



Impact of Visual Learning Devices on Secondary School Biology Students' Academic Performance in Ilorin, Nigeria

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ABSTRACT

Visual learning devices can be instructional tools utilised by the instructors globally. However, despite its relevance for teaching, the awareness of its use have not been notably established. Therefore, the study examined the impact of visual learning devices on secondary school (SS) biology students' academic performance in Ilorin, Nigeria. Study was of descriptive of the survey type and sampled were 100 teachers and 139 students in Ilorin, Nigeria. The instrument was the researchers-designed questionnaire which was validated by two Biology educators, two educational technologists and a test, measurement and evaluation specialist. Whereas, the face and content and pilot tested were observed with Cronbach alpha, and reliability coefficients were recorded at 0.05 level of significance. Seven research questions were raised and answered while three research hypotheses were formulated and tested. Findings revealed a significant difference between male and female students; between the students in SS I, II, and III and between the rural and urban schools students on impact of visual learning devices on students' academic performance. Therefore, the study concluded that visual learning devices has impact on students' academic performance. Hence, the use of visual learning devices was recommended for all secondary schools in Nigeria for the teaching of Biology.

Keyword: learning devices, academic performance, biology students, impact

INTRODUCTION

Learning devices are referred to as educational media, instructional media, digital learning tools, multimedia devices which are aids to instructional delivery. Studies on learning devices that has very successful instructional delivery in Nigeria schools have been looked into in the study. For example, Egomo, Enyi and Tah (2012) examined the accessibility and degree of utilization of Information and Communication Technology (ICT) devices for instructional delivery in Cross River State tertiary institutions. Their study concluded that there was significantly low usage in respect of the devices used by the instructors.

Meanwhile, Oshinaike and Adekunmisi (2012) examined the use of multimedia devices on learning. The authors stressed the needs for teaching and learning processes to be replaced by multimedia technology which provides a suitability learning environment that promotes self-paced and individualization. Also, Omodara and Adu (2014) further investigated the relevance of educational media and multimedia technology for effective content delivery. The study further highlighted the various classifications of educational media and multimedia technology with diagram and tabular illustration. The study concluded

that learning media like Information and Communication Technology (ICT) is inestimable in teaching and learning process. Likewise, Ngonso, Egielewa and Nyong (2018) worked on the influence of media on interactive communication in Nigeria Education. It was concluded that the learners and instructors are aware of this due to the use of the equipment by lecturers. In essence, visual learning devices are majorly the instructional equipment that catch the attention of the learners through the sense of sight.

Students' academic performance is often used in educational research, it is vague in nature. Although, academic performance is sometimes interchangeably used with the word academic achievement or academic success (York, Gibson & Rankin, 2015). In a nutshell, it can be said that academic performance is the student's success in attaining an educational goals and sometimes it reflects how well the learner achieve the attainment of standards set in the institution or by the educational authorities (Steinmayr, Meißner, Weidinger & Wirthwein, 2014). Many researches have been done on academics performances of students. For example, the study of Gbolli and Keamu (2017) researched into the motivational and learning strategy in improving student learning outcomes. Also, Duruji, Azuh and Olarenwaju (2014) studied the influence of learning environment on performance of students in external examinations. The study revealed the positive effects of some mentioned variables on students' academics performances. Likewise, Olanipekun and Aina (2014) worked on the extent to which teachers characteristics influence the outcome of learners' academic performance. The result revealed that students' were motivated to learn when their teachers exhibited positive characteristics. Adebayo and Adigun (2018) researched into the extent of availability of instructional materials on students learning, the result was that there were shortfalls in the availability of some visual instructional

materials for adequate learning. In essence, teachers should manipulate well the visual learning devices to promote fruitful academics performances.

Biology is one of the science subjects taught in secondary schools in Nigeria. It is the science subject that deals with the study of life. Biology is made of topics and concepts which will bring about human good health and happiness. Humans need the understanding of biology to maintain healthy living, so as to be able to pursuit their goals of life (Thompson and Soyibo 2012). This school subject is the scientific study of living things and vital process (Martin & Robert, 2015). Biology is further detailed to compose of numerous sub-discipline like zoology, botany, genetics, medicine, agriculture, anatomy and histology, to mention a few. Hornby and Wehmeier (2007) described Biology as the scientific study of life and structure of plants and animal. Similarly, Gorgeous (2013) describes Biology as a natural science that deals with study of life and living organisms, including their structures, growth, function, distribution, evolution and taxonomy.

The objectives of new Secondary School (SS) Biology curriculum as provided in the National Policy on Education (2013) include: Adequate laboratory and field skills in Biology: Acquisition of necessary Biology skills (for example observation, classification, Identification and others): Meaningful and relevant knowledge in Biology: Ability to apply scientific knowledge to everyday life, matters of personal and community health and agriculture and Reasonable and functional scientific attitude. (Federal Republic of Nigeria, 2013).

