is so because applications of mathematical products, such as formulas, are prevalent in virtually every field of human endeavour and play a vital role in the development of a country (Maass et al., 2019). However, there is poor performance in these crucial subjects, and various factors have been reported as causes of the students' underperformance.

Researchers have reported several factors underlying the undesirable state of mathematics achievement among students. These factors include mathematical conceptions, attitudes, and anticipations of students concerning mathematics and the teaching of mathematics have been deemed crucial elements influencing their academic experience and success (Barroso et al., 2021; Kele, 2018;

Steinmayr et al., 2019). Also, factors such as lack of effective teachers, large class size, poor teaching methods, and lack of basic and standard instructional materials for mathematics teaching have been attributed to the poor performance of the learners (Acharya, 2017; Ayebale et al., 2020; Kiwanuka et al., 2015; Mupa & Isaac Chinooneka, 2019; Nunan & Shantone, 2022; Peteros et al., 2019). However, studies have shown a very strong connection between students' performance in secondary education mathematics and the utilization of appropriate instructional materials for teaching (Bukoye, 2020; Simamora & Saragih, 2018).

Ordu and Amadi (2019b) stated that the utilization of graphic materials and computer (hardware and software) relate to students' academic performance as these tools were critical to academic success of students in the class. Dalnaik (2022) revealed in their study that the use of instructional material in mathematics not only improves both critical and analytical thinking of the learner but also enhance higher secondary school students' academic achievement. They also posited that it helps the teacher to present the lesson effectively and efficiently, as students learn and retain the concepts better and for a longer period. Studies have also shown that the academic performance of students who were taught with educational materials were notably perform better to that of those who were not instructed with such materials. Additionally, the utilization of instructional materials generally enhanced students' comprehension of concepts and resulted in commendable academic accomplishments (Ameen et al., 2019; Bukoye, 2020; Okoji & Olubayo, 2021; Ordu & Amadi, 2019a).

Akanbi and Imogie (2018) defined instructional materials as tools "crafted to enhance the teaching and learning processes, thereby contributing to improved learning" (p. 15). Adesola et al. (2022) describe instructional materials as encompassing both animate and inanimate objects, as well as human and nonhuman resources, that a teacher employs in teaching and learning scenarios to facilitate the desired learning outcomes. Ali et al. (2020) similarly characterize instructional materials as resources used by teachers to provide information, thereby contributing to the attainment of the necessary learning experiences. Consequently, instructional materials encompass all items or resources utilized by teachers as integral components of the instructional process to deliver effective and successful teaching that fosters positive learning outcomes for students. In essence, they represent intentionally employed materials by a teacher to influence students' learning during instruction. Achimugu (2017) grouped instructional materials into three main types: Visual aids which appeal to the sense of seeing (examples are: charts, maps, objects, pictures, etc); Audio aids which appeal to the sense of hearing (examples are; radios, radio cassette, record player, gramophone, etc); and audio-visual aids which appeal to the sense of sight and hearing (examples are; television, computers, projectors, video films). In mathematics these materials may include but are not limited to reference books, teacher manuals, kits, game, media collection of library books, counting equipment like blocks, stones or beads, natural displays models, charts, pictures, play materials, games, and audiovisual equipment (Tuimur & Chemwei, 2015). Instructional materials are very useful when any teacher aims to deliver an effective teaching and

learning experiences to the learners because they are powerful resources for teaching and learning mathematics (Adebule & Ayoola, 2016).

Additionally, Chukwunazo et al. (2022) stated that to achieve effective science subjects teaching, mathematics included, there is need for proper utilization of instructional materials to enrich the instruction in the classroom. Tety (2016) also argued that the quality of teaching/learning resources provided influences the quality of education a student receives, and that instructional materials can enhance the learning speed of students when they are used in the teaching process. Hence, "teachers, who are responsible for implementing the curriculum, are expected to use various and quality instructional materials for effective and efficient teaching and learning in the classroom activities."(Dalnaik, 2022). Umuhoza and Uworwabayeho (2021) stated that the use of instructional materials in teaching and learning mathematics makes learning easier, more interesting, concrete, enjoyable, and clear in real-life contexts.

