Effects of Multimedia Video Projection on Undergraduate Students' Achievement and Retention in Quantitative Economics in the Universities in Gombe State, Nigeria

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Abstract
This study was design to determine the effects of multimedia video projection on undergraduates' students' achievement and retention in quantitative Economics in Universities in Gombe State, Nigeria. Three research questions and two null hypotheses guided the study. Quasi-experimental research design specifying pretest posttest control group design was adopted for the study. The study was conducted in Federal University Kashere and Gombe State University, Gombe. Quantitative Economics Achievement Test (QEAT) designed by the researcher and validated three experts from Federal University, Kashere, Gombe State was the instrument used for the data collected for the study. The reliability coefficient of the instrument was determined to be 0.74 through Kudder-Richardson 20 (KR-20) statistics. Mean and standard deviation were used to answer research questions; while Analysis of Covariance was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that multimedia projection approach is more efficacious in enhancing students' achievement and retention in quantitative Economics than lecture method. There is no statically significant difference in achievement in Quantitative Economics by male and female students who were taught using multimedia video projection approach. Based on the findings, it was recommended that the use of multimedia projection should be encouraged in teaching Quantitative Economics in tertiary institutions and that is use should be popularized through workshops, seminars and conferences.
Keywords: Multimedia, Video Projection, Students' Achievement, Retention, Quantitative Economics

Introduction
Universities in Nigeria graduate large number of students annually into the labour market for appointments into their respective areas of specializations. But majority of them remain unemployed many years after their graduation. Researchers and scholars reported that employers complained that Nigeria University graduates including economics graduates are half baked and poorly prepared for work (Saint, Hatneat and Tresser, 2004; Oluyemi and Adedeji, 2012, Eneogu and Ugwuanyi 2021). Oluyemi and Adedeji further assertedthat the deficiencies among the graduates are in the areas of entrepreneurial skills, critical thinking, communication, decision making, information technology interpersonal problem solving and self-defected skills in which economics graduates from Nigeria Universities are not left out.

The inability to apply quantitative economics skills to solve economic problems due to poor teaching approach is one of the reasons why many of the economics graduates the unemployed and why many Nigerians, according to Kalu, (2014) are living below poverty line without hope of improvement of their condition even when national

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endowments abound. Kalu (2014) believed that the reason rate of unemployment is that our education system produces job seekers instead of job providers while Eneogu and Uguwanyi (2014) reported that is a mismatch between the skills and competencies possessed by the university graduates and the skills and competencies required in the labour market. It has also been observed that many students' achievements in quantitative Economics over the year tend to be very poor. This means that graduates without sound knowledge and applications of quantitative techniques in economics. Skills mismatch in the labour market (Eneogu and Ugwuanyi, 2014) and poor academic achievement (Ekpo, 2006; Madu and Nwangwu, 2014) have been attributed largely to the methods of instruction which is predominantly lecture method which makes learners become discouraged and passives (Aroh, 2006; Madu and Nwangwu, 2014). This is the method whereby teachers communicate ideas to learners by direct verbal discourse sometimes called talk and chalk method. Lectures use lecture method/expository strategy reading from text books/notes/computer systems, explaining concepts with little or no contributions from the students, asking and answering few question and dictating or copying notes on the board for students to copy.

Most Economics lectures often teach economics using lecture/expository method. Hence many do graduate without very low achievement in quantitative economics or drop out on the courses that have much to do with quantitative economics. All these have been attributed to the poor method of instruction used by the lecturers. However, rapid transformation in education sector as a result of advancement in technology which according to Bunfat, Sand, Dahah, Arifin and Zarid (2010) plays an important role in helping teachers to develop their instructions to students. One of this advancement in technology that has affected the teaching and learning is the use of multimedia video projection instructional strategy.

