EFFECTS OF PROGRAMMED INSTRUCTION TEACHING METHOD ON ACADEMIC ACHIEVEMENT AND RETENTION OF STUDENTS IN BUSINESS STUDIES IN OYO STATE, NIGERIA

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Abstract

The study investigates the effects of programmed instruction teaching method (PIM) on the academic achievement and learning retention of students in business studies in Oyo State, Nigeria. Three research questions guided the study and two hypotheses were tested at 0.05 level of significance. The population of the study was all junior secondary school business studies students in Oyo State, Nigeria. Purposive sampling technique was used to select a sample of 105 students for the study. Pre-test, post-test non-equivalent groups quasi- experimental design was used for the study and the instrument for data collection were programmed book in business studies and business studies achievement test (BSAT) which were developed by the researchers and validated by two experts. A reliability correlation co- efficient of 0.78 was obtained for the test items using test re-test and Pearson Product Moment Correlation instrument. Mean was used to analyse data relating to research questions while analysis of covariance (ANCOVA) was used to test the hypotheses. Findings revealed that students taught business studies using programmed instruction method (PIM) achieved better with higher post-test mean score than those taught using conventional teaching method (CTM). Also, findings revealed that mean retention score of students taught business studies using PIM was higher than that of those taught using CTM and that the interaction effects of teaching methods and gender was not significant on students' academic achievement and retention in business studies. It was recommended that business studies teachers should use programmed instruction method in teaching so as to enhance students' academic achievement and retention in the subject. The school administration and other stakeholders should provide opportunities for in-service training for business studies teachers in other to equip them with competencies needed in the application of programmed
instruction teaching method for teaching business studies.

Keywords: *Academic Achievement, Learning Retention, Business Studies, programmed Instruction Teaching Method*

Introduction

The present global yearnings for education for gainful living and self reliance indicates that there is the urgent need for effective and well trained individuals who would be able to take care of themselves and contribute meaningfully and productively to the

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development of the society both mentally, socially and economically. It is an age long fact that education is one of the most potent tools for survival, growth and development. The concept of education, according to Agbatogun (2010) is that it is a systematic way of imparting knowledge, skills and attitudes to the learners in the process of their preparation for meaningful life and contribution to better society. In the same vein, Lawal (2013) defined education as the process of giving knowledge or developing the learners' abilities through teaching, training and schooling. It is viewed as an instrument of positive re-orientation of both individuals and society towards more productive and beneficial ways of achieving desired goals and objectives.

Nigeria as a country, recognizing the importance of education has continued to make serious efforts towards providing the citizens with qualitative and functional education needed for social, economic and political development. Thus, the Federal Republic of Nigeria (2013) in her National Policy on Education (NPE) stated expressly that one of the aims and objectives of education in the country is to equip the child with appropriate productive or functional skills, abilities and competencies both in natural and physical dimensions so as to be able to contribute meaningfully to the development of the society.

Effective teaching and learning of business studies being a vocational subject is capable of addressing economic, political and social crises threatening the stability of Nigeria. Mustapha cited in Adeagbo (2014) observed that the teaching and learning of business skills is gaining prominence in many schools and colleges. The author maintained that this is caused by the need for producing educated, skilled and motivated workforce. Business studies as a subject is taught in junior secondary schools today and it encompasses office practice, commerce, typewriting, book-keeping and shorthand. Business studies has the following stated objectives according to Vanguard (2013) in Adeagbo (2014): to equip students with basic knowledge of business, to develop basic skills in office occupation, to provide orientation and basic skills with which to start a life of work for those who may not undergo further training, to provide basic skills for further use in future, to relate their knowledge and skills to the national economy.

Academic achievement is defined according to Epunam (2009) as performance in school subjects as depicted by scores or marks obtained in an achievement test. The author contended further that it is learning outcomes of students in terms of level of acquisition of skills, knowledge and ideas needed for gainful employment in related fields or careers. This definition suggests that academic achievement is attitudinal in nature and is a permanent change in conceptual attainment of knowledge, skills and attitude of the learner on the successful completion of a specified course of study. This assertion may be in line with the opinion of Spinath (2012) that academic achievement represents learning outcomes that shows the extent to which a person has accomplished specific goals that were the focus of activities of instructional environment particularly in schools. Academic achievement refers to how students performed in school examination and it could be high average, low or poor. Poor academic performance can be described as any academic performance that falls below the acceptable standards (Abdulahi, 2013).

