AVAILABILITY AND UTILIZATION OF AUDIO VISUAL INSTRUCTIONAL MEDIA IN LEARNING OF MATHEMATICS IN SELECTED JUNIOR SECONDARY SCHOOLS IN IKERE LOCAL GOVERNMENT

BY

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Abstract

This study investigated the availability and utilization of audio-visual instructional media in learning of mathematics in Ikere Local Government. The population of the study consists of all junior secondary schools in Ikere Local Government Area of Ekiti State during 2023/2024 academic session.200 students were selected using multistage sampling technique from the targeted population. Four research questions were formulated to guide the study. A well-developed questionnaire was used to obtain information from the respondents. The reliability of the instrument was obtained with test-retest approach using Pearson Product moment correlation and the reliability coefficient was 0.87. The data collected were analysed using descriptive statistics (frequency count, percentage and mean).Findings revealed that some secondary schools have invested in the availability of audio visual resources for students in their Mathematics learning. Teachers responsible for operating audio visual equipment are available in some junior secondary schools. Among others, it was recommended that, continuous training for teachers and students such as organising of workshops and seminars for teachers to further enhance their skills. Regular evaluation and feedback could involve periodic assessment from both teachers and students such evaluation will help to identify the strength and area of improvement.

Keywords: Instructional media, visual resources Projectors, television, teaching Practice

Introduction

The problem of poor achievement of students in Mathematics is of great concern to Mathematics educators and stakeholders in education. The chief examiner's report of the West African Examinations Council (WAEC) examiner as reported by the Federal Ministry of Education (2010) observed the poor performance of students in Mathematics. The researcher's observation as WAEC examiner revealed that poor performance of students over the years is alarming. Among the reasons adduced for the poor performance of Mathematics in examinations include lack of instructional materials and teacher method of teaching. In the junior secondary school, the use of audio-visual instructional media has gained prominence as a tool to enhance the teaching of mathematics. This study focuses on the availability and utilization of audio-visual instructional media in selected junior secondary schools within Ikere Local Government. With the advent of technology and its potential to enrich classroom experiences, it is

crucial to assess the extent to which these resources are accessible and effectively employed to facilitate mathematics instruction. The integration of audio-visual instructional media into the teaching and learning process has emerged as a pivoted factor in enhancing educational outcomes.

The availability of audio-visual instructional media in junior secondary schools is multifaceted issue. In Nigeria, Junior Secondary schools is governed by policies and guidelines set by the federal ministry of education, which emphasize the importance of using modern teaching aids including audio-visual resources. Audio-visual instructional media encompass a wide range of resources, including videos, audio, interactive presentation and multimedia materials designed to supplement traditional teaching methods (Clark & Mayer, 2016). These tools have been shown to enhance engagement, comprehension, and retention of subject matter (UNESCO, 2017)

In the Nigerian educational contest understanding the availability and utilization of such media is pertinent due to their potential to bridge educational disparities and improve learning outcomes in mathematics which is abstract in nature.

Audio-visual instructional media encompass a wide range of educational tools, including video, audio, interactive software, and visual aids. These resources have the potential to enhance pedagogical by making learning more engaging, interactive, and effective (Clark & Moyer, 2016).

The incorporation of audio-visual instructional media, including videos, multimedia presentations, and educational software has gained prominence in educational settings worldwide (Clark and Mayer 2016). Such media have been found to stimulate students visual and auditory senses, making learning more interactive and memorable.

The availability and utilization of audiovisual instructional media in secondary schools are essential for enhancing the quality of education (Smith, 2019 Adeyemi et al, 2021). Nigeria being one of the most populous countries in Africa, faces unique challenges in providing educational resources including audiovisual media, to its junior secondary schools (Ajayi, 2018). The availability and utilization of audio visual instructional media in Nigerian junior secondary schools present both opportunities and challenges (Adesina 2014). While there has been progress in providing these resources, addressing the issues of training, infrastructure, and localize content is crucial to realizing their full potential with the right support and investment, audio visual material can significantly enhance the teaching and learning of mathematics in Nigerian junior secondary schools, contributing on brighter educational future for the nation. While there has been progress in making audio-visual instructional media available in Nigeria junior schools their effective utilization remain a challenge. One major issue is the lack of technical expertise among educators to integrate these tools seamlessly into their teaching methods. Additionally, there is shortage of training programs to equip teachers with the skills needed to use audio-visual resources effectively, moreover, schools often face infrastructure challenges including unreliable electricity and a lack of resources maintenance which hinder the consistent use of these materials.