Academic achievement refers to the knowledge or skills acquired as a result of instruction or training usually measured through standardized test or examination reported in grades or score. It is represented by the grade awarded to students after test/examination following series of teaching and learning between teachers and learners. But for some years now, there has been abysmal academic achievement and performance of students in Quantitative Economics (Agbo, Anure & Asogwa, 2008; Aduba, Ezeofor & Okoro, 2010; Banwua & Oekeke, 2010) and this is largely traced to the method of instruction. Retention on the other hand is an individual's ability to remember and recall information, materials and experiences learned over time. This acquired materials in the mind need to be preserved in form of images for knowledge to develop. Okoye (2012) refers to retention as the process of maintaining the availability of new meanings or some part of them. Quantitative Economics contents therefore, need to be presented to the learners in a way or method that touches their sub consciousness, which can trigger quick recalling of the concepts, processes and skills being taught and learnt.

Learning experiences in which the contents and materials are presented in a form that appeal to multiple human senses simultaneously and to encourage active involvement of students in leaning activities have been associated with longer retention this is in line with Okoye (2012) who stated that active participation during instruction increases learning and retention.In predicting academic achievement and retention some scholars and researchers view gender a relevant factor to be reckoned with while others believe that gender is not a relevant factor. Gender in its narrowest sense means socially constructed sex roles of female or male. Consequently, there might be differences in male and female behaviors, partly as a product or outcome of gender roles orientation in social construction of a particular environment in which they belong to. Gender refers to the social meanings associated with being a male or a female, including the construction of identities, expectations, behaviours and power relationships that is derived from social

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interactions (Ambe-Uva, Iwuchukwu & Jibrin, 2008; Yang, 2010).

In a study by the U.S Department of Education (2012), boys did slight better than the girls in mathematics and science. Agomuoh (2010) found that gender influences students' achievement in favour of the male. Manasaray (2008), documents that girls perform significantly better than the boys. Fagbemi, (2004) and Yawa, (2006) found that male and female students performed equally well view that male and female students perform equally using concept mapping instructional strategy. The studies by Ogunleye and Babajide (2011) and Agomouh (2010) stated that the use of conventional encourages gender inequalities in science education. Njoku, (2010) emphasized that if teachers are made aware of the effects of their classroom practices, including some sarcastic jokes and innuendoes, on their female students, there is no doubt that they would become gender-sensitive.

From the foregoing, it can be seen that very little or consistent result has emerged from the study on the effects of gender on students' achievement and retention in learning qualitative economics. Therefore, the use of multimedia video projection in teaching and of quantitative economics may be useful as this will enable the students to watch, review and use the lesson projected in whatever manner that can best suit their educational needs. It's against this backdrop that the researcher (s) intends to investigate effects of multimedia video projection on undergraduate students' achievement and retention in quantitative economics in the Universities in Gombe State, Nigeria.

Purpose of the study
The purpose of this study is to determine effectsof multimedia video projection on undergraduate students' achievement and retention in quantitative economics. Specifically, the study sought to achieve the following objectives:
1. Find the mean achievement scores of students taught Quantitative economics using multimedia video projection compared to the use expository instructional strategy.

2. Find the mean achievement scores of male and female students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy
3. Determine the mean retention scores of students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy

Research Questions
The following research questions guided the study:
1. What are the mean achievement scores of students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy?
2. What are the mean achievement scores of male and female students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy?
3. What are the mean retention scores of students taught Quantitative Economics using Access multimedia video projection and that of those taught using expository instructional strategy?

Hypotheses
The following null hypotheses were formulated tested at 0.05 levels of significance.
Ho$_1$: There is no significant difference in the mean achievement scores of students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy.
Ho$_2$: There is no significant difference in mean achievement scores of male and female students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy.

