

## **EFFECTIVENESS OF INSTRUCTIONAL VIDEO TAPES AND SLIDES ON TEACHING AND LEARNING OF GEOMETRY AMONG SENIOR SECONDARY SCHOOLS IN TAMBUWAL LOCAL GOVERNMENT AREA, SOKOTO STATE, NIGERIA**

**<sup>1</sup>Haliru Shehu, <sup>2</sup>Nasiru Muhammad Dogondaji, <sup>3</sup>Habiba Sani Bodinga and <sup>4</sup>Adeola Aderonke Awoyode**

<sup>1</sup>Department of Educational Foundations, Sokoto State University, Sokoto  
e-mail: [hallirushehuyari@gmail.com](mailto:hallirushehuyari@gmail.com)

<sup>2</sup>Department of Science Education, Sokoto State University, Sokoto,  
e-mail: [inasiru.dmuhammad@ssu.edu.ng](mailto:inasiru.dmuhammad@ssu.edu.ng)

<sup>3</sup>Department of Educational Foundations, Sokoto State University, Sokoto

<sup>4</sup>Nasarawa State University, Department Guidance and Counselling

---

### **Abstract**

*The study focused on the effectiveness of video tapes and slides in teaching and learning of Geometry in senior secondary schools of Tambuwal local government area of Sokoto state, Nigeria. The study adopted survey research design. The population of the study consisted of 124 Mathematics teachers from 7 senior secondary schools of Tambuwal Local Government. 37 participants which is 30% of the total population were selected as the sample size from the population. Using Simple Random Sampling the 37 samples were selected. The study was guided by three objectives and three research questions. Questionnaire was used as an instrument for data collection. The instrument used for data collection was validated and reliability index of 0.8 was found. The data obtained was analyzed using descriptive statistics of mean and standard deviation. The major findings of the study revealed that, Mathematics teachers were aware of Video tapes and slides but they were not utilising them in teaching Mathematics. Similarly, majority of the teachers' encountered different challenges in using video tapes and slides for teaching where by lack of constant electricity supply, unavailability of computers were the major challenges. The study therefore recommends that workshops, seminars and in house training should be organized for Mathematics teachers so as to guide and train them properly on how to utilise video tapes, slides and other technological gadgets to enhance the productivity of teaching Geometry in Mathematics. Government and other related agencies should make available resource materials for teaching and learning of Mathematics such as computers, video tapes, slides and other ICT related tools in senior secondary schools.*

**Keywords:** Video Tapes & Slides, Geometry and Mathematics

### **Introduction**

Technological tools are now becoming the most useful tools for teaching and learning due to the fastest growing development of technology. Many areas in the field of study are now based on the use of multimedia devices such as (audio, visual and audio-visual) and other approach in educational technology. The method of teaching and learning under educational technology comprises both hardware and software as instructional materials, such as computer assisted instruction (CAI), computer based instruction (CBI), etc. Technological advancement has brought so many instructional media to the forefront as the most radical tools of globalization and social development which have influenced the classroom teaching and learning situation positively and brought about more effective instruction as observed by Olatayo, Adedapo & Omiola (2017). For instruction to be effective, the teacher should be able to identify the instructional materials to be use.

According to the Abdul-Kareem and Musa (2020), Instructional materials are the most necessary important tools in teaching and learning which facilitate the execution of a most difficult teaching part of Mathematics. It is also on the teacher's part to show his or her ability, creativity and understanding in teaching any relevant topics which require the teaching aids. The uses of instructional materials by teachers allow them to establish the validity and more explanation on relevant topic taught to their students. Abdul Kareem and Musa (2020) asserted that instructional materials are important tools for enriching, visualizing, simplifying, transmitting and accelerating the teaching and learning processes. Such technology or technological breakthroughs as networked and non-networked, projected and non-projected, visual, auditory, audio-visual electronic media are important landmarks in knowledge transfer. Generally, instructional media make teaching and learning easier and less stressful and they are equally indispensable catalysts for social and intellectual development of the learners.