Biology is undoubtedly a key discipline in understanding and responding to some of the most pressing issues of the day, from the many challenges arising from the population growth, human impact on ecosystems and services to climate change (Kim & Diong, 2012). It plays a vital role in the development of a nation. According

to Sarojini (2019); Nwakonobor (2008) and Ahmed & Abimbola (2011), recent advances in the field of Biochemistry, physiology, ecology, genetics and molecular Biology have made the subject a central focus in most human activities. The benefits of Biology have helped proffer solution to many problems which include; food scarcity, population explosion, health, pollution, hygiene, and family life.

Despite the importance of biological knowledge to human and the efforts of researchers to improve its teaching and learning, the performance of students in the subject had consistently remained low (Ibe, Gambari, Yaki, Gana & Ughiva 2014; Effiong&Odey 2013). Studies carried out by different science educators such as Cetin, Ertepinar and Geban (2015); Ali, Toriman and Gasim 2015 have revealed that students performed poorly in Biology. Given that the level of biology students' performance in Nigeria still remain inconsistent and low compared to the other two sciences. Many researchers like Obikwe (2008); Ityokyaa and Adejoh (2014); Gbigbadau, Abimbola and Ahmed (2014); Cetin Ertepinar and Geban (2015); among others have carried out studies to proffer solutions to the problem of students poor academic performance and they came up with different solutions, in which improvement where observed but the performance still remain unsatisfactory.

It is on this note, that this study is focusing on investigating the possible factors that influence the performance of Biology students in secondary school based on their learning devices. A number of studies have been conducted on the factors that influence the performance of students in secondary schools and higher institutions, in Nigeria and other countries, in science and other subjects. Edeh and Vikoo (2013) assessed the extent of the factors that influenced students' performance in chemistry Kolokuma/Opokuma local government area of Bayelsa State. It was found that attitude, previous preparation, study style, parental involvement and teachers' expectancy were the factors that influence the students' performance.

Also, Rossi (2017) investigated the factors affecting the academic performance of economics and business administration evening students of university. The study found a positive correlation between academic performance of the students and family social economic status. However, a negative relationship between the academic performance and working factors of the students. Similarly, the performance of students in Biology, chemistry and physics of the West African Senior School Certificate Examinations (WASSCE), for years 2012 to 2019 confirmed the poor performance of students in science, especially biology as shown in Table 1

Table 1. Candidates' Enrolment and Performance in May/June West African Senior School Certificate Examinations in Biology, Physics and Chemistry in Nigeria 2012-2019

Year	Biology			Physics			Chemistry		
	Total sat	Credit pass	%	Total sat	Credit pass	%	Total sat	Credit pass	%
2012	1,646,150	587,040	35.66	624,658	429,415	68.74	627,302	270,570	43.13
2013	1,648,363	852,717	51.73	637,023	297,988	46.77	639,296	462,517	72.34
2014	365,384	766,971	56.17	635,729	386,270	60.76	636,268	397,649	62.49
2015	1,390,234	798,246	57.42	684,124	410,543	60.01	680,357	412,323	60.60
2016	1,200,367	740,345	61.68	705,125	415,655	58.95	706,873	408,122	57.74
2017	580,449	394,898	68.03	377,851	205,757	54.45	377,970	320,635	84.83
2018	1,087,063	679,299	62.48	728,354	571,687	78.49	728,551	424,231	58.22
2019	1,033,304	775,103	75.01	725,853	565,746	77.94	726,132	566,156	77.96

Source: West African Examinations Council (WAEC). National Head Office, Yaba, Lagos.

Table 1 shows that Biology students' performance when compared with the other core science subjects (Chemistry and Physics) is poor from 2012 to 2019, despite the fact the subjects is being generally considered very important which includes study of living organisms and life processes. Nevertheless, there was gradual improvement in the years 2013 to 2019. However, the outcome of the performance generally is still not impressive (at credit level) for a country like Nigeria yearning for advanced scientific and technological development.

Gender influence had been identified as one of the factors affecting students' performance in science subjects at senior secondary school level. The biological clarification of gaps in the performance between male and female students recommended that the differences in the brain structure, hormone production, and maturation rates in them can give explanation for differentiated performance in school-related tasks. Studies also showed that the parts of the brain responsible for prescribing verbal information and allowing the replacement of information between cerebral hemispheres were more

highly developed in girls (Kimura, 2005). Viadero (2006) pointed out that girls displayed earlier development in their brain regions which is responsible for impulse control and they also matured earlier than boys. Nevertheless, the range to which these biological differences declared themselves in behavioural differences and their implications for learning was unknown.

There are many research works which have been carried out on gender studies and it has been discovered that the influence of gender on students' academic performance and achievement differs. And this has been very controversial. Many researchers established significant gender differences in science education while some did not. Naugah (2011) carried out a study on factors affecting the choice of science subjects among secondary school level in Mauritius, the findings revealed that both male and female students prefer hands-on-activities and contextual examples reflecting real-life situation as against the traditional method of teaching. It was also discovered that majority of the girls' experiences of science were negative and this deterred them from taking science

beyond the compulsory level though they were aware of its importance.

