TRADE IN OYO STATE GOVERNMENT TECHNICAL COLLEGES

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Abstract
Poor academic achievement of students in building/woodwork trade in Oyo State government technical colleges as a result of defects in demonstration method of teaching prompted the researchers to adopt project method as an alternative means to effective teaching and a way of replacing the old one. Two research questions and two hypotheses were postulated in line with the stated objectives. Quasi-experimental research design was adopted for the study. A sample of 78 building/woodwork trade year III students drawn by purposive sampling technique from a population of 250 students in five government technical colleges was used for the study. The instrument for data collection was a Building/Woodwork Trade Achievement Test (BWTAT) validated by three experts. Test-retest method was used to obtained reliability coefficient value of 0.76 through Person product moment correlation coefficient. The study revealed that project teaching method was more effective than conventional method in enhancing students' academic achievement in building/ woodwork trade. Also, it was found that project teaching method increases male academic achievement than female students in building/woodwork trade. Therefore, it was recommended that technical teachers should have workshop guidelines on how to use project method for practical skills on students. Also, technical teachers should ensure they plan their lessons with equal learning chances for both male and female students.

Keywords: Project Teaching Method, Academic Achievement, Building/Woodwork Tradeand Government Technical Colleges.

Introduction

Technical colleges are education learning centres which are charged with the responsibility of producing craftsmen and master craftsmen in various trades such as building/woodwork technology,electrical/electronicstechnology,automobile technology and mechanical technology (Federal Republic of Nigeria, 2013). The policy documented stated that the goals of establishing technical colleges among others include provision of trained manpower in the applied science, technology and business particularly at craft, advanced craft and technician levels. Therefore,

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technical colleges can be referred to as training centers where necessary skills are imparted to individuals who can fit into the world of work and adapt to the latest technological tools thereby enabling them to be relevant and self-dependent/reliant.

The National Board for Technical Education (2014) listed the programmes in technical colleges to include building/woodwork trade which covers block laying, bricklaying and concreting, draftsmanship, craft practice, joinery and carpentry, furniture design and construction, machine woodworking, painting and decorating. Building/woodwork trade provides learners with the knowledge and practical skills required for a tradesperson in the world of work. The curriculum contents include various and general design of a building, woodworking machine, preparation of stock, principles of foundations and trusses among others. These organized bodies of knowledge are transferred to learners through various teaching methods employed by technical teachers.

Demonstration method of teaching also referred to as the traditional method commonly used by teachers in the teaching and learning process in technical colleges. Mellissa (2014) described demonstration teaching method as the process whereby an instructor stands before a class of students and presents organized body of knowledge or curriculum contents to them. Furthermore, Bundles (2016) added that it is a process of presenting spoken explanation of the subject to be learnt to the students. However, Ahmad and Aziz (2009), Umar (2013), Okwelle, Emeli and Hart (2016) in their different studies proved the method to be defective in enhancing students academic achievement in different school subjects including building/woodwork trade as the practical aspects will not be given due recognition and attention. This, therefore, highlights the need for a method that can be more effective in imparting the right and appropriate skills needed in the world of work to the building/woodwork students.

Project method is an instructional method in which students influence the activities, materials and pace of learning (Adamu, 2016). Project method also described as a learner-centered teaching method because it gives room for independent learning and critical or creative thinking directed towards solving identified problems. Therefore, with project method students are more active and motivated towards learning thereby increasing their class participation which could in turn increase their academic achievement.

According to Adamu (2016) academic achievement is the measure of what a person had accomplished after exposure to educational programme. Students academic achievement can be influenced by several factors such as learning environment, teaching methods and gender difference among others. Salami in Adamu (2016) posited that factors resulting from gender differences such as the rate of which male students learn practical skills may be different from the rate at which their female counterparts learn. Likewise, class size and arrangement can also contribute to the differences in students' academic achievement rate. However, a key factor in the teacher and the method of teaching used (Ahmad & Aziz 2009, Umar 2013, Okewelle, Emeli& Hart 2016). Since technical college students require

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appropriate skills for solving related problems in building/woodwork trade, there is need for teachers to adopt methods that will enhance their active participation. One of such methods is the project teaching method. The advantages attributed to project method of teaching prompted the researchers to investigate the effect of project teaching method on students' academic achievement in building/woodwork trade in Oyo State government technical colleges**.**

Statement of the Problem

Persistent poor academic achievement of students of technical colleges in Nigeria generally and Oyo State in particular has been attributed to various factors among which is method of teaching adopted by teachers. The demonstration teaching method which is mostly used in technical colleges has been associated with several defects such as students being passive in the teaching and learning process and poor academic achievement among others. The project teaching method provides an excellent opportunity for students to develop critical thinking and problem solving skills among others. Therefore, the problem of this study is that academic achievement of students of government technical colleges in Oyo State has been persistently poor and if the ugly trend is not reversed, it will retard the program of the State. It is assumed that the project teaching method will produce a better learning outcome for students in building/woodwork trade but this need to be determined empirically, hence the study on effect of project teaching method on students' academic achievement in building/woodwork trade in Oyo State government technical colleges.

