

INVESTIGATING THE EFFECTS OF AUDIOVISUAL STIMULI ON LEARNING OUTCOME OF BASIC SCHOOL PUPILS IN MATHEMATICS IN OYO STATE, NIGERIA

K. A. SABITU, G. R. OLOSUNDE and T. A. AJAO

Department of Science Education School of General Studies Education Federal College of Education (Special) Oyo Oyo State, Nigeria

sabitcamor@gmail.com

Abstract

This study investigated the differential effects of color, animation and nonverbal sounds incorporated into microcomputer software on the learning of arithmetic concepts among basic school pupils. The population of the study was the pupils in Basic Schools in Oyo State, Nigeria. Fifty pupils were randomly selected and divided into two groups tagged the Experimental group and Controlled group to serve as sample using a simple random sampling technique. The control group was taught with primitive method while the experimental group was taught using audio visual aids. Mathematics Achievement Tests (MAT) which was the instrument was validated by experts and with reliability coefficient of 0.98 was administered after the lesson. Results showed that the significant role of Audiovisual Stimulus as the pupils taught with it performed better than the other group. Teachers to exhibit the use of audiovisual aids in teaching mathematics was recommended, among others.

Keywords: Audio, Learning, Mathematics, Technology and Visual

Introduction

Abimbade (2012) sees mathematics as the activities of human endeavours but in general terms, it is a discipline which helps to develop scientific thinking ability of an individual. The basic objectives of mathematics in secondary schools which are ability to recognise numbers and perform basic Functions, Data Collection and Interpretation, Critical Thinking and Problem Solving among others today are no longer realised. One of the reasons for this may be due to the poor foundation on which mathematics finds itself right from secondary school level of the pupils which leads to the pupils' poor performance in it as a subject. One of the reasons for these pupils' poor performance may be the influence of their peer group on them. In the Western world, starting at least from the 19th century, the debate on mathematics education has been huge and has involved some of the most important mathematicians. Such a debate has concerned any age range of the learners: from basic education until mathematics education at the university (Briggs, 2017).

Many pupils in basic and secondary schools experience difficulties with the learning of some aspects of the mathematics curriculum. Just as pupils find difficulties in learning mathematics, teachers equally find difficulties in achieving effective teaching in the

Nigerian school system. This has created challenges for parents, pupils, teachers and educationists. Teachers are now faced with the problem of achieving effective teaching that would result in better performances of pupils in both internal and external examinations (Azuka, 2015). According to Allen (2005), Audiovisual (AV) means possessing both a sound and a visual component, such as slide-tape presentations, films, television programs, church services, and live theater productions. Business presentations are often audiovisual (Becta, 2004). In a typical presentation, the presenter provides the audio by speaking and supplements it with a series of images projected onto a screen, either from a slide projector or from a computer connected to a projector using presentation software (Chute, 2009). Audiovisual service providers frequently offer web streaming, video conferencing, and live broadcast services.

Computer-based audiovisual equipment is often used in education, with many schools and universities installing projection equipment and using interactive whiteboard technology. (Burger & Shaughnessy, 2001). Another audiovisual expression is the visual presentation of sound (visual music) (Dwyer, 2009). The proliferation of audiovisual communications technologies, including sound, video, lighting, display, and projection systems, is evident in every sector of society: in business, education, government, the military, healthcare, retail environments, worship, sports and entertainment, hospitality, restaurants, and museums (Chute, 2009). The application of audiovisual systems is found in collaborative conferencing (which includes video-conferencing, audio-conferencing, web-conferencing, and data-conferencing); presentation rooms, auditoria, and lecture halls; command and control centers; digital signage, and more. Concerts and corporate events are among the most obvious venues where audiovisual equipment is used in a staged environment. Providers of this type of service are known as rental and staging companies, although they may also be served by an in-house technology team (e.g., in a hotel or conference center) (Sherard, 2001)

