Effect of Related Video Supported Technique on Achievement and Interest of Motor Vehicle Mechanics Work Students in Science and Technical Colleges in Benue State, Nigeria

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Abstract

Motor Vehicle Mechanics Work has been noted to be important to man because of the advantages attached to application. Efforts are also geared towards its success in teaching and learning outcome. However, there is poor academic achievement and interest of students in Motor Vehicle Mechanics Work. This has largely been blamed on teaching methods and strategies, inability of students to understand Motor Vehicle Mechanics Work, lack of student's interest among others. The purpose of this study was to empirically investigate the effect of related video supported teaching technique on interest achievement and of Motor Vehicle Mechanics Work students in Science and Technical Colleges. Four research questions were raised and four hypotheses were formulated. Quasi-experimental design, the non-equivalent control group were used. The sample was comprised of all the SS2 46 (36 male and 10 female) students studying Motor Vehicle Mechanics Work in two Science and Technical Colleges in Benue State selected for the study. Motor Vehicle Mechanics Work Achievement Test (MVMWAT) and Motor Vehicle Mechanics Work Students Interest Inventory Scale (MVMWSIIS) were the instruments that were used for the study. The Cronbach Alpha coefficient for the items in the MVMWSIIS instrument was calculated and found to be 0.785 and the Cronbach Alpha coefficient for the items in the MVMWSAT was 0.740 which indicated that the instruments were both reliable. Data collected was analyzed using mean and standard deviations to answer research questions and analysis of covariance (ANCOVA) to test hypotheses. The results of pre achievement mean and standard deviation of the control group was 2.76 and 1.62, respectively, while the post achievement mean and standard deviation scores of the group was 13.38 and 2.92 respectively. Whereas the pre experimental group mean and standard deviation score was 2.68 and 1.28 respectively, while the post mean and standard deviation were 15.36 and 3.82 respectively. The results of pre interest mean and standard deviation scores of the control group was 27.95 and 4.33 respectively, while the post group was 28.76 and 4.37 respectively. Whereas the post experimental group mean and standard deviation was 7.40 and 2.81 respectively, while the control group mean and standard deviation were 58.71 and 4.62 respectively. Interest and achievement scores of the students showed that related video supported teaching technique enhances student's interest and achievement. Based on the findings of the study, conclusions were drawn that student taught using related video supported teaching technique had achievement significantly higher than those taught using lecture method, imbalance in achievement and interest of male and female students was minimized to the barest minimum. The study therefore recommends that, related video supported teaching technique strategy should be used in the field of Motor Vehicles Mechanics Work for achievement and interest.

INTRODUCTION

Motor Vehicle Mechanics Work (MVMW) is a technical course offered at craft schools and technical colleges. Motor Vehicle Mechanics Work is a skill oriented course which enables students to acquire knowledge and skills for gainful employment in industries, companies, government establishments, or to be self-reliant. Idris (2011) pointed out that, some of the basic factors that could aid in achieving meaningful technical education in Motor Vehicle Mechanics Work include the provision of physical structure, tools and equipment. It is reported in detailed that students find it difficult to comprehend Motor Vehicle Mechanics Work (MVMW) modules especially the auto electricity (Coil Ignition System) among others. Ayedeso (2010) identified the use of rigid and fixed methods of teaching without complimenting them with the use of computers at this computer age as one of the factors responsible for unskilled graduates of schools. According to Babajide and Bolaji (2010), with the current trend in technological advancement, students prefer reading specific and relevant information electronically produced on computer devices like memory card, Digital Versatile Disc (DVD), Compact Disc (CD), I-pads, laptops and desktops computers. Riza (2011) explained that technology is being applied in most institutions to improve skills and knowledge acquisition. One of such technology application is the use of related video supported technique in teaching and learning processes. To Okafor (2010) and

Ajai (2008), the use of related video supported technique in teaching and learning processes implies the extensive use of images, text, voice, sound, music and pictures in which students can access, understand, process, express and apply knowledge. The National Business and Technical Examinations Board (NABTEB) Chief examiners' report of 2011, 2012, 2013, 2014 and 2015 and results analyses by Science and Technical College principals had consistently shown that, Motor Vehicle Mechanics Work students were persistently turning up with poor results in the National Technical Certificate (NTC) conducted by (NABTEB). According to Ayedeso (2010) rigid and fixed methods of teaching without complimenting them with the use of computers is one of the factors responsible for unskilled graduates of schools.

