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Utilization of Multimedia Facilities in the Teaching of Biology among Secondary Schools Students in Obudu Local Government Area of Cross River State

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Abstract: This study was designed to ascertain the extent of utilization of multimedia facilities among Secondary School Students in Obudu Local Government Area of Cross River State. The study adopted the quasi experimental design, specifically the pretest posttest non-equivalent group design. Two research questions and hypotheses were formulated, answered and tested respectively. The population consists of 527 senior secondary school students. The sample was made up of two hundred and fifty students (one hundred and thirty males and one hundred and twenty females). The data were collected using Questionnaire titled" Multimedia Facilities in Biology questionnaire (MFBQ)" and "Biology Achievement Test (BAT)". The instruments were validated by experts. Data were analyzed using percentage and mean for research questions with a bench mark of 2.5 while chi –square and T-tests were used to test the hypotheses at $p<0.05$ significance. The result from the findings revealed that the students taught using multimedia facilities performed better than those not taught with multimedia facilities, multimedia facilities were not available enough in the secondary schools in Obudu, teachers' competence in the use of multimedia facilities was good as observed from the frequency of use which had influence on students' academic achievement in Secondary Schools Obudu Local Government of Cross River State. It was however inferred based on the findings that the failure rate of students will be reduced if appropriate and relevant multimedia facilities were provided for the teaching of biology in secondary schools. Finally, it was recommended among others that the teaching of biology in secondary schools in Obudu should be conducted in the manner that students will effectively understand and learn the concepts taught with the use of the multimedia facilities and that the Federal and State Government should periodically organize and sponsor teachers' attendance to conferences, seminars and workshops on utilization of multimedia facilities in teaching and learning processes.

Keywords: Multimedia facilities, Secondary school students, Quasi experimental design, Academic achievement, Biology education

INTRODUCTION

Education is a key factor for sustainable development (Chimombo, 2005). The significance of education especially in developing countries is increasing because of progressing pressure to catch up with the developed world regarding competitiveness (Hawkins, 2012). Predictably, the educational settings are different in developing countries than in developed ones, such as low quality of education and narrow possibilities in attending schools in rural areas because of far distance and high opportunity costs. Chimombo (2005) posits that circumstances that hinders quality education for all have to be improved through compulsory and free education to foster general access to education.

The rapid changing technological developments have affected education as it does every other field of human endeavor. The number of technology applications used in education increases

every day. One of these technologies is the multimedia. In the studies about the use of technology in education, it has been agreed that multimedia increases students' success, affects students' attitudes and makes learning more enjoyable and understandable. The most effective factor in this process is high technology and its influence in the societies. The development and generalization of technology development has affected the function of educational institutions and the need to raise technology-user individuals for many fields (Akpinar, 2013). This change also has affected biology which targets to increase understanding of living systems and to allow one to consider the systems in relationship to self and other organisms in the natural environment.

The common goals of teachers everywhere are to make lesson presentation vital and interesting to their students. These goals can be reached most effectively through the effective utilization of instructional materials (multimedia) and other devices used for the transmission of concepts and other ideas deemed important. Instructional media derive their usefulness from the fact that they contribute to learning by providing worthwhile experience for learners as well as making learning productive. Educational materials used in teaching are helpful in understanding the concepts.

Multimedia can be defined as the combination of various digital media types such as text, images, sounds and video into an integrated multi-sensory interactive application or presentation to convey a message or information to an audience. Orlich & Harder (2017) describes multimedia as a ray of a computer driven interactive communication system, which creates, stores, transmits and retrieves textual, graphical and auditory networks of information. Multimedia can be interpreted as a combination of data carriers for example video, CD-ROM, floppy disks, animated graphics and simulations incorporated in an organized manner to accommodate the process of learning new things (knowledge) more efficiently. Fetherman (2010) also viewed multimedia as those resources used for instruction that include one or more media such as graphics, video, animation, images and sound in addition to textual information. He further identified four important characteristics of multimedia as multimedia systems are computer controlled, multimedia systems are integrated, the information content must be represented digitally, the interface to the final representation of media.