The availability and utilization of instructional materials in teaching and learning of mathematics will not only arousing students' interest positively in learning mathematics but assist teachers in achieving the predetermined learning objectives (Bukoye, 2020). Additionally, it has been reported that availability and utilization of instructional materials helps learners to retain more knowledge than those taught without instructional materials (Achimugu, 2017; Adu, 2020; Arokoyu & Ugonwa, 2012; Okoji & Olubayo, 2021; Olaniran et al., 2016; Sam-Kayode et al., 2020). Hence, it is plausible that the poor performance observed in students' mathematics performance, as mentioned earlier, may be linked to the status of instructional materials within schools. This condition is frequently identified in research findings, reflecting variations such as availability, non-availability, inadequacy, and underutilization. Consequently, the present study aims to scrutinize the status of instructional materials, focusing on their availability and utilization for the instruction of mathematics in senior secondary schools situated in Saki, Oyo State, Nigeria. Furthermore, teachers' variable such as gender, teaching qualifications and experiences will be evaluated in relationship to their utilization of instructional materials in senior secondary schools situated in Saki, Oyo State, Nigeria.

Studies have shown that these variables have significant influence on teachers' pedagogical processes which include utilization of proper and suitable instructional resources. Ademola et al. (2021) found that years of teaching experience significantly influence the teachers' efficacy of classroom teaching. Moreover, studies like those by Gong et al. (2018), suggest that teacher gender can affect students' academic and noncognitive outcomes, with female teachers potentially raising girls' test scores and altering their beliefs about gender stereotypes. Additionally, Klassen (2020) indicates that teacher status, gender, and years of teaching experience can impact job satisfaction and work engagement, which in turn may affect educational quality. Kenni (2020) stated that teacher's gender is of great influence on their uses of teaching aids as male teachers tends to deploy different resources to drive their point in classroom while female teachers regarded the use of instructional resources as a waste of the limited

instructional time. Teacher qualifications have a significant impact on the utilization of instructional resources in mathematics education. Qualified teachers are more likely to possess a deeper understanding of mathematical concepts and pedagogical strategies, which enables them to effectively select and use appropriate instructional materials. Research indicates that qualified mathematics teachers with qualifications, such as a B.Sc(Ed.), B.Ed or M.Ed, demonstrate improved student performance in mathematics compared to those without professional teaching qualifications (Omaliko & Okpala, 2021). This is attributed to their enhanced ability to integrate various resources, including technology and manipulatives, to facilitate a more engaging and comprehensive learning experience. Furthermore, qualified teachers are often more adept at adapting resources to meet diverse student needs and learning styles, thereby optimizing the educational process (Omaliko & Okpala, 2021). However, some of the findings are inconclusive which necessitate the need for this kind of a study, where teacher variables are investigation in relation to their utilization of instructional resources.

Purpose of the Study

The main purpose of this study is to examine the availability and utilization of instructional materials for teaching Mathematics in Senior Secondary Schools in Saki, Oyo State, Nigeria. Specifically, the study would examine the:

1. instructional materials available for teachers to teach mathematics in secondary schools.

2. level to which mathematics teachers utilize the instructional materials for teaching mathematics.

3. whether teachers' gender influences the level of utilization of instructional materials for teaching mathematics.

4. whether teachers' qualification (B.Sc, B.Sc[Ed], M.Ed, etc) influences the level of utilization of instructional materials to teach mathematics; and

5. whether teaching experience influences teachers' level of utilization of instructional materials.

Research Questions

To achieve the objectives of this study, answers were provided to the following research questions.

1. What are the instructional materials available for teachers to teach mathematics in secondary schools in Saki?

2. What is the extent of utilization of the available instructional materials for teaching mathematics?

3. Does teachers' gender influence their level of utilization of instructional materials for teaching mathematics?

4. Does teachers' qualification (B.Sc., B.Sc. [Ed], M.Ed., etc) influence their level of utilization of instructional materials for teaching mathematics?

5. Does teachers' teaching experience influence their level of utilization of instructional materials for teaching mathematics?

Research Hypotheses

The following were the research hypotheses tested at 0.05 level of significance.

Ho_1: There is no significant difference in the use of instructional materials for teaching mathematics between male and female teachers.

Ho_2: There is no significant difference in the use of instructional materials for teaching mathematics between qualified and unqualified teachers.

Ho_3: There is no significant difference in the use of instructional materials for teaching mathematics between experienced and in-experienced teachers.