Edmore, Maropeng and Cosma (2012) also carried out a study on female students' perceptions of gender and academic achievement: A case of sixth form girls in Zimbabwean school. The study adopted a qualitative approach in which focus interviews with female high school learners were conducted. The study found that female students believe that they were not in par with boys in terms of treatment. Their treatment in schools, at home and in society led to under-development and it was concluded that female high school students held certain perceptions which they believed negatively affected their academic achievement.

In a study carried out by Himschoot (2012) on student perception of relevance of biology content to everyday life, to determine the relationship between changes in perception of relevance and gender using three topics which are: cell-to-cell, genes and protein, and patterns of inheritance using ANOVA and *t*-test statistics. The results from the two-way ANOVA showed that, there was no significant relationship for the pre and post survey score by gender. So also the *t*-test statistic showed that after participating in a higher education non-biology major's course, there was no significant relationship between changes in students' perception of relevance of biology content to everyday life and gender for cell-to-cell communication ($F(1,192) = .130, p = .719$) and in addition, there was no significant relationship between changes in students' perception of relevance of biology content to everyday life and gender for relationship between changes in perception of relevance and gender for genes and proteins ($F(1,190) = .249, P = .618$). Similarly, there was no significant relationship between changes in students' perception of relevance of biology contents to everyday life and gender for patterns of inheritance ($F(1,178) = .151, P = .698$).

In the same vein, Adodo and Oyeniyi, (2013) examined student variables as

correlates of secondary school students' academic performance in biology in Ekiti State, Nigeria., using a descriptive survey type. The study comprised 400 biology students selected using stratified and simple random sampling techniques and a researchers designed questionnaire and biology achievement test to elicit response from the students. The data collected were analysed using Pearson's Product Moment Correlation and multiple regression analysis, the study found that there was no significant difference between male and female students in their academic performance in biology in the secondary schools.

Researchers had given reports over the years that there were no longer distinct differences in the cognitive, affective and psychomotor skill achievements of students in respect of gender (Arigbabu & Mji, 2004; Bilesanmi-Awoderu, 2006; David & Stanley, 2000; Din, Ming & Ho, 2004; Freedman, 2002; Sungur & Tekkaya, 2003). Females were being encouraged and responsive into developing positive attitudes towards science. Other researchers have stated that there is difference on this issue. For example, in a study carried out by Eriba and Sesugh (2006), also, Onekutu and Onekutu (2002) it was found out that males performed better than their female counterparts in science and mathematics achievements. These contradictory and inconclusive findings have led to using gender as the moderating variable for this study.

Many research workshave also been carried out on the influence of school location on teaching and learning. It was discovered that students learning may be influenced by the environment in which they find themselves. Owoeye and Yara (2011) researched on school location and academic achievement of secondary schools in Ekiti State, Nigeria it was found that there was a significant difference between academic achievements of students in rural and urban secondary schools as measured by senior school

certificate examinations. The mean for the rural school achievement score was 1:10 while the urban had an achievement score of 1:35

Lawal (2013) investigated the levels of scientific literacy among Senior Secondary School students in Oyun Local Government Area of Kwara State, Nigeria. The researchers found out that there was no significant difference in the levels of scientific literacy between students in rural and urban areas in Oyun Local Government as revealed in the study. There was no significant difference in the levels of scientific literacy of students' school location based on their knowledge, skills and attitude having X^2 value of 12.95 which is lower than the table-value (15.51), X^2 value (7.87) also lower than the table-value of (14.07) and X^2 value of 7.20, which is also lower than the table-value of 14.07 respectively. This implies that the urban secondary schools have benefit in terms of science equipment in the laboratory and science teachers to teach the subjects effectively but the equipment are not frequently used by the teacher.

Juma (2015) carried out a study on exploring the development of biology literacy in Tanzanian Junior Secondary School Students. The finding revealed that students in rural areas did not feel that what they learn in biology classes at school is useful or relevant to them, this is in contrast with the responses of urban students. It was seen in this study that urban participants are less interested in pursuing biology or science related career compared with their peers in rural schools. The percentage of both rural and urban participants interested in a biological related career were 72% and 39% respectively and of those who were not interested in pursuing a career in biology, 61% were located in urban schools and 28% were based in rural schools.

It was then submitted that rural students have fewer career role models to learn from than their peers in the cities and that most of the potential role models in rural areas are nurses and doctors who are

highly respected in rural communities, but urban students have a wider range of career role models to learn from. They are having more choices available for them. It was also seen that the rural students did not know how to apply the knowledge of biology taught in school to their day to day activities but could only be used in chosen career. Akintola (2017) assessed the knowledge of biological drawings possessed by the senior school students in Oyo State Nigeria. Students' biological drawings achievement test was used to collect data from the students. The study found that there was a significant difference in the knowledge of biology drawings possessed by senior school students based on their school location in favour of the students from urban schools. Therefore, studies on influence on school location on students' academic performance is inconclusive, hence, the need for this study.