Research method
This chapter presents under the following major subheadings, design of the study, area of the study, population of the study, sampling

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of the study, methods of data collection and method of data analysis

Design of the Study
The study adopted quasi experimental non-equivalent pre-test, post-test control group design, involving two intact groups of one experimental group and one control group. This is in line with Nworgu (2015) who observed that quasi experimental research design is used where random assignment of subjects to experimental and controlled groups is not possible in which the two intact groups used are:

Area of the Study
The study was carried out in Universities in Gombe State. The choice of this school is due to the fact that it is one of the tertiary institutions of learning where economic activities that require rational Economics decisions making are highly required

Population of the Study
The population of the study is five hundred (500) undergraduate students in degree awarding tertiary institution in Gombe State, Nigeria. The choice of year three students as the population for the study is because the selected Quantitative Economics are among their course contents.

Sample and Sampling Techniques
The sample size is 65 students made up of 30 male and 35 female students based on the intact classes in the sampled tertiary institution drawn using purposive sampling techniques. Simple random involving balloting with withdrawal and replacement were used for assigning the sampled institutions to control and experimental groups

Validation of the Instruments
Face and validity was carried out on Quantitative Economics Achievement Test (QEAT) and Quantitative Economics Retention Test (QERT) by two experts from Nnamdi Azikiwe University, Awka; one from measurement and evaluation, one from department of Economics.

For content validity of the QEAT and QERT, test blue print was used to construct the instrument and was trial tested and the scores analyzed. Responses of students in the upper one-third and lower one-third continuum on the basis of total test scores were compared. Consideration for including an item in the final version of the QEAT was based on the test item satisfying the psychometric quality of having an item discrimination capacity of $^{+}0.3$ and $^{+}1.00$. the ten items constituted the final version of the QEAT and QERT.

Reliability of Instruments
The QEAT used was pilot-tested and the scores were used to establish the internal consistency of the test items using Kudder-Richardson formula 20 (K-R, 20) method. Thus an internal estimate of 0.74 was obtained.

Method of Data Collection
Protest using the validated Quantitative Economics Achievement Test (QEAT) was first administered on the subjects by the researchers themselves and the results carefully recorded before the treatment session, which lasted for four weeks. A day after the treatment, post-tests was administered on the subjects by the researcher using the same QEAT. After two weeks of administering QEAT, the researchers administered the QERT.

Methods of Data Analysis
Mean and standard were used to answer research questions and analysis of covariance (ANCOVA) was used to test the null hypotheses at 0.05 alpha levels of significance all with the aid of Statistical Package for Social Sciences

Results   **Research question one**

Table 1: Mean Achievement Scores of Students in Quantitative Economics

Groups	Pre-test		Post-test		Mean gain	N
	$\overline{X}$	SD	$\overline{X}$	S D		
Multi-media video projection	27.07	4.353	75.74	5.035	48.65	27
Expository/Lecture	24.24	4.951	49.83	8.888	25.59	38

Table 1 shows that the experimental group has a pre-test mean score of 27.07, a post-test mean score of 75.74 and mean gain of 48.65 while the control group has a pre-test mean score of 24.24, a post-test mean score of 49.83 and mean gain of 25.59. The experimental group has a higher mean gain than control group. This shows that the group taught Quantitative Economics topics using Multi-media video projection have higher achievement score than those taught with expository instructional strategy.

Research question two

Table 2: Mean Achievement Scores of Male and Female Students Taught Quantitative Economics Using Multimedia Video Projection

Groups	Posttest		Retention Test		Mean Loss	N
	$\overline{X}$	SD	$\overline{X}$	S D		
Male	26.57	4.76	63.60	12.403	37.03	30
Female	24.43	4.867	58.00	16.469	33.57	35

Table 2 shows that male students have a pre-test mean score of 26.57, a post-test mean score of 63.60 and mean gain of 37.03 while female students have a pre-test mean score of 24.43, a post-test mean score of 58.00 and mean gain of 33.57. Male students have a higher mean gain that the female students. This shows that male students taught Quantitative Economics using multi-media video projection achieved higher than their female counterparts.