Furthermore, there is need for localized content. Many of the available audio-visual materials are developed for international audiences and may not align with the specific curriculum and

cultural context of Nigerian junior secondary schools. The lack of context that tailored to the Nigerian educational system link the potential benefits of these resources.

Benefits of Audio visual instructional media in Teaching and Learning of mathematics in junior secondary schools.

Researchers such as Smith (2019) have highlighted that the utilization of projectors and visual aids serves as an effective means of illustration complex concepts. This visual reinforcement enhances the engagement of students making the numerical thinking process more accessible and enjoyable.

Moreover, educational software has emerged as a powerful tool for interaction learning. Babatunde (2017) reemphasize the educational software fosters active engagement with the mathematics.

Through these platforms, students have the opportunity to practice mathematics in an interactive and dynamic environment.

This approach not only aligns with the National policy on Education's recommendations (Federal Ministry of Education, 2013) but also empowers students to take an active role in their process of mathematics learning.

Educational television programs have been recognized for their role in providing students with authentic reasoning opportunities as seen in the research by Stinson et al (2020), television programs documentaries and visual aids

By exposing students to diverse accents, these audiovisual media contribute to more inclusive mathematics teaching (Ajayi, 2018). Visual aids, as identifies by Agbemu and Onyen emezu (2019) offer a visually appealing presentation of texts, making reasoning more engaging and effective.

In addition, supporting quantitative reasoning, projectors and visual aids reinforce mathematics laws and theorems (Oyebonyi & Akinsola, 2018). The visual elements of these tools facilitate a deeper understanding of mathematics, helping students internalize language rules and patterns more effectively. This alignment with curriculum objectives ensures that students not only learn the calculation but also develop a comprehensive understanding of its structural elements.

Furthermore, the utilization of audiovisual media, including projectors, television and educational software has been noted to boost motivation and engagement in the mathematics classroom. This finding corresponds with the research by Adelani and Adeyemi (2017) which underlines the pivotal role of motivation in mathematics learning. When lessons are designed to be interactive and visually appealing, students are more likely to active participate in their learning and remain enthusiastic about the study of mathematics

Statement of the Problem

The qualities of education in Nigerian secondary schools, particularly in rural and seminary born areas like Ikere Local Government Area has been a subject of concern. The mathematics being a fundamental component of the curriculum demands effective teaching strategies that facilitate quantitative reasoning and mathematical acquisition among students. However, there is a concern that the traditional pedagogical methods used seem to have resulted into lack of interest in mathematics. One of the potential solutions to address the issues is the integration of audio visual instructional media. This study seeks to address the issue of limited availability and under utilization of audio-visual resources in junior

secondary schools, which may hinder the achievement of mathematics teaching and learning.

Purpose of the study

The purpose of the study is to examine the availability and utilization of audio-visual instructional media in the teaching and learning of mathematics. Specifically, to assess the current availability of audio-visual instructional media resources, educational videos, multimedia presentations and interactive software within junior secondary schools in Ikere Local Government. To know the impact and influence of audio visual media on the teaching and learning of mathematics.

To analyse how teachers incorporate audio-visual instructional media into their pedagogical practices for mathematics instructions and to identify the strategies they employ to enhance students learning experiences

Research Questions

The following questions were raised the study.

i. To what extent are audio-visual instructional media resources available in junior secondary schools?
ii. How do teachers incorporate audio-visual instructional media into mathematics teaching practice?
iii. What are the impacts of audio visual media in mathematics?
iv. What are the influence of the use of audio-visual instructional materials on academic performance of students?

