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Interactive Media as Determinant of Teaching Skills among Basic Science and Technology Teachers in Ekiti State, Nigeria

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ABSTRACT

Interactive media has been highly influential in teaching and learning various subjects. However, this kind of technology can be many-sided, making communication within and outside the classroom environment effective and focused. Although teaching can be highly informative, integrating pictures or figures can assist an individual in learning and holding on to information much more effectively. Therefore, in this study, attempts are made to investigate interactive media as the determinant of teaching skills among basic science and technology teachers in Ekiti state, Nigeria. The population of this study were basic science and technology teachers in science schools in Ekiti State, Nigeria. A purposive sampling technique was used to select the sample and six teachers, each representing the six teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closing) captured in the study. In all, eighteen (18) science teachers participated in the study, and they were six (6) basic science and technology teachers from each of the three (3) science schools located in the three (3) senatorial districts of Ekiti state, Nigeria. A descriptive survey design was employed for this study, while Interactive Media and teaching skills Questionnaire IMATSQ was used to collect data on relevant variables. Data collected were analyzed using mean, frequency counts and Pearson's Moment Correlation. Findings revealed that teaching skills among basic science and technology teachers in science schools in Ekiti state, Nigeria, were reasonable but needed to be adequately interactive. In addition, the interactive media usage level is required to be higher in teaching and learning basic science and technology in science schools in Ekiti state, Nigeria.

Keywords: Education, Multimedia, Interactive Technology, Teaching, Learning, Integration

I. INTRODUCTION

Learning is the light that shows humankind the right direction to follow. It is the industry where human capital is produced for growth and development in any society through the raw material of knowledge. Science and technology are bodies of knowledge crucial for sustainable development worldwide as both

have contributed immensely to the material progress of nations. According to Olagunju, Adesoji, Iroegbu and Ige (2003), they are also necessary for the economic development of countries. Consequently, national growth and development can only be achieved when science and technology are given prominent attention. Eliora (2005), while supporting the need for science and technology education, posits the effectiveness of the science teacher in ensuring the quality of life and stability in society.. Apling and Sri Haryani (2019) have shown that effective teaching requires best practices, considering the complexity of education and learning in the contemporary world. However, to ensure best practices in basic science and technology classrooms, the teacher who is the facilitator of teaching and learning processes should be helped to develop adequate teaching skills (Akpan, 2010). Moreover, appropriate teaching skills are essential. To make teaching and learning of science content relevant to the growth and development of the individual and the society, according to Gbolagade (2009).

Thankachan (2010) defines *teaching skill* as an act or behaviour intended to facilitate learning activities directly or indirectly and a specific instructional activity with procedures that teachers should employ to cope with classroom situations. Ayeni (2011) posits that knowledge in science and technology teaching can be facilitated when teachers engage teaching skills to achieve the specific objective of the lesson for desired learning outcome. Onwuagboke, Osuala and Nzeako (2017) claim that teaching skills are inevitable tools for effective teaching and more so that Ike (2017) submits that science and technology teachers should be pedagogically sound in the demonstration of basic teaching skills such as set induction, use of examples/ stimulus variation, various questioning techniques, re-enforcement, planned repetition, non-verbal communication and closure.

The dynamic age requires every science teacher to be confident in their teaching skills because teaching offers the chance to permanently change other people's lives (Ige & Ogunseemi, 2016). However, this is because the present age science and technology learners must develop mastery of its dynamic content with the necessary quality to cope with the twenty-first-century skills, and this makes acquisition and demonstration of teaching skills an indicator of best practices and teaching effectiveness at all levels of education (Goodley, 2018). Therefore, teaching basic science and technology in Nigerian schools calls for introducing appropriate strategies to teach various subject matter in science. These strategies will be the medium that makes the evaluation of the teaching process more objective, highly reflective, realistic and practical in teacher professional development is the integration of interactive media into teaching practice. Recently, interactive media has been infusing the instructional method as an instrument for effective teaching and learning, as shown in Oshinaike and Adekunmisi (2012).

Interactive media facilitates reflective teaching observation by allowing participants and observers to view their work and point out behaviors as seen from the camera perspectives (Huntley-More & Panter, 2006). Through interactive media, the communication of information can be done more effectively and can be an effective instructional medium for delivering information. Moreover, interactive media brings multimedia access to knowledge with possibilities of information and communication technology that tremendously impact learning. The instructional media have emerged in various resources and equipment and can be used to increase or consummate teachers' efforts to guarantee the learners' effective learning. According to Oshinaike and Adekunmisi (2012), it is discerned that traditional media technologies can meet the demands of our educational system; as a result, they are being substituted by multimedia technology.

Interactive media provides a learning environment that is self-paced, learner-controlled and individualized. Given this, Neo and Neo (2000) described the power of multimedia as being sensory, stimulating the many senses of the audience. It is also interactive, enabling the application's end users to sway the content and flow of information. This medium has introduced significant educational system changes and impacted how we communicate information to learners. Ogunbote and Adesoye (2006) expressed that interactive media adds a new dimension to learning experiences because concepts are easier to present and comprehend when the words are complemented with images and animations.

