

Co-operative learning method and metalwork student's academic achievement in technical colleges

Shefiu Ogunbote¹ and Rasheed Adegbenro Dawodu²

¹Department of Technology Education, Lagos State University of Education, Oto, Ijanikin, Lagos, Nigeria

²Department of Technology Education, Lagos State University of Education, Oto, Ijanikin, Lagos, Nigeria

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ABSTRACT: The paper investigates cooperative learning method and Students' Academic achievement in Technical College Metalwork Technology in Lagos state. The study covered four out of five Technical Colleges in Lagos state. To guide the study one research question and one hypothesis are formulated and tested at 0.05 significant level. To guide the study one research question and one hypothesis are formulated and tested at 0.05 significant level and Quasi experimental designed was used for the study. Eight (80) students were randomly sampled from the four technical colleges and assigned to experimental and control groups. A thirty-five Metalwork achievement test (MWAT) adapted from National Board for Business and Technical Education past questions papers was used to assess the students. Validation of the instrument was established by four experts in metalwork technology and reliability of the instrument using person product moment correlation yields 0.89. Data collected were analysed using mean and T-test statistics. The findings revealed that cooperative learning method has significant effect on students' academic achievement in Metal Work Technology in Technical Colleges. Based on the findings, it was recommended that cooperative learning method should be adopted in teaching metal work technology in technical colleges.

KEYWORDS: Cooperative learning, metalwork technology and academic achievement.

INTRODUCTION

One of the principles of education in Nigeria to equip every citizen with knowledge, skills, attitudes and values that will enable him/her derive maximum benefits from his membership of society, have a fulfilling life and contribute towards the development and welfare of the community (FRN, 2013). Recognizing the importance of technical education in general and metal work in particular in National development, the Federal Government of Nigeria (FRN, 2013) infuse metal as one of the subject to be studied at all level of the educational institutions provides opportunity for

technological development. Oranu (2002) observed that one of the most rapidly growing units of our educational system is technical education. In emphasizing the increasing complexity in industrial development through technical education, Olaitan (2001) describes it as education for lives-work and national development.

Co-operative learning is the umbrella term for a variety of educational instructional strategies involving joint intellectual effort by students, or students and teacher together. According to Duckworth (2010) co-operative learning is students working together in small groups, thereby helping each other to achieve a certain goal in the teaching and learning process. It is part of group teaching and learning techniques where students interact with each other in order to meet expected learning outcomes.

Also, Alton (2015) asserted that cooperative learning is a method that assist instructors in carrying out the process of teaching and learning for students to reach their goals effectively. Therefore, cooperative learning method requires a small number of students to work together on a common task, supporting and encouraging one another to improve their learning through interdependence and co-operation with one another

Larry, Z. Hartman, (2002). Teaching Metalwork at the Technical College requires good teaching, skills and mastery of the subject matter. Dawodu (2014) asserted that for the Technical College graduates to be well trained in Metalwork technology, their teachers must have possessed the needed competencies for teaching the subject at the Technical Institution level.

Academic Achievement in metalwork technology connotes performance in metalwork as symbolized by a score an achievement test in the subject. Alturm (2003) contended that achievement is dependent on several factors among which are instructional methods, the learning environment and the learner. The integration of co-operative learning method into metal work technology classroom interaction needs teacher to have interesting and rich materials for learning that foster thinking, creativity, production and how to solve problems using practical approach.

Academic Achievements of students have been found to be enhanced by the use of cooperative learning Alturm (2015); Bulama (2003) and Bashir (2005) stated the fact that cooperative learning has been linked to increase in the academic achievement of learners at all ability levels is another reason for its usage. Mkomele (2015) noted that cooperative learning activity engages the student in the learning process and seeks to improve the critical thinking, reasoning and problem solving skill of the learner.

The study therefore seeks to find out the efficacy of co-operative learning instructional method in technical college students' achievement in metal work technology.

STATEMENT OF THE PROBLEM

The use of co-operative learning instructional method is capable of motivating students' achievement and improving the students critical thinking, reasoning, retention and problem solving skills.

