



EFFECTS OF MULTIMEDIA PACKAGES ON JUNIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN BASIC SCIENCE IN ABUJA FCT

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ABSTRACT

This paper looked to examine the Effects of Multimedia Packages on Junior Secondary School Students' Achievement in Basic Science in Abuja, FCT. Multimedia is a method of conveying information which considers several methods of communication. Effects of multimedia packages on students achievement is very important. This work was guided by two hypothesis. The purposive sampling technique was used to select two comparable Junior Secondary Schools with identical pretest mean score and a stratified random sampling techniques to select 5 students from each school, totaling 60 students and 5 basic science teachers from the sampled school. Data were analyzed using average mean score. It was revealed that a significant number of respondents strongly agreed that the use of multimedia packages in the teaching and learning improves students' academic achievement in basic science. Combination of various digital media types that integrates multisensory interactive presentations to convey message to the learners gives students retentive memory to recall learning concepts.

Keywords: *Multimedia, Achievement, Effect and Basic Science*

Introduction

Science is widely regarded as the foundation of modern technology around the world. Worldwide, especially in developing countries such as Nigeria, nations strive to grow their economies and education via the use of technology and science. This is because the world is becoming increasingly “scientific” (Allan, Emmanuel & Francis. 2019).

In the past, traditional lecture method, involving only the teacher in the teaching and learning processes was adopted. However, these strategies have not been successful in promoting effective learning, because effective teaching is key to effective learning. As a result, effective teaching refers to a way of teaching that can help pupils develop specific necessary abilities. .

Multiple-media has recently become a popular brand when it comes to educational technologies; businesses, education, and technology are just a few examples of where it is used. In recent years, as new and growing digital technologies have emerged, the phrase has become information and can be presented in a variety of ways, as indicated by the term “multimedia”. An alternative definition is a digital form. According to Allan, Emmanuel & Francis, (2019) when we talk about multimedia, whereas we’re talking about “means of communication through numerous media”, whereas we’re talking about “a document (a set of structured information) that contains information coded in at least one continuous (time-dependent) medium and one discrete (time independent included in multimedia elements are audio and video clips as well as animated graphics).

Audio, text, images, animations, and video are intelligently blended in today’s multimedia with the help of authoring software, which automate (Akinbadewa & Olaniyi, 2020). The interaction of multimedia is yet another distinguishing aspect. This allows the user to control “when” and “how” the elements are delivered. An area that has tremendously benefited from the particular capabilities of multimedia technology is education using them, teachers can present knowledge to pupils in variety.

In the nearest future, the use of multimedia instructions in teaching and learning will be the easiest means of impacting knowledge to students where the teachers and students may not necessarily be in physical contact and other technological instruments like robots may be used in passing information..

Concept of multimedia in Education

As a means of storing information, multimedia technology is somewhat similar to a traditional textbook Although students may be able to change the text using an electronic device, this method is more engaging than traditional note-taking (Allan, Emmanuel & Francis, 2019). Multimedia technology has the potential

and functionality to hold enjoyment for users compared to that of a standard textbook. Any learning or teaching should be associated with feelings of pleasure and enjoyment instead of boredom or fear.

Types of Multimedia

Text: Including notes, captions, subtitles, and other resources such as tables of contents, indices, dictionaries, and help facilities.

Data such as tables, charts, graphs, spreadsheets, statistics, and raw data of various kinds.

Video: Is a collection of moving pictures combined with audio files that provides one of the most intensive multimedia experiences.

Audio: Audio files are collection of sounds that can be added and combine with all other types of media in a multitude of ways (including speech, music, atmospheric background noise, and sound effects).

Graphics: Traditional media such as drawings, prints, maps and posters are commonly used in conjunction with computer-processed or totally computer-created imagery. It is possible to create photographic images using a variety of photographic mediums, such as (which record photographic images directly as computer graphics).

Animation: Any form of recording, whether it is on film, video, or a computer. Animated images (specifically, digital video, either converted from analogue film and video, or created entirely within a computer). Learning content can be presented in a multimedia format in a number of different ways. It was shown that signaling was more effective when the scientific explanation was delivered verbally as a text passage compared to when it was presented verbally as speech and when it was presented verbally and visually as a narrated animation in the study (Allan, Emmanuel & Francis, 2019)..

Rationale for Multimedia Usages

Media-rich learning experiences are a natural way for people to learn new things. It is possible to speed up the learning process by engaging all of the senses. Even in a structured educational setting, kids' sensory responses differ in their efficacy. As a result, multimedia learning experiences have the

advantage of appealing to the learner's pace, interest, and readiness, as well as his or her interests. .