METHODOLOGY

Research Model

This study employed a descriptive survey research design to investigate the availability and utilization of instructional materials for teaching mathematics in senior secondary schools in Saki, Oyo State, Nigeria. This type of research was adopted because it assisted the researcher to identify, observe, describe and analyse existing phenomenon on the basis of prevailing circumstances, then draw inferences (Johnson & Christensen, 2017; Leavy, 2017; Rajasekar et al., 2013).

Population, Sample and Sampling Technique

All the teachers teaching mathematics in the study area were involved in the research. The target population included all mathematics teachers in both public and private secondary schools in Saki East and West Local Government Areas. A purposive sampling technique was utilized to select a total of 127 mathematics teachers who voluntarily participated in the study after the purpose of the study was clearly stated to them.

Table 2 Demographic characteristics of the Respondents

Variable	Type	Frequency	%
Gender	Male	79	62.20
	Female	48	37.80
Experience	Less Exp.	70	55.12
	Experienced	57	44.88
Qualification	Qualified	82	64.57
	Not Qualified	45	35.43
Total		127	100.00

Criterion: Experienced- 6yrs-Above; Less Experience-Less than 5years. Qualified Teacher are teacher with teaching qualifications such as B.Sc. + PGDE ( ) B.Ed./B.Sc. (Ed.), M.Ed. while Not Qualified Teacher-without any teaching Qualifications

Table 2 revealed the demographic characteristics of the respondents in the study and shows that 79(62.20%) of the respondents were male, while female teachers in the study were 48(37.80%). Also, out of 127 teachers involved in this study, 82(64.57%) were qualified which constitute majority of the respondents while 45(35.43%) fell in the category of not qualified. This implies that despite the low number of mathematics teachers in the study location, majority of the available ones were qualified. The table revealed that most of the teachers were less experienced with 70(55.12%) mathematics teachers while the well experience mathematics teachers constitute 57(44.88%). This means that, majority of mathematics teachers in the study location were less experienced. Also, the table revealed that 96 (75.59%) were teachers from public schools while 31 (24.41%) were teachers from private schools.

Data Collection Tools

The research instrument, the Availability and Utilization of Instructional Materials Questionnaire (AUIMQ), consisting of two sections, was adapted from Okobia (2011). Section "A" gathered background information on respondents, including educational qualification, teaching experience, gender, school type, school name, and Local Government Area. Section "B" comprised 21 instructional materials items used for teaching mathematics, for example, Straight edge, Graph board, Geoboard, Sets Square, Protractor, Pair of compasses, etc. Respondents indicated the availability (Available and Not Available) and extent of use (Frequently used, Seldomly used, and Not used), providing reasons if not available. The instrument underwent validation both face and content validation by experts in Mathematics Education and Educational Technology. A test-retest involving 20 mathematics teachers outside the sampled schools assessed reliability, yielding a Pearson Product Moment Coefficient of Correlation (r) of 0.91.

Ethics and Quality Assurance

Ethical considerations were paramount, ensuring voluntary participation and addressing issues of anonymity, privacy, and confidentiality. Informed consent forms were obtained from participating mathematics teachers and school principals. The study encompassed all components of ethical

standards, with data handled confidentially and solely for research purposes. No risks were posed to participants, as data collection occurred during regular school hours.

Data Analysis

The research focused on answering five research questions using frequency and percentages, while Chi-Square ($\chi 2$) served as the inferential statistical method to test formulated hypotheses at a 0.05 significance level. In order to check the availability a benchmark was given as 50%. Any item that was above 50% was regarded as available and any item below 50% was regarded as not available. While for the utilization, score-values were assigned to the responses using the Three-point scale as follows: Frequently used=3, Seldomly used= 2, and not used=1. The average means is 2 which means that any available instructional resources with a mean score of 2.00 and above are regarded as been utilized by the teacher while the mean score rating of below 2.0 are regarded as not utilized by teachers. This is in line with the study of (Okobia, 2011) and (Achimugu, 2017).

RESULTS

Research Question 1: what are the instructional materials available for teachers to teach mathematics in secondary schools in Saki?

