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EFFECT OF E-LEARNING AS INSTRUCTIONAL AIDS ON THE PERFORMANCE OF SENIOR SECONDARY SCHOOL BIOLOGY IN YOBE STATE IMPLICATION FOR BIOLOGY EDUCATION IN NIGERIA

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Abstract
This study determines whether e-learning method makes a difference on Student Academic Achievement in Biology. A simple random sampling method was used to select one (Zone A) out of the three educational zones in Yobe State. Stratified method of sampling was used to select four secondary schools in Damaturu. Students were randomly selected from the Senior Secondary School 49 female's student and 71 males. The research design was quasi experimental while the three null hypothesis were tested using the computer t-test at 0.05 level of significance. The findings indicated that the better performance of students with e-learning as against those taught with the lature method is a pointer to the fact that student's performance can be enhanced through the use of e-learning. The use of better instructional technique by biology teachers in secondary schools, as found in this study, will produce better scientist who are more intellectually competent and technologically sound.

Keywords: *E-learning, Instructional aids and Implication*

Background to the Study

Among the goals of every committed teacher is to make lesson alive and lasting, and to impart information and ideas in the shortest possible time in accordance with the principles of teaching and learning. Osuji (2003) asserted that the most effective learning involves combined sense of hearing and seeing with twenty percent (20%) of what was learnt coming through what we hear, while about thirty percent (30%) comes through what we see.

However, the concept of effective teaching refers to the totality of what is used in the course off teaching to enhance understanding and achievement. These include among others teaching methods and relevant instructional materials (Ozoji, 2003). As a result, the traditional lecture method if gradually being supported with the use of instructional media which is a current development in technology in the education sector.

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In this information era, e-learning becomes the knowledge provider. Knowledge is disseminated and is made available to many seekers via information technology advance in computer hardware and software facilities, communication and networking system (Penick & Bonnseter, 2006). With the idea to appeal to the mind through visual and auditory sense organs, educators of all ages seek to utilize audio, visual and audio-visual equipments and materials for teaching and learning. Osuji, 2004, & Wellington, 2000 rightly noted that the growth in the use of technology has brought outstanding development into modern education. Osuji further noted that media serve as channels through which messages, information, ideas and knowledge are disseminated.

E-education (electronic education) or e-learning has been defined as the comprehensive framework for the delivery of education using e-learning as tools. Any form of teaching learning, management, administration, counseling and other educational activities that engage the use of ICT for its delivery falls within the e-education framework (Ayogu, 2000). A onetime Honorable Ministry of Education in Nigeria, Prof. Osuji (2004), observed the growing trend worldwide towards the adoption of e-learning as a framework for enhancing the delivery of quality education in the quest to achieve education for all.

Objective of the Study

This study is therefore conducted to find out the effect of e-learning as instructional aids on the performance of secondary school seniors in biological drawing and labeling. The differential effect of these instructional aids on student's performance level base on gender affiliation was also investigated.

Hypothesis

i. There is no statistical difference in performance mean scores between the students that were taught with e-learning as instructional aid and students that were taught with lecture method.
ii. There is no significant difference in performance mean scores between the male and female students taught biological drawing and labeling using e-learning.
iii. There is no significance difference in performance means scores between the male and female that received instruction on biological drawing and labeling through the use of e-learning.

Methodology

Experimental Design

The research design is pre-test experiential design. Each of the experimental groups has equal number of students.

Sampling and Sampling Techniques

One hundred and twenty SS II students from both private and government secondary schools in Yobe, State were used for this study. Thirty students were randomly selected from each of these schools. The whole sample consists of 49 females and 71 males. Government Day Secondary School, Damaturu and Yobe scholar's private school, constitute the control group while Government Secondary School and government Girls College both in Damaturu were used as experimental group.

Validity and Reliability OF Research Instrument

The instrument used in collecting data for this study was a Biological Drawing and labeling skill test (BDLST). The BDLST is made up of 14 items based on the outcome of the content validity of eight experts. The questions were constituted by consulting question papers and marking schemes of biology I practical of WAEC and NECO. The reliability of the instrument was investigated by test-retest reliability procedure. A reliability coefficient (r) was computed as 0.89 from the pilot scores.