The use of multimedia facilities in teaching is very important as they help to stimulate learners' interest and promote understanding. According to Akano (2006) the teaching and learning of biology which is a practical course requires practical laboratory activities because experiment is the hall mark of science education. Onah & Ugwu (2010) also opined that meaningful learning of science requires the use of multisensory approaches where appropriate facilities are selected and used. This is necessary because in this kind of learning, students make use of more than one sense modality in learning.

According to Adebayo & Adigun (2018) who carried out an empirical study titled the extent of availability, application and impact of multimedia facilities on improving academic performance of physics students in Federal Capital Territory (FCT) secondary schools Abuja. The population of the study was limited to secondary schools in three Area councils of the FCT. The sampled schools used for the research had a total of 3,150 students with teaching staff strength of 163. The study was carried out among the senior secondary SS2 and SS3 physics students and their teachers. Two research questions were posed and one hypothesis formulated for this study. Descriptive survey design was adopted for this study with 60 items on the questionnaire for students and 15 items for teachers. The research questions were asked and analyzed using frequency count and percentages. The data gathered were further interpreted to arrive at findings which showed that the physics teachers in FCT secondary schools were using multimedia facilities, there was significant difference in academic performance of students taught with multimedia facilities; the findings equally revealed that there were shortfalls in availability of some materials. Recommendations were suggested that government should formulate policy statement on availability, distribution, selection and maintenance of multimedia facilities in FCT secondary schools.

Also, Nwana (2014) investigated the availability and utilization of ICT facilities in teaching computer education among secondary schools' teachers in Anambra state. Two research questions guided the study. The study population comprised of 450 computer teachers teaching computer education in the school. From the population, 300 computer teachers were sampled and used for

the study. A descriptive research design was adopted to conduct the study. The instrument for data collection was a self-developed 40 item questionnaire. It was validated by experts and the reliability co- efficient stood at 0.79. The data collected were analyzed using frequencies and percentages. The findings revealed that ICT facilities needed for the teaching of computer education are not available. It also revealed that majority of the ICT facilities needed for the teaching of computer education are not being used by the teachers. In view of the findings, recommendations were made that the government should provide adequate ICT facilities for effective teaching and learning of computer education, the government should embark on training and retraining of teachers for effective teaching of computer through short-term courses, seminars, workshops and conferences.

Moreover, Okobia (2011) carried out a study designed to assess the availability and teachers use of computer in the implementation of junior secondary school Basic science in Edo state. Three research questions were raised and one hypothesis was formulated. A sample of fifty Basic science teachers were randomly selected from fifty secondary schools in five local Government Area of the state. Data analysis were carried out using t-test for the hypothesis and percentage for question one, two and three. The results showed that computer facilities available were grossly inadequate. It was also observed that there was no difference in the use of computers between specialist basic science teachers and non-specialist teachers. It was therefore recommended that computers be made available for the teachers of basic science.

There is currently an abundant knowledge-base to inform us that in schools, teachers play a critical role in students learning and achievement (Cornelius-White, 2007). Research reveals that how teachers instruct and their interaction with students is the corner stone around which to build effective schools. The word "competence" in increasingly being used in education circles today. It is a description of one's ability, a measure of one's performance. A person's competencies may be defined in terms of one's knowledge, skills and behavior. Onasanya et al. (2011) carried out a study on teacher's competence and extent of utilization of computer. It also examined the relationship between competence, extent of utilization and teachers' gender. The research population were 240 science and health education teachers drawn from 10 Local Government Area of Oyo State. Two instruments were designed by the researcher and used for this study. These are 40 items computer literacy test (with reliability coefficient measure of 0.77) and the 20-item questionnaire on teacher's level of utilization of computer (with Cronbach Alpha Measure of 0.82). Data were analyzed using weighed mean scores, standard deviation and t-test. The result shows that the level of computer literacy of science teachers examined is low. Their level of utilization of computer was also found to be very low. From the two hypotheses tested, the result showed that there was significant difference between the main scores for male and female science teachers in their level of computer literacy. It also indicated that the males were more competent than their female counterparts in both instances. Therefore, all science teachers especially the females need to be motivated and provided with relevant ICT training experiences at pre-service and in-service levels in order to enhance their instructional delivery productivity.

