
EFFECT OF MULTIMEDIA PRESENTATION ON ACHIEVEMENT OF MOTOR VEHICLE MECHANIC WORKS STUDENTS IN SCIENCE AND TECHNICAL COLLEGES IN BENUE STATE

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ABSTRACT

The Technical Trade Motor Vehicle Mechanics Works is noted to be very important to man considering the importance of transportation of goods and services. As such concerted efforts are being made by institutions in ensuring success in the teaching and learning of the trade. Despite this, there is evidently poor academic achievement and declining interest of students in the trade. This is largely blamed on ineffective teaching methods adopted by teachers and negative attitudes of students amongst other factors. The purpose of this study therefore is to determine the effects of multimedia lesson presentation on the achievement of students in Science and Technical Colleges. Two research question and two hypotheses were formulated for the study. A quasi-experimental research design was used. The sample was made up of 105 SSII students. The experimental group was made up 52 students (46 males and 6 females) while the control group had 51 students (46 males and 5 females). A Motor Vehicle Mechanics Work Achievement Test (MVMWAT) was designed and used by the researcher to generate data. Data collected was analyzed using mean and standard deviation to answer research question and analysis of covariance (ANCOVA) to test the hypothesis. The result showed that multimedia presentation as a teaching method enhances the achievement of students. There was no significant difference between the achievement of male and female students. The study therefore, recommended the use of multimedia as a teaching strategy to boost academic achievement of students in the trade as well as related technology subjects. The massive use of computer aided instructions should be encouraged in the teaching and learning process in MVMW.

INTRODUCTION

Motor vehicle mechanic works (MVMW) is a technical course offered at both craft school and science and technical colleges. It is a course or trade

designed to produce technologists, technicians and crafts men in the area of motor vehicle (NBTE 2003). The curriculum content of MVMW comprises general metal work, service station mechanics, petrol engine maintenance, diesel engine maintenance, engine reconditioning, auto electricity and others. Upon graduation, trainees are to be self employed or pursue higher studies. Despite the good intention of training in MVMW, most graduates are unemployed largely due to poor learning attitudes during training. As a result the achievement of students in final year NABEB examination is usually low. Ayedeso (2014) identified the use of rigid and fixed conventional methods of teaching as a factor responsible for the production of unskilled graduates in Technical Colleges. There is therefore need to compliment teaching with child centered, interactive and stimulating methods like multimedia presentation to boost achievement of students. One particular area that students do not understand easily is coil ignition system. Coil ignition system is an aspect of auto-electricity designed to produce technicians that will be able to carry out general maintenance, diagnose faults and rectify same. The content of coil ignition system includes, design, construction and operations of the coil ignition system as well as maintenance. Component parts include; Battery, coil, contact breaker, distributor unit, condenser, spark plugs, high tension wires and general safety.

To teach this aspect of MVMW, it is necessary to compliment teaching with highly interactive teaching methods like multimedia presentation to improve the achievement of students. This is in agreement with Ukoha (2012) who explained that technology is being applied in teaching to improve both skills and knowledge acquisition. Okafor (2014) viewed multimedia presentation as the extensive use of images, text, voice, sound, music, pictures, charts, diagrams, animations and graphics in teaching and learning process, multi means many while media is plural of medium. Multimedia presentation as seen by Ajai (2016) is the presentation of instruction that involves more than two delivery medium. Major characteristics of multimedia are: Learner controls what he or she learning, when and how to learn. He learns at his or her own pace. Ofuefuna in Egwu (2014) lamented that no strong emphasis was placed by teachers on the use of multimedia presentation for teaching and learning to compliment chalk and talk methods like lecture and verbal explanation methods. Achievement connotes performance in schools subjects as symbolized by a score on an achievement test usually measured in percentage (Onyenuga 2015).

According to Anene (2015) achievement is a measure of student's academic standing. Poor achievement in final year examination may have adverse effect on the trade generally. Another aspect of importance in education is gender. Gender refers to a psychological term which describes overt behaviors and attributes expected of individuals on the basis of being a male or female (Nwameiye and Osunde, 2015). Ogwu and Oranu (2006) have indicated that achievement of both boys and girls in technology related subjects can be improved based on instructional technique used by the teacher. There is very high need in identifying innovative techniques such as multimedia presentation to improve achievement of both boys and girls in MVMW. The study focuses on determining the effects of multimedia presentation on the achievement of students in MVMW. This is in line with Modukpe (2014) who emphasized that there is need to develop a framework for activity based instructional packages to compliment the conventional methods of teaching.