As reported by Okobia (2012) causes of students' poor achievement has to do with the instructional methods used by the teachers, which are inadequate to bring about desired level of achievement and classroom participation of students. Some of the methods used by teacher are conventional which makes students to become passive. Eze (2009) and Osakwe & Oganwu (2005) found that many Nigeria teachers mostly used conventional teaching method that centers on the teacher, textbook, the chalk and the chalkboard. However, conventional teaching method presently used by the metal work teachers to teach technical college students has been proved inadequate due to deteriorating annual failure of students in the National Business and Technical Examination Board [NABTEB].

Hence, the researcher is curious to know what causes the students poor achievement in metalwork technology. Therefore, the study investigated if cooperative learning instructional method have any effect in technical college student's achievement in metalwork technology.

PURPOSE OF THE STUDY

The purpose of this study was to investigate co-operative learning method and students' academic achievement in Technical College Metalwork Technology.

specifically, the purpose of this study sought to:

Compare the mean percentage score of students taught metal work technology using cooperative learning method and those taught using conventional teaching method.

RESEARCH QUESTION

What are the mean percentage scores of students taught Metalwork technology using cooperative learning method and those taught using conventional teaching method?

HYPOTHESIS

The hypothesis formulated are tested at 0.05 level of significance.

H_{01} , there is no significant effect in academic achievement in metal work technology of technical college between students taught using cooperative learning method (CLM) based on their mean percentage scores in Metalwork Technology Achievement test.

LITERATURE REVIEW

Study conducted by Vitalice (2018) among secondary school students in Kisii achievement and attitude toward oral literature genres and outcome shows that cooperative learning approach is the starting point in improving the learner's performance and attitude towards the study of oral literature genres. In the study of Mkomele (2015) among secondary schools in Temeke District in Tanzania on cooperative learning approaches it was established that the approaches stimulate cognitive development along with constructivist approaches that place the students at the centre of the learning process.

Also, Ehsan, Vida and Mehdi (2019) examine the impact of cooperative learning on developing speaking ability and motivation towards learning English in China, cooperative learning approaches showed a significant improvement than those from control group which used other approaches of learning. Another study of Osalusi (2012) investigate the difference between cooperative learning in the experimental group and other teaching methods in control group. The findings revealed a significant difference in the critical thinking and decision making ability level between the experimental and control groups. The study revealed that cooperative learning method had higher mean score's as compared to those exposed to other methods of teaching. Another study by Christian and Pepple (2012) investigated the effects of cooperative and individualized learning strategies on students' achievement in chemistry in River state; 370 senior secondary schools factorial post-test quasi experimental and control design was adopted for the study.

Two research questions and two hypotheses were posed for the study, a 35 item multiple choice chemistry achievement test and CA1 was used for data collection. Mean, standard deviation, linear regression, ANCOVA, and scheffe multiple comparisons were used for data analysis. The results show statistically effect of cooperation learning student achievement in chemistry. The reviewed literature is of concern with students' achievement which is similitude of the present study.

METHODOLOGY AND PROCEDURE

DESIGN

A quasi experimental research design was employed using two groups experimental and control.

POPULATION

The population of the study comprises of all Metalwork Students in Technical Colleges in Lagos State.

SAMPLE AND SAMPLING TECHNIQUES

Simple random sampling was used in selecting four Technical Colleges from 4 LGA in Lagos State. From each of the 4 colleges, 20 year 11 Metalwork technology students were selected. The students were randomly assigned to two (treatment and control) groups.

INSTRUMENT

The instrument used for data collection was metalwork achievement test (MWAT). The Metalwork Achievement Test (MAT) is a 35 item multiple choice achievement test adapted from National Business and Technical Education Board (NABTEB) past question papers. The content of the adapted questions covers the syllabus of the class chosen for the study.

VALIDATION AND RELIABILITY OF INSTRUMENT

The face validity of the instrument was established by: Two experts in metalwork with NABTEB and Two Experienced Metalwork teachers drawn from Technical colleges in Epe and Ikorodu L.G.A in Lagos State.

Pearson product moment correlation a reliability coefficient of 0.89 were obtained.