Bamigboye et al. (2013) carried out a research titled Teachers Attitude and Competence towards the use of ICT Resources: A case study of model secondary school Abeokuta. The main objective of the study was to investigate the teacher's attitude and competence towards the use of ICT resources in their teaching. For the said purpose, the researcher constrained himself to two research questions. The research design used for the study is the survey method, using questionnaire and observation as instrument for data collection. The population of the study was drawn from nine secondary schools in the state which were randomly selected. A total of 250 copies of questionnaire were distributed to teachers in the schools under study. Out of the number, only 211 copies were returned to the researcher which were found useful for the study. The data generated were analyzed using frequency, percentage and correlation analysis. The result of the findings showed that majority of the respondents for this study have positive attitude and competency towards the use of ICT resources while teaching. It also revealed that majority of the respondents were competent in various areas of ICT such as running of programme, search for files on computer system, connect the computer and its peripherals, download files from the internet, present power point, use web search

engines etc. Thus, to promote effective integration of ICT resources into teaching, teachers are advised to go for training in the area of ICT resources so that they can have up-to-date knowledge of these ICT resources.

Wei et al. (2016) conducted a survey on the relationship between teacher's ICT competency and teacher Acceptance of ICT in teaching. The study aims at examining the relationship between teacher ICT competence and teacher acceptance and use of ICT in Negeri Sembilan secondary schools in Malaysia. This is a non-experimental quantitative research using survey technique through the administration of a set of questionnaires that comprised teacher's ICT competency and teacher acceptance and use of ICT. The targeted population of this study comprised all public secondary day school teachers in Negeri Sembilan, Malaysia. There are 6499 teachers within 89 schools located at six different districts in Negeri Sembilan. Sample selection for this study was conducted in several stages by probability sampling procedure involving proportional stratified random sampling, simple random sampling and systematic random sampling. A total of 450 questionnaire were distributed to the respondents and a total of 417 questionnaires collected were analyzed, representing a valid response rate of 92.7%. The findings showed that teachers in Negeri Sembilan rated themselves as having high level of computer competency and acceptance. Furthermore, data indicated that there was a statistically significant moderately strong positive correlation between teacher's ICT competence and teacher's acceptance and use of ICT in teaching.

It is observed that many teachers and learners in secondary schools do not have a good perception of the good intent of multimedia. This has made it impossible for them to imbibe the idea of multimedia learning. Hence they cannot use it in the teaching-learning process. Predictably, teachers do not show genuine interest and competence in the multimedia so as to utilize it in teaching-learning process. Adegbite (2014) believes that the reluctance on the part of the teachers to show acceptability to the use of multimedia facilities such as projectors, computer etc. bothers on lack of understanding or even outright fear of technology. Sequel to the above assertion, Sofowora & Egbedokun (2010) carried out an empirical survey of technology application in teaching geography in Nigerian secondary schools. The main thrust of this study was to find out the extent of application of the new technologies like projectors in the teaching and learning of geography in secondary schools in Nigeria. The sample for the study was made up of 214 geography teachers from secondary schools in Osun state. The schools and the teachers were selected through stratified sampling techniques based on school types, location, local education area and gender. A structured questionnaire was used to collect data from the participants. It was divided into five sections and was validated using construct validity. The coefficient of reliability was 0.68. The finding s showed that 55% of geography teachers had access to projectors but did not have prerequisite ICT skills. Out of the modern technologies available for teaching geography, the most commonly used are instructional television (54%), instructional radio (54%), and video (59%). Other findings showed that 54% of the geography teachers do not know the instructional value of CDROM/interactive Web packages available free for teaching geography. Not only this, 84% of the teachers also rarely use the news group, while 42% rarely make use of the multimedia.

On the same line, Kazoka & William (2016) investigated the secondary school teacher's knowledge and practice towards the use of instructional television. The aim of their study was to investigate their use of instructional television in teaching and learning process in Tanzania. The study used interview protocols, discussion and practical observations as instrument for data collection. Qualitative approach was used in this study as data were analyzed in terms of content and thematic approach. The use of instructional television is one of the modern ways of elaborating many concepts. The findings from observation checklist showed that all five secondary schools involved in the study had ICT facilities. The facilities found in the schools are computer laboratories, computers, scanners, radio, televisions and scanners. However, the data from practical observation checklist and interview with the teachers revealed that, out of 20 teachers observed, only 7 (35%) teachers were using instructional television in the whole process of teaching and learning while the remaining 13 (65%) teachers were not using instructional television. This is because the computer laboratory is not always open for the teachers and there are no professionals to drill them. This study concludes that,

the effective use of ICT facilities in teaching and learning process in Tanzanian secondary schools can be achieved through cooperation among education stakeholders, including the government, schools' principals and teachers.