STATEMENT OF THE PROBLEM

The federal Republic of Nigeria have committed a lot of resources to the establishment of so many Science and Technical Colleges across the nation. The aim is to train and input necessary and relevant skills into learners who will be vibrant, self employed and self reliant. Despite all these, products of our technical colleges are unable to gain employment due to lack of skills and knowledge required by industries for employment. There is high rate of change of course by students from MVMW to other computer based courses. Researchers have continued to attribute this trend to the non usage of technology driven techniques like multimedia presentation method of teaching to compliment conventional methods. In view of the above there is need to establish the effects of multimedia presentation on students achievement where students learn at their pace, choose what to learn and how to learn.

Purpose of the Study

The main purpose of the study is to determine the effect of multimedia presentation on achievement of motor vehicle mechanic work students in science and technical colleges in Benue state Nigeria. Spastically the study aims at the following.

1. Determine the achievement scores of MVMW students exposed to multimedia presentation and those exposed to conventional lecture method.

2. Determine the achievement scores of male and female students of MVMW exposed to multimedia presentation.

Research Questions

Based on the purpose of the study, the following research questions have been formulated to guide the study.

1. What is the difference in the mean achievement scores of motor vehicle mechanics work students in Science and Technical Colleges exposed to multimedia presentation and those exposed to conventional lecture method?
2. What are the comparative mean achievement scores of male with female students of motor vehicle mechanic work exposed to multimedia presentation?

Research Hypotheses

The following null hypotheses will be tested at 0.05 level of significant to guide the study.

HO₁: There is no significant different in the mean achievement scores of motor vehicle mechanic work students in science and technical colleges exposed to multimedia presentation and those exposed to conventional lecture method.

HO₂: There is no significant difference in the mean achievement scores of male and female students of motor vehicle mechanic work exposed to multimedia presentation.

Research Methods

The study adopted the quasi –experimental research design to determine the effects of multimedia presentation on the achievement of students. It used the pre-test non-equivalent control groups design, two study groups were used. The experimental group was taught using multimedia presentation while the control group was taught using conventional method (Lecture or Discussion). The study was carried out in Benue state of Nigeria. The study covered eight science and technical colleges offering motor vehicle work trade. Four colleges were used for experimental group while the other four colleges were uses as control group. All the part one students in the eight colleges were used. As such no sample and sampling techniques was used. The instrument called motor vehicle mechanics work student achievement test MVMWASAT was developed and used by the researcher. The items were selected from past examination questions based on the coil ignition

module. The achievement test MVMWASAT consists of 25 items with four options A-D multiple choice objective test. The items were in line with objectives as stated in the curriculum under coil ignition system. Test items were thoroughly shuffled and reproduced with two sets to be used for pre-test and post-test. The instrument MVMWSAT is made up of two sections, section A was used to collect students' data while B section consists of test items on coil ignition system operation. At the end a marking scheme was produced and used to mark and score the test. Two sets of lesson plan were developed. One for multimedia presentation and the second for conventional teaching method. A pretest was conducted on both experimental; and control group before commencement of treatment. A post-test was therefore administered on both groups after treatment. Experimental bias and reactors variability were controlled. The instrument MVMWSAT was subjected to both face and content validation using three experts from Benue State University. The instrument was trial tested on 18 students outside the study area. A reliability coefficient was obtained using cronbat Alpha to be 0.740 indicating the instrument is reliable.

The instrument was administered by the technical teachers of the respective schools. The researcher collected both the scripts and scores from the teachers for correlation. Data collected was analyzed using mean and standard deviation to answer research questions. The hypothesis was tested using analysis of covariance (ANCOVA) at $P < 0.05$ level of significance using the statistical package for social sciences (SPSS)

RESULT

Research question 1

What is the difference in the mean achievement scores of motor vehicle mechanics work students MVMW taught using multimedia presentation and those taught using lecture method?

