

## **THE INFLUENCE OF INSTRUCTIONAL MEDIA ON THE ACADEMIC PERFORMANCE OF BIOLOGY STUDENTS IN IKONO LOCAL GOVERNMENT AREA**

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### **ABSTRACT**

This study reported the extent to which instructional media are being utilized in teaching and learning of biology in Ikono local government area of Akwa Ibom state. In order to effectively handle the study, four research questions were formulated to guide the study. Description statistical method was employed to determine the impact of teacher's effectiveness. Five secondary schools were selected to represent the population of study, the result of the findings revealed that instructional media were not readily available. Many teachers were not competent to integrate technology into teaching and learning. From the analysis, students that was taught with instructional media performed better. It was therefore, recommended that teachers should receive frequent technological training and that instructional media should be made available and accessible in schools to enhance effective teaching and learning.

**Keywords:** Freq. – Frequency, STEM – Science Technology Education & Mathematics, ICT – Information Communication Technology

### **INTRODUCTION**

The failure rate of students in examinations over the years is alarming and most importantly the science subjects nationwide. A

Careful observation of the phenomenon has revealed that aside from certain students and teachers variables, the instructional methods adopted by the teachers may play an important role in students understanding- most importantly is the removal of a sense of abstraction like in the teaching of sciences Seth *et al* (2010). Teachers need various kinds of information for teaching and research for the purpose of impacting knowledge on students and self- development. To achieve this, the right information must be available for the right person at the right time in the appropriate format, and consumed by the intended audience likely the students.

Instructional media is a broad term, which is often used interchangeably and synonymously with other term such as educational design and educational technology to generally refer to as tools technological tools, such as computer programmes, films, video-editing programmes, word processing equipment and calculating instruments used for teaching and enhancing learning outcomes in students Yang *et. al*(2009). Media refers to channels of communication. They are carriers of information between a source and a receiver. Media are very essential to good teaching and; to get the most of them, they must be selected properly and used effectively. Examples of media include power points, slides, videotapes, diagrams, printed materials and computer software. These are considered as instructional media when they carry messages with an instructional purpose Adjei (2012).

Accordingly, the purpose of Instructional media is to facilitate communication as well as to enhance learning. Instructional media serve a variety of roles in education. Their primary role is to help students learn, one way they do this is by providing an information-rich environment Gunga & Odundo (2013). Instructional media provide stimulated experiences, for example

visuals give added meaning to words and as such students can see what a new invention looks like. Videos or series of pictures are used to demonstrate a process and it gives learners the best opportunity to see skills demonstrated.

The enhancement of instruction through visual media utilization, through video and lecture capture offers unique approach for integrating visual media into an instructional environment. Visual media are source of data and information in the form of visual representation. These may be abstractions, analogues, rough illustrations, or digital reproduction of objects the data pertains to; as such they generally require the interpretation of data gathered Phorio Standards (2012). Their level of reliability compared to the sources varies considerably. These sources may be hosted on the internet, printed in publications, displayed through broadcast media, or otherwise disseminated.

Instructional materials are print and non-print items that are rested to impact information to students in the educational process. Instructional materials include items such as: kits, textbooks, magazines, pictures, newspapers, recording videos, etc. Instructional materials play a very important role in teaching and learning process. It enhances the memory level of students. At this time that education has spread widely, oral teaching cannot be the key to successful pedagogy. Therefore, the teacher has to use instructional materials to make teaching and learning interesting Adoyin (2010). Instructional materials are tools locally made or imported that help to facilitate teaching and learning process. Experience in a situation prepares a person to respond to similar situation in future. Use of instructional materials can appeal to the individual's attention by creating interest goal that will help the learner achieve direct effort. Eshiet (2013) summarized the role of teaching aids as follows:

- It promotes meaningful communication and effective learning
- They ensure better retention, thus making learning more permanent
- They provide a common experience upon which late learning can be developed
- They stimulate and motivate students to learn
- They encourage participation especially if students were allowed to manipulate materials used

A visit to some of the Colleges of Education revealed that some of the teachers are not training student-teachers on how to effectively use instructional media in their lessons. The teachers are basically using lecture method in teaching with very limited instructional media integration. The end result would be that student-teachers could end up teaching from abstracts after completion of their programmes because that was what they saw their teachers doing while under training. Supporting this view, Kemp (2010) asserted that "in order for pre-service teachers to demonstrate technology competences, teacher educators must themselves, model the use of technology in their own teaching". The use of well-planned visual aids during classroom lessons enhance the academic performance of students especially in the sciences.