Overtime, students' academic achievement /performance in both internal and external examination has been used to determine excellence in teachers and teaching. Considering the government huge investment in public education, output in terms of quality of students has been observed to be unequal with government expenditure. Consequent upon the observed deterioration in the academic achievement, attitudes and values of secondary school students, one wonders if the high failure rate and poor quality of students is not a reflection of the instructional quality in the school. Due to the nature of poor academic achievement among secondary school students especially in external examination, many educationists tend to shift the blame on the teaching methodology adopted by the teachers. However, this may not be the main reason why students perform poorly in external examination/ other practical engagements. The declining quality of education in the country and breeding of graduate with little technical know-how resulted in serious setbacks to the nation's industrial development. Thus, the study endeavors to answer the question: To what extent is the utilization of multimedia in the teaching of biology in the secondary schools in Obudu Local Government Area?

The study is guided by three research questions. Firstly, the study seeks to determine the extent of availability of multimedia facilities in the teaching of biology in secondary schools. Secondly, the study aims to investigate how the competence of teachers in using multimedia facilities, specifically video tapes, influences students' academic achievement in biology. Lastly, the study seeks to determine how frequently teachers use multimedia facilities, particularly videotaped instruction, in teaching biology in senior secondary schools in Obudu.

The study also formulated three null hypotheses, which were tested at a significance level of 0.05. The first null hypothesis suggests that the competence of teachers in using multimedia facilities has no significant influence on students' academic achievement. The second null hypothesis states that the frequency of using multimedia facilities has no significant influence on students' academic achievement. The third null hypothesis posits that teaching and learning using multimedia facilities have no significant influence on students' academic achievement. These hypotheses were tested to determine if there is a significant relationship between the variables under investigation.

METHODS

The study utilized a quasi-experimental design to investigate the relationship between multimedia facilities and academic achievement in biology. The design was considered appropriate since intact classes were used to avoid disrupting normal class lessons. The study population consisted of 527 students, with 309 males and 218 females, while the sample size comprised of 250 students, with 130 males and 120 females. The instruments used for data collection were the Multimedia Facilities in Biology Questionnaire (MFBQ) and the Biology Achievement Test (BAT) obtained from NECO 2014/2015, 2015/2016, 2016/2017, and 2017/2018 academic sessions. The MFBQ had two sections, A and B, while the BAT had one section, with 15 multiple-choice objective test items. The questionnaires were subjected to content and face validity by experts to ensure their relevance to the research questions and hypotheses.

Data collection was carried out in selected secondary schools with the help of the teachers as research assistants. Before administering the questionnaires, permission was sought from the sampled schools through a letter of introduction from the researcher. The questionnaires were administered to the students, and all 60 copies were retrieved due to careful supervision by the research assistants. Data analysis was carried out using the mean and simple percentage for research questions 1, 2, and 3, while the research hypotheses were analyzed using the chi-square and independent t-test at a significance level of 0.05. The study aimed to provide insights into the relationship between multimedia facilities and academic achievement in biology, and the research design and methodology employed were appropriate for this purpose.

RESULTS

The availability of multimedia facilities in teaching of biology in secondary schools

Table 1 shows the results of a survey conducted to determine the availability of multimedia facilities in teaching biology in secondary schools. The survey included five items, each with four response options: strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD). The table presents the frequency of responses for each item, as well as the mean score (X) for each item, which is calculated by assigning numerical values to the response options (4 for SA, 3 for A, 2 for D, and 1 for SD), summing the values for all responses, and dividing by the total number of responses.