Methodology

The descriptive survey design was employed for the study to investigate the availability and utilization of audio-visual instructional media in teaching and learning of mathematics in selected junior secondary schools in Ikere Local Government Area .The population for the study consisted all junior secondary schools students of Ikere Local Government Area, Ekiti State. Nigeria. Multistage sampling technique was used for the study. Four co-educational schools were selected through simple random technique. Fifty (50) students each was chosen from four randomly selected secondary schools in Ikere Local Government Area of Ekiti State. The research instrument used for collection of data was a self - constructed questionnaire The questionnaire was divided into two sections; Section A and B. Section A consisted of information on bio-data of the respondents while section B was divided into parts with items from each part addressing the stated research questions . A. 4-point Likert type rating scale of Strongly Agreed SA= (4). Agreed (A) =3, Disagreed (D) = 2, Strongly Disagreed (SD) =1 was used. Each of the respondent picked the items as applicable. The research instrument was validated using face and content validity with the help of two (2) experts in the test, measurement and evaluation. The reliability of the instrument was obtained with test-retest approach using Pearson Product Moment Correlation Coefficient of 0.87.The researcher took permission from the principals and through them got in touch with the Mathematics teachers and students in the schools for the administration of the questionnaire .The data collected were analysed using frequency count, percentage and mean.

Research Analysis

ResearchQuestion1:

To what extent are audio-visual instructional media resources available in junior secondary schools?

Table 1: Descriptive analysis on the Extent of Availability of Audio-Visual instructional media resources in junior secondary schools

S/No	Item	SA %	A %	D %	SD %	Mean	Std
1	Audio visual resources such as TVs Projector or computers are accessible in our junior secondary school	56 (26)	102 (51)	33 (16.5)	9 (4.5)	3.02	0.79
2	Our Junior secondary school has dedicated classrooms or spaces equipped with audiovisual resources for teaching and learning	86 (43)	73 (36.5)	32 (16)	9 (4.5)	3.18	0.86
3	Our school has invested in the availability of audio visual resources for teachers to use in their mathematics teaching	58 (29)	122 (61)	18 (9)	2 (1)	3.18	.62
4	Trained personnel or teachers responsible for operating audiovisual equipment are available in our junior secondary school	98 (49)	62 (31)	38 (19)	2 (1)	3.28	.80
5	I play games on a computer or tablet to learn mathematics in school	54 (27)	90 (45)	41 (20.5)	15 (7.5)	2.91	.88

Weighted Average=3.15, Benchmark=2.50

Table 1 shows the extent to which audio-visual instructional media resources are available in junior secondary schools. The table show that the teacher agreed that the trained personnel or teachers responsible for operating audio visual equipment are available in our junior secondary school receiving the highest mean score (x=3.28). Meanwhile, ,since the weighted average as shown in table 1 is 3.15 which is greater than the benchmark of 2.50,it can be concluded that the extent to which audio-visual instructional media resources are available in junior secondary schools in Ikere Local Government Area of Ekiti State.

Research Question 2

How do teachers incorporate audio-visual instructional media into their mathematics teaching practices?

Table 2: Descriptive analysis on the Ways teachers incorporate audio-visual instructional media into teaching

S/No	Item	SA %	A %	D %	SD %	X	Std	Decision
1	Teachers in our school incorporate audio visual	83 (41.5)	88 (44)	17 (4.5)	12 (6)	2.75	0.81	Accepted

	instructional media into their mathematics teaching							
2	I have used videos or pictures to practice mathematics class as instructed by my teacher	90 (45)	42 (21)	30 (15)	3 (19)	2.91	.85	Accepted
3	Teachers receive feedback or assessment on their use of audiovisual media in mathematics instruction	77 (38.5)	62 (31)	61 (30.5)	0 (0)	3.08	0.83	Accepted
4	Teachers express a high level of satisfaction with the support and resources available for incorporating audiovisual media into their mathematics instruction	58 (29	92 (46	1 0.5)	49 (25.5)	2.80	0.84	Accepted
5	Teachers use a variety of audiovisual resources including educational software online platform and mathematics learning Apps	72 (36)	75 (37.5)	2 (1)	41 (26.5)	2.90	0.81	Accepted