Table I: Mean achievement score of motor vehicle mechanic work students.

	Group	Mean	Standard deviation	N
Pre-achievement Scores	Experimental group	2.68	1.28	25
Difference	Control group	2.76	1.62	21
Post achievement Scores	Experimental group	15.36	3.82	25
	control group	13.38		

Table I: Revealed that the pretests mean achievement scores of experimental and control groups are 2.68 and 2.76 while their standard deviations are 1.28

and 1.61 respectively. The mean difference of both groups before treatment was 0.08. At the post test the mean achievement scores of both experimental and control groups are 15.36 and 13.38 while the standard deviations are 3.82 and 2.90 respectively. The mean difference at post test is 1.98 in favour of the experimental group. This indicated that the experimental group taught using multimedia presentation achieved higher than those exposed to lecture method.

Research Question 2

What are the comparative mean achievement scores of male with female students of motor vehicle mechanics work taught using multimedia presentation?

Table 2: Mean achievement scores of male and female students of motor vehicle mechanics work

	Sex	Mean	Standard deviation	N
Pretest Achievement Scores	Male	2.83	1.47	19
Pretest Achievement Scores	Female	2.42	1.17	6
	Difference	0.41		25
Post test achievement Scores	Male	15.67	4.27	19
	Female	15.26	3.78	6
	Difference	0.40		25

The table 2 shows that at pretest, the mean achievement scores of 19 male students in experimental group was 2.83 with a standard deviation of 1.47 while that of the 6 female students was 2.42 with a standard deviation of 1.16. The mean difference of both groups at pretest was 0.41. At the posttest, the mean achievement of scores of 19 male students was 15.66 with a standard deviation of 4.27 while that of 6 female students was 15.26 with a standard deviation of 3.78. The mean difference after treatment was 0.40. This therefore, shows that both male and female students performed equally better after being exposed to multimedia presentation.

Hypothesis

HO₁: There is no significant difference in the mean achievement scores of motor vehicle mechanics work students in science and technical colleges taught using multimedia presentation and those taught using lecture method.

Table 3: ANCOVA for the difference between experimental and lecture method groups of the students.

Dependent variable: Post achievement scores

Source	Type III sum of square	df	Mean square	F	Sig
Corrected Model	108.969	2	54.48	5.16	0.010
Intercept	1451.320	1	1451.32	137.33	0.000
Pre achievement scores	64,268	1	64.27	6.08	0.018
Group	54.114	1	54.11	5.12	0.029
Error	454.444	43	10.57		
Total	10177.000	46			
Correct Total	563.413	48			

a.R square = 0.193 (adjusted R squared = 0.156)

The difference between the mean achievement scores of MVMW students taught using multimedia presentation and those taught using lecture method is read from table 3 across row heading group. It shows that $F = 5.120$, $df = 1$ and $sig = 0.029 = P$ is < 0.05 which means the noted difference is significance, so the hypothesis which states that there is a no significance difference in the mean achievement scores of MVMW students taught using multimedia presentation and those taught using lecture method is rejected.

Hypothesis 2

HO₂: There is no significance difference in the mean achievement scores of male and female students of MVMW taught using multimedia presentation

Table 4: Difference in the mean achievement scores of male and female students of MVMW

Source	Type III sum of square	df	Mean square	F	Sig
Corrected model	15.837	3	5.28	0.33	0.802
Intercept	612.997	1	612.99	38.55	0.000
Gender	2.924	1	2.92	0.18	0.672
Pre achievement scores	14.693	1	14.69	0.92	0.347
Sex		*			
Pre achievement scores	4.305	1	4.30	0.27	0.608
Error	333.923	21	15.90		
Total		6248.000	25		
Correct Total		349.760	24		

a.R square = 0.045 (Adjust R square = 0.091)

The difference between the mean achievement scores of male and female students of MVMW taught using multimedia presentation is shown in table 4 across row heading gender $F = 0.18$, $df = 1$ and $sig = 0.672 = P$ is > 0.05 which

means the noted difference is not significance difference in the mean achievement that there is no significance difference in the mean achievement scores of male and female students taught using multimedia presentation is accepted.

