International Journal of Advanced Research and Learning, 2022 1 (1)
Published online Jan-March 2022 issue in rajournals.net

Effects of Co-operative and Demonstration Teaching Methods on Students' Academic Achievement in Block Laying and Concreting in Technical Colleges in Rivers State

Okwelle, P.C. & Azukwu, S. A.
Department of Vocational & Technology Education,
Faculty of Education,
Rivers State University,
Corresponding Author's Email: pcokwelle@gmail.com

Abstract

The study investigated the Effect of co-operative and demonstration teaching methods on students' academic achievement in block laying and concreting in Technical Colleges in Rivers State. Three research questions guided the study while three hypotheses were formulated for the study. Quasi-experimental design, specifically, the non-randomized control group design involving two intact classes was used. The population of the study was 90 National Technical Certificate (NTC) II Blocklaying and concreting students of two technical colleges in Rivers State. Blocklaying and concreting Performance Test instrument was developed, validated and used for data collection. Reliability of the Blocklaying and concreting performance test was 0.75. Arithmetic mean and standard deviation were used to analyze data collected in respect to the research questions while ANCOVA was used to test the hypotheses at 0.05 level of significance. Findings of the study revealed that co-operative teaching methods has significant effect on student's achievement in Blocklaying and concreting. It was recommended that States and Federal Ministries of education including professional bodies like Nigerian Association of Teachers of Technology and examination bodies like National Business and Technical Examination Board (NABTEB) should organize workshops, seminars and conferences to train and encourage teachers on the use of this innovative technique to improve students' performance in Blocklaying and concreting.

Keywords: Co-operative Teaching Methods, Demonstration Teaching Methods, Performance, Blocklaying and Concreting.

INTRODUCTION

The contributions of technical and vocational education in any country in the world today is enormous, hence it plays a very significant role on the national welfare. Technical and Vocational Education (TVE) is described as the training of individuals for the implementation of technological development of a nation by providing the citizens with the right skills necessary for employment (Eze, 2013). The program enlisted among others ranging from welding and fabrication, mechanical/automobile technology, electrical/electronic technology, woodwork and block laying and concreting etc. Technical and vocational education serves as a catalyst for economic, social and political changes of a nation due to its uniqueness in nature (Momo, 2012).

Block laying and concreting is one of the courses offered in Nigeria technical colleges. Almost all the members of the society benefit from the products of block laying and concreting. Block laying and concreting programme at the technical college level is designed to produce skilled builders for the building industry. Block laying and concreting as a course comprises of different components or operations which require skills to perform them. These components

include designing of building plans, setting out of the building, execution, block work on the concrete foundation, leveling of the building, roofing pattern, plastering and rendering of walls. These areas of operation require that students of block laying and concreting should possess the necessary skills to carry them out. block laying and concreting students should possess skills in designing building plans and be able to read and interpret them. Students of block laying and concreting should posses skills in setting out of buildings, form block walls on the concrete foundation, be able to level the building and also possess skills in designing good roofing pattern.

Block laying and concreting is an aspect of vocational technical education. Vocational technical education is an education for work. According to Nworlu-Elechi (2013) vocational technical education is any form of education whose purpose is to prepare person(s) for employment in an occupation or group of occupations. Ojimba (2012), stated that vocational technical education is the acquisition of skills and techniques in chosen occupation or profession to enable an individual earn a living. Abdullahi (2011) viewed vocational technical education as an aspect of education which leads to the acquisition of practical and applied skills. Skills involve the ability to do something well. Skills according to Aftab, and Mohd, (2012) are the learned capacities to carry out pre-determined results often with minimum outlay of time and energy. Skill according to Audu, Aede, Yusri, and Muhammad (2013) is a manual dexterity through repetitive performance of an operation. He further explained that skill is expertness, practised ability, dexterity of tact. It is well established habits of doing things by the people. Skills could be gained through experience and training on skill acquisition and development (Awraris, 2013).