The importance of audio-visual (AV) technology in education should not be underestimated. There are two reasons for this; one, learning via AV creates a stimulating and interactive environment that is more conducive to learning; two, we live in an audio-visual age which means that having the skills to use AV equipment is integral to future employment prospects. Therefore exposure to AV technology in education is imperative (Allen, 2005). AV skills are essential in the world of business today. In the current economic climate, the government needs to make a long-term plan to ensure that the skills set of Nigeria match the evolution of AV. A research report conducted by 'Prospects' (a United Kingdom graduate careers company) identified that: *“there are strong signs that the IT industry will continue to grow across a range of industries and IT is the essential component which ensures businesses can run effectively and efficiently.”*

This highlights the absolute necessity of the role of the national curriculum to educate children with the AV skills that are necessary to perform the jobs of the future (Becta, 2004).

Hanna (2006) opined that AV technology has been used in schools for decades, but only in the form of a TV and video player to show short educational films. Now it is the computer that shows these educational films and homework is also being done increasingly

on PCs. Children learn differently and audio visual equipment gives teachers the chance to stimulate each child's learning process with a combination of pictures, sounds and attention-grabbing media. We are surrounded by audio-visual equipment and children are keen to understand the technology and keep up to date with applied science. More and more schools are taking advantage of AV technology to teach their pupils (Allen, 2005). This equipment can be used to present information to pupils but also the fact that they are interacting with AV technology daily also makes them proficient in using technology. Not exposing children to different forms of technology is depriving them of vital learning opportunities that could benefit them in later life for example through increased career opportunities. AV lessons should not just consist of children working in pairs on a PowerPoint presentation or rewriting a piece of work using Word, ICT should be challenging, exciting and fun (Becta, 2004).

Schools are sometimes reticent to recognize the benefits that technology offers to children who are in contact with them every day. Also, a child's technological ability often outweighs than that of the teacher (Burns, 2012). This creates a clear barrier to using AV in education effectively. A report was written by Becta in 2004 on 'a review of the research literature on barriers to the uptake of AV by teachers' states many factors to illustrate this gap. For example, "Resistance to change is a factor which prevents full integration of ICT in the classroom." Also, a very significant determinant of teachers' levels of engagement in ICT is their level of confidence in using the technology. Teachers who have little or no confidence in using computers in their work will try to avoid them altogether. The epileptic power supply is also another barrier in ours part of the world. Therefore to use AV technology successfully in education, these barriers need to be overcome. Audio-visual technologies will play a huge role in the future of schools thanks to the development of technology and the increasing body of evidence that proves its ability to improve learning and future employment prospects (Dwyer, 2006). AV is described as something that prepares pupils to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to a varied and developing technology. A wide selection of AV tools make teaching and learning a rich and enjoyable experience, inspires learners with creative and innovative multimedia activities and will also save time in lesson preparation. The ability to share this information will eventually create a 'global curriculum', (Becta, 2004).

Statement of the Problem

Basic school is the bedrock of all academic endeavours. There should be proper upbringing of children right from there. Pupils have not been exposed to the use of AV from the basic schools which may have enhanced their performances not only in mathematics but other subjects. This problem might be from unavailability, the inability of the teachers to use and so on. Having realised this, the study is designed to investigate the effect of audiovisual stimuli on learning of mathematics through the microcomputer-based class presentation.

Purpose of the study

The general purpose of this study is to investigating the effects of audiovisual stimuli on learning outcome of basic school pupils in mathematics in Oyo State, Nigeria. The specific purposes are to sought if;

1. There is significant difference between the performances of the pupils in the controlled and experimental groups.
2. There is no difference between the performance of male and female pupils in the experimental group.

Research Hypotheses

The following hypotheses guided the study

H₀₁: There is no significant difference between the performances of the pupils in the controlled and experimental groups.

H₀₂: There is no difference between the performance of male and female pupils in the experimental group.