Table 1. The availability of multi-media facilities

S/N	Items	SA	A	D	SD	X	Decision
1	My school resource center has enough television set for teaching and learning.	9	34	3	14	2.63	Accepted
2	There are radio and audio recorder cassette in our school resource center.	8	29	10	13	2.53	Accepted
3	There are computer and internet facilities in our school ICT laboratory.	43	13	3	1	3.63	Accepted
4	My school resource center has filmstrip projector, CD ROMS and transparencies.	8	25	15	12	2.48	Rejected
5	My school resource center has overhead projector for teaching.	10	40	10	-	3.00	Accepted
	Grand mean					2.85	Accepted

Based on the grand mean score of 2.85, it appears that the availability of multimedia facilities for teaching biology in secondary schools is generally accepted, meaning that the majority of respondents either agreed or strongly agreed with the statements presented. Specifically, items 1, 2, 3, and 5 were accepted, with mean scores ranging from 2.63 to 3.00, indicating that respondents generally agreed that these facilities were available in their schools. Item 4, on the other hand, was rejected, with a mean score of 2.48, indicating that respondents disagreed that their school resource center had filmstrip projectors, CD ROMS, and transparencies for teaching.

The competence of the teachers in using the multimedia facilities influence the students' academic achievement in biology

Table 2 presents the results of a survey on the influence of teachers' competence in using multimedia facilities on students' academic achievement in biology. The table shows the responses of the students to five different statements related to their teachers' use of multimedia facilities in teaching biology. The responses were rated using a Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The table also shows the grand mean of the responses.

A grand mean of 3.0 or higher indicates that the statement was accepted, while a grand mean lower than 3.0 indicates rejection. Based on the grand mean, statements 6, 7, 8, and 10 were accepted, indicating that the students agreed that their teachers' competence in using multimedia facilities positively influenced their academic achievement in biology. However, statement 9 was

rejected, indicating that the students disagreed that their interest in biology grows every time they see their teacher using multimedia facilities with mastery.

Table 2. The influence of teachers' competence on the students' academic achievement

S/N	Item	SA	A	D	SD	X	Decision
6	My teacher is very versatile in operating the computer when teaching biology, hence I see biology as a simple course.	30	15	13	2	3.22	Accepted
7	Biology is interesting to me especially with the standard diagrams and videos that my teacher easily gets from the web.	50	5	3	2	3.72	Accepted
8	The presentation (audio/video) clips used during my lessons, keep my memory fresh till examination day.	48	7	3	2	3.68	Accepted
9	My interest in biology grows every time I see my teacher using the multimedia facilities with mastery.	20	10	5	25	2.42	Rejected
10	I feel challenged and enthused when I see my teacher editing text online containing internet links and images.	40	10	1	9	3.35	Accepted
	Grand mean					3.28	Accepted

The frequency of use of multimedia facilities in the teaching of biology in Obudu secondary schools

Table 3 shows the frequency of use of multimedia facilities in the teaching of biology in Obudu secondary schools. The table includes five items (11-15) that were rated by the respondents on a Likert scale ranging from Strongly Agree (SA) to Strongly Disagree (SD). The table also includes the grand mean of the ratings, which is 3.36, indicating that the frequency of use of multimedia facilities in the teaching of biology in Obudu secondary schools is generally accepted. The items with the highest ratings are items 12 and 13, indicating that the teachers in Obudu secondary schools often use multimedia facilities to teach biology, even in the face of poor power supply. The item with the lowest rating is item 15, indicating that the use of internet facilities for quick information access is not as frequent as other multimedia facilities.

Table 3. The frequency of use of multimedia facilities

S/N	Item	SA	A	D	SD	X	Decision
11	My teacher often teaches us with video-taped instruction.	51	3	2	4	3.68	Accepted
12	My teacher always makes sure that he teaches us at least once a week with the multimedia facilities even when there is poor power supply.	54	4	1	1	3.85	Accepted
13	My teacher introduces new topics using video- taped instructions at least every week.	20	35	2	3	3.20	Accepted

S/N	Item	SA	A	D	SD	X	Decision
14	My teacher uses the projector for lesson more than ordinary chalk board.	38	2	10	10	3.13	Accepted
15	My teacher uses the internet facilities frequently to enable us access quick information from the web.	32	8	5	15	2.95	Accepted
	Grand mean					3.36	Accepted

The results from the respondents on Table 3 indicates a high frequency of the use of multi-media facilities in Obudu Local Government Area. The few responses against the frequency of usage may be due to personal views, this is because most students are not satisfied with a little, and they always want more. The 3.36 mean is far above the bench mark of 2.5 level of acceptance.