Characteristics of Multimedia

1. Multimedia system must be computer centered
2. When it comes to constructing learning centers, the advent of multimedia instructional and support systems has given us the resources to do so.
3. Through the use of media technology as a means of assistance It is possible to provide pupils with a variety of approaches to learn a variety of subjects.
4. Multimedia systems are not limited to a particular sort of learning or instructional mode; they are a support for a variety of modes of learning and education.
5. When it comes to generating a variety of learning models, multimedia systems are touted as being more capable than a traditional classroom setting.
6. as a result of the fact that multimedia devices provide the possibility to learn extremely complicated abilities, which are related to a variety of different and precise theoretical knowledge bases
7. If we consider of the classroom and the instructor as the primary facilitator of instruction, then the advent and development of multimedia educational systems has opened up a world of possibilities.
8. There must be a multi-media system that is integrated, and the information that is processed must be presented digitally (John, 2016).

Challenges of Education in Nigeria

Education is incredibly important to the human race. Education is generally viewed as a human right that should be granted to everyone. The vast majority of international human rights organizations see this as a fundamental human right.

As a country, we face a number of challenges that make it difficult to provide a high-quality education that can lead to sustainable development. The funding of education in Nigeria has become a function of international financial institutions' demands (IFTs). In 2017 and 2018, the central government's education spending was less than 10 percent of its total spending, according to

figures. Education requires a steady stream of funds, and thank goodness states like Jigawa give it special attention. There are billions of naira that the government has allocated to the education sector in 2017.

Education growth in Nigeria is hampered by disagreements between the Federal, State, and Local Governments over the management of education at different levels of government. Let's say the federal government does not have full control over elementary school management, nor do states or local governments. This creates severe barriers to effective educational development at the lower levels..

As a result, many schools are created and governed by different governments, based on regional or party-political considerations, among other insignificant reasons. Currently, admittance to universities, polytechnics, colleges of education, and medical schools is based on political connections, rather than academic performance, in our educational institutions. Even the Unity secondary and primary schools and other well-equipped schools aren't immune to this admissions fraud, which has been going on for years now. In reality, Nigerian politicians today use their political positions or influence to help educate their own children, according to a recent study.

Information and Communication Technology in Instruction-Remedy

ICTs have made dynamic change in our modern societies. It has influenced all facets of life. The effects even more on our schools. The fact that ICTs offers both learners and teachers with more prospects in adjusting learning and teaching to individual need, schools are aptly forced to respond to this technological innovation. Ojo & Adu, (2018) states the possibilities of ICTs to increase access and improves relevancy and superiority of education in evolving countries. Tinio further itemized the capacities of ICT as follows: ICTs seriously enables the gaining and absorption of knowledge, offers the developed and emerging nations unprecedented potentials to promote educational institutions, promote policy development and implementation, and broaden the range of prospects for businessmen and the poor. One of the extreme adversities endure by the poor, and many other citizens of the weakest countries, is their sense of isolation deprived knowledge. ICTs can create access to knowledge in an unimaginable ways.

Mudasiru & Adedeji (2010) noted that ICTs have transformed the way People work and is currently revolutionizing education across the globe. As such, if schools continue to teach children using outdated skills and technologies, such students may not be able to compete in tomorrow's world. This alone is a sufficient reason ICTs' global recognitions and attentions. .

Although ICTs play substantial roles in presenting leveling strategies for developing countries, the certainty of the digital divides the gaps between those that can access and control the technology and those who do not and cannot. This makes an enormous variation in the use of ICTs. This shows that the initiation and incorporation of ICTs at variant stages and several types of education is now one of the most challenging task especially in developing countries. Failure to meet these trials will further broaden the gap of knowledge. According to Ojo & Adu (2018), there exist a public certainty that adoption of ICTs in schools contribute to a more constructivist learning and an increases greater responsibility on learners. This confines the role of the instructor to support, advice, and coaches' students rather than pure transmission of knowledge. The steady improvement in using multimedia packages started from learning about computer, to learning the computer skills, and finally to learning with the computers (Ojo & Adu, 2018). Teachers' unwillingness to implement novelties need to be consider in the context of present technology and obligations. Watson (2001) stated that "change or improvement can happen at schools if teachers understand themselves and understood by others".

For example, several teachers presently cannot make informed decisions on ICTs to achieve their teaching aims. A variety of factors are responsible for problems of using ICT in the curriculum (Mudasiru & Adediji, 2010). As such, the coming of ICT is yet to bring groundbreaking changes at most schools. Most often, computers are used for drill-and-practices and word processing. However, there has been a growing recent interest to find how computers and web can best be applied to improve on efficiency of education across all levels of formal and non-formal settings.