Ogunkule (2010) generally defined interest as to have, feel, show or express curiosity or concern about somebody or something. In education, interest means a state of wanting to learn or know something. It is a strong desire for knowledge, or quality that arouses concern, curiosity or power to hold somebody's attention. Student's interest in a subject or area determines their achievement to a large extent. However, both student's interest and level of achievement is hinged on the instructional approaches or strategy. Since student's interest in a subject depends on strategic strategies used for instruction as seen by Nwanchukwu, (2010), it has become incumbent on Science and Technical College teachers to be creative in selecting interaction based strategies of teaching in order to arouse the interest of the students. Some of the teaching methods adopted by Motor Vehicle Mechanics Work teachers inhibit the student from acquiring relevant, saleable skills necessary for self-employment just because they do not involve the use of computers.

The concept of achievement literally means the ability of somebody to gain or reach a set goal through effort, skills or courage (Ezike, 2011). Ogunkule (2010) explained that, an achievement test is one based on a course content which a student has been taught. It is designed and administered to find out how much of the curriculum content the student has learned. Student achievement has to do with the ability to perform with adequacy and excellence as measured against specific standards attainment. Achievement measurement against these standards means a systematic and purposeful quantification of learning outcomes (Nworgu, 2012). Students' achievement in Motor Mechanic is therefore a systematic and purposeful quantification of students' cognitive and psychomotor learning outcomes. This systematic quantification of acquired knowledge, abilities, competencies, attitudes and skills is based on curriculum content taught by the teacher. Achievement is measured within the term, at the end of a term, each year or at the end of three year programme. The final examination is administered by National Business and Technical Examination Board (NABTEB) leading to the award of National Technical Certificate (NTC). The chief examiners report has continued to indicate low achievement in Motor Vehicle Mechanics Work since 2010 in Benue State (NABTEB, 2010).

From the fore going it has become imperative to determine the effect of related video supported teaching technique on achievement and interest of motor vehicle mechanics work students in science and technical colleges in Benue State, Nigeria.

Research Questions

The following research questions were 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 taught using related video supported teaching technique presentation (experimental method) and those taught using lecture method (control method)?
2. What is the difference in the mean interest rate of Motor Vehicle Mechanics Works students in Science and Technical Colleges taught using related video supported teaching technique presentation and those taught using lecture method?
3. What is the comparative mean achievement scores of male with female students of Motor Vehicle Mechanics Work taught using related video supported teaching technique presentation?
4. What is the comparative mean interest rate of male with female students of Motor Vehicle Mechanics work in Science and Technical Colleges taught using related video supported teaching technique presentation?

METHODOLOGY

Area of the Study

The study was carried out in Benue State of Nigeria. Benue state is located in the North central geo-political zone of Nigeria. The study included two Science and Technical Collges where Motor Vehicle Mechanics Work trade is taught in Benue State namely; Benue State University Science and Technical College Makurdi and Federal science and Technical college Otukpo.

Research Design

The study was carried out using quasi-experimental research design. The pre-test and post-test non-equivalent control group design was used. This design was necessary because it was not a laboratory research work but rather field work which involved group of students.

Population of the Study

The population of the study comprised all the SS II 46 (36 male and 10 female) students studying Motor Vehicle Mechanics Work in two Science and Technical Colleges in Benue State selected for the study. The SS II students of MVMW students were used because the SS II syllabus covers operation of the coil ignition system which is the specific area the study is centered on.