Skill acquisition according to Ayomike, Okwelle, and Okeke (2015) is the process by which individuals are expected to learn and continuous practice in particular task till the learner becomes proficient in the operation and can perform them when required. Ayonmike (2015) said that skills are acquired when procedural instructions are matched with performance activities. For skills to be acquired, there must be opportunities for participation and practice of such skills under real life situation. Skill acquisition is very necessary at this stage of Nigeria's economic and technological development. Ayonmike, Okwelle and Okeke (2015) said that the acquisition of skills prepares students for vocational occupation and progressive development in it. Skill acquisition remains the major goal of vocational technical education and this helps to satisfy the personal work needs of both the individual and the society (Ayonmike, Igberadja, Igberaharha, & Okeke, 2015). To acquire skills in vocational technical education courses such as block laying and concreting at technical college level, opportunities must be provided for students to practice the skills they are taught in an environment that is relevant to the job skills learnt. Such opportunities that should be provided that may improve skill acquisition of block laying and concreting students include field trip/excursion, allocation of more time for practical work, production unit, provision of materials to practice with.

The concept of production unit in technical colleges is a situation whereby a department organizes her students with the permission of the school authority to undertake some direct – labour jobs in the school. At times the unit

may canvas for jobs outside school. A well organized production unit does not only expose the students to skill acquisition processes but also generates fund for the school. Production unit activities should be carried out under close supervision of the teacher. For proper skill acquisition in block laying and concreting, appropriate teaching strategies must be applied by teachers for teaching both the theory and practical aspect of block laying and concreting. Teachers also need relevant building tools and equipment for imparting skills to students under their control. A teacher in the opinion of Igberadja (2014) is a person who gives instruction to a learner, i.e, a person who communicates knowledge, skills and attitudes to someone in a school. In the context of this study, a teacher of block laying and concreting is one who gives instructions, communicates knowledge, skills and attitudes in block laying and concreting to students. Two categories of teachers of block laying and concreting could be found in technical colleges. That is qualified and unqualified teachers. A qualified teacher of block laying and concreting is an individual who has teaching qualifications such as Nigerian Certificate in Education (NCE) technical, Bachelor of Education (B.Ed) or Masters of Education (M.Ed) as stated in National Policy on Education (2013) and has been in employment of teaching block laying and concreting to students. But unqualified teacher of block laying and concreting is a person who has been teaching block laying and concreting to students in technical college with qualifications such as National Diploma (ND) or Higher National Diploma (HND).

Many methods of teaching have been shown to be comparatively unproductive in the students' ability to master and then retain vital concepts. The traditional methods of teaching (lecture, recitation, and laboratory) do not tend to foster collaborative problem-solving, critical thinking and creative thinking (Adekoya, & Olatoye, 2011). With regard to the prevailing scenario in engineering education, in general, students are taught memorization and routine application, and not reasoning methods, analysis, synthesis and evaluation. Employers complain that today's college graduates are severely lacking in basic skills particularly communication, problem-solving, the ability to prioritize tasks and decision making (Algarve, 2006). A high dropout rate is a current problem in the engineering schools. The institutions have to raise the student success ratio and have to reduce the numbers of dropouts. It is reported that the Universities around the world are investing major efforts to: (a) identify the challenges faced by engineering education programs, and (b) make changes to achieve what is generally termed as "Excellence in Engineering Education" (Akinoglu, & Tandogan, 2007). The poor performance of students in engineering education may be attributed to poor teaching strategies and skills (Alvarado, & Herr, 2003). These problems have led to desperate search for appropriate teaching strategies that would best be used to realize the aims of engineering teaching, thereby improving learning and skills acquisition.

Teaching strategies are decisions about organizing people, materials and ideas to provide learning Amadi (2006) viewed teaching strategies as both the teaching method and the materials used in the process of teaching. Some of these teaching strategies include inquiry, discussion, lecture and demonstration, co-operative and demonstration teaching methods among others.