The importance of visual learning devices on the students' academic performance as been established by some studies. For example, Ngozi, Samuel and Isaac (2012) agreed that visual materials gains more understanding in terms of multiple impression recorded through the eye, ear, touch and other senses. Also, Muhammad, Ya'u, Aliyu and Hassan (2018) mentioned that visual device helps to eradicate mostly the challenges of instruction on the school curriculum. Similarly, Ezenwa (2018) established that visual learning devices is significant positive in teaching of French language. Also, Adediran, Orukotan and Adeyanju (2015) submitted that use of visual learning device assist to accompany classroom instruction.

The aforementioned work were done generally on instructional devices which includes information and communication technology. There is no study so ever known to the researchers done on learning devices in the post primary schools axis which is the focus of this study. Therefore this study looked at availability of learning devices such as 1, 2, 3, 4, 5, and their

usefulness for delivery of learning content in secondary school Biology in Ilorin metropolis.

Research question:

What is the available learning devices used for teaching Biology in secondary school? What is the perceived usefulness of learning device to the teachers? What is the perceived advantage of using learning devices? What is the perceived significant difference on the impact of visual learning devices on the academic performances? What influence does gender has on the impact of visual learning devices on the Academic performance of students? How does student’s classes influence the impact of visual learning devices on the Academic performance? Does school type of students influence the impact of visual learning devices on the Academic performance?

Research hypotheses:

Based on research question 4, these research hypotheses were put forward for the study:

Hypothesis testing

There is no significant difference on the impact of visual learning devices on the academic performance of students based on gender. There is no significance difference on the impact of visual learning devices on the academic performance of students based on their classes. There is no significance difference on the impact of visual learning devices on the academic performance of students based on their schools type.

METHODS

This study which was a descriptive of the survey type, sampled are the teachers and students in Ilorin metropolis, Kwara State. The population of five secondary secondary Schools of 139 students and 100 teachers.

Researcher-designed questionnaires were made available for both the learners and teachers to establish the respondents’ view on the learning devices availability, use of learning devices, and advantages of learning devices for improving learning in the primary school. The draw up of the questionnaire was validated by two Biology educators, two educational technologists and a test, measurement and evaluation specialist for suitability in respect of the face and content and pilot tested on 20 pupils and the data generated were analysed with Cronbach alpha, part by part, to measure the internal consistency. That result reliability coefficients of availability of learning devices $r=0.76$, $p<0.00$. $r=0.88$, $p<0.00$ in term of the frequency of adoption usage of learning devices, $r=0.84$, $p<0.00$ for usefulness of learning devices, $r=0.78$, $p<0.00$ for the advantages of utilising learning devices, specified the reliability of stated instrument for the data collection.

Table 2 shows that male teachers were 4 (40%) and female teachers 6 (60%) were the respondents, also male senior secondary school students were 45 (32%) and female were 94 (68%).

Table 2. Distribution of Respondents

Variable	Teachers		Students	
	Numbers of the Respondents (Teachers)	%	Numbers of the Respondent (Students)	%
Male	40	40	45	32
Female	60	60	94	68
Total	100	100	139	100

What are the types of Visual instructional devices used by the teachers. The visual instructional devices used by the teachers include, Flash Cards, Film Script,

Charts, Pictures, Video, Television, Maps, Diagrams, Digital Video Disc and Camera.

The perceived usefulness of the learning devices on students' academic performance was highlighted in the table 3.

Table 3 Perceived usefulness of learning devices by the teachers

S/N	Items	Mean
1	Learning devices enhance my effective teaching	4.7
2.	Learning devices give me absolute control over my teaching	4.4
3.	Learning devices support part of my teaching.	4.2
4.	Learning device reduces boredom over my teaching	4.8
5.	Learning device makes my teaching more different	4.4
6.	Learning device increases my clarity in teaching.	4.0
7.	Learning devices becomes much easier with Visual instructional devices.	4.0
8.	Learning device assists me to achieve my stated objective.	5.0
9.	Learning device makes me talk less	4.0
10	Learning device promotes active participation of my students.	4.7
Grand mean		4.4

Table 3 shows that, item 8, learning device assists me to achieve my stated objective with the mean of 5.0 which was the highest. Followed by item 4, learning device reduces boredom over my teaching, with 4.48 and the least was item 3, learning devices support part of my teaching. The grand mean score for usefulness of learning devices was found to be 4.40 taking 2.5 as

the average benchmark. It can then be inferred that teachers perceived the usefulness of learning devices in teaching and learning.

The perceived advantages of using learning devices on students' academic performance are revealed in the table 4.