Research hypothesis I

Table 4 presents the results of Research Hypothesis I, which states that there is no significant influence of the competence of teachers in using multimedia facilities on students' academic achievement. The table displays the chi-square values for five different items. The "Favorable" column shows the number of respondents who responded positively, while the "Not favorable" column shows the number of respondents who responded negatively to each item.

Table 4. The results of research hypothesis I

Items	Favorable	Not favorable
1	54	6
2	55	5
3	55	5
4	30	30
5	50	10
Total	235	65
Test	**Value**	
Chi-square	141.277	
df	4	
α level	0.05	
Critical val.	9.488	
Decision	Reject	

The calculated chi-square value is 141.277, which is greater than the critical value of 9.488, indicating a highly significant influence of the competence of teachers using multimedia facilities on students' academic achievement. Therefore, the null hypothesis that there is no significant influence of the competence of teachers in using multimedia facilities is rejected.

Research hypothesis II

Table 5 presents the results of a chi-square test for hypothesis II, which investigates the relationship between students' perception of the use of multimedia facilities and their academic achievement in biology. The table shows the number of respondents who had a favorable or not favorable perception of the use of multimedia facilities in their biology classes. The total number of respondents is 300, with 247 having a favorable perception and 53 having a not favorable perception.

Table 5. Chi-Square Test for Hypothesis II - Relationship between students' perception of the use of multimedia facilities and their academic achievement in biology

Items	Favorable	Not favorable
1	54	6
2	58	2
3	55	5
4	40	20
5	40	20
Total	247	53
Test	**Value**	
Chi-square	34.741	
df	4	
α level	0.05	
Critical val.	9.488	
Decision	Reject	

The chi-square value of 34.741 with four degrees of freedom is compared to the critical value of 9.488 at a significance level of 0.05. Since the chi-square value is greater than the critical value, the null hypothesis is rejected, indicating that there is a significant relationship between students' perception of the use of multimedia facilities and their academic achievement in biology.

Research hypothesis III

Table 6 presents the t-test result for Research Hypothesis III which aims to examine the influence of teaching and learning using multimedia facilities on students' academic achievement. The table shows the results for both the experimental group (which received teaching and learning using multimedia facilities) and the control group (which did not receive such teaching and learning).

Table 6. The t-test result for Research Hypothesis III

Group	N	X	S^2	Sp	A	Df	t_{cal}	t_{crit}	Decision
Experimental group	30	11.4	4.5	1.987	0.05	58	-3.27	-1.98	Rejected
Control group	30	16.7	3.4						

The analysis of the t-test above shows that the null hypothesis which states that "teaching and learning using multi-media facilities has no significant influence on the students' academic achievement is rejected. This conclusion is based on the fact that t_{cal} -3.27 < t_{crit} -1.98.

DISCUSSION

The availability of multimedia facilities in teaching of biology in secondary schools

The findings based on the responses derived from the respondents, showed that, most schools in Obudu have television sets for teaching and learning biology, a good number of schools in Obudu have radios and audio recorder cassettes for teaching, the internet and ICT facilities in most schools are not functional, at least to a reasonable extent, a good number of schools in Obudu Local Government Area has CD ROMs and projectors for use. This result is in support with Okobia (2011) who carried out a study designed to assess the availability and teachers use of computer in the implementation of junior secondary school Basic science in Edo state. The results showed that computer facilities available were grossly inadequate. It was also observed that there was no difference in the use of computers between specialist basic science teachers and non-specialist teachers. It was therefore recommended that computers be made available for the teachers of basic science and that computer facilities should be adequately made available. This result though subjective are

likely a true picture of the real state of things in Obudu secondary schools. This is because, the multi-media facilities are usually too expensive for most schools to afford. This result is also in support of the study carried out by Adebayo & Adigun (2018) titled the extent of availability, application and impact of multimedia facilities on improving academic performance of physics students in Federal Capital Territory (FCT) secondary schools Abuja. The population of the study was limited to secondary schools in three Area councils of the FCT. The sampled schools used for the research had a total of 3,150 students with teaching staff strength of 163. The study was carried out among the senior secondary SS2 and SS3 physics students and their teachers. Two research questions were posed and one hypothesis formulated for this study. Descriptive survey design was adopted for this study with 60 items on the questionnaire for students and 15 items for teachers. The research questions were asked and analyzed using frequency count and percentages. The data gathered were further interpreted to arrive at findings which showed that the physics teachers in FCT secondary schools were using multimedia facilities, there was significant difference in academic performance of students taught with multimedia facilities; the findings equally revealed that there were shortfalls in availability of some materials. Recommendations were suggested that government should formulate policy statement on availability, distribution, selection and maintenance of multimedia facilities in FCT secondary schools.