Students' scores in science subjects are usually below expectation (Akinbobola, 2006). It has become necessary to seek strategies that will employ approaches that ensure and enhance better academic performance of the students in the science subjects. In education today, there are interesting cooperative learning methods that enable students to have an active control over their own learning and also enhance academic achievement (Agboola, & Oloyede, 2007). Cooperative learning is a teaching strategy in which small teams, each with students of different levels of ability use a variety of learning activities to improve their understanding of a subject.

Cooperative instructional strategy is an instructional strategy where students of different levels of ability are grouped into small ties to improve their understanding of a subject (Afolabi, & Akinbobola, 2009). Each member of a team is responsible not only for comprehending what is being taught but also for helping teammates learn, thus creating an atmosphere for improved achievement. Students work through the assignment until all group members successfully understand and complete it. Teachers can use this approach to stimulate students to acquire the knowledge, as well as create interpersonal and team skills. Some authors have identified cooperative learning as an edge over other teaching methods in terms of its effectiveness for improved cognition, social skills and motivation (Amanoah, Okwelle, & Wokocha, 2015)

Demonstration strategy is a method of teaching concepts, principles of real things by combining explanation with handling or manipulation of real things, materials or equipment (Bilgin, Senocak, & Sozibilir, 2009). "In the matter of physics, the first lessons should contain nothing but what is experimental and interesting to see. A pretty experiment is in itself often more valuable than twenty formulae extracted from our minds." A famous quote by Albert Einstein; The novelty, spectacle and inherent drama of an in-class demonstration can provoke significant interest from students. Psychologists termed this kind of interest, situational interest which spontaneously creates interest among all students (Driscoll, 2000). The demonstration strategy is effective for long-term memory retention and appropriate to college students' study skills. The act of demonstrating readily helps to kindle more natural interactions between the students and the teacher. Their active responses and completely spontaneous observations provide an excellent opportunity for the teacher to connect with the students and with their unedited ideas which enhances their academic achievement.

Academic achievement according to Lavin theory propounded in 1965, refers to some methods of expressing a student's scholastic standing. This can be regarded as course or subject grade, an average for a group of courses/subjects in a programme of study (in this case, auto-mechanics technology is being referred to). There are two dimensions to academic achievement: good academic achievement that leads to success and poor academic achievement that resulted to failure. Each of the achievement has been experienced by students in one form or another. In this study, any student that score between 20 and 40 out of the obtainable 40 marks will be considered to have good academic achievement while those who score between 0-19 will be considered to have poor academic achievement.

Achievement could be perceived as a method of expressing students' scholastic standing. It could be grades for subjects, or trade courses as symbolized by a score or mark in an achievement test, expressed in numerical scale (Danis, Cannas, & Ortega-Medina, 2007). According to Dow (2000), achievement is quantified by measure of the students' academic standing in relation to those of other students of their age. Eva (2003) contended that student's achievement is dependent upon several factors among which are instructional methods, learning environment and the learner. Achievement in academics can be in cognitive or psychomotor domain. The cognitive domain according to Eze (2002) involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns and concepts that serve in the development of intellectual abilities and skills.

Statement of the Problem

There is a general concern over the low performance of technical college graduates, most especially those of block laying and concreting who cannot cope with the world of work. The goal of block laying and concreting in technical colleges in Nigeria according to NBTE (2009) is to produce skilled craftsmen with good knowledge of the working principles of block laying and concreting and the techniques and safety practices involved in block laying and concreting.

Block laying and concreting programme in technical colleges is aimed at producing skilled craftsmen who will be able to perform basic functions in block laying and concreting both in private and public sector (NBTE, 2001). block laying and concreting is a skill oriented programme whose graduates are expected to be self-employed or set – up their businesses after graduation but rather than being self employed or set up businesses in the area they were trained many have turned to what is popularly known today as "OKADA" operators while others become hawkers in cities. It has been observed that the objectives have not been achieved over the years. In spite of the huge investment by successive Nigerian government in Technical College programme aimed at improving the image and performance of Technical College students, the academic achievement of the students in block laying and concreting trade is not encouraging. The Federal Ministry of Education has observed that some of the factors responsible for the high failure rate of Technical College students in the NABTEB examinations particularly in block laying and concreting trade include poor teaching methodology in the Technical colleges. The National Technical and Business Examination Board (NABTEB) (2018) chief examiner's report observed that the poor performance of the students in National Technical Certificate (NTC) examinations in recent years is partly due to the teaching methods employed by the teachers. Moreover, it has been discovered that the persistent poor academic performance of students in block laying and concreting and other technical subjects is as a result of the inappropriate teaching methods adopted by the teachers (Aina, 2000).