Table 4. The perceived advantage of using learning devices

S/N	Items	Mean
1.	Using learning devices for teaching will not be difficult	4.5
2.	Adopting learning devices for teaching will not be frustrating	4.5
3.	Utilising learning devices for teaching will not take more time	4.2
4.	Employing learning devices would not allow external forces on my teaching.	5.0
5.	Make use of learning devices for teaching will not be cumbersome.	4.3
6.	Implementing learning devices for teaching will not be too complex	5.0
7.	Adopting learning devices for teaching will not navigate	4.5
8.	Utilising Learning devices for teaching will not create tension among students	4.5
9.	Using learning devices for teaching will not instill panic on the students	4.5
10.	The use of learning devices for teaching will not bring embarrassment to my teaching	5.0
Grand mean		4.6

As shown in Table 4, items 4, 6 and 10 employing learning device would not allow external forces on my teaching, Implementing leaning devices for teaching will not be too complex and The use of

leaning devices for teaching will not bring embarrassment to my teaching with 5.0 mean are the highest. Followed by item 1, Using leaning devices for teaching will not be difficult, 2 Adopting leaning devices for

teaching will not be frustrating, 8 Utilising Learning devices for teaching will not create tension among students and 9, Using learning devices for teaching will not in still panic on the students having the mean of 5.0 each. While Using Visual instructional device for teaching will not take more time with 4.2 in item 2 was the least.

However, the grand mean score for advantage of using learning devices was 4.6. Using 2.5 as the average benchmark, it can then be inferred that teachers had positive perception towards the using of Visual learning aids for instruction.

Hypothesis testing

Research question which asked the influence which gender has on the visual learning devices particularly on the academic performance of students. Translated to Hypothesis one.

Ho₁: There is no significant difference on the impact of learning devices on the academic performance of students based on gender.

To test this hypothesis, t-test statistics was used to compare the mean of the male and female. This appears in table 5.

Table 5. t-test statistics mean of the male and female primary school students.

Variables	No	Mean	SD	Df	t-value	p-value
Female	94	46.60	5.20	137	2.208	.029
Male	45	48.47	3.50			

Source: Field survey 2019

Table 5 reveals the significant value of 029 is greater than 0.05 alpha level. This result points out that there is significant difference between male and female students on impact of learning devices on students' academic performance. Therefore the null hypothesis was rejected.

Research question 6, which states that: How does student's classes influence the impact of visual learning devices on the

academic performance? translated to Hypothesis two.

Ho₂: There is no significance difference on the impact of learning devices on the academic performance of students based on their classes.

To test this hypothesis, ANOVA statistics is used to compare the mean of the students in the three classes (I, II, and III). This appears in table 6,

Table 6. The ANOVA statistics of the senior secondary school classes I, II, and III students

Source	Type III Sum of Squares	F	Mean Square	F	Sig.
Corrected Model	215.606	2	107.803	4.854	.009
Intercept	308087.819	1	308087.819	13871.748	.000
Factor	215.606	2	107.803	4.854	.009
Error	3020.524	136	22.210		
Total	311322.000	139			
Corrected Total	3236.129	138			

Source: Field survey 2019

Table 6 revealed the significant value of .009 is greater than 0.05 alpha level. This result points out that there is significant difference between the students in SS I, II, and III in their academic performance. Therefore the null hypothesis was rejected.

H03: There is no significance difference on the

impact of visual learning devices on the academic performance of students based on their schools.

To test this hypothesis, ANOVA statistics was used to compare the mean of the students in public secondary schools. This appears in table 7.

Table 7. The ANOVA statistics of the five senior secondary schools.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91.171 ^a	4	22.793	.992	.414
Intercept	300545.692	1	300545.692	13078.410	.000
Factor	91.171	4	22.793	.992	.414
Error	3033.399	132	22.980		
Total	307075.000	137			
Corrected Total	3124.569	136			

Source: Field survey 2019

Table 7 revealed the significant value of 4.14 is greater than 0.05 alpha level. This result points out that there is significant difference between the SS II on impact of visual learning aids on students their academic performance. Therefore the null hypothesis was also rejected.

RESULTS AND DISCUSSION

The use of visual learning devices is positive in the part of the teacher, therefore it can then be inferred that teachers perceived the usefulness of visual devices for teaching and learning. Also, that teachers had positive perception towards the using visual learning aids for instruction. More so, the teachers agreed that using visual aid come along with the constraints and the hindrances in teaching and learning.

The result of hypothesis were rejected, that means the significant value are greater than 0.05 alpha level. This clearly show that there was a significant differences in the stated null hypothesis

therefore, the study was in line with the study of Cannon (2010) which showed the significant differences and effectiveness of an educational program which improve language skills of deaf children. It was also agreed with the study of Moursi (2013) which demonstrated the effectiveness of the different intensity of visual stimuli in the academic achievement among the students.

On gender, the study was supported by the findings of Atanda and Jaiyeoba (2011) who submitted no significant differences in the visual learning devices and availability to enhances effective learning and better performance of students among the male and female students. Also, the findings of Onasanya and Omosewo (2011) who reported that female students that were taught with the use of instructional materials did not performed better significantly than their counterpart.

The findings contradicted to the findings of Okoye (2009) which revealed interaction effects of gender on students' academic performance have significant. However, the study is in agreement with the

opinion of Oladejo, Olosunde, Ojebisi and Isola (2011) who found that gender has no significant effects on the academic achievement of students in Physics. In essence, the finding was in line with that of Levasseur and Sawyer (2006), Jones (2009), Michelle (2013) and Alabi, Emmanuel and Falode (2015) whose finding affirmed that students' attention are more captured through visual devices irrespective of gender.

