
Effect of Technology Tools on Students' Interest in Biology: A Survey of Osun State High Schools in Nigeria

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Abstract: *The main purpose of this study was to investigate the effect of technology tools on Osun state high school students' interest in Biology. A descriptive survey method was used for this study. Three hundred science students selected from ten high schools in Osun state were sampled in this study. A self-designed questionnaire was used for data collection. Data collected were analyzed using appropriate descriptive statistics. Findings revealed that: students make use of technology tools for learning in high schools which influence their interest in learning Biology but technology tools for learning Biology are scarce. The study concluded that few students make use of technology tools in learning Biology in high schools and these technology tools influence students' interest in learning Biology. Based on the findings, the study recommends government and other stakeholders in education to provide support in the use of technology in teaching and learning process in schools to enhance performance.*

Keywords: *Technology tools, education and technology, technology use in teaching and learning, teaching biology, teaching science, teaching biology using technology, technology effect in education, students' interest in Biology*

1. INTRODUCTION

Science is a systematic acquisition of organized knowledge about the natural and physical world which is established in form of predictions, observations and experimentations, without which a nation's technological advancement becomes almost impossible. There are three basic science subjects offered in Nigerian high schools among which Biology is one. Umar (2011) stated that Biology is a natural science which deals with the living world. It explains the structure, function, development and existence of living things, while also providing justifications for their reactions with the environment within which they exist. Peter (2015) declared that the study of Biology

provides an ideal preparation for a list of careers ranging from basic science to engineering. The Biology curriculum offered in Nigerian high schools has the objectives of preparing the students to acquire adequate laboratory and field skills in Biology; acquire meaningful and relevant knowledge in Biology as well as acquire reasonable and functional scientific attitude (FME, 2009). It is imperative therefore to train individuals particularly in Biology who would not only possess the qualities as spelt out in Biology curriculum but would also develop the necessary interest required to excel in the subject.

The provision of a future workforce which possess skills and competences necessary to meet society's needs is a key deliverable of the educational system, it is a paradox therefore, that there is now a decreasing focus on learning Biology at all educational levels (Lawler, 2016). Some students find learning Biology more interesting with the use of technology tools (Bigler & Hanegan, 2011; Dong, Guerrero & Moran, 2008; Peterman, Pan, Robertson & Lee, 2014, Spornjak, Puhek, & Sorgo, 2010). Some however stated that high school students don't necessarily find the learning of Biology like other subjects more interesting with the use of technology tools except for the particular technology tools which they find acceptable (Cheung, Yen & Tsang, 2011).

With an increasing instance of electronic possibilities as teaching methods, textbooks are fast becoming obsolete, and using technology tools may likely increase students' interest, motivation and achievement. Mobile and electronic-learning have transformed the traditional learning context from classroom to a virtual space (Gikas & Grant, 2013). Despite a significantly high presence of mobile devices, computers and interactive technologies in today's classrooms, teachers still lack the required skills and knowledge regarding how to integrate these technologies into the curricula (Ogwu & Ogwu, 2010). As Brush, Glazewski and Hew (2008) have stated, technology tools are used for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. It makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of technology tools. Technology tools also support student-centered and self-directed learning. In spite of the widely advocated benefits of implementing technology-based teaching/learning activities, there are obstacles preventing teachers and students from using technology in their classrooms (Beak, Jung & Kim, 2008; Ogunleye, 2007; Ndudi and Chinedu, 2016).

Even though there are many new technology tools currently available for teachers to use in their classrooms, training must be provided and continuously encouraged for implementation to be successful. Teachers should realize that if they spend the initial time learning to use technology tools, such as an interactive whiteboard, email, or the Internet, the tools could benefit their

students on the long run. With practice and a little extra planning time, teachers should be able to integrate technology into their classrooms and soon witness the benefits, such as improved students test scores, motivation and interest. The technology tools suggested in this study are user friendly and could possibly reap many rewards for students in the classroom. Therefore, this study intended to examine the effect of technology tools on students' interest in biology with reference to osun state high schools in Nigeria.

2. METHODOLOGY

Survey research design was adopted for this study, with the various methods of collecting information from a sample of students. This was done to examine the effect of technology tools on Osun State high school students' interest in Biology. One category of respondent was involved in this study, namely students. Random sampling technique was used for selection of schools. Stratified sampling technique was used in selection of science students offering Biology in selected high schools. The sample size was ten high schools in Osun State. Thirty (30) science students were selected from each school making a total of three hundred respondents.