Table 3 Frequency and Percentage of Availability of Instructional Resources for Teaching Mathematics

S/N		Available		Not Available		
	Instructional Materials	Frequency	%	Frequency	%	Decision
1.	Straight edge	115	90.6	12	9.4	Available
2.	Pair of compasses	111	87.4	16	12.6	Available
3	Protractor	115	90.6	12	9.4	Available
4.	Sets Square	87	68.5	40	31.5	Available
5.	Geo Board	55	43.3	72	56.7	Not Available
6.	Graph board	107	84.3	20	15.7	Available
7.	3-dimentional shape models	111	87.4	16	12.6	Available
8.	2-dimensional shape models	95	74.8	32	25.2	Available
9.	Geographical globe models	71	55.9	56	44.1	Available
10.	Pictures	103	81.1	24	18.9	Available
11.	Charts (Showing 2 or 3 dim. Objects)	111	87.4	16	12.6	Available
12.	Television	8	6.3	119	93.7	Not Available
13.	Slide projectors	8	6.3	119	93.7	Not Available
14.	Computers	12	9.4	115	90.6	Not Available
15.	Textbooks	90	70.9	37	29.1	Available
16.	Projected and non-projected materials	56	44.1	71	55.9	Not Available
17.	Balancing scale	56	44.1	71	55.9	Not Available
18.	Graphs and Charts	64	50.4	63	49.6	Available
19.	Videos	56	44.1	71	55.9	Not Available
20.	White Interactive Board	40	31.5	87	68.5	Not Available
21.	Mathematics Kits	40	31.5	87	68.5	Not Available

Table 3 revealed that out of 21 instructional materials identified, 12 instructional materials for teaching mathematics were available in the sampled areas while 9 instructional materials were not

available. This implies that most of the instructional materials identified were available in the schools sampled.

Research Question 2: what is the extent of utilization of the available instructional materials for teaching mathematics?

Table 4 Frequency, Percentages and Mean of Mathematics Teachers' Level of Utilization of Instructional Materials

S/N	Instructional Materials	Frequently Used(%)	Seldomly Used(%)	Not Used (%)	Mean Utilization	Remarks
1	Straight edge	71(55.9)	44(34.6)	12(9.5)	2.46	Utilized
2	Pair of compasses	79(62.2)	32(25.2)	16(12.6)	2.49	Utilized
3	Protractor	68(55.9)	44(34.6)	15(9.5)	2.46	Utilized
4	Sets square	71(55.9)	16(12.6)	40(31.5)	2.24	Utilized
5	Geo board	32(25.2)	32(25.2)	63(49.6)	1.75	Not Utilized
6	Graph board	71(55.9)	36(28.3)	20(15.8)	2.40	Utilized
7	3-dimentional shape models	63(49.6)	48(37.8)	16((12.6)	2.37	Utilized
8	2-dimensional shape models	55(43.3)	56(44.1)	16(12.6)	2.31	Utilized
9	Geographical globe models	48(37.8)	23(18.1)	56(44.1)	1.93	Not Utilized
10	Pictures	71(55.9)	16(12.6)	40(31.5)	2.24	Utilized
11.	Charts (Showing 2- or 3-dimension objects)	111(87.4)	8(6.3)	8(6.3)	2.81	Utilized
12.	Textbooks	115(90.6)	4(3.1)	8(6.3)	2.84	Utilized
13.	Balancing scale	40(31.5)	39(30.7)	48(37.8)	1.93	Not Utilized
14.	Graphs and Charts	87(68.5)	28(22.1)	12(9.4)	2.59	Utilized
15.	White Interactive Board	40(31.5)	24(18.9)	63(49.6)	1.81	Not Utilized
16.	Mathematics Kits	47(37.0)	8(6.3)	72(56.7)	1.80	Not Utilized
17.	Television	32(25.2)	8(6.3)	87(68.5)	1.57	Not Utilized
18.	Slide projectors	32(25.2)	16(12.6)	79(62.2)	1.63	Not Utilized
19.	Computers	20(15.7)	35(27.6)	72(56.7)	1.59	Not Utilized
20.	Videos	0(0.0)	24(18.9)	103(81.1)	1.18	Not Utilized
21.	Projected and non-projected materials	16(12.6)	23(18.1)	88(69.3)	1.43	Not Utilized

Table 4 revealed the Frequency, percentages and mean of mathematics teachers' level of utilization of instructional materials. The table shows that 10 items (Straight edge, Pair of compasses, Protractor, sets square, Graph board, 3-dimentional shape models, Pictures, Charts (Showing 2 or 3 dimensional objects), Textbooks and Graphs & Charts) were instructional resources that were frequently used by mathematics teachers to teach mathematics. While 11 items were either seldomly used or not used. Also, the table shows that 11 instructional materials were utilized as their mean was above the benchmark mean 2.00, while 10 were not utilized as their mean was below the benchmark mean 2.00.