On school, the findings also supported by the study of Odewumi, Gambari and Bada (2019) whose study revealed that there was significant difference between the performances of students in term of their classes in both public and private junior secondary school students taught with graphic organizer. Similarly, the finding agrees with the findings of Clark (2007) which revealed that visual learning with graphic helps students to understand difficult concepts generate thoughts, and ideas.

In essence Education is necessary for everybody, it is very vital, deprived of education cannot lead a good life. Teaching and learning are the important element in education. The teacher use different approaches and substantial to teach and achieved effective learning. Visual learning devices arouse the interest of learners and help the teachers to explain the concepts easily, they are paramount in education system.

CONCLUSION

The findings of this study based on the research questions and the hypotheses formulated are summarized as follow:

- Teachers recognized the usefulness of visual learning devices in teaching and learning.
- Teachers had positive perception towards the using of Visual learning devices for instruction.

- Teachers agreed that there are constraints and hindrances in learning using visual learning aids.
- There is no significant difference on the impact of visual learning devices on the male and female students.
- There is no significant difference on the impact of visual learning devices on the senior secondary schools students' classes.
- Visual learning aids have no difference significantly or impact on the type of schools.

RECOMMENDATIONS

Based on the findings following recommendations are made in this research:

- Teachers should be encouraged to use learning devices for students understanding
- The school should provide and monitor the usage of learning devices
- Refresher courses and workshops need to be put up and encourage the secondary school teachers to attend to improve their knowledge on uses of learning device.
- Ministry of Education should organizes periodic training for secondary school teachersto be re-trained for efficacy of learning devices.
- Schools should be contact non-governmental organizations and private sectors including individuals the for learning devices to replace the obsolete ones.

REFERENCES

- Adebayo, O. O. & Adigun, S. Q. (2018). Impact of Instructional Aids on Students' Academic Performance in Physics in Secondary Schools in Federal Capital Territory (FCT) Abuja, Nigeria. *European Scientific Journal* 14(4), 366- 376

- Adediran, A. A., Orukotan, A. F., & Adeyanju, E. O. (2015). *Instructional Strategies for Effective Teaching and Learning in Nigeria Secondary Schools*. First Asia Pacific
- Conference on Advanced Research (APCAR-2015). ISBN: 9780994365668 www.apiar.org (146-155).
- Adodo, S. O., & Oyeniyi, J. D. (2013). Student variables as correlates of secondary school students' academic performance in biology. *International Journal of Science and Research* 2(7) 386-390. Retrieved from www.ijsr.net
- Ahmed, M.A & Abimbola, I.O (2011). Influence of teaching experienced and school location on Biology teachers rating of the difficult levels of nutrition concepts in Ilorin, Nigeria *Journal of Science, Technology, Mathematics and Education* 7(2), 52-61.
- Akintola, D. A. (2017). *Assessment of the knowledge of biological drawings possessed by senior school students in Oyo State, Nigeria*. (Unpublished Ph.D. Thesis), University of Ilorin, Nigeria
- Alabi, T. O., Emmanuel, O., & Falode, C. O. (2015). Effects of videodisc mediated and computer assisted instructional packages on achievement of junior secondary school mathematics students in geometry in Minna, Nigeria. *Journal of Science, Technology, Mathematics and Education (JOSTMED)*, 11(3)240 - 251
- Ali, A. R., Toriman, M. E., & Gasim, M. B. (2015) Academic achievement in biology with suggested solutions in selected Secondary Schools in Sano state, Nigeria. *International journal of educational research*, 2(11), 215-224.
- Atanda, A.I., & Jaiyeoba, A.O. (2011). Effects of school-based quality factors on secondary school students' achievement in English language in South-Western and North-Central Nigeria. *Journal of Emerging Trends in Educational Research and policy Studies*, 2(2), 93-99.
- Arigbabu, A. A., & Mji A. (2004). Is Gender a Factor in Mathematics Performance among Nigeria Pre-service Teachers? *Sex Role*, 51(11 & 12), 749- 753.
- Bilesanmi-Awoderu, J. B. (2006). Effect of Computer-Assisted Instruction and Simulation/Games on the Academic Achievement of Secondary School Students in Biology. *Sokoto Educational Review*, 8(1), 49-60.
- Cetin, G., Ertepinar, H., & Geban, O. (2015). Effects of conceptual change text based Instruction on ecology, attitudes toward biology and environment. *Educational Research and Reviews*, 10(3), 259-273.
- David, K. D., & Stanley, H. L. (2000). Effect of Gender on Computer -Based Chemistry Problem-Solving. *Electronic Journal for Science Education*, 4(4), 36-46.
- Din, Y. Y., Ming, M. C., & Ho, E. S. (2004). Hong-Kong Students Achievement in OECD-
- PISA Study. Gender Differences in Science Concept, Literacy Skills, and Test Item Formats. *International journal of Science and Mathematics Education*, 2(1): 91-106.
- Duruji, M., Azuh, D., & Olanrewaju, F. (2014). *Learning Environment and Academic Performance of Secondary*