The competence of the teachers in using the multimedia facilities influence the students' academic achievement in biology

From the analysis in Table 2, it is clear that the effective use of multi-media facilities is influenced by the competence of the teachers which in turn, influence the students' academic performance. This influence is great to the extent that most students see biology as a simple subject based on how their teacher manipulates the computer with ease. The grand mean of 3.28 is far above the bench of 2.50 which shows teachers' competences has great influence on the use of the multi-media facilities on the students' level of academic achievements. This result supported the study carried out by Onasanya et al. (2011) titled teacher's competence and extent of utilization of computer. It also examined the relationship between competence, extent of utilization and teachers' gender. The research population were 240 science and health education teachers drawn from 10 Local Government Area of Oyo State. Two instruments were designed by the researcher and used for this study. These are 40 items computer literacy test (with reliability coefficient measure of 0.77) and the 20-item questionnaire on teacher's level of utilization of computer (with Cronbach Alpha Measure of 0.82). Data were analyzed using weighed mean scores, standard deviation and t-test. The result shows that the level of computer literacy of science teachers examined is low. Their level of utilization of computer was also found to be very low. From the two hypotheses tested, the result showed that there was significant difference between the main scores for male and female science teachers in their level of computer literacy. It also indicated that the males were more competent than their female counterparts in both instances. Therefore, all science teachers especially the females need to be motivated and provided with relevant ICT training experiences at pre-service and in-service levels in order to enhance their instructional delivery productivity.

Furthermore, Bamigboye et al. (2013) carried out a research titled Teachers Attitude and Competence towards the use of ICT Resources: A case study of model secondary school Abeokuta. The main objective of the study was to investigate the teacher's attitude and competence towards the use of ICT resources in their teaching. For the said purpose, the researcher constrained himself to two research questions. The research design used for the study was the survey method, using questionnaire and observation as instrument for data collection. The population of the study was drawn from nine secondary schools in the state which were randomly selected. A total of 250 copies of questionnaire were distributed to teachers in the schools under study. Out of the number, only 211 copies were returned to the researcher which were found useful for the study. The data generated were analyzed using frequency, percentage and correlation analysis. The result of the findings showed that majority of the respondents for this study have positive attitude and competency towards the use of ICT resources while teaching. It also revealed that majority of the respondents were competent

in various areas of ICT such as running of programme, search for files on computer system, connect the computer and its peripherals, download files from the internet, present power point, use web search engines etc. Thus, to promote effective integration of ICT resources into teaching, teachers are advised to go for training in the area of ICT resources so that they can have up-to-date knowledge of these ICT resources.

The frequency of use of multimedia facilities in the teaching of biology in Obudu secondary schools

The grand mean of 3.36 is far above the bench mark of 2.50 though the responses may not give a true idea of the reality on ground, but it is evident that multi-media facilities like the smart board, projectors, computers etc. are frequently being used by most schools. This result is contrary to the findings made by Nwana (2007), who investigated on the availability and utilization of ICT facilities in teaching computer education among secondary school teachers in Anambra State, he discovered that the ICT facilities made available for teaching were not being properly used. In the other hand this result is supported by Sofowora & Egbedokun (2010) who carried out an empirical survey of technology application in teaching geography in Nigerian secondary schools. The main thrust of this study was to find out the extent of application of the new technologies like projectors in the teaching and learning of geography in secondary schools in Nigeria. The sample for the study was made up of 214 geography teachers from secondary schools in Osun state. The schools and the teachers were selected through stratified sampling techniques based on school types, location, local education area and gender. A structured questionnaire was used to collect data from the participants. It was divided into five sections and was validated using construct validity. The coefficient of reliability was 0.68. The finding showed that 55% of geography teachers had access to projectors but did not have prerequisite ICT skills. Out of the modern technologies available for teaching of geography, the most commonly used are instructional television (54%), instructional radio (54%), and video (59%). Other findings showed that 54% of the geography teachers do not know the instructional value of CDROM/interactive Web packages available free for teaching geography. Not only this, 84% of the teachers also rarely use the news group, while 42% rarely make use of the multimedia.