The importance of technology integration into teaching and learning have been hailed by educational technologists across the world. Branford (2010) lamented in his book (Education without Technology) that "it does not make sense to think of a higher academic achievement when you had not recognized the important role technology plays in education". Technology enthusiasts have long heralded the power of technology; from the printing press to black board, to the laptops – to transform

education. There is a high level of interest for several reasons in harnessing modern technology to enhance teaching and learning. A substantial body of research shows that teachers' perception of instructional benefits is an influential factor that affects technology integration in classroom. Their findings showed that teachers computer proficiency, teachers overall support, teachers technical support and computer availability had a significant influence on teachers' belief about technology. Teacher's technological competencies had a stronger influence on the use and integration of ICT in classroom. Christensen *et al* (2014) revealed that teachers' competence with computer technology is a key factor for effective use of ICT in teaching. Teachers' computer competence is a major predator of integrating ICT in teaching

### **Objectives of study**

- Assess how instructional media influence the academic performance of students
- Assess the extent to which teachers use instructional media in teaching and learning
- Find out the availability of instructional media for teaching and learning
- Ascertain the factors that influence the teachers decision to integrate technology in teaching and learning

### **Research Questions**

- How does instructional media usage by the teachers affect the academic performance of teacher-trainee?
- How often do the course teachers use instructional media for teaching and learning?
- What are the instructional media available for the college to facilitate teaching and learning
- What factors influence the use of instructional media in teaching and learning

### **Scope of study**

The area of this study is Ikono Local Government Area of Akwa Ibom State. Ikono local government area is strategically located at the north central of the state. It is bounded to its north by Ini Local Government area, to the east by Ibiono Ibom local government area, to the west by Ikot Ekpene local government area and to its south by Abak and Uyo local government area respectively Ministry of Lands and Town planning (2015). The area has a male population of 69,501 and the female population of 62,403. Thereby making a total population of 131,904 people of all ages National Population Commission (2006).

The people of Ikono are the Ibibos, sharing the same customary beliefs, taboos, traditional worship system, market days, marriage rites, dress codes, and food types as well as languages and norms Okoko (2001). Subsistence agriculture is the main occupation of the people, they are also engaged in trading, transportation, artisans and civil service jobs.

### **Significance of study**

This study is significant in a number of ways and to a number of people, including the teachers, the school administration, the government, as well as parents. For the teachers, this study will educate the teachers on styles of teaching especially now that learners centered approach is advocated for. The study will educate the teacher on the importance of the application of certain useful media in the teaching of science subjects like Biology to improve student's understanding and hence their academic performance. The school administration will in turn directly responsible for the procurement of any device which is recommended for use in the classroom by the teacher. This study will educate them on the use of instructional media in teaching and learning, it will make their lesson delivery easier. The government on the other hand will create an enabling

environment at school which permits the introduction and the application of Technology-aided instructional media. Such enabling environment include funding the school as well as re-training the teachers on the use of the devices. The parents for major stakeholders in educational process, they are the worthy trustees of any school in a given locality for example, Parents Teachers Association. This study will inform parents of the need for a better, more qualitative and effective instructional lesson delivery for their children.

## **METHODOLOGY**

Descriptive research design was adopted for this study. This preferred because it determines the impact of teacher's effectiveness on academic performance of biology students in secondary schools in Ikono local government area.

### **Population of Study**

The population of the study consist of all senior secondary schools (SS2) in Ikono local government area.