It has also been observed that the teacher-centered method is the main teaching method employed by the technical teachers for implementing the curriculum. Obviously, the adoption of teacher centered methods of teaching by the teachers results into ineffective use of varieties of instructional method and instructional techniques and inability of teachers to effectively implement

the curriculum to naturally increase students interest, involvement and commitment in learning. The short coming in teacher-centered method of teaching could be responsible for poor academic achievement of block laying and concreting students in public examination. Therefore, there is need for a change of methods and techniques in the teaching of block laying and concreting, so as to enable the graduates of Technical Colleges acquire adequate knowledge and skills for the world of work, better achievement in public examinations and further studies.

This unsatisfactory situation could lead to breakdown in the industrial, technological and educational growth of a nation since the main goal of technical education is to achieve self-reliance. The foregoing therefore underscores the need to explore other teaching approaches that would enhance and facilitate understanding and acquisition of knowledge of what is been taught in block laying and concreting and possibly encourage higher enrolment of students in the trade. Therefore, the problem of this study is what are the comparative effect of co-operative and demonstration teaching methods on students' academic achievement in block laying and concreting in Technical Colleges in Rivers State?

Purpose of the Study

The aim of the study was to determine the effect of co-operative and demonstration teaching methods on students' academic achievement in block laying and concreting in Technical Colleges in Rivers State. Specifically, the study sought to determine:

1. Effects of co-operative and demonstration teaching methods on students' academic achievement in Building Drawing and Design in Technical Colleges in Rivers State
2. Effects of co-operative and demonstration teaching methods on students' academic achievement in Blocklaying in Technical Colleges in Rivers State
3. Effects of co-operative and demonstration teaching methods on students' academic achievement in Blocklaying in Technical Colleges in Rivers State

Research Questions

Three research questions were formulated to guide the study:

1. What is the effect of co-operative and demonstration teaching methods on students' academic achievement in Building Drawing and Design in Technical Colleges in Rivers State?
2. What is the effect of co-operative and demonstration teaching methods on students' academic achievement in Blocklaying in Technical Colleges in Rivers State?
3. What is the effect of co-operative and demonstration teaching methods on students' academic achievement in Blocklaying in Technical Colleges in Rivers State?

Hypotheses

The following null hypotheses tested at .05 level of significance guided the study,

1. There is no significant difference in the mean achievement scores of students taught Building Drawing and Design using co-operative teaching method and those taught with demonstration teaching methods in Technical Colleges in Rivers State

2. There is no significant difference in the mean achievement scores of students taught Building Blocklaying using co-operative teaching method and those taught with demonstration teaching

methods in Technical Colleges in Rivers State

3. There is no significant difference in the mean achievement scores of students taught blocklaying using co-operative teaching method and those taught with demonstration teaching methods in Technical Colleges in Rivers State

METHODOLOGY

Design of the Study: A quasi-experimental design was used in this study. Specifically, the pre-test, post test, non-equivalent control group design was adopted for the study. According to Gall, Gall and Borg (2007) quasi-experimental design can be used when it is not possible for the researcher to randomly sample the subject and assign them to treatment groups without disrupting the academic programmes of the schools involved in the study. The experimental design of the study is symbolically represented as follows:

E = Experimental group. C = Control group. O_1 = Pre-test.
O_2 = Post-test. − Treatment. ≠ No Treatment.