Ojo & Adu, (2018) description of the major roles of ICTs, distinguished it as an object for study, a piece of a vocation, and a medium of teaching. As a medium of teaching, ICTs are capable of realizing and implementing the evolving pedagogy of constructivism. Moreover, the differences between

conventional learning setting and constructivist methods are that the former sees learning as communication of knowledge to students as a singular responsibility of the instructor. .

Statement of the problem

This study is designed to investigate the effectiveness of a multimedia package in improving the achievement of secondary school students in Basic science.

Purpose of the Study

- To adopt a multimedia package for the learning of Basic Science in Junior Secondary School in AMAC, FCT.
- To examine the differences in achievement scores between learners instructed with multimedia approach and those instructed with the traditional approach in Basic Science in the selected junior secondary school students in AMAC - F. C. T

Research questions

The research questions addressed in this study are as follow:

- i. What is the effect of multimedia packages on the achievement of junior Secondary School Students in Basis science in AMAC-F.C.T?
- ii. What different accomplishment scores exist between learners taught with multimedia method and those instructed with the traditional approach in basic science in the selected junior secondary school students in AMAC - F. C. T?

Research Hypotheses

The following hypotheses are formulated for the study:

- a. Multimedia package has no significant effect on the educational accomplishment of Junior Secondary School Students in Basic Science in AMAC, Federal Capital Territory (FCT).
- b. There no statistical differences-existed between the achievements of high and low scorers exposed to multimedia packages in Basic Science.

Significance of the Study

This research work will be useful to the students, teachers, School administrators, teachers training Institutes and researchers. The study will help

students to participate actively in the lesson and also help students to alleviate the problem of large class size which typifies Basic science class.

The study will also develops the teachers' abilities of using multimedia software in teaching Biology. School administrators

Scope and Delimitation of Study

The study focuses on the effect of multimedia packages on junior secondary school student's achievement in basic science in AMAC Abuja FCT and to compare the differences between use of multimedia packages and traditional method of teaching.

Methodology

The research design chosen for this study was Quasi-experimental design

Population

The study comprises of all the JSS students in AMAC, FCT Abuja.

Sample and Sampling Technique

The study target Junior Secondary School Students in some selected schools in the FCT, thirty students were randomly selected.

Instrument for Data Collection

A self designed questionnaire was used. Section A of the questionnaire was personal data of the respondents while section B some items on the research question directly related to the research questions. The instruments were subjected to experts scrutinizing for validation to ascertain the content validity of the instrument before the production of the trial copy for the instrument. The instruments were validated by two experts in the department of test and measurement from University of Lagos.

Data Collection

The researcher used on the spot administration and collection of the questionnaire in order to to guide against lost of questionnaire in transit.

Data Analysis

The scale used in the instrument are Strongly Agreed (A) carries 4 marks, Agree (A) carries 3 marks, Disagree (D) carries 2 marks and Strongly Disagree (SD) carries 1 mark. Data was analyzed using mean statistical tools.

Presentation of Data Results

Table 1: Distribution of Respondents by sex

Sex	Number of respondents	Percentage
Male	25	40%
Female	35	60%
Total	60	100%

Table 1: shows that 40% of the respondents were male, while 60% of the respondents were female. This shows that female student's respondent's outnumbered male respondents which signify that majority of the respondents were female.

Hypothesis 1

Multimedia packages have no significant effect on the achievement of Junior Secondary School Students in Basic Science in AMAC – F.C.T.

Table 2: Analysis of average mean score on the effects of multimedia packages on the achievement of Junior Secondary School Students in Basic Science.

S/N	Items	SA	A	D	SD	X	Decision
		4	3	2	1		
1	It provides stakeholders with useful information to promote the use of multimedia in teaching and learning basic science	42	15	3	-	3.56	Accepted
2	It is a combination of various digital media types that integrates multisensory interactive presentations to convey message to the audience or learners.	50	10	-	-	3.83	Accepted

3	It frequently relies on problem solving as a basis for understanding – using images and videos of real world experiences.	41	13	4	2	3.52	Accepted
Average mean score						3.63	

To determine the effect of multimedia packages on the students' academic achievement a questionnaire was used to test the null hypothesis that multimedia packages have no effect on the academic achievement of Junior secondary school students in Basic science in AMAC – FCT Abuja and the result was analyzed using average mean score, with mean score of **3.56**, this is a positive response, based on this data, therefore, we reject the null hypothesis, meaning that multimedia packages has significant effect on students' academic achievement of junior secondary school students in basic science in AMAC, FCT.

Hypothesis 2:

There is no significant differences in achievement scores between students taught using multimedia approach and those taught using the traditional approach in basic science in the selected junior secondary school students in AMAC-F.C.T.

Table 3: Analysis of mean score of differences in the achievement score between students taught using multimedia approach and those using the traditional approach in basic science.