Data Collection
The pre-test was carried out in the first week of the three weeks duration of the experiment. This is to evaluate the students previous knowledge. In the second week the experimental and control groups were exposed to e-learning and lecture method respectively. Each lesson lasted for 45 minutes. A post test was carried out in the third week.

Statistical Analysis
The data collected were subjected to the t-test analysis statistical tool to determine if there is any significance difference at $P< 0.05$ level.

This allows for whether the null hypothesis stated is to be rejected or accepted.

Result Analysis
Table 1: t-test analysis of different between the pre-test mean scores of experimental and control groups.

Treatment Group	N	X	df	Se	T_C	T_I
Exp. Control. Total.	60 60 120	4.12 4.20 4.16	118	0.3223	0.32282 Ns	1.963

ns=No Significant difference $P<0.05$.

Table 1 depicts that there is no statistically significance difference in the pre-test mean scores of both experimental and control groups. This was attested to by the calculated value $t_c = 0.2482 >$ table value $T_I = 1.962$ at 0.05 level. The result above signify that both of the treatment groups have not been exposed to the treatment groups have not been exposed to the treatment, hence table 1 depicts the previous knowledge of the two groups in biological drawing and labeling.

Table 2: t-test analysis of different between the post-test means scores of experimental and control groups.

Treatment Group	N	X	df	Se	T_C	T_C
Exp. Control. Total.	60 60 120	8.65 5.87 7.26	118	0.2755	** 10.091	1.96.

** Highly significant at $P =0.05$ levels.

As shown in table 2, the post-test mean score of eh experimental group is significantly higher than the post mean score of the control group as calculated t-value (t_c) of 10.91 was far greater then the table value (t_c) of 1.962. thus the null hypothesis was therefore rejected. This indicates that e-learning aided students ability in experimental group to perform better than the lecture method group (control group). The performance means scores of post-test experimental and control groups were however, both higher than those of the pre-test experimental and control groups (table 1 and 2).

Table 3: t-test of different between the post-mean scores of male and female students in experimental group.

Treatment Group	N	X	df	Se	T_C	T_C
Exp.	30	8.45				
Control.	20	8.70	48	0.4706	0.5737	2.012
Total.	50				Ns	

ns=No Significant difference at P<0.05.

Table 4: t-test of different between the post-mean scores of male and female students in control group.

Treatment Group	N	X	df	Se	T_C	T_C
Exp.	30	5.67				2.012
Control.	20	5.90	48	0.8745	0.2630	
Total.	50	5.79			Ns	

ns=No significant difference at P=0.05.

Table 3 and 4 revealed that there was no significant difference in performance of those male and female students in post-test experimental group and those of the control group. This is supported by the calculated t-value (t_i) = 0.5757 < t_i = 2.012 for the experimental group (table 3), and the t-calculated value (t_i) = 0.2630 < t_i = 2.012 for the control group (table 4). The null hypothesis 2 and 3 are therefore accepted (tables 3 and 4).

Discussion

The data analysis indicated that a significant difference exist between the achievement of students that were exposed to lecture method and e-learning. This findings is consistent with those of Tayseer (2004). Wellington (2000) and Ayogu (2000). They reported that e-learning facilitate effective teaching off small and large group of learners.

Another outcome of this investigation was that there was no statistical differential effect on the achievement of students base on their gender affiliation among the experimental and control groups. This is despite the larger mean scores of female over the male students in both treatment groups. This finding is in concordance with those of Madu and Adeniran (2000).

Conclusion and Recommendation

Based on the result analysis of data collected from the investigation carried out on the effect of e-learning on secondary school student's performance in biological drawing and labeling. It is clear that eh e-learning is better than the lecture method as there was statistical significant difference.

Also the study showed that there was no significant difference in performance between male and female students when both e-learning was used.

The implication of this finding is that the use of e-learning as instructional aid enhances effective learning which translates into higher performances. This instructional aid was also not gender biased.

I therefore recommend that e-learning be used in secondary school as an instructional aid during lecturer method instruction.

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