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Academic achievement measures the acquisition of knowledge and skills, but it is not enough as there is the need to recall what has been taught hence, this is called retention. Houghton (2007) defined learning retention as the ability of the mind to remember information acquired from reading observation or other process. It is the amount of what the learner has retained about the learnt material equals amount the learner originally learned less the amount forgotten (Zain, Subramaniam, Rashid, & Ghani, 2009). The retention ability of students depends on the teaching method and activities performed by the students. Safo,

Ezenwa & Wushishi (2013) defined retention as the ability to keep or retain the knowledge of what is learnt and be able to recall it when required hence, retention in this work refers to the ability to recall or remember what has been taught after a given period of time with the notion of measuring students' academic achievement in business studies.

Many strategies have been employed by the teachers to teach business studies in schools. Some of these common strategies used by teachers include: traditional method of teaching, project, lecture, play way, demonstration, problem solving among others. Igboko and Ibeneme (2006) noted that traditional education practices like demonstration and lecture methods alone have proved incapable of producing desired skills needed to cope with the present challenges of explosion in technology and economic development. They argued further that teachers are strongly advised to use the students' activity based and inquiry mode, involving substantial workshop activities in their teaching so as to ensure proper achievements and learning of concepts in the classroom. One of the methods in this regard that is, activity and inquiry based is programmed instruction.

Programmed instruction teaching method refers to a method of presenting new subject matters to the students in a graded sequence of controlled steps. Students work through the programmed materials by themselves at their own speed and after each step the teacher tests their comprehension and capabilities by giving them examination questions or fill in the gap or objectives. They are then immediately shown the correct answer or given additional information. Computers and other teaching machines are often used to present the materials, although books and printed materials may also be used (Edutechwiki, 2017). Programmed instruction consists of a network of statements and tests which direct the students to new statement depending on their pattern of errors. It is based on a particular tool which is called teaching machine (Encyclopedia, 2017). Also Study Lecture Notes (2017) defined programmed instruction method of teaching as an autocratic and individualized strategy that is based on psychological principle of operant conditioning. The authors argued further that it can be used in secondary schools where many subjects are being taught.

There are mixed results from studies on gender differences and academic achievement. For instance, studies have shown that girls spend more time on homework than boys but compared to boys, in standardized test, girls have better results in reading and worse results in science and mathematics (Gershenson and Holt, 2015, OECD, 2013a).

Programmed instruction method can also be linked to computer aided instruction (CAI) which refers to an innovative teaching and learning strategy where topics and contents to be taught are carefully planned, written and programmed on a computer which could be run at the same time on several computer units (Safo, Ezenwa &Wushishi, 2013) Safo,et al. posited that the instruction can also be programmed in a Computer Disk (CD) which could be

printed, played in either audio or video systems for student to learn the programmed instruction at his/her own leisure hour or pace. This definition suggest that the strategy gives room for individualized thinking which is one of the hallmark of teaching business studies because it will allow the learners to have comprehensive business thinking idea needed to be more successful in the present competitive business environment.

There are different types of programmed instruction. Maheshwari (2016) grouped them into two namely; linear sequence and branching sequence. The linear sequence is conceptualized as a programme in which the learners responses are controlled externally by the programmer sitting at a distant place and the learner followed as straight in behavioural modification (initial behaviour to terminal behaviour) in which learner proceed from one frame to the next until the programme is completed. It has the characteristics of exposing small amount of information, rewarding correct responses of the students, correcting their mistakes and enhances self pace learning. Also responses are controlled and emphasized, cheating is discouraged and responses are self-structured. The linear programming thus has five principles; principle of small step, active responding, immediate confirmation, self pacing and student resting. The major advantage of this type of programme is that itenable students to learn better as learning is presented in small steps and it is appropriate for teaching in secondary schools particularly for recall and recognition of facts and it is disadvantaged in that it is monotonous in nature and this may lead to lack of motivation. Also, it is costly and does not permit differentiation among responses.

The branching sequence is a problem solving approach. It is a programme which adapts to the needs of the learners without medium or external device like computer. Hence it is intrinsic because it allows the learners to make decision and adapt their learning to their needs. It has the characteristics of larger material frame in which much information can be presented to students to aid learning, differentiation in students' responses, allows for communication in teaching, learner can choose their own line of action according to the subject matter, materials are presented in form of books and offer less guidance to learners. It is based on the principles of exposition, diagnosis and remediation. Hence the programme is similar to linear programming but differs in that it is more complicated since there is attempt to diagnose learners' response. The major advantages of this type of programming that makes it more appropriate for teaching business studies according to Maheswari (2016) is that it enables students to learn better because it exposes them to whole situation or contents, it facilitates democratic learning environment, it is learner-centered, it gives the learner freedom to learn and hence improves learning; it allows for learning of new concepts and learning is self paced but it suffers the setbacks of guess learning as learner may guess the correct response, high cost of preparation, low consideration to learning process and places more emphasis on remediation .