Video tapes and slides are the audio-visual media that could be used to facilitate instruction. Video tapes and slides instruction appeals to senses of hearing and sight. Recent advances in multimedia and communication technologies as reported by Aboyeji (2014) have resulted in powerful learning system with instructional video tapes and slides components. The instructional video tapes and slides used in early studies was primarily either broadcasted TV Programme or stored on CDs – ROM, the linear nature of such video produced inconsistency results (Brecht, 2012; Onawola, 2012; Today, video content resides in multiple learning formats and a variety of distribution modes – ranging from closed circuit instructional programming, to one – way and two –way tele courses connecting teachers with distance learners, to repackaged broadcast and Programme segments available via video cassettes, CD – ROM, DVDs, and via the internet. From the instructional point of view, the effectiveness of the video tapes and slides concerned with cognitive learning of students. This is because learning is a process through which knowledge, skills, habits, facts, ideas, and principles are acquired, retained and utilized; and the only means of achieving this is through the use of relevant Audio visual instructional materials in which Video tapes and slides are part of. Aramide & Balarind, (2015) supportively asserts that any teacher who takes advantage of these resources and learns to use them correctly will find that they make almost an incalculable contribution to instruction. Therefore, the teaching and learning of Mathematics as a science subject requires use of appropriate instructional materials and different pedagogical methods that will enhance meaningful teaching and learning of the subject.

Mathematics is the bed rock and essential tool for scientific, technological, and economic advancement of any nation (Muhammad, Maccido, & Hassan 2016). It is the study of size, numbers and patterns. It is the most international of all subjects, and mathematical understanding influences decision making in all areas of life-private, social and civil. It is the subject that enables scientists and technologists to develop relationships among biological, chemical, geophysical and physical qualities; understand and explain natural phenomena; hence, the teaching of Mathematics in Nigeria secondary schools needs to be properly handled.

Geometry is a branch of Mathematics that deals with the study of shapes and sizes. Sam-Kayode & Salman (2015) defined Geometry as the study of shapes and their properties. These shapes can be found all around us in every object. The shape could either be plane shapes such as triangles, rectangles, squares, rhombus, circle, trapeziums and kites and so on or solid shapes such as cubes, cuboids, cone, pyramid, cylinder, sphere and so on.

Sambo (2015) asserted that, Geometry is used by people in many fields; by engineers who build bridges and houses, by rocket and space scientists. so it is therefore expected that when a student is trained in it he/she could apply it in any vocation he might have chosen.

Despite the importance of Mathematics in human progress, students' performance in the subject in external examinations such as West African Senior Secondary School Examination Certificates (WSSCE) is by the day becoming lower and lower. Chief Examiners Report shows that students' performances remain very poor over the years. For instance, WASSCE result in Nigeria and Kastina State from 2017 to 2020 indicated that in the previous years of 2017, 2018, 2019, and 2020 only 36.57%, 48.15%, 64.18%, and 39.18% of the candidate passed the Mathematics for the respective years which was not encouraging at all. Many factors have been attributed to the low performances in Mathematics by senior secondary school students. These include among others, the perceived abstract and difficult nature of Mathematics, inadequate learning materials, unqualified or inexperienced Mathematics teachers, poor teaching strategy and in appropriate use of video tapes and slides in teaching and learning activity.

It's on this background that the researchers seek to examine the effectiveness of video tapes and slides in teaching and learning of Geometry in Senior Secondary Schools in Tambuwal local Government Area, Sokoto State, Nigeria.

A problem statement is a concise description of an issue a study or project seeks to address. It is a condition to be improved upon. It identifies the gap between the current state and desired state of the research process. Most of the Mathematics teachers applied traditional teaching method which emphasises on abstract concepts of Mathematics, as such, students found Mathematics very difficult to understand which lead to poor performance in the subject. Hence the teaching and learning of Mathematics requires multimedia instructional materials i.e. (video tapes and slides) that will enable students to understand concepts of Mathematics very easy. The teachers' level of resourcefulness, creativity and imagination is credited to the attainment of quality education. These are expressed in how well the teacher is able to generate and use the relevant information that can enhance and promote the effective teaching and learning activities.

The high failure rate of students in Mathematics is the major problems facing most secondary schools in the Nigeria society today in particular, the secondary schools in Tambuwal local Government area of Sokoto State are no exception.

From experience as a teacher, there are some other factors that contribute to high failure rate of students in Mathematics which include: non-availability of resource materials to teach Mathematics concepts, unqualified or in experienced Mathematics teachers handling Mathematics classes. Therefore, the transfer of knowledge from instructors to the learners should be based on the use of relevant and appropriate use of instructional video tapes and slides in the teaching and learning processes.

This study therefore, seeks to investigate the effect of utilising video tapes and slides in the teaching and learning of mathematics using selected secondary schools in Tambuwal Local Government, Sokoto State.