Research question three

Table 3: Mean Retention Scores of Students Taught Quantitative Economics Using Multimedia Video Projection And That of Those Taught Using Expository Instructional Strategy

Groups	Posttest		Retention Test		Mean Loss	N
	$\overline{X}$	SD	$\overline{X}$	S D		
Multi-media video projection	75.74	5.035	70.41	5.833	5.33	27
Expository/Lecture	49.83	8.888	37.68	7.56	12.15	38

Hypotheses
Ho_1: There is no significant difference in the mean achievement scores of students taught Quantitative Economics using multimedia video projection and that of those taught using expository instructional strategy.

Table 4: Analysis of Co-Variance (ANCOVA) of Students' Posttest Achievement Scores in Quantitative Economics – Multimedia Video Projection, Expository Method and Gender

Source	Dependent variable	Type III sum of squares	Df	Mean Square	F	Sig.
Corrected model	Post-test	13019.756[a]	5	2603.951	131.307	.000
Intercept	Post-test	2952.298	1	2952.298	148.873	.000
Pretest	Post-test	940.999	1	940.999	47.451	.000
Gender	Post-test	8.317	1	8.317	.419	.520
Group	Post-test	1274.604	1	1274.604	64.273	.000

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Gender group	Post-test	8.884	1	8.884	.448	.506
Error	Post-test	1170.029	59	19.831		
Total	Post-test	252772.000	65			
Corrected total	Post-test	14189.785	64			

Significant at 0.05 levels

Table 4 also shows that the difference in the mean achievement scores of male and female students taught Quantitative Economics using multimedia video projection is not significant since the F-value at 0.448 in respect of treatment main effect is not significant at 0.506. This, therefore, shows that 0.05 level of significant, the F-value of 0.448 is not significant. The observed difference in achievement scores of between the two gender groups is merely due to chance. The research hypothesis is therefore accepted. There is no significant difference in mean achievement scores of male and female students taught some quantitative economics topics using multi-media video projection.

Discussion of Findings
The findings showed that multi-media video projection yielded a significant difference on students' achievement in Quantitative Economics than the conventional expository instructional strategy. This is in line with Aroh (2006), Nwangwu and Obi (2014) and Kolawole (2012) who noted that multi-media video package is more learner-centered and makes learners more active than the conventional lecture approach. The students can learn quantitative economics topics better when they are actively involved and when the lesson appeal to varieties of their senses.Therefore, the perceived abstract nature of economics which contributes to students' perception of most of the quantitative economics topics can be remedy using multi-media video projection to teach the contents.
The finding also revealed that gender as a variable had no significant effects on students' achievement in quantitative economics. This is in line with the views of Aroh (2006) who opined found that male and female students performed equally well in biology using self-instructional computer-based packages and Onuoha (2010) who stressed that male and female students performed equally using concept mapping instructional strategy but not in line with the views of Manssary (2008) who discovered that female students achieved higher in Biology than the male students when exposed to treatment. This difference could be as a result of the differences in instructional approach used in the reviewed work and multi-media video projection and differences in methods of data analysis.

Conclusion
Multi-media video projection proved efficacious in enhancing undergraduate students' achievement in Quantitative Economics. This means that in an effort to promote high economic achievement and retention in tertiary institutions in developing countries, Quantitative Economics topics should be tonight using multi-media video projection. The conventional (expository) instructional strategy had been proved to be ineffective in enhancing students' achievement in Quantitative Economics. Gender is not an important factor in determining the instructional approach to be adopted in teaching Quantitative Economics. This is confirmed by the available data that the teaching strategy has similar or equally effects on students' achievement in Quantitative Economics irrespective of their gender.

Recommendations
Based on the findings of the study, the following recommendations are made:
1. Economics lecturers should adopt multi-media video approach in teaching Quantitative Economics and lecturers should be motivated to integrate multimedia approaches in their classes.
2. The school authorities should equip their institution with the state of the art multimedia facilities such as computers, up-to-date multimedia software, DVD, VCD etc. and ensure regular electricity power supply.

3. Enlightenment campaign, seminars, workshop and conferences for use of multi-media packagers in teaching and learning should be organized by faculties, schools and professional associations.

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