Statement of the Problem

To enhance acceptable standard of academic achievement teachers of business studies have adopted several methods of teaching. Despite all their efforts, it is observed that many students are finding it too difficult to pass business studies judging by their learning

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outcomes in both internal and external examinations. The reasons for this difficulty may vary but could be ascribed to teaching strategies adopted by business studies teachers to disseminate instruction to students during classroom situations. For instance, Omotayo (2014) suggested that poor academic performance of student is caused by poor strategies and approaches of teaching, lack of instructional materials and wrong teaching methods.

It is observed that the common conventional teaching methods do not sufficiently fit the demand of present day students whose motive is to seek freedom and creativity because the methods do not give them the opportunity to participate in classroom and therefore they do not acquire skills and knowledge they require. Eze, Ezenwafor and Molokwu (2015) maintained that poor performance of students can be linked to deficiency in the methods of teaching adopted by the teachers which is always teacher-centered in an attempt to cover more grounds and this in turn creates frustration, learning difficulties and in-active participation of students. Furthermore, despite all their efforts, these methods do not seem to yield the expected results as there is a situation of decline in academic achievement of students in some school subjects (NECO, 2014). What is not certain is whether the poor performance in business studies could be traceable to inappropriate teaching strategies, parents' attitudes, and students' attitudes. Moreover, Umar, Abdulahi and Hassan (2015) stressed that students-centered methods could improve academic achievements in some subjects better than the conventional teaching methods. If this study is not conducted, student's academic achievement and retention in business studies may stagnate or even worsen. Therefore, what are the effects of programmed instruction teaching method on
academic achievement and retention of students in business studies in Oyo State?

Purpose of the Study

The main purpose of the study is to determine the effect of programmed instruction, teaching methods on the academic achievement and retention of students in business studies. Specifically, the study sought to:

i. determine the differences in the academic achievement of students taught business studies using conventional teaching method and those taught using programmed instruction method.
ii. ascertain the differences in the mean academic retention score of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method.

Research Questions

The following research questions guided the study:

i. What are the differences in the academic achievement of students taught business studies using conventional teaching method and those taught using programmed instruction method?
ii. What are the differences in the mean academic retention score of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method?

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Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

Ho[1] There is no significant difference between the pretest and post-test achievement mean scores of students taught business studies using conventional teaching method and those taught using programmed instruction method.

Ho[2] There is no significant difference between the mean academic retention scores of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method.

Methods

The study adopted quasi experimental research design in which intact class of 105 junior secondary school II business studies students were used for the study. The major instrument used for data collection was Business Studies Achievement Test (BSAT) containing 40 test items of four options A to D developed by the researchers. It was face validated by two research experts and was pilot tested by using 30 students who are not part of the selected sample at interval of two weeks after which the scores obtained were treated using Pearson Product Moment Correlation Instrument. A reliability co-efficient of 0.78 obtained indicates that the instrument was reliable.

The pre-test was administered on both experimental and control groups after which copies of programmed book in business studies developed by the researchers were given to the control group as treatment to study on their own for four weeks which implies that the experiment lasted for four weeks. At the end of the treatment, post-test was conducted on the two groups to determine the differences in the academic achievement while a delayed post-test was equally conducted on them two weeks after post-test to determine difference in learning retention.

Mean was used to answer the research questions while hypotheses were tested using analysis of covariance (ANCOVA). Any method with higher mean is adjudged to be better than the other while hypotheses will be rejected if the calculated F-value is less than F-critical at 0.05 level of significance but were it is greater at 0.05 level of significance, it is not rejected.

Results

This section presents analysis of data collected in the study based on research questions and hypotheses.

Research Question 1 : What are the differences in the academic achievement of students taught business studies using conventional teaching method and those taught using programmed instruction method?

Table 1: Mean achievement scores of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method.

Groups	N	Pre-test (X_1)	Post-test (X_2)	Mean Difference (X)
Control	36	27.47	33.95	
Experimental	69	32.26	56.80	22.85

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Table 1 shows control and experimental groups' post-test mean achievement scores of 33.95 and 56.80 respectively with a mean difference of 22.85 in favour of experimental group. The result therefore indicates that after treatment, the students in the experimental group achieved higher than those in control group.