Research Question 3: Does teachers' gender influence their level of utilization of instructional materials for teaching mathematics?

Table 5 Frequency and Percentages of Influence of Gender on the Utilization of Instructional Materials

S/N	Gender	Frequently Used	%	Seldomly Used	(%)	Not Used	(%)
1.	Male	58	45.7	26	20.4	43	33.9
2.	Female	52	40.9	28	22.1	47	37.0

Table 5 shows frequency and percentage of influence of gender on the utilization of instructional materials for teaching mathematics. The result shows that the male mathematics teachers utilized

instructional material with 58(45.7%) more than their counterpart in public schools with 52(40.9%). Therefore, gender influences the utilization of instructional materials for teaching mathematics.

Research Question 4: Does teachers' qualification influence their level of utilization of instructional materials for teaching mathematics?

Table 6 Frequency and Percentages of Influence of Qualification on the Utilization of Instructional Materials

S/N	Qualification	Frequently Used	%	Seldomly Used	(%)	Not Used	(%)
1.	Not Qualified	58	45.7	28	22.0	41	32.3
2.	Qualified	61	48.0	25	19.7	41	32.3

Table 6 shows frequency and percentage of influence of qualification on the utilization of instructional materials for teaching mathematics. The result shows that the qualified mathematics teachers utilized instructional materials with 61(48.0%) more than not qualified mathematics with 58(45.7%). Therefore, teachers' qualification influences the utilization of instructional materials for teaching mathematics.

Research Question 5: Does teachers' experience influence their level of utilization of instructional materials for teaching mathematics?

Table 7 Frequency and Percentages of Influence of Experiences on the Utilization of Instructional Materials

S/N	Teaching Experience	Frequently Used	%	Seldomly Used	(%)	Not Used	(%)
1.	Less Experienced	58	45.7	26	20.4	43	33.9
2.	Experienced	53	41.7	27	21.3	47	37.0

Table 7 shows frequency and percentage of influence of teaching experience on the utilization of instructional materials for teaching mathematics. The result shows that the less experienced mathematics teachers utilized instructional materials with 58(45.7%) more than experienced mathematics teachers with 53(41.7%). Therefore, teachers' teaching experience influences their level of utilization of instructional materials for teaching mathematics.

Testing Hypothesis

Ho_1: There is no significant difference in the use of instructional materials for teaching mathematics between male and female teachers.

Table 8 Chi-square Analysis of Level of Utilization of Instructional Materials Based on Gender

Variable	**FU**	**SU**	**NU**						
Gender	Observed (Expected)			N	Cal χ^2	Crit χ^2	Z-test	df	Sig Value	Remark
Male	58(45.7)	26(20.5)	43(33.8)	127	7.29	5.99	7.63	2	0.05	S
Female	52(40.9)	28(22.1)	47(37.0)							

Key: FU= Frequently Used, SU=Seldomly Used, NU=Not Used

Table 8 shows Chi-Square analysis of level of utilization of instructional materials based on gender. The result shows that chi-square calculated value (Cal χ^2 =7.29) is greater than chi-square critical value (Crit χ^2 =5.99), which implies that the null hypothesis is rejected. Therefore, there is significant difference in the use of instructional materials for teaching mathematics between male and female teachers. Furthermore, the multiple Z test for two proportions score is 7.63 and greater the critical value at α = 1.645. Hence it is supported the rejection of the null hypothesis and it favour Male teachers to utilize the instructional resources more than their female counterparts.

Ho_2: There is no significant difference in the use of instructional materials for teaching mathematics between qualified and not qualified teachers.