Purpose of the Study

The main purpose of this study was to determine the effect of project teaching method on students' academic achievement in building/woodwork trade in Oyo State government technical colleges. Specifically, the study determined:

1. Mean gain academic achievement of students taught trusses using project method and those taught with demonstration method in Oyo State government technical colleges.
2. Interacting effect of gender and teaching methods on academic achievement of students in trusses in Oyo State government technical colleges.

Research Questions

The following research questions guided the study:

1. What is the mean gain academic achievement of students taught trusses using project method and those taught with demonstration method in Oyo State government technical colleges?

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2. What is the interacting effect of gender and teaching methods on academic achievement of students in trusses in Oyo State government technical colleges?

Hypotheses

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

1. There is no significant difference between mean gain academic achievement of students taught trusses using project method and those taught with demonstration method in Oyo state government technical colleges.
2. There is no significant difference between the mean gain in interacting effect of gender and teaching methods on academic achievement of students in trusses in Oyo State government technical colleges.

Method

The study employed the use of quasi-experimental design. Specifically, the pretest, posttest, non-equivalent control group design was adopted for the study. According to Afuwape, Afuwape and Adeagbo (2016), quasi-experimental design can be used in research when its involves selection of groups upon which a variable is tested without any random pre-selection process as well as with a variable being compared between different groups or over a period of time. The study investigated the effect of project teaching method on students' academic achievement in building/wood work trade in Oyo State technical colleges. This design was considered suitable for this study on effect of project teaching method on students' academic achievement in building/woodwork trade in Oyo State government technical colleges because intact classes and non-randomized groups were studied. The design is graphically presented as follows:

Group	Pretest	Treatment	Posttest
Experimental	O1	X	O2
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Control	O1	-X	O2

Where O1 = Pretest for both experimental and control groups
O2 = Posttest for both experimental and control groups
X = Treatment given to the experimental group (Project Method)
-X = No treatment given to the control group (Demonstration Method)
--- = Non-randomization

The population for this study consists of all 250 NTC III students (281 males and 73 females) of building/woodwork trade in the five government technical colleges in Oyo State. The information was obtained from the office of the director; Oyo State Ministry of Education, Science and Technology on 27th February, 2018. Trusses as a subject content was chosen because it is related to both building and woodwork trade and only NTC III curriculum content contains it. Purposive sampling technique was used for the selection of two technical colleges in the State, government technical

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college, Awe, Oyo was used as experimental group to be taught Trusses with project method. While Government technical college, Iseyin was used as control group learning trusses with demonstration method. Experimental group consist of 43 (38 male and 5 female) students while control group consist of 35 (27 male and 8 female) students.

The instrument for data collection was a Building/Woodwork Trade Achievement Test (BWTAT) developed by the researchers based on the purpose of the study and literature reviewed. It contains 20 multiple-choice test items with four options. The face and content validity of the instrument was established by three experts from technical education department, Emmanuel Alayande College of Education, Oyo, Oyo State. They scrutinized the instrument to determine the relevance of the questionnaire items, their clarity and comprehensiveness. These were to ensure that the items strictly addressed the research questions raised for this study. The corrections were effected and incorporated into the final draft of the instrument.Test-retest method was used to determine the reliability of the instrument. BWTAT was administered to 15 NTC III students in Ijebu-Ode Government Technical College, Ijebu-Ode, Ogun State who were not part of the population of the study. After two weeks interval, it was administered to the same group and Person product moment correlation coefficient was used to obtain co-efficient value of 0.76 which was considered high enough to regard the instrument as reliable for the study (Afuwape, Afuwape & Adeagbo, 2016).

Experimental Procedure

The treatment procedures used for the study are as follows;

1. Permission was obtained from the two technical college principals involved in the study to carry out the research.
2. Pre-test was administered for both experimental and control groups.
3. The experimental group was taught the concept of Trusses using project method while the control group was taught the concept of Trusses using demonstration method.
4. The experiment lasted for two weeks. Errors made by students were corrected and necessary precautions were observed.
5. Post–test was administered for the two groups and the results were collected and recorded for analysis.

The pre-test scores for both experimental and control groups were collected and recorded. At the end of the treatment, post-test was administered to both experimental and control groups and the scores were collected and recorded. Mean ($\overline{X}$) and standard deviation were used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. T-test was adopted based on the recommendation of Afuwape, Afuwape and Adeagbo (2016), that t-test can be use for comparing the means of two sample (or treatment) in a study.

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Results

Research Question 1

Table1.Mean gain academic achievement of students taught trusses using project method and those taught with demonstration method in Oyo State government technical colleges.