Methodology

The method adopted for this study was a Quasi-experimental control group designed in which intact classes were assigned to experimental conditions. The population for this research work was made of pupils of basic schools in Oyo. The audiovisual aid used for this research work was software designed for the purpose, a computer system, and a projector. The sample included fifty (50) pupils who are randomly selected from five different schools in Oyo metropolis. The researcher ensured that at least a school is used in every four (4) local governments in Oyo metropolis, Oyo state. The pupils were divided into two groups. The first group called the control group was taught using the primitive method and the second group called the experimental group was taught using audio-visual aid scores for analysis were obtained and analysed using t-test at a 0.05 level of significance.

The instrument used for the study was a Mathematics achievement test (MAT) carefully structured using the basic school Mathematics syllabus. The instrument was given face and content validity by two Principal lecturers at the Educational Psychology Department of Federal College of Education (Special), Oyo, Oyo State. The instrument was firstly administered to pupils in Ibadan central Basic school which is not part of the proposed sampling school to test for the reliability of the instrument. A reliability coefficient of 0.98 was obtained using the test-retest method.

Permission was sought from the heads of the schools and the research was carried out with the aid of some class teachers in the schools. The data were analysed using t-test statistics.

Results and Discussions

The results of the work were organised in accordance in the research hypotheses as follow:

Hypothesis 1: There is no significant difference between the performances of pupils taught with AV and conventional Methods.

Table 1: Mean, Standard Deviation and t-test Statistic of Pupils Achievement in CSMI and conventional Method

Group	No	\bar{x}	S.D	t-cal	t_{α}	df	Remarks
Experimental	25	8.04	2.29				
Control	25	6.20	0.50	6.745	1.675	48	Reject the null hypothesis

From the above table, since t-calculated is greater than t- tabulated, the null hypothesis is rejected and we accept the alternative hypothesis that there is a statistical significant difference between their performances. The pupils taught with AV performed better despite they are from the same environment but different methods used. This is in corroboration with the view of Becta, (2004).

Hypothesis 2: There is no difference between the performance of male and female pupils in the experimental group.

Table 2: Mean, Standard Deviation and t-Test Statistic of Male and Female Pupils Achievement in the Control Group

Group	No	\bar{x}	S.D	t-cal	t_{α}	df	Remarks
Male	36	7.80	4.33				
Female	14	7.00	4.50	-4.62	1.68	48	Accept the null hypothesis

The table shows that t-calculated is less than t- tabulated, we, therefore, accept the null hypothesis that there is no statistical difference between the performance of males and female in the experimental group. This indicates that gender is not a factor in learning mathematics with audio-visual aids. Both male and their female counterpart have the same ability to learn mathematics in the same way. This is in corroboration with the view of Sherard (2001) that gender should not be a hindrance to the learning of mathematics at any level of education.

Summary and Conclusion

The findings of this study revealed that enough technological tools were not supplied to basic schools. The result presented in Table 1 where the total outcome of student performance in control group is lesser than that of their counter-parts in the experimental group confirms the statement. This is due to the computer illiteracy of many pupils.

There is no better time for a mathematics teacher to be well groomed in various ways of using computer to pass instruction to learner than now. So, the use of various computer software and audiovisual tools will enable the pupils to become proficient in solving problems. If various mathematical softwares are used in mathematics learning at the basic school level, the current overwhelming cry from parents and general public

concerning pupils performance in mathematics will be a things of the past and so the country witness national and technological development.

Recommendations

Based on the result of the study, it was recommended among others that in teaching mathematics, teachers should employ the use Audio –Visual Aids. This will help in arising and maintain the attention of pupils. Also, Mathematics teachers can use eclectic approach to the teaching of mathematics to basic school pupils. Eclectic approach suggests that mathematics teachers should develop his/her own technique for effective teaching. Teacher should use power point presentation to make teaching and learning of mathematics more interesting to the pupils.

Curriculum planners should inculcate new innovative methods of mathematics teaching into the curriculum and Government should introduce Computer Based Learning (CBL), such as E-learning should be introduced in basic School.

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