- School Students in External Examination: A study of selected schools in Ota, Education 14 proceedings*, pp. 5042 – 5053.
- Edeh, I. E., & Vikoo, B. (2013). Some factors affecting the performance of secondary school students in chemistry, Akolokuma/Opokuma study. *Journal of Education and Practice*, 4(7), 1-4
- Edmore, M., Maropeng, M., & Cosmas, M. (2012). Female students' perceptions of gender and academic achievement: A case of sixth form in girls Zimbabwe school. *Journal of Social Science* 32(1), 111-120
- Effiong, A. A. & Odey E. O. 2013. Effect of teacher variables and utilization of instructional materials on performance of senior secondary three (SS3) biology students in calabar Cross River State. Nigeria. *Journal of Educational media and Technology*. 17(1), 105-117
- Egomo, J. E., Enyi, B. I. & Tah, M. M. (2012). Availability and utilization of ICT tools for effective instructional delivery in tertiary institutions in Cross River State, Nigeria *Global Advanced Research Journal of Educational Research and Review*. 1(8), 90-195
- Eriba, J. O., & Sesugh, A. (2006). Gender Differences in Achievement in Calculating Reacting Masses from Chemical Equations among Secondary School Students in MarkurdiMetropolis. *Educational Research Revised* 1(6): 170-173.
- Ezenwa, P. C. N. (2018). Evaluation of Teachers' Use of Instruction Materials for Teaching French in Junior Secondary Schools. *Global Journal of Educational Research* 17 (39-45).
- Freedman, M. P. (2002). The Influence of Laboratory Instruction on Science Achievement and Attitude toward Science across Gender Differences. *Journal for Women Minorities in Science and Engineering*, 8(2), 50.
- Federal Republic of Nigeria (2013). *National Policy on Education (4th Edition)*, Abuja: NERDC Press.
- Gbollie., C. & Keanu, H. P. (2017). Student Academic Performance: The Role of Motivation Strategies and Perceived Factors Hindering Liberian Junior and Senior High School students learning. *Foundation for Research, Education and empowerment (FREE) Liberia, Monrovia*. Page 11
- Gbigbadua, D. A., Abimola I. O.; Ahmed M.A. (2014) *Effects of pre instructional word-clearing strategy on the achievement of senior secondary school biology students in Ilorin, Nigeria* (Unpublished master's dissertation). University of Ilorin, Ilorin, Nigeria.
- Gorgeous, B. (2013). Nature of science: The complex interaction of systems of biological molecules. *International Journal of Science Education*, 41(2), 411-423
- Hornby, A. S. & Wehmeier, S (2007). *Oxford advanced learner's dictionary of current English (9th ed.)*. Oxford: Oxford University Press.
- Himschoot, (2012). Student perception of relevance of biology content to everyday life: study in higher education biology courses. *Faculty Scholarship-Biology. Paper2*. Available at <http://digitalcommons>.
- Ibe, E., Nworgu, Gambari, Gana, Yaki, & Ughiva, N. J. (2014). Influence of teachers' characteristics on the academic achievement of secondary school biology students. *British*

- Journal of Science*, 13(2), 33-44
- Jones, J. B. (2009, November). Challenging the presentation paradigm (in 6 minutes, 40 seconds): PechaKucha. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com> on the 6th August 2014
- Ityokyaa, F. M., & Adejoh, M. J. (2014). Evaluation of the implementation of biology programme in secondary schools in Benue State of Nigeria. *Journal of Modern Education Review*, 4(11), 970-977
- Juma, Z. R. (2015). *Exploring the development of biology literacy in Tanzanian junior Secondary school students A Ph.D. Thesis* University of Wellington, New Zealand retrieved from researcharchive.vuw.ac.nz/xmlui/bitstream/handle/10063/4246/thesis.pdf?sequence=2
- Kim, M., & Diong, C. H. (Eds.) (2012). *Biology education for sustainable development* Singapore: Sense Publishers
- Kimura, D. (2005). Sex Differences in the Brain. *Scientific American, Battle of the Sexes*. (Exclusive Online Issue 20).
- Lawal, K. B. (2013). *Levels of scientific literacy among Senior Secondary School students in Oyun Local Government Area, Kwara State, Nigeria*. (Unpublished M.Ed. Dissertation), University of Ilorin, Nigeria.
- Levasseur, D. G., & Sawyer, J. K. (2006). Pedagogy meets PowerPoint: A research review of the effects of computer-generated slides in the classroom. *The Review of Communication*, (6), 101-123
- Martin, E., & Robert, H., (Eds.). (2015). *A dictionary of biology (6th Edition)*. London: Oxford University Publishers.
doi:10.1093/acref/9780199204625.001.001
- Michelle, J., & Marie, P. (2013). Effects of visual media on achievement and attitude in a secondary biology classroom. Unpublished Master Thesis submitted to Faculty of the Education and Human Services, Ohio University Moursi (2013).
- Muhammad, Ya'u, Aliyu, U. I., & Hassan, M. (2018). Communication Teaching and Learning English Language in Nigerian Schools: Importance and Challenges. *Teacher. Education and Curriculum Studies*. 3 (1), 10-43.
- Naugah, J. (2011). *Factors affecting the choice of science subjects among girls at secondary level in Mauritius*. A Thesis Submitted for the Degree of Doctor of Philosophy School of Sport and Education Brunel University. Retrieve from full text thesis. Pdf
- Communication Education in Nigeria: A Study of the Use of Power Point in Teaching
- Ngonso B. F., Egielewa, P. E. & Nyong, A. E., (2018). Influence of Interactive Media on Mass Communication. *Global Media Journal*. 16 (31), 142-
- Nsofor, C. C., & Momoh, G. D. (2013). Effects of developed electronic instructional medium on Students' achievement in biology. *Journal of Education and Learning*, 2 (2).
- Ngozi, B.O, Samuel A.O, Ameh O.I, (2012), Motivating use of Audio-Visual in a Nigeria Technological University Library. *Journal of*