Groups	Teaching Methods	Number of respondents	Pre-test $\overline{X}$	SD	Post-test $\overline{X}$	SD	$\overline{X}$ gain
Experimental Group	PM	43	11.15	3.05	24.06	5.82	21.44
Control Group	DM	35	7.43	2.43	15.96	4.00	
Total		78	18.58	5.48	40.02	9.82	21.44

PM- Project Method, DM- Demonstration Method, SD- Standard Deviation

Table 1 shows that the pre-test and post-test mean scores of students taught Trusses using PM and CM are 11.15; 24.06 and 7.43; 15.96 respectively. The mean gain was then calculated to be 21.44 to favour the experimental group. From this result, students of the experimental group performed better in the BWTAT than those in the control group. This shows that the project teaching method is much more effective than the demonstration method in enhancing students' academic achievement in building/woodwork trade in Oyo State government technical colleges. Also, standard deviation of pre-test and post-test of both experimental and control groups were 3.05; 5.82 and 2.43; 4.00 respectively, indicating that the respondents were not too far from one another in their responses, proving that the items were valid.

Research Question 2

Table 2. Mean gain interacting effect of gender and teaching methods on academic achievement of students in trusses in Oyo State government technical colleges.

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Gender	Experimental group						Control group				
	Pre- test			Post- test			Pre-test			Post- test	
	N	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$ Gain	N	$\bar{x}$	SD	$\bar{x}$	SD $\bar{x}$ gain
Male	38	5.02	2.53	13.21	4.72	8.19	27	3.44	1.02	9.72	3.27 6.28
Female	05	4.43	2.00	6.43	5.21	2.00	08	4.22	1.00	7.32	2.86 3.10
Total	43	9.45	4.53	19.64	9.93	10.19	35	7.66	2.02	17.04	6.13 9.38

PM- Project Method, DM- Demonstration Method, SD- Standard Deviation

Table 2 shows that male students taught Trusses with project method had pre and post-test mean scores of 5.02 and 13.21 with mean gain of 8.19. However, female students taught Trusses with project method had pre-test and post-test mean score of 4.43 and 6.43 with mean gain of 2.00. Also, male students taught Trusses with demonstration method had a pre-test and post-test mean score of 3.44 and 9.72 with mean gain of 6.28. Meanwhile, female students taught with demonstration method on Trusses had pre-test and post-test mean score of 4.22 and 7.32 with mean gain of 3.10. It was evident from the result that male students taught Trusses had higher mean score than their female counterparts. Hence, there is a gender influence on students' academic achievement in building/woodwork trade.

Hypothesis 1

Table 3: Independent sample t-test on the mean gain academic achievement of students taught trusses using project method and those taught with demonstration method in Oyo State government technical colleges.

Group	**N**	**Mean**	**SD**	**Df**	**Alpha**	**t-cal**	**t-crit**	**Decision**
Exp.	43	17.23	6.57	76	0.05	7.53	1.96	Significant
Cont.	35	10.68	4.29					

Table 4 shows the experimental and control groups mean score of 17.23 and 10.68 with standard deviation of 6.57 and 4.29 respectively. It also shows the observed t-calculated value of 7.53 and t- critical value of 1.96. The null-hypothesis is

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thus rejected because there was a significant difference in the students' academic achievement taught trusses using project method and those taught with demonstration method in Oyo State government technical colleges.

Hypothesis 2

Table 4: Independent sample t-test on the mean gain between interacting effect of gender and teaching methods on academic achievement of students in trusses in Oyo State government technical colleges.

Gender	N	Mean	SD	Df	Alpha	t-cal	t-crit	Decision
Male	43	17.23	6.57	76	0.05	7.53	1.96	Significant
Female	35	10.68	4.29					

Table 5 shows the male and female mean score of 17.23 and 10.68 with standard deviation of 6.57 and 4.29 respectively. The table also revealed the t-calculated value of 7.53 and the t-critical value of 1.96. The null-hypothesis is hereby retained because there was significant difference in the extent to which gender difference affect the academic achievement of students taught trusses using project method in Oyo State government technical colleges.

Discussion

Based on the result findings, it was evident that the students taught trusses with project method performed better than those taught with the demonstration method. This is supported by Umar (2013) who posited that project method assist learners for self and intellectual development. Okewelle, Emeli and Hart, (2016) also added that project method proffer the learners with the opportunity of critical thinking and problem solving ability.

Result also revealed that male students taught trusses had higher mean score than their female counterparts. Therefore, with the adoption of project method there is a gender influence on students' academic achievement in building/woodwork trade. This result was similar with the findings of Umar (2013) and Adamu (2016) who posited that male students perform better with project method than their female counterparts.

Conclusion

The study investigated the effect of project teaching method on students' academic achievement in building/woodwork trade in Oyo State government technical colleges. It was evident from the result that students taught trusses with project method perform better than those taught with the demonstration method. Also, with the adoption of project method there is a gender influence on students' academic achievement in building/woodwork trade in Oyo State technical colleges favoring the male students.

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Recommendations

Based on the findings and conclusion of the study the following recommendations were proffered;

1. Technical teachers should adopt project method for teaching building/woodwork technology curriculum contents to increase students participation in the teaching learning process as this improve their academic achievement.
2. Building/woodwork teachers should ensure they plan their lessons using project method with equal gender learning chances to increase female students academic achievement.

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