Table 9 Chi-square Analysis of Level of Utilization of Instructional Materials Based on Qualification

Variable	**FU**	**SU**	**NU**						
Qualification	Observed (Expected)			N	Cal χ^2	Crit χ^2	Z-Test	df	Sig Value	Remark
Qualified	58(45.7)	28(22.0)	41(32.3)	127	19.59	5.99	6.05	2	0.05	S
Not Qualified	61(48.0)	25(19.7)	41(32.3)							

Key: FU= Frequently Used, SU=Seldomly Used, NU=Not Used

Table 9 shows Chi-Square analysis of level of utilization of instructional materials based on qualification. The result shows that chi-square calculated value (Cal χ^2 =19.59) is greater than chi-square critical value (Crit χ^2 =5.99), which implies that the null hypothesis is rejected. Therefore, there is significant difference in the use of instructional materials for teaching mathematics between qualified and unqualified teachers. Furthermore, the multiple Z test for two proportions score is 6.05 and greater the critical value at α = 1.645. Hence it is supported the rejection of the null hypothesis and it favour Qualified teachers to utilize the instructional resources more than their counterparts who are not a qualified teacher.

Ho_3: There is no significant difference in the use of instructional materials for teaching mathematics between experienced and less experienced mathematics teachers.

Table 10 Chi-square Analysis of Level of Utilization of Instructional Materials Based on Teaching Experience

Variable	**FU**	**SU**	**NU**							
Teaching Experience	Observed (Expected)			N	Cal χ^2	Crit χ^2	df	Z-score	Sig Value	Remark
Experienced	58(45.7)	26(20.4)	43(33.9)	127	13.98	5.99	2	7.23	0.05	S
Less Experienced	53(41.7)	27(21.3)	47(37.0)							

Key: FU= Frequently Used, SU=Seldomly Used, NU=Not Used

Table 10 shows Chi-Square analysis of level of utilization of instructional materials based on experience. The result shows that chi-square calculated value (Cal χ2 =13.98) is greater than chi-square critical value (Crit χ2 =5.99), which implies that the null hypothesis is rejected. Therefore, there is significant difference in the use of instructional materials for teaching mathematics between experienced

and less experienced mathematics teachers. Furthermore, the multiple Z test for two proportions score is 7.23 and greater the critical value at $\alpha = 1.645$. Hence it is supported the rejection of the null hypothesis and it favour experienced teachers to utilize the instructional resources more than their less experienced counterparts.

DISCUSSION

The findings of this study indicate that the availability and utilization of instructional materials for teaching mathematics in the sampled areas are not optimal. Firstly, the study reveals that there is a considerable gap in the availability of instructional materials, with only 57.1% of the sampled materials present in the areas under investigation. This scarcity may impede the delivery of effective mathematics instruction, as a substantial portion of the necessary materials is unavailable. This finding is line with other studies (Achimugu, 2017; Adu, 2020; Arokoyu & Ugonwa, 2012; Okoji & Olubayo, 2021; Sam-Kayode et al., 2020) where they are indicated that the instructional resources needed for effective teaching are not adequately available in schools and there is need for improvement.

Furthermore, the utilization of instructional materials presents a nuanced picture, with 52.4% of the available materials were utilized by teachers in teaching mathematics. This suggests a need for increased emphasis on strategies to enhance the utilization of existing materials, potentially through targeted teacher training or curriculum development initiatives. Similar findings from (Achimugu, 2017; Isma'il & Lukman, 2022; Okoji & Olubayo, 2021; Okori & Jerry, 2017; Sam-Kayode et al., 2020) reported that despite of the importance of instructional materials in mathematics teaching, teachers are still underutilize instructional materials and some cases the resources are rarely utilized which affect later students' performance. This finding also agreed with Abdelraheem and Al-Rabane (2018), that teachers mostly utilize textbooks, newspapers, magazines, government documents, teachers' guide, duplicated materials, journals, handbook, bulletins, pictures, workbooks, pamphlets, leaflets as instructional materials for teaching. More so, Kadzera (2016) noted that there was infrequent use of higher order instructional technologies such as overhead projectors, videos and computers.

The identified gender-based differences in the use of instructional materials among teachers highlight an area of concern. The study indicates a significant difference between male and female teachers; therefore, gender influences the utilization of instructional materials for teaching mathematics. This emphasizing the importance of exploring and addressing potential disparities to ensure equitable access to resources and enhance the overall quality of mathematics education. The finding disagreed with the study carried out by Fakomogbon et al. (2015) which showed that there was no significant difference between the use of instructional media between male and female teachers. Unlike, the current study which shows significance difference in the use of instructional resources by teachers

Moreover, the marked divergence in the use of instructional materials between qualified and unqualified teachers accentuates the influence of educators' qualifications on instructional practices. This finding emphasizes the imperative of investing in teacher training programs and professional development opportunities to bridge the gap and foster a more uniform and effective use of instructional materials. Therefore, teachers' qualification influences the utilization of instructional materials for teaching mathematics. The finding agreed with Mkpaoro and Nwagu (2019) that there were significant differences in the effectiveness between professionally trained teachers and untrained teachers in their instructional material utilization competencies.