Weighted Average=2.76
Benchmark mark=2.5

Table 2 shows how teachers in selected junior schools in Ikere Local Government Area incorporate audiovisual instructional media into their mathematics teaching practices. The table shows that only the "I have used videos and pictures to practice calculation in class as instructional by my teacher with a mean score of 2.75"Teachers receive feedback or assessment on their use of audio visual media in mathematics instruction with mean score of x=2.91) were accepted. Teachers express a high level of satisfaction with the support of resources available for incorporating audiovisual media into their Mathematics instruction (2.8). Teachers use a variety of audio visual resources including instructional software, online platform to teach Mathematics (3.39)Based on the result from this table and mean score acceptance by the decision rule, the teachers in selected junior secondary schools in Ikere Local Government Area incorporate audio-visual instructional media into their mathematics teaching practices.

Research Question 3:

What are the impact of Audio visual media in mathematic learning outcomes?

Table3: Descriptive analysis on the Perceived impact of Audio-visual media in mathematics learning outcomes

S/N	Item	SA %	A %	D %	SD %	X	Std	Remark
1	It is mere exciting to learn Mathematics with videos and pictures than with books and worksheets	65 (32.5)	109 (54.5)	17 (8.5)	9 (4.5)	3.15	0.75	Accepted
2	When I watch videos or listen to songs I feel like understand Mathematics more	90 (45)	78 (39)	12 (6)	0 (0)	3.29	0.73	Accepted
3	Watching fun videos and pictures helps to learn mathematics better than just mathematics	71 (35.5)	60 (30)	60 (30)	9 (4.5)	3.42	0.92	Accepted
4	It is easier to remember when I watch or listen to something	106 (43)	74 (37)	12 (6)	8 (4)	3.39	0.76	Accepted

Weighed Average=3.31, Benchmark=2.50

Table 3 shows that the perceived impact of audio-visual media on mathematics learning outcomes of junior secondary school students in Ikere Local Government Area compare to traditional teaching methods. All the items received has a mean score that is above the ave bench mean score of 2.50. based on the result from the table and mean score acceptance by the decision rule, the perceived impact of a audio visual media on the mathematics learning outcomes of junior secondary school students in Ikere Local Government Area compare to traditional teaching methods are better at their mathematics because of the video and pictures used in class. It is more exciting to learn mathematics with videos or listen to songs, they feel like they understand mathematics more, watching fun videos and pictures helps to learn mathematics better than just calculation (3.42). It is easier to remember mathematics contents that are abstract when they watch or listen to the contents (3.39)

Research Question 4

What are the influence of the use of audio-visual instructional materials on academic performance of students?

Table 4

Perceived Effects of Audio-Visual Instructional Media on Attention Span

S/N	Item	SA %	A %	D %	SD %	Mean	Std	Remark
1	Audio Visual Instructional media help me to stay focused during lessons	84 (42)	89 (45.5)	27 (13.5)	0 (0)	3.29	0.69	Accepted
2	Using videos and pictures in class makes learning more interesting for me.	39 (19.5)	110 (55)	42 (21)	9 (4.5)	2.89	0.76	Accepted
3	Audio Visual aids make it easier for me to understand	82 (41)	38 (19)	74 (37)	6 (3)	2.98	0.95	Accepted
4	Watching educational videos can improve my	90 (45)	74 (37)	36 (18)	0 (0)	3.27	0.75	Accepted

	attention span							
5	Visual aids like charts and diagrams engage me and keep my attention	81 (40.5)	75 (37.5)	26 (13)	18 (9)	3.09	0.94	Accepted

Weighted Average=3.17. Benchmark=3.17

Table 4 shows the perceived effects of the use of audio visual instructional media on the attention span of the pupils. The table shows that the respondents agreed to all the items .They perceived that effects of the use of audio visual instruction media help them to stay focused during lessons. Based on the result from this table and mean score acceptance by the decision rule, the perceived effects of the use of audio visual instructional media on the attention helps them to stay focused during lesson (3.29),Using videos and pictures in class makes learning more interesting for them(2.89), Audio-visual aids make it easier for them to understand complex concepts(2.98) Watching educational videos can improves their attention span(3.27) and visual aids like charts and diagram engage them and keep their attention (3.09).It can be concluded that the are effects of the use of audio-visual on the attention span of the students

Discussion of Findings.