Population: The population for the studies comprise of 90 National Technical Certificate (NTC) II Blocklaying and concreting students in the two technical colleges in Rivers State.

Sample: Simple random sampling technique was used to select two technical colleges out of the four technical colleges in Rivers State.

Area of the Study: The study was carried out in Rivers State. Furthermore, the intact classes used indicated that the entire Vocation II Blocklaying and concreting students in government technical college Port Harcourt and Government technical college Ahoada were used.

Instrument for Data Collection: One instrument was developed for this study. The Block laying and Concreting Performance Test (BBLCPT) which has three parts according to the topics outlined was used for data collection. The test consists of 40 objective questions base on technical college the curriculum content for NTC ll students.

Validation of the Instrument: The test was validated by deriving the blocklaying and concreting test from National Technical and Business Examination Board (NABTEB) past questions of blocklaying and concreting practice. An initial pool of 40 items was drawn up based on the table of specifications or test blue print and sent to three experts for face-validation. The experts focused on adequacy of content, logical sequence and suitability of the technical term used. The items was corrected based on the validates' criticisms and suggestion before testing.

Reliability of the Instrument: The instrument used for the study is Block laying and Concreting Performance Test. The instrument was pilot tested on 16 NTC ll students of Government Technical College Bayelsa State. The reliability co-efficient of instrument was determined using Kuder Richardson formula 20 (KR-20). This help to establish the internal consistency of the items. The students' scores were computed which yielded a reliability index of 0.75.

Method of Data Collection: Data was collected through the use of pre-test post-test for each topic in each week. The test results were the data which the blocklaying and concreting teachers submitted to the researcher for analysis.

Method of Data Analysis: The data for the research questions of this study was analyzed using mean and standard deviation. The hypotheses were tested at 0.05% level of significance using analysis of covariance (ANCOVA). The statistical package for social sciences (SPSS) was used for all data analysis in this study. With the calculated f-ratio being greater than the table or critical f-ratio, the null hypotheses were rejected. The value of calculated f-ratio being less than the table f-ratio value, the null hypotheses was accepted. The value of f-ratio at 0.05% level of significance and above was accepted while the value of f-ratio less than 0.05% level of significance was rejected.

RESULTS

Research Question 1: What is the effect of co-operative and demonstration teaching techniques on students' academic achievement in building drawing/design in technical colleges in Rivers State?

Table 1: Mean and Standard Deviation of Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Building Drawing/Design

Group	School	N	Pre-test		Post-test		Mean-Gain
			$\bar{x}$	SD	$\bar{x}$	SD	
Co-operative	GTC Ahoada	50	18.60	3.24	40.07	2.98	22.1
Demonstration	GTC PH	40	16.50	3.50	26.50	3.43	10

Table 1 shows the pre-test and post-test mean score of students' performance in building drawing and design for co-operative and demonstration groups respectively. Result shows that the students in the co-operative group had a pre-test mean score of 18.60 with a standard deviation of 3.24 and a post-test mean score of 40.07 with a SD of 2.98. The difference between the pre-test and post-test mean for the co-operative group was 22.1, while the demonstration group had a pre-test mean score 16.50 with a standard deviation of 3.43 and a post-test mean score of 26.50 and SD of 3.43. This shows that the mean score for the co-operative group is higher than the demonstration group, indicating that those taught with the co-operative teaching technique performed better.

Research Question 2: What is the effect of co-operative and demonstration teaching techniques on students' academic achievement in Blocklaying in technical colleges in Rivers State?

Table 2: Mean and Standard Deviation of Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Blocklaying

Group	School	N	Pre-test		Post-test		Mean-Gain
			$\bar{x}$	SD	$\bar{x}$	SD	
Co-operative	GTC Ahoada	50	14.21	3.49	31.85	4.48	17.64
Demonstration	GTC PH	40	15.00	3.55	24.75	3.99	9.75

Table 2 shows the pre-test and post-test mean score of students' performance in Blocklaying for both co-operative and demonstration groups. Result shows that the students in the co-operative group had a pre-test mean score of 14.21 with a standard deviation of 3.49 and a post-test mean score of 31.85 with a SD of 17.64. The difference between the pre-test and post-test mean for the co-operative group was 17.64, while the demonstration group had a pre-test mean score 15.00 with a standard deviation of 3.55 and a post-test mean score of 24.75 and SD of 3.99. This shows that the mean score for the co-operative group is higher than the demonstration group, indicating that those taught with the co-operative teaching technique performed better.