### **Sample and Sampling Technique**

The researcher made use of the sample size of twenty (20) students from each of the five (5) public secondary schools and 67 teachers randomly selected for the study. Pieces of papers were written alphabetically to represent each school. The first five papers were picked representing the five (5) schools to be used as samples, the sample size was considered adequate as this could reduce sample error and enable generation of results.

**Table 1: Numbers of students selected from each of the sample schools.**

S/N	Name of Schools	No. of Students
1.	Comprehensive Secondary school Ukpom	20
2.	Government Secondary School Afalia Eket Eket	20
3.	Ikono Ibom Comprehensive Secondary school	20
4.	Federal Government Girls College Ikot IbioItong	20
5.	Government Secondary School NtoNsek Ession Udim	20
	Total	100

### **Research Instrument**

The instrument used for the data collection were a self-developed questionnaire having a total of 10 items. The instrument were relevant to the study because it elicited information about participant’s ways of thinking which aided in answering the research objectives.

The questionnaire item was piloted on five secondary schools in Ikono local government area. The questionnaire was designed to generate information on the basis of research questions.

## **RESULTS AND DISCUSSION**

### **Research question 1: How do instructional media affect the academic performance of students?**

To answer this question, a sample of 100 students (shared into 2 groups- group A=50 and group B= 50) were selected from five secondary schools in Ikono local government area to be engaged in a Biology lesson on the topic “Digestion in Human” as an experimental group A and control group B. The experimental



group was taught with instructional media (video simulation of digestion in human) while the control group was taught the same topic without any instructional media apart from the traditional blackboard illustration. A test was given after the lesson. The achievement scores of students when taught with instructional materials and when taught without instructional materials were recorded in Table 2.

**Table 2: Results of students based on instructional materials**

Variables	No. of respondents	No. of respondent with correct answers
Group A: With instructional materials	50	49
Group B: Without Instructional materials	50	8

Table 2 above shows that there is relationship between the use of instructional materials in teaching and learning of students in biology. The result revealed that students taught with instructional materials (video simulation of digestion in human) had correct answers while only few students in the control group passed, most of them did not answer the question correctly.

## Research question 2: How often do the course teacher use instructional media in teaching and learning?

**Table 3: Frequency of the use of instructional media**

Media	All the time		Often		Sometimes		Never	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Computer	2	3.0	8	11.9	51	76.1	6	9.0
Overhead projector	-	-	5	7.5	45	67.2	17	25.4
Electronic mail	-	-	-	-	8	11.9	59	88.1
E-learning package	-	-	-	-	8	11.9	59	88.1
Video	-	-	7	10.4	50	74.6	10	14.9
Real objects	6	9.0	50	74.6	11	16.4	-	-
Posters	3	4.5	8	11.9	13	19.4	43	64.2
Geographic map	2	3.0	4	6.0	49	73.1	12	17.9
Internet	-	-	5	7.5	11	16.4	51	76.1
Social Media	-	-	2	3.0	50	74.6	15	22.4

Source: Field data 2017

Freq. –

Frequency

From the survey questions dealt with the frequency of use of technologies by the teachers. Responses of participants in the table above revealed that almost 59(88%) students were never taught with the e-mail and online learning packages in teaching. Fifty-one students admitted they were never taught with internet. Unavailability of overhead projector made it difficult for the teachers to use video. Similarly, most students reported either sometimes or never have they been taught with geographic maps. One medium which was reported highly was real objects.

### Research Question 3: What are the Instructional Media Available in your school for teaching and learning?

**Table 4: Inventory of main instructional media in the 5 secondary school in Ikono LGA**

Schools	Computers	Overhead Projectors	Flip Charts	Video equipment	Internet connectivity
Comprehensive Secondary school Ukpom	3	-	1 ream	-	Not available
Government Secondary School AfoliaEketEket	2	-	-	-	Not available
Ikono Ibom Comprehensive Secondary school	2	-	-	1	Not available
Federal Government Girls College Ikot IbioItong	5	-	2 reams	2	Not available
Government Secondary School Nto NsekEssionUdim	1	-	1 ream	1	Not available
Total	13	-	3	3	

Source: Field Data 2017

From table 4, all the secondary schools does not have internet connectivity. They have quite a few computers, apart from the federal school that has upto 5. The videos equipment are not adequate in number, for some schools flip charts are available.