The research instrument adopted for this study was a self-designed questionnaire titled "Effect of technology tools on Osun State high school students' interest in Biology" The questionnaire was segregated into two (2) sections A and B. Section A was demographic. It elicits information on the personal data of the respondents such as name of school, type of school, gender, class. Section B consists of four (4) parts of twenty (20) items. The draft copy of the questionnaire was shown to experts in tests and measurement as well as specialists in technology tools implementation and evaluation who adjudged both the face and content validity of the instrument. The reliability of the research instrument used was determined using test-retest method of reliability test and Pearson Product Moment Correlation statistic to determine its internal and external consistency. A reliability value of 0.762 was obtained. Since this reliability coefficient was high above the 0.5 average, the designed instrument was adjudged fit for the purpose for which it was constructed.

The researcher personally visited some selected high schools in Osun State and obtained permission from the schools' authority for this study, copies of the questionnaire were personally distributed to the respondents by the researcher and effort was made to see that the respondents understand the contents of the materials and assistance was given where necessary so that they will comply with the directives. At the end of the exercise, copies of the questionnaire administered were returned to the researcher immediately. The personalities of respondents were also kept confidential and anonymous, while research ethics and legal issues in research were also observed to the letters. Data were analyzed using frequency count of responses, percentage,

mean, standard deviation and relative importance index. Modified Likert rating scale was used to determine whether the items were strongly agreed, agreed, disagreed or strongly disagreed to by respondents.

3. RESULTS

3.1 Demographic Characteristics

The demographic characteristics of the respondents was established. One category of respondent was involved in this study which is students. The minimum age of students who partook in this study was 14 and the maximum age was 20. The least (29.8%) in the population of respondents were found in high school Three, a higher (32%) population of respondents were found in high school One, while the highest (38.2%) were found in high school Two.

3.2 Students' Usage of Technology Tools in Learning Biology in Osun State High Schools

The descriptive analysis on students' usage of technology tools in learning Biology in Osun State high school is as found in Table 1.

Table 1

Students' Usage of Technology Tools in Learning Biology in Osun State High schools

| S/N | ITEMS | SA | A | DS | D | RII | P (%) | Ranking |
|-----|--|----|-----|-----|----|------|-------|-----------------|
| 1. | I have not been using technology tools for learning Biology at all. | 44 | 98 | 79 | 79 | 0.59 | 59 | 4 th |
| 2. | I make use of technology tools for learning Biology once in a while. | 34 | 108 | 108 | 50 | 0.61 | 61 | 2 nd |
| 3. | I am frequent in the use of technology tools in learning Biology | 72 | 100 | 77 | 50 | 0.66 | 66 | 1 st |
| 4. | Technology tools can only be used for learning specific topics in Biology | 51 | 80 | 95 | 69 | 0.59 | 59 | 4 th |
| 5. | Technology tools for learning Biology is not available in my school | 48 | 88 | 87 | 94 | 0.60 | 60 | 3 rd |
| 6. | My teachers do not make use of technology tools while teaching Biology | 58 | 85 | 81 | 78 | 0.61 | 61 | 2 nd |
| 7. | Use of technology tools within Osun State high school environment is unrealistic | 66 | 75 | 83 | 73 | 0.61 | 61 | 2 nd |

Table 1 shows students' usage of technology tools in learning Biology in Osun State high schools. Of which 66% frequently used technology tools in learning Biology, followed by once in a while usage, my teachers do not make use of technology and usage of technology tools within Osun State high school environment is unrealistic by 61%, followed by technology tools for learning Biology is not available in my school by 60%, and finally I have not been using technology tools for learning Biology at all or technology tools can only be used for learning specific topics in Biology or technology tools available for teaching Biology are not compatible with our classroom environment by 59%.

3.3 Osun State High School Students' Interest in Biology with the use of Technology Tools

The descriptive analysis to check if Osun State high school students find Biology more interesting with the use of technology tools is shown in Table 2.

Table 2

Students' interest in Biology with the use of technology tools

| S/N | ITEMS | SA | A | DS | D | RII | P (%) | Ranking |
|-----|--|-----|-----|-----|-----|------|-------|-----------------|
| 1. | I get more interested in learning Biology using technology tools. | 120 | 117 | 45 | 16 | 0.78 | 78 | 1 st |
| 2. | I get more confused while using technology tools to learn Biology. | 34 | 61 | 108 | 93 | 0.52 | 52 | 4 th |
| 3. | Using technology tools for learning Biology makes no differences. | 42 | 68 | 104 | 78 | 0.55 | 55 | 3 rd |
| 4. | Learning Biology is more encouraging without employing technology tools. | 75 | 82 | 86 | 57 | 0.65 | 65 | 2 nd |
| 5. | Technology tools for learning Biology is time wasting | 32 | 47 | 99 | 118 | 0.49 | 49 | 5 th |
| 6. | My teachers dislike the use of technology tools | 31 | 38 | 108 | 113 | 0.47 | 47 | 6 th |

Table 2 shows if Osun state high school students find Biology more interesting with the use of technology tools. I get more interested in learning Biology using technology tools by 78% followed by learning Biology is more encouraging without employing technology tools by 65% (but the gap between the 1st and 2nd is wide), using technology tools for learning Biology makes no difference by 55%, I get more confused while using technology tools to learn Biology by 52%. Technology tools for learning Biology is time wasting by 49% and my teachers dislike the use of technology tools by 47%.