Research Question 2: What are the differences in the mean academic retention score of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method?

Table 2: Mean retention scores of students taught business studies using conventional and those taught using programmed instruction teaching method.

Groups	N	Post-test(X 1)		Delayed Post-test (X 2)	Mean Difference (X-
ontro l	6	3.95	0.72		
				31.40	
Experimental	69	56.80	62.12		

Table 2 shows control and experimental groups' delayed post-test mean achievement scores of 30.72 and 62.12 respectively with a mean difference of 32.40 in favour of experimental group. The result therefore indicates that after treatment, the students in the
experimental group add higher mean retention score than those in control group.

Test of hypotheses

Hypothesis 1: There is no significant difference between the pretest and post-test achievement mean scores of students taught business studies using conventional teaching method and those taught using programmed instruction method.

Table 4: ANCOVA summary on conventional teaching method and programmed instruction teaching method on student's achievement scores in business studies after the treatment

Source	Type III sum of Squares	Df	Mean Square	F	P-value	Decision
orrected model	4871.581	1	14871.581	32.777	0.000	
Intercept	1389.472	1		12.405	0.000	
Group	14871.581	1	1389.472	132.777	0.000	Rejected
Error	12544.356	105	14871.581			
Total	264153.000	107	112.003			
Corrected total	27415.938					
		106				

Table 4 shows that at 0.05 level of significance and 1 Df, the P-value is 0.000s which is lower than the level of significance of 0.05. This implies that there was significant difference between the post-test mean achievement scores of students taught business studies using conventional teaching method and those taught using programmed instruction method. Thus, null hypothesis was therefore rejected.

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Hypothesis 2: There is no significant difference between the mean academic retention scores of students taught business studies using conventional teaching method and those taught using programmed instruction teaching method.

Table 5: ANCOVA summary on conventional teaching method and programmed instruction teaching method on student's mean academic retention scores in business studies.

Source	Type III sum of squares	Df	Mean square	F	P-value	Decision
Corrected model	4065.172	1	4065.172	11.997	0.001	
Intercept	52437.666	1		154.760	0.000	
Group	4065.172	1	52437.666	11.997	0.001	Rejected
Error	37949.352	105	4065.172			
otal	319858.000	107	38.815			
Corrected total	42012.525	106				

Table 5 shows that at 0.05 level of significance and 1 Df, the P-value is 0.001 which is lower than the level of significance of 0.05. This implies that there was significant difference between the mean retention scores of students taught business studies using conventional teaching method and those taught using programmed instruction method. Thus, null hypothesis was therefore rejected.

Discussion of Findings

The study in table 1 revealed that students who were taught business studies using programmed instruction method (PIM) achieved higher post-test score than those taught using conventional teaching method (CTM). This result is in line with the findings of Anupam (2014) who reported that PIM is very effective in the attainment of skills by the learners at their own pace and that it increase academic achievement and independent learning of the learners. The findings also agrees with that of Emaikwu (2012) who reported that students taught using activities method like PIM performed better than those taught using CTM like lecture and discussion methods.

The study in table 2 revealed that students taught business studies using PIM tend to retain better what they have learnt over a period of time than those taught using CTM. This implies that teaching method used in teaching students was significant on students' retention. This finding is line with the opinion of Snezana and Sonja (2013) who found that PIM is one of the interactive teaching methods through which efficient and effective acquisition and application of knowledge and development of skills can be achieved and maintained. This could be as a result of experiences involved which made the students to develop their own knowledge, meaning and retain the concept taught. Also, all the null hypotheses were rejected which implies that there is significant difference between the academic achievement and learning retention of students taught business studies using PIM and those taught using CTM in favour of PIM.

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Conclusion

The findings of the study so far showed that programmed instruction increase students' academic achievement and retention in business studies and that if teachers can use the method in teaching and learning process, students will acquire and possessing- depth knowledge and skills which will help them to demonstrate and retain the concept for good achievement in test and examination as well as in daily practical activities.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Teachers of business studies should acquire the knowledge and skills for using programmed instruction through in-service training, conferences, seminars, and workshops.
2. School administration should encourage business studies teachers to use programmed instruction by sponsoring in-service training that can equip them with competencies needed in its use.
3. Education stake holders and relevant professional bodies in business studies should sponsor more research on the efficacy of programmed instruction method so as to popularize the method
4. Government and stake holders in education should provide adequate instructional materials, gadgets and facilities at the secondary school level to facilitate effective use of programmed instruction method in the teaching of business studies.

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