Research Question 3: What is the effect of co-operative and demonstration teaching techniques on students' academic achievement in blocklaying skills in technical colleges in Rivers State?

Table 3: Mean and Standard Deviation of Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Blocklaying Skills

Group	School	N	Pre-test		Post-test		Mean-Gain
			$\bar{x}$	SD	$\bar{x}$	SD	
Co-operative	GTC Ahoada	50	16.29	2.98	33.32	3.78	17.03
Demonstration	GTC PH	40	15.50	2.14	25.58	2.04	10.08

Table 3 shows the pre-test and post-test mean score of students' performance in blocklaying skills for both co-operative and demonstration groups. Result shows that the students in the co-operative group had a pre-test mean score of 16.29 with a standard deviation of 2.98 and a post-test mean score of 33.32 with a SD of 3.78. The difference between the pre-test and post-test mean for the co-operative group was 17.03, while the demonstration group had a pre-test mean score 15.50 with a standard deviation of 2.14 and a post-test mean score of 25.58 and SD of 2.04. This shows that the mean score for the co-operative group is higher than the demonstration group, indicating that those taught with the co-operative teaching technique performed better.

Hypotheses Testing

Hypothesis 1: There is no significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in building drawing and design in technical colleges in Rivers State.

Table 4: The Analysis of Covariance (ANCOVA) on Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Building Drawing and Design

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	495.780[a]	2	247.890	29.113	.000
Intercept	1022.187	1	1022.187	120.050	.000
PRE-TEST	94.637	1	94.637	11.115	.002
GROUP	448.270	1	448.270	52.647	.000
Error	417.220	49	8.515		
Total	46166.000	52			
Corrected Total	913.000	51			

Significance at $\alpha \leq 0.05$

The analysis of covariance of students performance scores presented in Table 4 showed that f-calculated for teaching methods in the two groups is 52.647 at 0.000 significant level. It therefore implies that the null hypothesis is rejected. Thus, there is a significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in building drawing and design in technical colleges in Rivers State.

Hypothesis 2: There is no significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in Blocklaying in technical colleges in Rivers State.

Table 5: Analysis of Covariance (ANCOVA) on Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Blocklaying

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	691.898[a]	2	345.949	19.467	.000
Intercept	1671.541	1	1671.541	94.058	.000
PRE-TEST_A	39.135	1	39.135	2.202	.144
GROUP	680.757	1	680.757	38.307	.000
Error	870.794	49	17.771		
Total	44028.000	52			
Corrected Total	1562.692	51			

Significance at $\alpha \leq 0.05$

The analysis of covariance of students performance scores presented in Table 5 showed that f-calculated for teaching methods in the two groups is 38.307 at 0.000 significant level. It therefore implies that the null hypothesis is rejected. Thus, there is a significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in Blocklaying in technical colleges in Rivers State.

Hypothesis 3: There is no significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in blocklaying skills in technical colleges in Rivers State.

Table 6: The Analysis of Covariance (ANCOVA) on Co-operative and Demonstration Teaching Techniques on Students' Academic Achievement in Blocklaying Skills

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	907.019[a]	2	453.510	63.722	.000
Intercept	482.309	1	482.309	67.769	.000
PRE-TEST_B	133.210	1	133.210	18.717	.000
GROUP	563.667	1	563.667	79.201	.000
Error	348.731	49	7.117		
Total	47279.000	52			
Corrected Total	1255.750	51			

Significance at $\alpha \leq 0.05$

The analysis of covariance of students' performance scores presented in Table 6 showed that f-calculated for teaching methods in the two groups is 79.201 at 0.000 significant level. It therefore implies that the null hypothesis is rejected. Thus, there is a significant difference in the effect of co-operative and demonstration teaching techniques on students' academic achievement in blocklaying skills in technical colleges in Rivers State.