3.4 Challenges Faced by Osun State High School Students while Using Technology Tools in Learning Biology

The descriptive analysis on challenges students face while using technology tools in learning Biology is expressed in Table 3.

Table 3

Challenges Faced by Students while Using Technology Tools

| S/N | ITEMS | SA | A | DS | D | RII | P (%) | Ranking |
|-----|---|----|-----|-----|----|------|-------|-----------------|
| 1. | I find it difficult to handle and manipulate technology tools. | 46 | 62 | 90 | 93 | 0.54 | 54 | 5 th |
| 2. | Technology tools for learning Biology are too expensive for me to afford. | 55 | 82 | 81 | 74 | 0.59 | 59 | 4 th |
| 3. | Technology tools for learning Biology are scares | 73 | 105 | 73 | 46 | 0.67 | 67 | 1 st |
| 4. | Most technology tools available for learning Biology make use of electricity which is epileptic and thus discouraging | 55 | 98 | 77 | 67 | 0.61 | 61 | 2 nd |
| 5. | Biology concepts are not well supported by technology tools | 53 | 70 | 114 | 60 | 0.59 | 59 | 4 th |
| 6. | Available technology tools for learning Biology are obsolete | 66 | 68 | 84 | 82 | 0.60 | 60 | 3 rd |

Table 3 shows the challenges students face while using technology tools in learning Biology. Which were: technology tools for learning Biology were scarce by 67% followed by most technology tools available for learning Biology make use of electricity which is epileptic and thus discouraging by 61%. Available technology tools for learning Biology are obsolete by 60%, technology tools for learning Biology are too expensive for me to afford, Biology concepts are not well supported by technology tools by 59%, and I find it difficult to handle and manipulate technology tools by 54%.

4. DISCUSSION

The findings of this study revealed that majority of respondents agree that students frequently use technology tools in learning Biology which agrees with the studies of both Gikas and Grant (2013); as well as that of Brush, Glazewski and Hew (2008), who stated that technology tools are used by students to discover learning topics, solve problems, and provide solutions to the problems in the learning process, and that it makes knowledge acquisition more accessible, and

concepts in learning areas are understood while engaging students in the application of technology tools.

Also, some students find learning Biology more interesting with the use of technology tools, which concur with Bigler & Hanegan (2011); Dong, Guerrero & Moran (2008.); Peterman, Pan, Robertson, & Lee (2014) and Spornjak, Puhek, & Sorgo (2010) whose research studies indicated that the use of technology tools for learning increase students engagement, interest, motivation and satisfaction in learning Biology and other science subjects. On the contrary, Cheung, Yen & Tsang (2011) stated that high school students don't necessarily find the learning of Biology like other subjects more interesting with the use of technology tools except for the particular technology tools which they find acceptable.

Furthermore, it was shown that challenges like scarcity of technology tools, epileptic power supply to drive those tools, and the obsolete nature of some tools are encountered by students in the course of employing technology tools for the learning of Biology, which is in line with the position of Beak, Jung and Kim (2008) that in spite of the widely advocated benefits of implementing technology-based teaching/learning activities, there are obstacles preventing teachers and students from using technology in their classrooms and thus its application in Nigerian high schools is still low. Ogunleye, (2007), Ndudi and Chinedu, (2016) however have a contrary view on the calibre of challenges faced in employing technology tools for learning biology by stating that the problem is not about students learning but that most teachers are not prepared to use technology tools and that the majority of the existing school buildings are not equipped to integrate the new ICT especially in public high Schools.

5. CONCLUSIONS

From the findings of this study, it was concluded that few students make use of technology tools in learning Biology in high schools and these technology tools influence students' interest in learning Biology. It is also established that there are challenges encountered by students while learning Biology. Some of these are: scarcity of technology tools, epileptic power supply to drive those tools, some tools are obsolete while some others are quite expensive to afford.

Based on the findings of this study, it was recommended that there is a need for high school students to be better encouraged in utilizing technology tools for learning Biology so as to boost their interest in the subject. School management, government and other relevant stakeholders in the education sector should come together and address the challenges encountered by students while learning Biology.

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