**Research question 4: What factors are influence the use of instructional media in teaching and learning**

**Table 5: Factors Influencing Teachers use of Instructional Media**

Factors	Very important	Important	Somehow important	Not important
Training	62(92.5%)	1(1.5%)	4(6.0%)	-
Accessibility	62(92.5%)	1(1.5%)	4(6.0%)	-
Workshop and seminars	24(35.8%)	43(64.2%)	-	-
Personal interest	53(79.1%)	12(17.9%)	2(3.0%)	-
Availability	54(80.6%)	8(11.9%)	5(7.5%)	-
Attitude	53(79.1%)	10(14.9%)	4(6.0%)	-
Peer support	11(16.4%)	14(20.9%)	40(59.7%)	2(3.0%)

The total number of teachers=67

Responses in Table show that high percentages of teachers valued all items as being very important with “training and accessibility” as the most highly rated (92.5%), followed by “Availability that was rated (80.6%).

The responses given by the teachers indicated that such factors were very important in influencing their decision in using instructional media. This is not different from the assertion given by Spodark (2003) when he called these an enabling environment that caters for the total integration of the appropriate media in teaching and learning. Similarly, Sandholtz& Reilly (2004) in their

finding revealed that teacher's technological skills was a strong determinant in ICT integration, but they are not conditions for effective use of technology in the classroom. They argue that training programmes that concentrate on ICT pedagogical skills instead of technical issues and effective technical support, workshop and seminars, help teachers apply technologies in teaching and learning.

Adjei (2012) revealed that "students learn best when audio-visual materials are integrated in teaching process. Instructional materials facilitate learning of abstract concepts by helping students to concretize ideas and also stimulate their imagination. The use of instructional media makes teaching effective as it enables learners to participate actively in classroom instruction. The implication is that performance is enhanced when teachers use different types of instructional materials in teaching all subjects particularly science. It is therefore, important for teachers to integrate technology into teaching process since it has the potential of improving the performance of students

## **CONCLUSION**

The findings derived from this study are:

- The use of instructional materials impact teaching and learning of students in biology
- The use of teaching aid make learning real and permanent
- Biology teachers does not always make use of available teaching aid during instruction
- Teaching aids available for teaching of biology is grossly inadequate and this negatively affect effective teaching and learning
- The use of instructional material promote retention
- The use of teaching aid influences the academic achievement of students in biology

It was found that instructional materials play a vital role on students' academic performance in senior secondary two students in biology. Proper presentation of lessons with good instructional materials enhance good understanding of subject matter.

## **RECOMMENDATION**

These recommendations were aimed at paving way to Nigerian schools including the schools in Akwa Ibom State and Ikono local government area in particular, to improve on the use of instructional materials in all secondary schools in Nigeria. In so doing, it will help the students to carry out their learning activities with lots of interest and hence good academic achievement.

- There must be adequate provision of instructional media by the government and philanthropist.
- The availability of the instructional materials should be coupled with accessibility to prevent the materials from turning into white elephant
- There should be training opportunities for the teachers to acquire technological skills. The training opportunities should include sponsorship for ICT teachers to upgrade their skills and in turn provide support for the rest of the teachers
- The government should establish resource centers to enable teachers borrow teaching aids which may not be in their school
- It is recommended that the management of the schools should set up online and wireless internet services so that the students and the teachers could access them all the time. The online service should include training programme for teachers to use e-learning packages like Moodle, which will enable teaching and learning to happen anytime, anywhere and any day
- The government should organize workshops, seminars and conferences for teachers to enable them up-date their

knowledge on new developments on the use of instructional materials

- Teachers should try hands on the production of simple aids so that students can see what they are talking about in lessons
- School heads should supervise their teachers more closely to ensure that the available instructional materials are effectively utilized.

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