On the same line, Kazoka & William (2016) investigated the secondary school teacher's knowledge and practice towards the use of instructional television. The aim of their study was to investigate their use of instructional television in teaching and learning process in Tanzania. The study used interview protocols, discussion and practical observations as instrument for data collection. Qualitative approach was used in this study as data were analyzed in terms of content and thematic approach. The use of instructional television was one of the modern ways of elaborating many concepts. The findings from observation checklist showed that all five secondary schools involved in the study had ICT facilities. The facilities found in the schools are computer laboratories, computers, scanners, radio, televisions and scanners.

However, the data from practical observation checklist and interview with the teachers revealed that, out of 20 teachers observed, only 7 (35%) teachers were using instructional television in the whole process of teaching and learning while the remaining 13 (65%) teachers were not using instructional television. This is because the computer laboratory was not always open for the teachers and there were no professionals to drill them. This study concludes that, the effective use of ICT facilities in teaching and learning process in Tanzanian secondary schools can be achieved through cooperation among education stakeholders, including the government, schools' principals and teachers.

Research hypothesis I

This hypothesis seeks to find out if the influence of the competence if teachers in using the multi-media facilities on students' academic achievements is significant. According to the result of the chi-square on table 4, the significant influence is great, with 141. 28 > 9.49 table value. This result justifies the Banduras' (1999) social learning theory that states that people learn through observation and modeling. This theory is based on the belief that learning occurs through observing other people,

things, or events in the environment. Also, Sims & Manz (1982) discovered that the learner is not a passive recipient of information. This learning theory posits that there are three regulatory systems that control behavior: the antecedent; the reinforcement; and the importance of cognitive function in learning. Thus, the competent use of the multi-media facilities will greatly influence the students' academic achievements.

Research hypothesis II

This hypothesis sought to find out if the frequency of usage of the multimedia facilities has a significant influence on the students' academic achievement. The result in Table 5 shows that the Chi-square calculated (34.74) is far greater than the critical value (9.49, which shows a great level of significant influence. This result justifies the findings of Jibrin et al. (2017), who carried out a research on the effect of internet on academic achievement of secondary school students in Niger state, Nigeria. The findings of the study revealed that, internet is one of the beneficial learning tools in this era of ICT. The finding also supports with the study carried out by Zubairu (2016) who researched on the effect of internet usage on academic achievement of senior secondary school students in biology in Kaduna.

Research hypothesis III

This hypothesis investigated if teaching and learning using multi-media facilities has influence on the students and if the influence is statistically significant. According to the t-test analysis on table 6, the null hypothesis was rejected. Thus, teaching and learning using multi-media facilities has a significant influence on the students' academic achievement. This result is in agreement with Neo & Neo (2001) who posited that the power of multi-media lies in the fact that it is multi-sensory, stimulating many senses of the audience. Finally, the outcome of this result, justifies the statement of Malik & Agarwal (2012) who stated that the nature of multi-media is interactive which provides the room to improve the traditional "chalk and talk" way of teaching and learning.

CONCLUSION

From the results obtained in the study, it was concluded that the failure rate of students will be curtailed if appropriate and relevant multimedia facilities were provided for teaching of biology in secondary schools. Furthermore, teacher's competence in the use of multimedia facilities will build a bridge between students' retention of knowledge and the learning objectives, motivate interest in the subject matter and illustrate the relevance of many concepts. And lastly students taught using multimedia facilities perform better than students taught without multimedia facilities.

RECOMMENDATIONS

Based on the findings of this study and their implications, the following recommendations were made: The Government through the Ministry of Education Science and Technology (MOEST) should make available multimedia facilities for use in teaching and learning in "all" secondary schools to enhance students' academic achievements and organize/sponsor teachers to conferences, seminars and workshops on utilization of multimedia facilities in teaching and learning in education to enhance teachers' competence among others.

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