## **Purpose of the Study**

The purpose of the study was to investigate the Teachers' perception on the effectiveness of video tapes and slides in teaching and learning of Geometry in senior secondary schools of Tambuwal local government area of Sokoto State, Nigeria. Specifically, the objectives include to:

- i. find out if senior secondary school teachers of Tambuwal local Government Area of Sokoto state are aware of video tapes and slides for teaching and learning.
- ii. examine the extent of utilisation of video tapes and slides by senior secondary school teachers for teaching and learning.
- iii. find out the challenges of teachers in using video tapes and slides for teaching.

## **Research Questions**

The following Research Questions were used to guide the study:

Are senior secondary school teachers of Tambuwal local Government Area of Sokoto state aware of video tapes and slides for teaching and learning?

To what extent does the senior secondary school teachers utilise video tapes and slides for teaching and learning?

What are the challenges of teachers in using video tapes and slides for teaching?

## **Methodology**

The research design adopted for the study is the Descriptive Survey research design. It was considered appropriate for the study because it gives the researchers the opportunity to collect data from a sample of defined population. The population of the study consisted of all Mathematics teachers' in Senior Secondary Schools of Tambuwal local Government Area of Sokoto State. The total number of Mathematics teachers is 124 drawn from all the seven (7) Secondary Schools of the local Government Area. Simple random sampling technique was used to select the sample. From the population of 124 Mathematics teachers a sample size of 37 Mathematics teachers was selected. The sample obtained tallies with Awotunde and Ugodulunwa (2004) who recommended 30% of the population to be the minimum sample size in a survey research.

## **Instrument for data collection**

The researchers Adapted teacher's questionnaire called Mathematics Teachers Perception Questionnaire (MTPQ) in order to assess the Teachers' perception on the effectiveness of video tapes and slides in teaching and learning of Geometry in senior secondary schools of Tambuwal local Government area of Sokoto State, Nigeria. The questionnaire was based on the four point Likert scale which are strongly agree (SA), Agreed (A), Disagreed (D) and strongly disagreed (SD). The responds would tell us the accurate personal opinion of the respondents. The questionnaire consisted of three sections, i.e. section A, B and C. Section A, introduction, Section B, Demographic information of the respondent while sections C deals with teacher's opinion. The questionnaire was adapted from Muhammad, Isma'ila and Maccido (2020). A survey research on Lecturers' Awareness and Utilisation of Blended Learning in Colleges of Education Sokoto state, Nigeria and also from Edem and Ekon (2021). The Extent of Use of Video Clip for Teaching and

Learning in Nigerian Universities: A Case Study of Faculty of Education, University of Calabar

Copies of the instrument were subjected to the assessment of two experts. These experts examined the items of the instrument in relation to suitability for both content and construct validity. The items were modified to five (5) items from each variable, this was to enhance the face and content validity.

For the reliability of the instrument, the instrument was trial tested from the schools not participating in the study and the reliability index of 0.8 was obtained using Cronbach Alpha.

**Results**

The data collected was analysed using simple descriptive statistics of mean and standard deviation to answer the research questions as follows:

*Research Question one:* Find out if senior secondary school teachers of Tambuwal local Government Area of Sokoto state are aware of video tapes and slides for teaching and learning?

**Table.1: Teachers’ Awareness of Video Tapes and Slides**

S/N	Items	SD	D	A	SA	Total	Mean	STD	DC
1	I’m aware of Video tapes (VT) and slides	2	3	10	22	37	3.4	0.8	A
2	Video tapes and slides has been introduced in my school curriculum	5	2	22	8	37	3.0	0.8	A
3	My school gave me refresher training about VT and slides	16	18	2	1	37	2.0	0.7	D
4	I have access to VT and slides resources materials in my school	3	7	19	8	37	3.0	0.8	A
5	All my students have competency enough to work with computer and other technological tools.	0	10	20	7	37	3.0	0.6	A
<b>Average Mean and Average STD</b>							<b>2.9</b>	<b>0.7</b>	<b>A</b>

Disagree (D) = (1.5-2.49); Agree (A) = (2.50-4.00)

Table 1 above shows that, teachers expressed positive responses for the majority of the items raised. This indicated that the participants were aware of video tapes and slides as the average mean was 2.9 which was above the mean criterion of 2.5. This revealed that, teachers are aware of instructional video tapes and slides as tools for teaching and learning of Geometry. The standard deviation was relatively high that shows that the responses revolved above the mean.

*Research Question two:* To what extent does the senior secondary school teachers utilise video tapes and slides for teaching and learning?