- Education and Social Research* 2(1) 26- 34.
- Nwakanobor, F.E. (2008). Realizing the Vision of National Economic Empowerment and Development Strategies (NEEDS) and Millenium Development Goals (MDGs): Implication for Biology Education. *Journal of Science Education* 8(1), 58-68
- Obikwe, C. L. (2008). *Effects of constructivist instructional approach on students' achievement and interest in basic ecological concepts in biology.* (Unpublished M.Ed. Dissertation) Department of Science Education, University of Nigeria, Nnsukka.
- Odewumi, M. O., Gambari, A. I. & Bada, T. Abass. (2019). Efficacy of graphic organizer on primary school students' performance in cognitive writing skills. *International Journal of New Trends in Arts, Sports & Science Education* 8 (1), 34-41#
- Okoye, N.S. (2009). The effects of the writing process method on students' performance in English composition, Ph. D Thesis. University of Nigeria, Nsukka.
- Oladejo, M.A., Olosunde, G.R., Ojebisi, A.O., & Isola, O.M. (2011). Instructional materials and students' academic achievement in physics. Some Policy Implications. *European Journal of Humanities and Social Sciences*, 2(1), 112-126.
- Olanipekun, S. S. & Aina, J. K. (2014). Improving Students' Academic Performance in Nigerian Schools: the Role of Teachers *International Journal of Research in Humanities and Social Studies* 1(2), 2358 – 2361.
- Omodara, O. D. & Adu, E. I. (2014). Relevance of Educational Media and Multimedia Technology for Effective Service Delivery in Teaching and Learning Processes. *Journal of Research & Method in Education (IOSR-JRME)* 492), 48-51.
- Onasanya, S.A., & Omosewo, E.O. (2011). Effect of improvised and standard instructional materials on secondary school students' academic performance in Physics in Ilorin, Nigeria. *Singapore Journal of Scientific Research*, 1(1), 68-76.
- Onekutu, A., & Onekutu, P. O. (2002). Gender Differences in Achievements in J. S. S. Examinations in Integrated Science: Implication for National Development. In O.O. Okpeh (Ed.): *Review of Gender Studies in Nigeria.*
- Onwuagboke, B. B. C., Singh, T. K. R. & Fook, F. S. (2015). Need for ICT Integration for Effective Instructional Delivery in Nigerian Colleges of Education. *Journal of Education and Practice.* 6(3), 51-57.
- Oshinaike A. B. & Adekunmisi S. R. (2012). Use of Multimedia for Teaching in Nigerian University System: A Case Study of University of Ibadan. *Library Philosophy and Practice*
- Owoeye, J. S., & Yara, P. O. (2011). School location and academic achievement of secondary school in Ekiti State, Nigeria. *Asian Social Science*, 7(5), 170-175
- Tamah, S. M (2007): *Jigsaw Technique in Reading in Reading Class of Young Learners; revealing students interaction.* Online submission.
- Viadero, D. (2006). Concern Over Gender Gaps Shifting to Boys. *Education Week*, 25 (27), 16-17

- Rossi, M. (2017). Factor affecting academic performance of university evening students. *Journal of Education and Human Development*, 6(1), 96-102
- Sarojini, T. R. (2019). *Modern Biology for Senior Secondary Schools*. (6thed.). Africana FirstPublishers plc. 88-90.
- Steinmayr, R., Meißner, A., Weidinger, A. F., & Wirthwein, L. (2014). Academicachievement. Oxford Bibliographies. doi, 10, 9780199756810-0108.
- Sungur, S., & Tekkaya, C. (2003) Students' Achievement in Human Circulatory System Unit: The Effect of Reasoning Ability and Gender. *Journal for Science Education Teachers*, 12 (1), 59-64.
- Thompson j. & Soyibo kola (2012). Effects of lecture, teachers demonstrationson biology. *Research in science & technology education*.20 (1)25-37.
- York, T. T., Gibson, C., & Rankin, S. (2015). Defining and Measuring Academic Success.
- Sungur, S., & Tekkaya, C. (2003) Students' Achievement in Human Circulatory System Unit: The Effect of Reasoning Ability and Gender. *Journal for Science Education Teachers*, 12(1), 59-64.