DISCUSSION OF FINDINGS

The findings of the study with respect to research question one on table 1 and hypothesis one on table 3 revealed that achievement of students (25) taught using multimedia presentation, was significantly improved as compared with those students (21) taught using lecture method. These findings are in consonance with Oyenuga (2015) and Arene (2015) who maintained that, a student acquires higher grade only when he or she scores higher grade than another students in the same subject. The findings of the research is also in agreement with Abduraheem (2014), who revealed that students taught using computer aided instruction achieved higher than those taught using conventional methods of teaching such as discussion and lecture. The study further revealed based on research question two and hypothesis two as shown on table 2 and 4 that there is a positive mean achievement score of both male and female students taught using multimedia presentation. This is in agreement with Ogwo and Oranu 2012, who noted that academic achievement in technology related subject could be improved in both male and female based on effective instructional technique employed by the teacher.

The multimedia instructional strategy employed made students to be more focused and clearly made learning easier and attractive to both male and female students. In addition, the study revealed that there is no significant difference between the achievement of male and female students, this shows that the teaching strategy is effective for both male and female.

Educational Implications of the Study

The results of this study have implication to both the teachers and students. The teachers of technology will now know that using multimedia presentation as a teaching strategy will improve achievement of students. Based on the above findings Federal, State and Local government educational authorities should organize seminars and workshop to equip teachers with the skills and techniques of lesson delivery using technology for effective lesson delivery.

The findings further stresses the importance of using child centered approach to learning instead of teacher centered approach if effective teaching and learning process must be achieved.

CONCLUSION

The following conclusions were made: That the student exposed to multimedia presentation lesson delivery achieved much higher than those taught using conventional methods. Student's attention and interest improved during lesson delivery. As such teachers of technology should adapt this strategy while teaching since it enhances achievement. It was also revealed that unbalances in academic achievement of boys and girls were reduced to the barest minimum, since both boys and girls equally improved in achievement at the end of teaching learning process.

RECOMMENDATION

1. The use of multimedia presentation as a teaching method should be encouraged to enhance achievement and interest in the trade.
2. That teachers and students be given training in the application of computer aided instruction to enhance efficiency.
3. Training Colleges should be well equipped for the application of technology driven instructions, while parents should equip their wards in this respect too.
4. Government at all levels should subsidize computer equipment to make them affordable to all categories of staff and student.

REFERENCES

- Ajai, T. (2016). Effects of Games and Simulation on Interest and Achievement in Goemetry in Gwer Local Government Area of Benue State. M.Ed Dissertation Faculty of Education, Benue State University, Makurdi.
- Anene, G.U. (2013): Home Economics and Academic Performance of a child *Journal of Home Economics Research* 6(1) 99-103
- Ayedeso, J. (2014) Improving Facilities for Adequate Acquisition of skills for the Achievement of Vision 2020 in Niger state. *Journal of Vocational and Technical Education* 2(2) pp 27-129
- Egwu, M.O. (2014): Effects of Pictures Supported with Audio taped Instruction on Students Achievement in History. Unpublished.

M.Ed Dissertation for Art Education, University of Nigeria
NSUKKA

Modukpe, A. (2014): *Globalization and imperatives for Changes in Educational Policy Making and Implementation in Nigeria*. Paper presented at the 3rd Vittachi Internal Conference on rethinking educational change in France.

National Board for Technical Education (NBTE) (2007): National Technical Certificate and Advanced National Technical Certificate curriculum Modules Specification of Auto Mechanics, Kaduna, NBTE.

Ogwu, B.A. and Oranu R.N. (2006): *Methodology in Formal and Non-formal technical/vocational education, Nsukka*. University of Nigeria Nsukka Press Ltd.

Okafor, LC (2014): *An analysis of Classroom Interaction Patterns in Biology in Secondary Schools in Anambra State* (Unpublished Doctorate Thesis) University of Nigeria Nsukka.

Oyenuga, A.O. (2015): *Effects of Models on Interest and Academic achievement of auto-mechanic students in technical*, University of Nigeria Nsukka.

Ukoha, U.A (2012): *Educational Media and Instruction Makurdi*, Onaivi Printing and Publishing Co. Ltd.