Furthermore, it has been established that learners retain more when a variety of senses are engaged in imparting knowledge, and the intensity of the experience aids retention and recall by engaging social, emotional and intellectual purposes. The evolution of interactive media has made it possible for learners to become more involved in their work. However, this would make them active participants in their learning process instead of just being passive learners of the educational content. Therefore, basic science and technology teachers should approach teaching sessions with relevant skills incorporating interactive media into teaching and learning processes. However, most basic education teachers have been found to exhibit poor teaching skills, which may negatively affect classroom performance and inhibit the lesson objectives' attainment. This study seeks better ways by which basic science and technology teachers can be helped to develop teaching skills to encourage learners-centred environments relevant to the contemporary world. Therefore, to address the problem of teaching skills, it is pertinent to investigate interactive media as the determinant of teaching skills using basic science and technology teachers in Ekiti state, Nigeria, as a case study.

Research Questions

Two research questions guided the study

1. What is the level of teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closing) among basic science and technology teachers in science schools in Ekiti State, Nigeria?
2. What level is interactive media usage among basic science and technology teachers in science schools in Ekiti State, Nigeria?

Research Hypothesis

The following hypothesis was formulated for the study;

1. Is there any significant relationship between the usage of interactive media and basic science and technology teachers' teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closure)?

2. METHODOLOGY

A descriptive survey design was employed for this study because it allows for collecting facts from a selected population. The population of the study were all basic science and technology teachers of the government science schools in Ekiti state, Nigeria. Purposive sampling was used to select the sample and six (6) teachers, each representing the six (6) teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closing) captured in the study. In all, eighteen (18) science teachers participated in the study. The samples were drawn from Six (6) basic science and technology teachers from each of the three (3) science schools located in the three (3) senatorial districts of Ekiti state, Nigeria. Interactive Media and Teaching Skills Questionnaire IMATSQ was developed to collect data on relevant variables.

The instrument comprises section A, the respondents' bio-data, among others. Section B is relevant questions relating to their knowledge of teaching skills, while section C seeks information on computer efficacy; both are with (4) alternatives scoring A= 4, B = 3, C = 2, D =1, of which respondents are required to pick the correct answer. The researcher ascertained the reliability coefficient of the instrument at 0.85. Data collected were collated and analyzed using descriptive and inferential statistics. Administration of the tool took about 30 minutes, during which every participant has given the Interactive Media and Teaching Skill Questionnaire (IMATSQ) to complete. The two research questions were answered using frequency counts, percentages and mean; Pearson Product Moment correlation was used to test the only hypothesis generated for the study researcher ascertained

3. RESULTS AND DISCUSSIONS

Research Question one: What is the level of teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closing) among basic science and technology teachers in science schools in Ekiti State, Nigeria?

Table 1: Level of basic science and technology teachers' teaching skills.

Items	Very High	High	Average	Low	Very Low	Mean \bar{x}
Lesson planning	7 (38.89)	4 (22.22)	3 (16.67)	2 (11.11)	1 (5.56)	3.96
Set induction	9 (50.00)	2 (11.11)	5 (27.78)	1 (5.56)	0 (0.00)	3.68
Stimulus variation	8 (44.44)	5 (27.78)	1 (5.56)	1 (5.56)	3 (16.67)	3.75
Questioning	5 (27.78)	4 (22.22)	4 (22.22)	4 (22.22)	1 (5.56)	2.54
Use of Instructional materials	6 (33.33)	5 (27.78)	3 (16.67)	2 (11.11)	2 (11.11)	3.51
Closure	8 (44.44)	7 (0.38)	0 (0.00)	2 (11.11)	1 (5.56)	2.33
Weighted Mean						3.23

Note: Mean responses range from 0-1.40 = Very Low, 1.50-2.40 = Low, 2.50-3.40 = Average, 3.50-4.40 = High, 4.40-5.00 = Very High while figures in brackets are percentages

Table 1 shows that the status of teaching skills of basic science and technology teachers in science schools in Ekiti state was generally higher, with the weighted Mean of 3.23, which is greater than the threshold of 3.00. Though teaching skills were considered moderate by rating, questioning skills and closure were lower than the threshold of 3.00 against the skills of lesson planning, set induction, stimulus variation and the use of instructional materials among basic science and technology teachers in science schools in Ekiti state, Nigeria. The predictive power of questioning skills and closure was meagre compared to all other teaching skills captured in the study. One could easily tag the low rating of questioning skill in this work with the submission of Sugihartini, Sindu, Dewi, Zakariah, and Sudira (2019), who argued that the use of questioning to assist the learning process is relatively recent. Teachers previously dictated the questioning process during lessons.