Discussions of Findings

The findings of the study revealed that students taught with the co-operative teaching technique performed better than students taught with demonstration teaching techniques in building drawing and design in technical colleges in Rivers State. The finding is in line with Pratt (2008) who stated that carefully designed inquiry learning environments can assist students in the process of transforming information and data into useful knowledge" (Co-operative teaching technique is often described as a cycle or a spiral, which implies formulation of question, investigation, creation of a solution or an appropriate response, discussion and reflection in connection with results).

The findings of the study revealed that students taught with the co-operative teaching technique performed better than students taught with demonstration teaching techniques in Blocklaying in technical colleges in Rivers State. The finding is in agreement with Parpala, Lindblom-Yla¨nne, Komulainen, Litmanen, and Hirsto (2010) who viewed Co-operative teaching technique as a means that teachers design situations so that pupils are cause to employ procedures research scientist used to recognize problems, and to ask questions, and to apply investigational procedures, and to provide consistent descriptions, prediction and explanations which are compatible with shared experience of the Building Technology world.

The findings of the study revealed that students taught with the co-operative teaching technique performed better than students taught with demonstration teaching techniques in blocklaying skills in technical colleges in

Rivers State. The finding is in accordance with Loyens, and Rikers (2011) who asserted that organizing learning using co-operative teaching technique would enable teachers and students to integrate knowledge across the disciplines through the cultivation of disciplined habits of mind. Loyens, and Rikers (2011) was certainly ahead his time, and traces of his extensions exist today in our need to reaffirm a place for inquiry within our learning system.

Conclusion

Based on the findings of the study, the following conclusions are drawn. A co-operative teaching technique for teaching skills in Blocklaying and concreting has been developed and its efficacy based on syllabus for technical colleges was tested. The mean performance of the students taught with the co-operative teaching technique is better than those taught with demonstration teaching technique. This performance is consistent in all of the five Blocklaying and concreting and this cannot be said to have occurred by chance, but rather due to the effectiveness of the co-operative teaching technique. Therefore, the co-operative teaching technique for teaching Blocklaying and concreting skills has yielded better performance in the academic achievement of the student.

Recommendations

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

1. In line with the responsibility vested on practicing technical teachers in technical colleges for guiding students to improve their performance in Blocklaying and concreting, technical teachers should subject this newly developed technique to further try-outs in order to serve as means of further assuring its performance usefulness, and eventual adoption for continual use in teaching performance skills in Blocklaying and concreting. Using the co-operative teaching technique will yield a better student performance in Blocklaying and concreting.
2. Standardization and harmonization of programmes being part of the responsibilities of National Board for Technical Education (NBTE), this board should consider introducing co-operative teaching technique as a standardized guide for the implementation of a uniform instructional strategy in Blocklaying and concreting in technical colleges as this teaching technique have proved to have positive effect on the students' performance in block/brick laying and concreting programmes in Technical Colleges in Rivers State.
3. In view of the dearth of instructional materials (textbooks, instructional guides, manuals, in technical and vocational education, the NBTE should undertake or support the production of the co-operative teaching technique for use in technical college

References

Abdullahi, S.M. (2011). Entrepreneurship skills needed by TVET Students for effective learning in technical colleges of Northern Nigeria. *Journal of Science, Technology, Mathematics and Education (JOSTMED).* 7(2): 140-148.

Adekoya YM, Olatoye RA (2011). Effect of demonstration, peer-tutoring, and lecture teaching strategies on senior secondary school students' achievement in an aspect of agricultural science. *The Pacific Journal of Science and Technology*, 12(1): 320-332.