**Table 2: Teachers Utilisation of Video Tapes and Slides**

S/N	Items	SD	D	A	SA	Total	Mean	STD	DC
1	I uses VT and slides to present my lesson	15	20	2	0	37	1.6	0.7	D
2	I uses VT and slides to engage students for learning	13	18	4	2	37	1.9	0.6	D
3	VT and slides are more convenient than traditional method for teaching	6	4	21	6	37	2.5	0.9	A
4	VT and slides are not time consuming for teaching and learning	14	19	4	0	37	1.7	0.5	D
5	VT and slides are helpful in improving students learning.	10	19	6	2	37	2.6	1.1	A
<b>Average Mean and Average STD</b>							<b>2.1</b>	<b>0.8</b>	<b>D</b>

Disagree (D) = (1.5-2.49); Agree (A) = (2.50-4.00)

Table 2 reveals that, majority of the teachers in the study are not utilising video tapes and slides as they disagreed with most of the items provided. The average mean was 2.1 which was below the mean criterion of 2.5. This indicates that, participants in the study are not utilising video tapes and slides as instructional tools for teaching. The standard deviation was also relatively low which implies that the teachers' responses turned below the mean.

*Research Question three:* Find out the challenges of teachers on using video tapes and slides for teaching?

**Table.3: Challenges of Teachers on Video Tapes and Slides**

S/N	Items	SD	D	A	SA	Total	Mean	STD	DC
1	Unavailability of computers and other technological tools	4	3	21	9	37	2.9	1.0	A
2	Power outage	0	2	24	11	37	3.3	1.2	A
3	Inadequate provision for in-house training	2	0	8	27	37	3.6	0.8	A
4	Overcrowded class rooms	3	4	10	20	37	3.3	0.9	A
5	Unavailability of video tapes and slides resources materials	4	2	12	19	37	3.3	0.9	A
<b>Average Mean and Average STD</b>							<b>3.3</b>	<b>0.10</b>	<b>A</b>

Disagree (D) = (1.5-2.49); Agree (A) = (2.50-4.00)

In table 3, Majority of the teachers in the study agree that there are a lot of challenges in using video tapes and slides for teaching as they agreed with most of the items provided. The average mean was 3.3 which was above the mean criterion of 2.5. This indicates that there are a lot of challenges in using video tapes and slides for teaching. The standard deviation was relatively high which implies that the teachers' responses turned above the mean.

### Discussion of Findings

The study was aimed at finding out Teacher's perception on the effectiveness of video tapes and slides in teaching and learning of Geometry in senior secondary schools of Tambuwal local Government Area of Sokoto State, Nigeria. Statistical analysis used in the study were mean and standard deviation of descriptive statistics for answering three (3) research questions.

The findings showed that, almost all the Mathematics teachers of Tambuwal local Government Area are aware of Video tapes and slides for Teaching and learning of Geometry because table 1 showed that 86.5% (32 out of 37) agreed or strongly agreed. This indicates that, they are aware of Video tapes and slides. This finding is in accordance with Badamosi (2020) whose study revealed that teacher's awareness and readiness to implement new technology could enhance the learning productivity of Children. Moreover, with regards to teachers utilisation of Video tapes and slides, it shows that majority of the Mathematics teachers do not utilize Video tapes and slides for teaching as it indicated in table 2, where 94. 5% (35 out of 37) agreed or strongly agreed that they are not utilising video tapes and slides for teaching and learning of Mathematics. This is because most of the teachers do not present their lessons using instructional video tapes and slides. This finding conformed with the findings of Edem and Ekon (2021).

However, on the challenges of teachers in using video tapes and slides for teaching, it shows that, majority of the teachers encountered different challenges as indicated in table 3, where 94.5% (35 out of 37) agreed or strongly agreed that they have challenges. This is because most of the teachers are not properly trained on how to use video tapes and slides for teaching Mathematics. The findings of the study also confirmed the findings of Badamosi (2020) where after reviewing existing literature in collaboration with observation on the state of technology integration in Nigerian Secondary Schools, he concluded that Nigerian teachers were not ready to integrate technology because they were not trained to do so. The second major challenge is the non-availability of computers, video tapes and slides resources materials in the secondary Schools. The findings reveal that, 83.8% agreed or strongly agreed that these resources were not available, as such, most of the Mathematics concepts were taught abstractly as teachers do not have access to these resources.

## **Conclusion**

The discussion above demonstrates that although the respondents in the study were aware of the video tapes and slides for teaching, but they are not utilising it to teach Geometrical concepts in Mathematics. Similarly, most of the Mathematics teachers found challenges in using video tapes and slides for teaching, and the main challenges were: lack of proper training and unavailability of computers, video tapes and slides resources materials in the schools.