Still, with the era of mastering learning content to mastering life skills today, questioning is now a skill that has to be learned. In addition, the low rating of the teaching skill of closure may not be different from Sugihartini, Sindu, Dewi, Zakariah, and Sudira (2019) that teachers' inability to close the lesson and end the core learning activities bothers deficiency in reviewing, conducting evaluations, and giving follow up. These components are necessary to carry out a comprehensive view of all the learning materials and to know students' concentration levels and assimilation in the teaching and learning processes.

Research Question 2

What level is interactive media usage among basic science and technology teachers in science schools in Ekiti State, Nigeria?

Table 2: Level of usage of interactive media among basic science and technology teachers.

Items	Very High	High	Average	Low	Very Low	Mean \bar{x}
Moving images and graphics	9 (50.00)	4 (22.22)	3 (16.67)	1 (5.55)	1 (5.55)	1.37
Animation	6 (33.33)	7 (38.89)	2 (11.11)	2 (11.11)	1 (5.55)	0.78
Digital text	5 (27.78)	2 (11.11)	4 (22.22)	4 (22.22)	3 (5.55)	1.20
Video	7 (38.89)	4 (22.22)	4 (22.22)	2 (11.11)	1 (5.55)	2.45
Audio	10 (55.55)	4 (22.22)	2 (11.11)	1 (5.55)	1 (5.55)	2.34
Weighted Mean						1.63

Note: Mean responses range from 0-1.40 = Very Low, 1.50-2.40 = Low, 2.50-3.40 = Average, 3.50-4.40 = High, 4.40-5.00 = Very High while figures in brackets are percentages

Table 2 indicates that the level of interactive media usage among basic science and technology teachers in science schools in Ekiti state is low, with a weighted mean of 1.63, which is less than the threshold of 3.00. All the items on interactive media (moving images and graphics, animation, digital text, video, audio) are found to be low among basic science and technology teachers in Science Schools in Ekiti state, Nigeria. The result of the study negates the submission of Huntley-More and Panter (2006), who states that interactive media, among other uses, are meant to facilitate a reflective teaching observation process both by allowing participants and observers to view their work and also potentially allowing them to point out behaviors as seen from the camera perspectives.

It, therefore, reveals that there was no reflective practice in teaching and learning basic science and technology in science schools in Ekiti. Findings also indicate an inadequate flow of information. The lesson content needed to be adequately disseminated during teaching and learning basic science and technology in science schools in Ekiti state, Nigeria. Ekiti The previous submission differed from Neo and Neo (2000), who described the power of multimedia as such that it can stimulate all learner senses.

Testing of Hypothesis

Hypothesis one: There is no significant relationship between the usage of interactive media and basic science and technology teachers' teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closure).

Table 3: Correlational Matrix of the Predictor Variable

Variables	Interactive media	Lesson Planning	Set Induction	Stimulus variation	Questioning	Use of Instructional materials	Closure
Interactive media	1.00						
Lesson Planning	0.017**	1.00					
Set induction	0.001**	0.225	1.00				
Stimulus variation	0.005**	0.410	0.015	1.000			
Questioning	0.664	0.467	0.182	0.274	1.00		
Use of Instructional materials	0.223	0.014**	0.032	0.012	0.067	1.000	
Closure	0.003**	0.452	0.433	0.025**	0.263	0.358**	1.00

**= Significant at $p < 0.05$ alpha level

Table 3 shows the correlation matrix between interactive media and teaching skills (lesson planning, set induction, stimulus variation, questioning, use of instructional materials and closure). The study indicates that lesson planning ($r=0.017$, $p < 0.05$), set induction ($r=0.001$, $p < 0.05$), stimulus variation ($r=0.005$, $p < 0.05$) and closure ($r=0.003$, $p < 0.05$) have positive and significant relationships with interactive media. Moreover, questioning ($r=0.664$, $p > 0.05$) and use of instructional materials ($r=0.223$, $p > 0.05$) are insignificant to interactive media. The result indicates that lesson planning, set induction, stimulus variation, and closure were significant while questioning and using instructional materials have no meaningful relationship with interactive media.

Therefore, the null hypothesis is, as a result of this, rejected for lesson planning, set induction, stimulus variation, and closure at 0.05 significant level. The outcome of this study agrees with Neo and Neo (2000), who describe interactive media as stimulating the audience's many senses. It also corroborates Ogunbote and Adesoye (2006). They expressed that interactive mechanism adds a new dimension to learning experiences because concepts are easier to present and comprehend when the words are complemented with images and animations.

4. CONCLUSIONS AND RECOMMENDATIONS

Teaching skills among basic science and technology teachers in science schools in Ekiti state, Nigeria, were found to be reasonable but needed to be adequately interactive. In addition, the level of usage of interactive media could have been higher in teaching and learning basic science and technology in science schools in Ekiti state, Nigeria. Therefore, the findings of this study acclaimed that; various interactive media can still improve the teaching skills of basic science and technology teachers while policymakers can put different programmes and policies in place to encourage and enforce multimedia teaching and learning in schools in Ekiti state, Nigeria. Moreover, relevant authorities can deploy more multimedia resources to schools, followed by adequate training on its usage in Ekiti state, Nigeria.

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