EXPERIMENTAL PROCEDURE

The Metalwork teachers in the technical colleges selected were used in administering the instrument. The cooperative learning method was used for the experimental group and the conventional teaching method for control group. The topics

were taught for a total of six periods of 40 minutes each for each group. The instrument of 35 items was administered to both group for a duration of 50 minutes after which the instrument was collected.

METHOD OF DATA ANALYSIS

The data for the study was analysed using simple percentage. These were summed up and the mean percentage score computed for each of the two groups t-test statistic was used to test the hypothesis.

RESULTS

The results of the study are presented in the table below.

RESEARCH QUESTION 1

What are the mean percentage scores of student taught metalwork using cooperative learning method and those taught using conventional teaching method?

Table 1. Mean percentage scores of students in experimental groups

Group	N	Mean score \bar{x}
Experimental group (cooperative learning method)	40	53.5
Control group (conventional Teaching Method)	40	25.3

Data in Table 1 showed that students taught with cooperative learning method had percentage mean score of 53.5 whilst those taught with conventional teaching method had percentage mean score of 25.3. The study reveals that the experimental group (cooperative learning method performed better than the control group (conventional teaching method)

HYPOTHESIS

There is no significant effect in the academic achievement in metalwork technology of technical college between students taught using cooperative learning method and those taught using conventional teaching method.

Table 2. T-test analysis of mean achievement scores of students taught using cooperative learning method and those taught using conventional teaching method

Teaching Method	N	Mean score	SD	STD	T-cal	T-crit	Decision hypothesis
Cooperative Learning method	40	53.5 3.5	9.54 4.23	1.65	17.1	1.96	Rejected
Conventional Teaching Method	40	25.3	4.23				Rejected

From the Table 2, the t-test revealed that t-calculated (17.1) is greater that the t-critical (1.96) at 0.05 level of significance, the null hypothesis that status that there is no significant effect in the academic achievement in metalwork technology of technical college between students taught using co-operative learning method and those taught using conventional teaching method is rejected. The result implies that the students taught Metalwork with cooperative learning approach significant 1, outperformed students taught with cooperative learning method out per form those taught with conventional teaching method in metalwork.

DISCUSSION

The findings in this study have demonstrated that the effectiveness of cooperative learning method in the teaching of metalwork at the technical colleges. Data presented in Table 1 and 2 provide answer to research question 1 and test to

hypothesis 1. Findings revealed that students taught Metalwork with cooperative learning approach significant, outperformed students taught with conventional teaching method. An explanation for this could be as a result of the students learning, investigate and construct ideas in groups.

The result of this study are in line with Osalusi (2012), Vitalice (2018); Mkomele (2015); Ehsan, Vida & Mehdi (2019); and Christian and Pepple (2012) in which they asserted that cooperative learning method of instruction has significant effect on students' academic achievement.

IMPLICATIONS OF THE STUDY

The findings of this study have implications for students, teachers, curriculum planners and Administrators. The students must realise that when learning occur in groups and sharing common purpose and tasks, the students must broaden interactions to fit the zone of maximum response opportunity.

The teacher should model their method of instruction to enforce student-student interaction.

Moreso, the curriculum planners should develop appropriate curriculum that would made provision for adoption of cooperative learning method for teaching metalwork in technical colleges.

There is urgent need for the administration of technical colleges in providing facilities for practical as the need arises for the implementation of teaching metal work with cooperative learning method.

RECOMMENDATIONS

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

1. Cooperation learning method should be adopted by the school's administrator as effective learning approach in teaching metalwork
2. Metalwork technology teachers should be trained and re-trained to update their skills in teaching effectively
3. The curriculum planners should incorporate cooperative learning strategy in the curriculum of the students and teacher training institutions for competent use of method
4. Students should be carefully instructed in the use of cooperative learning techniques to enable the successful integration of new concept into the existing cognitive structure

CONCLUSION

The study has proved that cooperative learning method in teaching metal work is more effective than conventional teaching method of instruction. The study has contributed to knowledge on the effect of cooperative learning to enhance effective understanding and comprehension of metalwork concepts and acquisition and this motivates the interest of the students.

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