Sample and Sampling Technique

The sample size for the study was forty six, Purposive Sampling was used for the purpose of convenience, because the study involved gender and not all the colleges are mixed sex, only two (Benue State University Science and Technical College which was an experimental group with 19males and 6 females) and Federal Science and Technical College Otukpo which was a control group with 17 males and4females) out of the eight Science and Technical Colleges studying Motor Vehicle Mechanics Work trade in Benue State were considered.

Instrumentation

The instruments that was used for data collection was; 20 items on Motor Vehicle Mechanics Work Student Achievement Test (MVMWSAT) and 20 items on Motor Vehicle Mechanics Work Student's Interest Inventory scale (MVMWSIIS), the scoring was five marks for each right item (MVMWSAT and MVMWSIIS). The instruments were developed from related video supported teaching technique package based on the coil ignition system operation.

Validation of the Instrument

The two instruments namely; MVMWSAT and MVMWSIIS were subjected to face and content validation. The two instruments MVMWSAT and MVMWSIIS were initially made up of 40 and 30 items respectively, which were presented to two experts of auto mechanics, and one measurement and evaluation expert from Benue State University, for face and content validation. Some of the questions with poor distracters were advised to be deleted, and some options that clearly gave out answers were advised to be either deleted or modified. Also items that were not well structured were advised to be restructured. Options such as none of the above, all of the above in MVMWSAT were advised to be deleted and substituted with appropriate distracters. On the lesson plans, it was pointed out that during the development, the objectives, content, method and evaluation aspects of the lesson plan should be properly aligned.

Reliability of Instrument

The modified package of 20 MVMWSA Test items multiple choice and 20 MVMWSIIS was trial tested on 18 students (15male and 3 females) of Science and Technical College Zaki- biam in Benue State which had the same characteristics with the experimental and the control groups. Data collected from the administered 18 SS2 Motor Vehicle Mechanics Work students of Science and Technical College Zaki-biam in Benue state were subjected to reliability analysis to ascertain reliabilities of the instruments. Cronbach Alpha statistical tool was used which is suitable for instruments composed of items of attitudes scales that provides responses on a rating of "Strongly Agree, Agree ,Disagree and Strongly Disagree''.

The Cronbach Alpha coefficient for the items in the MVMWSIIS instrument was calculated and found to be 0.785 and the Cronbach Alpha coefficient for the items in the MVMWSAT was 0.740 which indicated that the instruments were both reliable (Julie, 2008).

Method of Data Collection

Students of the two selected schools were subjected to a pre-test using the MVMWSAT test items. After the pre-test, the experimental and control groups were administered with the post-test for both interest and achievement test. The collected scripts were marked and scored which became data for the study.

Experimental Design Procedure

A pre-test was conducted on both groups (experimental and control group) using the same test item and the teaching method use for control was lecture method. All the five lessons took, lasted for forty minutes each and were conducted all on the same day. After both experimental and control groups had received their lessons, post test was administered on both of them with Motor

Vehicle Mechanics Work Student Achievement Test (MVMWSAT) and Motor Vehicle Work Mechanics Student Interest Inventory Scale (MVMWSII).

Motor Vehicle Mechanics Work Student Achievement Test (MVMWSAT)
The instrument MVMWSAT was developed by the researcher and consist of 20 items, four-option (A-D) multiple choice objective test, the 20 items spans from lesson one to five. The items were designed in line with the objectives stated in the curriculum on each topic under coil ignition system operation. The test items were thoroughly shuffled and reproduced into two sets. The first set was used for post-test, while the second set was used for pre-test.

Marking Scheme and Lesson Plans
Each correct MVMWSAT question for both pre-test and post-test items was awarded five marks. The marking schemes for MVMWSAT and MVMWSIIS had five lesson plans each for both experimental and control groups.