S/N	Items	SA	A	D	SD	X	Decision
		4	3	2	1		
1	It brings about teaching and learning activities that could ensure maximum students participation in teaching and learning of basic science	48	12	-	-	3.8	Accepted
2	It gives retentive memory to the students	52		8-	-	3.86	Accepted

3	The use of multimedia packages counter the traditional method of teaching basic science	44	15	1	-	3,72	Accepted
4	It makes students to learn at high level from well-designed multimedia presentations that traditional verbal or text only presentations	49	11	-	-	3.82	Accepted
Average mean score						3.8	

From table 3, Questionnaire was used to test the null hypothesis that there are no significance differences in achievement scores between students taught using multimedia approach and those taught using the traditional approach in basic science. With the mean score of 3.8, therefore we reject the hypothesis, meaning that there is significant differences in achievement scores between students taught using multimedia approach and those taught using the traditional approach in biology in the selected junior secondary school students in AMAC - F. C. T.

Discussion of findings

From the table 2 above, the average mean score of 3.63, this is a positive response. Based on this data, it is revealed that a significant number of respondents strongly agreed that the use of multimedia packages in the teaching and learning improves students' academic achievement in basic science. Also, the combination of various digital media types that integrates multi- sensory interactive presentations to convene message to the learners gives students retentive memory to recall learning concepts. Furthermore, the table show that the use of multimedia packages frequently relies on problem solving as a basis for understanding-using images and videos of real world experience has a positive influence on the teaching and learning of basic science in junior schools in AMAC. These findings are in conformity with that of Akinbadewa & Olaniyi, (2020) where it was found that multimedia instructional packages used in teaching and learning Basic Science in Junior Secondary schools enhanced

better students' engagements and positive attitudes toward learning. There are many reports about the importance of instructional resources on the teaching of Basic Science in Junior Secondary School. Corey & Jon (2020), mention seven basic roles of using instructional materials which include extension of human experience, provision of meaningful information, stimulation of interest, grouping of students interest, overcoming physical limitation, stimulating problem solving and providing diagnostic and remedial tools for teachers in teaching.

From table 3 above, the average mean score of 3.8 which is positive response, It can be concluded that there are differences in the achievement scores between students taught using multimedia approach and those taught using the traditional approach in basic science. This also reveals that multimedia packages brings about teaching and learning activities that could ensure maximum students participation in teaching and learning of basic science. More so, the use of multimedia packages counter the traditional method of teaching basic science, gives retentive memory to students and also makes students to learn at high level from well-designed multimedia presentations than traditional verbal or text only presentations in teaching and learning of basic science in Junior Secondary Schools in AMAC. These findings corroborates those of (Allan, 2015), where he postulated that 'there was a significant difference between the academic achievement of students exposed to multimedia instruction and those not exposed to in the study of photosynthesis.'

This implies that the intervention actually improved the students' achievement and therefore, can be concluded that the use of multimedia in teaching has a highly significant effect on students' academic achievement in Junior School Basic Science.

This implies that multimedia packages are effective for teaching basic science in junior secondary schools.

Conclusion

The use of multimedia Package has significant impact on students' academic achievement in basic science. It helps the teachers to utilize their talents fully, participate in all studies taken by their students' innovate and improve their methods of teaching through creating much work for them. The rapid changes

taking place all over the world pose a challenge to the educational sector. No doubt that modern communication and information technology tends to be contributive to rapid scientific advancement of the society. The need to educate our teachers and students in modern ICT cannot be over emphasized. This will facilitate effective knowledge transfer and build proper media for scientific and technological acquisition for students. An improved educational technology curriculum in line with current trends will enable basic science teachers meet up the challenges for the future. The ICT obviously is an indispensable tool for the science teachers of the 21st century. Judging from the research questions to the findings and analysis one can see that multimedia packages have much role to play in teaching and learning of basic science in our junior secondary schools in Federal Capital Territory.

1. The use of multimedia packages in the teaching and learning improves students' academic achievement in basic science;
2. Multimedia packages reduces the teachers work load, and also helps the teacher to integrate ICT tools and other forms of technology into classroom lesson in teaching and learning of basic science in junior secondary schools.
3. The students exposed to multimedia package performed statistically better than their counterparts exposed to traditional class room instruction in basic science.

Recommendations

In view of the above analysis, the following recommendations were made:

1. Teachers of basic science in junior secondary schools should employ the use of multimedia approach in the improvement of the levels of students retention.
2. In-service training programs, workshops and seminars are suggested to be organized for teachers of basic science.
3. Resource centers should be established in secondary schools to encourage the use of multimedia approaches for teaching secondary school subjects.
4. The basic problem of implementing basic science successfully in schools is lack of sufficiently qualified teachers.

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