Similarly, the study underscores the impact of experience on the utilization of instructional materials among mathematics teachers. The identified significant difference between experienced and less experienced teachers emphasizes the need for mentorship programs and collaborative initiatives that facilitate knowledge exchange, ensuring that less experienced teachers can benefit from the expertise of their more seasoned counterparts. This finding did agree with the study carried out by Mutodi and Ngirande (2014) which stated that teachers' experience and expertise determines their use of concrete materials as teaching and learning aids.

CONCLUSION

The study concluded that the availability of instructional materials for teaching mathematics was 57.1% in the sampled areas, that is, 12 out of 21 sampled materials for teaching mathematics were present, while 9 were unavailable. Also, it was concluded that the utilization of instructional materials for teaching mathematics was 52.4% in the sampled schools, this means that among the 21 available materials, 11 were effectively used (mean > 2.00), while 10 were underutilized (mean < 2.00). A significant difference exists in the use of instructional materials for teaching mathematics between male and female teachers ($\chi 2 = 7.29 > 5.99$, $p < 0.05$). There is a notable difference in the use of instructional materials for teaching mathematics between qualified and unqualified teachers ($\chi 2 = 19.59 > 5.99$, $p < 0.05$). The study reveals a significant difference in the use of instructional materials for teaching mathematics between experienced and less experienced mathematics teachers ($\chi 2 = 13.98 > 5.99$, $p < 0.05$).

Recommendation

1. There is need to implement policies and initiatives to ensure a consistent and sufficient supply of instructional materials for teaching mathematics.
2. Provide regular professional development opportunities for teachers to enhance their skills in incorporating instructional materials into mathematics instruction, fostering interactive and engaging learning experiences.

3. Implement inclusive professional development programs and research initiatives to identify and eliminate gender-based disparities in the distribution and utilization of instructional materials.
4. Establish policies and ongoing professional development programs to ensure that all mathematics teachers meet the necessary qualifications, emphasizing the crucial role of well-trained educators in utilizing instructional materials effectively.
5. Facilitate mentorship programs and teacher communities to encourage the exchange of knowledge and best practices, particularly between experienced and less experienced mathematics teachers, enhancing overall instructional effectiveness.

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APPENDIX I

UNIVERSITY OF ILORIN
FACULTY OF EDUCATION
DEPARTMENT OF SCIENCE EDUCATION

This questionnaire is designed to assess the availability and utilization of instructional materials for teaching mathematics in senior secondary schools in Nigeria. Please, fill in your responses as honestly as possible. The results from the questionnaire will be strictly used for academic purposes.

Yours faithfully,
The Researchers

SECTION A: Respondent's Personal Data

1. Name of School: ……
2. Local Government Area of the school: ……
3. School Type: Public () Private ( )
4. Gender: Male () Female ( )
5. Academic Qualification: O.N. D (), N.C.E ( ), H.N.D ( ), B.Sc. ( ), B.Sc. + PGDE ( ) B.Ed./B.Sc. (Ed.) ( ), M.Ed. ( ), Ph.D. + P.G.D.E( ) Others (Please specify) ( )
6. Teaching Experience: Less than 5 years ( ) 6yrs-Above ( )

SECTION B

Please read each statement carefully and tick (√) appropriately the option which satisfies your opinion.

S/N	AVAILABILITY OF INSTRUCTIONAL MATERIALS	AVAILABLE			NOT AVAILABLE
		Frequently used	Seldomly used	Not used	Reason(s)
1.	Straight edge				
2.	Pair of compasses				
3.	Protractor				
4.	Sets square				
5.	Geoboard				
6.	Graph board				
7.	3-dimensional shape models				
8.	2-dimensional shape models				
9.	Geographical globe models				
10.	Pictures				
11.	Charts (showing 2 or 3 dimensional objects)				
12.	Textbooks				
13.	Balancing scale				
14.	Graphs and Charts				
15.	White Interactive Board				
16.	Mathematics Kits				
17.	Television				
18.	Slide projectors				
19.	Computers				
20.	Videos				
21.	Projected and non-projected materials				