Method of Instruction for the Study
Sample of Motor Vehicle Mechanics Work (video supported Lesson Plan) was used for Experimental group and Lecture method Lesson Plan for Control Group (LMLP)

Method of Data Analysis
Data collected for the study was analyzed using mean and standard deviation to answer research questions. The hypotheses were tested using analysis of covariance (ANCOVA) and t-test at 0.05 level of significance The choice of ANCOVA for testing the null hypotheses was because, according to Nworgwu (2008), ANCOVA is the most appropriate statistical technique for analyzing data obtained from pre-test-post-test non-equivalent group design. The technique explains how the pre-test scores were used as a covariate to the post-test scores from the above; therefore, ANCOVA was considered most appropriate for the study.

RESULTS

Table 1: Mean achievement scores of Motor Vehicle Mechanics Work Students in Science and Technical Colleges

	Group	Mean	Std. Deviation	N
Pre achievement scores	Experimental Group	2.68	1.28	25
	Control Group	2.76	1.62	21
	Difference	0.08		
Post achievement scores	Experimental Group	15.36	3.82	25
	Control Group	13.38	2.92	21
	Difference	1.98		

Table1 revealed that the pretests mean achievement scores of both experimental and control groups were 2.68 and 2.76 while their standard deviations were 1.28 and 1.61 respectively. The mean difference of both groups before treatment was 0.08. At the post-test mean achievement scores of both experimental and control groups were 15.36 and 13.38 while the standard deviations were 3.82 and 2.90 respectively. The mean differnce at post test was 1.98 in favour of the experimental group.

Table 2: Mean interest rating scores of Motor Vehicle Mechanics Work Students in Science and Technical College

	Group	Mean	Std. Deviation	N
Pre-Interest	Experimental Group	28.76	4.37	25
	Control Group	27.95	4.33	21
	Difference	0.81		
Post-Interest	Experimental Group	73.40	2.81	25
	Control Group	58.71	4.62	21
	Difference	14.69		

Table2 Revealed that the pre-test mean interest rating scores for 25 students in experimental group was 28.76 with standard deviation of 4.37, while the control groups mean interest rating was 27.95with standard deviation of 4.32. The mean difference of the two groups at the pretest was 0.81. After treatment, the mean Interest rating for experimental group was 73.40 with standard deviation of 2.81 while that of the control group was 58.71 with standard deviation of 4.62. The mean interest rating difference of the two groups after treatment was 14.69 in favor of the experimental group.

Table.3: Mean achievement scores of male and female students of Motor Vehicle Mechanics Work

	Sex	Mean	Std. Deviation	N
Pre- ArchScores	Male	2.83	1.47	19
	Female	2.42	1.17	6
	Difference	0.41		25
Post –ArcScores	Male	15.67	4.27	19
	Female	15.26	3.78	6
	Difference	0.40		25

The Table 3 revealed that, the pre-mean achievement scores (Pre-Arch Scores) of 19 male students in experimental group was 2.83 with standard deviations of 1.47while that of 6 female students was 2.42 with standard deviation of 1.16. The mean difference of both groups was 0.41. The post-mean achievement scores (Post-Arch Scores) of the 19 male students was 15.66 with standard deviation of 4.27 while that of 6 female students was 15.26 with standard deviation of 3.78. The mean difference after treatment was 0.40. This implies that the method used both on male and female greatly enhanced their understanding (especially the female students) of the topics taught.

Table 4: Male with female students of Motor Vehicle Mechanics work taught using related video supported technique.

	Sex	Mean	Std. Deviation	N
Pre-Interest	Male	29.21	4.59	19
	Female	27.33	3.56	6
	Difference	1.88		
Post-Interest	Male	73.74	2.83	19
	Female	72.33	2.73	6
	Difference	1.40		

Table 4, revealed that, the pre-interest mean rating scores for 19 male students in experimental group was 29.21 with standard deviation of 4.59. While the 6 female students in the experimental group had a pre-interest mean rating of 27.33 with standard deviation of 3.56. The pre-interest mean difference of the two groups at beginning was 1.88. After treatment, thePost-Interest mean rating for male students was 73.74with standard deviation of 2.83 while that of the 6 female students was 72.33 with standard deviation of 2.73. The Post-Interest mean rating difference of two groups after treatment was 1.40.