## **Recommendations**

From the findings of the study, the following recommendations were made:

1. Workshops, seminars and in house training should be organized for Mathematics teachers to guide and train them properly on how to utilise video tapes, slides and other technological gadgets so as to enhance the productivity of teaching Geometry in Mathematics.
2. Government and other relevant stakeholders should make available standard electricity supply in the senior secondary schools through some other sources like solar energy, Generators e.t.c.
3. Government and related agencies should make available resources materials for teaching and learning of Mathematics such as computers, video tapes, slides and other ICT related tools in senior secondary schools.

## Reference

- Abdul Kareem, M. and Musa, L. (2020). "Assessment of Availability, Utilization and Impact of instructional Materials on Performance of Physics Students in Kastina Metropolis" Nigeria. *Journal of the general studies unit, federal university wukari*. 2 (3): 44-54. ISSN: 2579-1273
- Aboyeji, B. O. (2014). Comparative effectiveness of video and print instructional packages for Teaching basic technology concepts in Nigerian schools. *Unpublished (Doctorial) Thesis submitted to the Department of Educational Technology, University of Ilorin*.
- Aramide, K.A. and Balarinde, O. M. (2015). Availability and use of Audio Visual and Electronic Resources by Distance Learning Students in Nigeria Universities: A case Study of National Open University of Nigeria (NOUN), Ibadan Study Center.
- Awotunde, P. A. and Ugodulunwa, C. A. (2004). *Research Methods in Education*. Fab Anieh (Nig) Ltd, Jos Nigeria
- Badamosi, A. A. (2020). Assessment of teachers' utilization, readiness and perception of PowerPoint usage for mathematics instructions in senior secondary schools in Sokoto metropolis, Nigeria
- Brecht, H. O. (2012). Learning from online lecture. *Journal of innovative in practice*. California State University. Sacramento California, USA.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches (4<sup>th</sup> ed.)*. Library of Congress Cataloging in Publication Data. Printed in the United State of America.
- Edem, N. B. and Ekon, E. E. (2021). The extent of use of video clip for teaching and learning in Nigerian universities: A case study of faculty of education, University of Calabar. *Academic Journals*, 16 (7): 289-295, July, 2021. ISSN: 1990-3839
- Muhammad, N. D. Maccido, I. and Hassan, A. (2016). Teachers' Perception on the problems of Teaching Construction (Geometry) in some Selected Secondary Schools in Sokoto State Metropolis. A paper presented at the 53<sup>rd</sup> Annual National Conference of the Mathematics Association of Nigeria (MAN) held at Ahmadu Bello University Zaria, Nigeria
- Muhammad, N. D. Isma'ila, A. A. and Maccido, I. (2020). lecturers' awareness and utilisation of blended learning for teaching educational courses in colleges of education in Sokoto state, Nigeria. *Journal of Education in Developing Areas (JEDA)*, 28 (1): March 2020 ISSN: 189420X
- Muhammad, N.D. Maccido. I. & Aliyu, M.D. (2022). Perception of University Lecturers on the Effectiveness of Remote Learning Technique for Teaching Educational Courses during Covid 19 pandemic in the North western Region of Nigeria. A paper submitted to *journal of science, mathematics and technology education Research for publication in volume 3* (1): ISSN: 2714-5166
- Olatayo, S.O. Omiola, M.A. & Adedapo, I.Y. (2012) Effect of Using Video Mediated Instruction as an Advanced Organizer on the Cognitive Achievement of Students in Mathematics. *International Journal of Educational Benchmark (Ijeb)*, ISSN: 2489-0170
- Onawola, L.C. (2007). Relative effects of two instructional textbooks on secondary school Students' performance in integrated science in Lokoja, Kogi State. Unpublished M. Ed. Thesis to the Department of Science Education, University of Ilorin.



- Sambo, Y. A. (2015). Effect of teachers' background knowledge of senior secondary school Mathematics course contents on students' achievement in geometry. *Abacus The Mathematical association of Nigeria*, **40** (1): 134-142.
- Sam Kayode, C. O. and Salman, M. F. (2015). Identification of conceptions of geometry held by Senior secondary school students in Ogun state, Nigeria. *Abacus – The mathematical Association of Nigeria*, **40** (1): 51-62.
- West African Examination Council, (2017 – 2020). Chief Examiners' Report. Analysis of Mathematics Results: Lagos WAEC.