Based on the investigation conducted on research question one, from table I, 79% of the respondents agreed that audio visual resources such as television, projector or computer are accessible in our junior secondary schools while 21% disagreed 79.5% agreed that their junior secondary schools has dedicated classrooms or spaces equipped with audio visual resources for teaching and learning while 20.5% disagreed. 90% agreed that their schools has invested in the availability of audio visual resources for teachers to use in their Mathematics teaching while 10% disagreed. 80% trained personnel or teachers responsible for operating audio visual equipment s are available in their junior secondary school while 20% disagreed. 72% agreed that they played games on a computer or tablet to learn Mathematics in school while 28% disagreed.

The findings reveal that availability and usage of audio visual instructional media resources, specifically, they indicated that resources such as TVS Projectors or computers are accessible in the junior secondary schools. The result is in the agreement with Anthony (2022) which submitted that blended instructional media approach is beneficial to the learning and comprehension of mathematics contents by the students at the lower class.

On research question two, from the table 2, 85.5% agreed that teachers use audio visual instructional in their Mathematics teaching while 14.5% disagreed.

28% of the respondents agreed that they have used video or pictures to practice Mathematics as instructed by their teachers while 72% disagreed. 69.5% teachers received feedback or assessment on their use of audio visual media in mathematics instruction while 30.5% disagreed, 24.5% agreed that teaching express a high level of satisfaction with the support and resources available for incorporating audiovisual media into their Mathematics instruction while 75% agreed that teachers use a variety of audio visual resources including educational software, online platform and mathematics learning Apps while 25% disagreed. According to Peter (2013) many teachers are active in using multimedia

in the classroom due to availability of experts among the teachers to handle it confidently

On research question three, from the table 3, 87% of the respondents agreed that it is more exciting to learn Mathematics with videos and pictures than with books and worksheets while 13% disagreed. 84% of respondents agreed that when they watch videos or listen to songs they feel like understand mathematics more while 16% disagreed. 65.5% of the response agreed that watching fun videos and pictures help to learn Mathematics better than just learning mathematics with rote learning while 34.5% disagreed. 80% of the respondents agreed that it is easier to remember contents when they watch or listen to videos while 20% disagreed.

Finally, on research question four, from table 4, 86.5% agreed that of the respondents agreed that audiovisual instructional media help them to stay focused during lessons while 13.5% disagreed 74.5% of the respondents agreed that using videos and pictures in class makes learning more interesting for them while 25.5% disagreed. 60% of the respondents agreed that audio visual aids make mathematics easier to understand while 40% disagreed.

82% of the respondents agreed that watching Educational videos can improve their attention span while 18% disagreed.

88% of the respondents agreed that visual aids like charts and diagram engage them and keep their attention while 12% disagreed. This work is in line with Babatunde (2017) that when students watch videos or listen to songs, they understand mathematics more.

Conclusion

This study describes the application of blended audio-visual instructional media resources into teaching and learning of mathematics in junior secondary schools in Ikere Local Government Area of Ekiti State. The application of these instructional media over face-to-face instruction exercises from textbooks and developed course materials which was used in the tutorial class and also made available on the e-learning. Moreover teachers are actively incorporating these resources into their mathematics teaching practices. The use of audio-visual media appears to enhance engagement, understanding and retention among students, thus positively affecting their attention span during lessons

Recommendations

Based on the findings, the following are recommended

1. Continuous training for teachers such as organizing of workshops or training sessions for teachers to further enhance their skills in effectively integrating audio-visual instructional media into mathematics
2. Regular evaluation and feedback could involve periodic assessment from both teachers and students such evaluation will help identify strengths and area for improvement allowing for adjustments to teaching practices.
3. Investment in infrastructure and resources to support the use of audio-visual instructional media in junior secondary schools.
4. Encourage collaboration among teachers within and across schools to share best practices, lesson

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