Afolabi, F. & Akinbobola, O.A. (2009). Constructivist problem based learning technique and the academic achievement of physics students with low ability level in Nigeria secondary school. *Eurasian Journal of Physics and Chemistry Education 1(1),* 45-51.

Agboola, O. S. & Oloyede, E. O. (2007) Effects of project, inquiry and lecture-demonstration teaching methods on senior secondary students achievement in separation of mixtures practical test. *Journal of Educational Research and Review*, 2(6), 124-132.

Akinbobola, A.O. (2006). Effect of cooperative and competitive learning strategy on academic performance of students in physics. *Journal of Education Development,* 22 (1), 163-171

Akinoglu, O., & Tandogan, R. O. (2007). The effects of problem based active learning in science education on students' academic achievement attitude and concept learning. *Eurasia Journal of Mathematics Science and Technology, 3(1),*71-81.

Algarve, M. N. (2006). The effect of teachers' behavioral characteristics on students' interest in agriculture. *Journal of Research in Education*, 3(1), 47-50

Alvarado, A. E., & Herr, P.R. (2003).*Inquiry-based learning using everyday objects.Hands on instructional strategies that promote active learning in grades 3-8*. California: Corwin press Inc.

Amadi, R.O. (2006). *Teaching Skills and General Methodology*. Port Harcourt: Celwil publishers.

Amanoah, C.I; Okwelle, P.C. & Wokocha, C.M. (2015). Influence of School Location and class size on academic performance of students in public secondary schools in Rivers State. *African Social and Educational Journal*, 3(2), 33-42.

Audu, R., Aede, H.B.M., Yusri, B. K. & Muhammad, S. B. S. (2013). Provision of workshop tools and equipment: necessity for technical vocational education graduates skills acquisition. 2nd International Seminar on Quality and Affordable Education (ISQAE), 74-75.

Awraris, M. (2013). Factors influencing the quality of training: technical and vocational education in Addis Ababa. *Korea Review of International Studies*, 49-63.

Ayomike, C.S., Okwelle, P.C. & Okeke, B.C. (2015). Towards quality technical vocational education and training (tvet) programmes in Nigeria: challenges and improvement strategies. *Journal of Education and Learning*. 4(1), 25-34.

Ayonmike, C.S. & Okeke, B.C. (2015). The role of technical vocational education and training in the diversification of Nigerian economy: beyond oil approach. *International Journal of Vocational Education and Training,* 23(2), 45-54.

Ayonmike, C.S., Igberadja,S., Igberaharha,C.I. & Okeke, B.C. (2015). Status of partnership between tvet institutions and industries in Delta State Nigeria. *International Journal of Vocational Education and Training,* 23(1), 32-43.

Eze, C.P.(2013), "Empowering the Youth Through Technical and Vocational Education". A Panacea for Sustainable National Development UnizikOrient. *Journal of Education*.Vol.7(1). 59 – 64

Federal Republic of Nigeria (2013).*National Policy on Education* (6th Ed) Lagos: FGN Nigerian Educational Research and Development Council (NERDC).

Igberadja (2014). Challenges of implementing technical and vocational education and training curriculum in Nigerian Universities. *Global Advanced Research Journal of Educational Research and Review*, 3(5), 98-101.

Momo, O. A. (2012). "*Revitalization of Technical Education in Nigeria As A Vehicle for Transformation*"; Proceedings of COREN 21st Engineering Assembly, 53 – 81.

Nworlu-Elechi, O. (2013), " Technical and Vocational Education for National Transformation" Proceeding of 1st ASUP Zone D National Conference 21-37.

Ojimba, D.P.(2012). "Vocational and Technical Education in Nigeria: Issues, Problems and Prospects" Dimensions. *Journal of Education and Social Research* Vol. 2(9) November, 2012.

To cite: Okwelle, P.C. & Azukwu, S.A. (2022). Effects of Co-operative and Demonstration Teaching Methods on Students' Academic Achievement in Block Laying and Concreting in Technical Colleges in Rivers State. International Journal of Advanced Research and Learning, 2022 1 (1) 82-96