Table 5: Test of interest rating scores of Motor Vehicle Mechanics Work Students taught using related video supported technique.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2478.191[a]	2	1239.10	88.87	.000
Intercept	3901.154	1	3901.15	279.79	.000
Pre-Interest	16.738	1	16.74	1.20	.279

Group	2401.788	1	2401.79	172.26	.000
Error	599.548	43	13.94		
Total	207700.000	46			
Corrected Total	3077.739	45			

a. R Squared = .805 (Adjusted R Squared = .796)

Reading from Table 5 across row heading Group revealed F=172.258, df =1, Sig. =0.000 =p.

Since p is < 0.05, the difference between the groups (experimental and control) was significant.

Table 6: Difference in the mean achievement scores of male and female students of Motor Vehicle Mechanics Work Students

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	15.837[a]	3	5.28	.33	.802
Intercept	612.997	1	612.99	38.55	.000
Gender	2.924	1	2.92	.184	.672
Pre-ArchScores	14.693	1	14.69	.92	.347
Pre-ArchScores	4.305	1	4.30	.27	.608
Error	333.923	21	15.90		
Total	6248.000	25			
Corrected Total	349.760	24			

a. R Squared = .045 (Adjusted R Squared = -.091)

The difference between the mean achievement scores of male and female students of MVMW in Science and Technical colleges taught using experimental strategy in Table 6 showed that gender (**Sex**) F = .184, df = 1 and **sig.=**.672= p was> 0.05 which means the noted difference was not significant. This implies that both male and female students taught using experimental strategy (video related technique) understood the concepts almost on the same range.

Table 7: Test the difference in the mean interest scores rating of male and female students.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	11.812[a]	2	5.91	.73	.494
Intercept	2691.277	1	2691.28	332.28	.000
PreInterest	2.830	1	2.83	.35	.560
Gender	6.913	1	6.91	.85	.366
Error	178.188	22	8.09		
Total	134879.000	25			
Corrected Total	190.000	24			

a. R Squared = .062 (Adjusted R Squared = -.023)

Table 7shows that, gender (**Sex**) F = 0.853, df = 1 and **sig. =**.366 = p. Since p was> 0.05 which means the noted difference was not significant.

DISCUSSION

The findings of the study with respect to research question one on has revealed that, achievement of students taught using related video supported technique presentation, was significantly improved as compared with the students taught using lecture method. The finding of the research was in agreement with Anyigbo (2009) and Anene (2012).The findings of the research was also in agreement with Abdu-el-aziz (2013), who discovered that students taught using innovative method achieved higher than those taught using conventional method of teaching.

The study further revealed that students taught using related video supported technique presentation have significantly higher interest than those taught using lecture method. This finding was in agreement with Chukwu (2010) who discovered that interest was a persisting tendency to pay adequate attention, enjoy doing some activity and score high grades. The findings of the research is also in agreement with Olatude (2011),Balogun (2008) who said that students taught using the innovative method have higher interest than those taught using conventional method of teaching which lecture method is among.

Ogwo and Oranu (2012) stated that academic achievement and interest in technology related subjects can be improved in both male and female based on instructional technique employed by the teacher.

CONCLUSION

The study revealed that, interest of the students taught using related video supported technique presentation was higher than those taught using lecture method. The students taught using related video supported technique presentation achieved significantly higher than those taught using lecture method. This method prepared the student readily for Motor Vehicle Mechanics Work and they follow the lesson execution with understanding. At the end, they were able to perform better than their counterparts.

Recommendations

Using related video supported teaching technique presentation as a teaching strategy will reduce low Achievement and lack of interest in the field of Motor Vehicle Mechanics Work.

Parents should endeavour to buy or acquire related video supported teaching technique packages in the field of Motor Vehicle Mechanics Work for the various topics of Motor Vehicle Mechanics

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