

# Effect of Cooperative Learning Technique on Students' Performance in Carpentry and Joinery Works in Technical Colleges in Edo State

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## ABSTRACT

The study examined the effect of cooperative learning technique on students' performance in carpentry and joinery works in technical colleges in Edo State. One research question and one hypothesis were raised to guide the study. The hypothesis was tested at 0.05 level of significance. The study adopted quasi-experimental research design, precisely the pretest and posttest non-equivalent control group design. The population of the study comprised all the 38 Vocational II students' offering Carpentry and Joinery work in three out of the six technical colleges in Edo State. Three intact classes were used which was made up of the 38 students; purposive sampling technique was used to select the students offering carpentry and joinery works in the technical colleges in Edo State. The instrument for data collection was titled; Carpentry and Joinery Works Achievement Test (CJWAT), which was subjected to content validity by three experts of which two of them are from the department of Vocational and Technical Education, Faculty of Education, Ambrose Alli University Ekpoma, and one from the department of Measurement and Evaluation, University of Benin (UNIBEN) both of Edo State. The experts were requested to assess the items in terms of appropriateness in addressing the problem of the study and research question under investigation. Their suggestions and recommendations were in-cooperated in the final draft of the instrument. The instrument was subjected to test-pretest reliability test technique. The reliability coefficient was calculated using Cronbach-Alpha coefficient which yielded reliability value of 0.72. The data collected were analyzed using Mean and Standard Deviation and Analysis of Covariance (ANCOVA). Mean and standard deviation were used to analyze the research question and ANCOVA was used to test the hypothesis. The result shows that difference existed between the pretest and posttest mean score of students' taught Carpentry and Joinery Works using cooperative learning technique and Conventional Teaching Method. The researcher suggested that one of the best teaching strategies for teaching and learning carpentry and joinery works is to implement cooperative learning, based on the findings.

**Keywords;** Education, Cooperative Learning, Carpentry and Joinery work, Technical Colleges and Conventional Teaching Method.

## INTRODUCTION

### Background to the Study

According to Okoro (2016), Technical Colleges are the principal vocational institutions in Nigeria, which gives full vocational training intended to prepare graduate for entry into various occupations such as Carpentry and Joinery, Brick laying and Construction, Auto-mechanics, Metal work, Electrical and Electronics amongst others. The National Business and Technical Examinations Board (NABTEB) is responsible for awarding all certificates. Carpentry and Joinery Works (CJW) is a vocational curriculum offered in technical colleges in

Nigeria.

The discipline of acquiring skills related to carpentry and joinery work, which is done during the construction of wooden objects or buildings and involves the installation or coupling of wooden parts, materials, and woodwork maintenance, is known as carpentry and joinery work.

National Board for Technical Education (NBTE), 2014 gave the objectives that guide the teaching and learning of trade subjects in technical colleges in Nigeria include to;

1. Provide technical training to meet the demand of woodwork industries and individuals by allowing the students to identify their career objectives.
2. Prepare an individual with job satisfying skills towards employment and self-reliance.
3. Prepare students to acquire entry level knowledge and manipulative skills for employment in technical industries.

Despite the admirable nature of these goals, there appears to be a barrier to their realization in technical colleges because CJW is a practically-focused program. To overcome this obstacle, appropriate teaching strategies must be used. One such strategy is cooperative learning, which has been shown to improve student performance in carpentry and joinery work by encouraging positive behavior, increasing learning rate, dividing students into groups, and enhancing practical skills and confidence.

These days, learning methods based on cooperation are more widely used with the aim of encouraging team work, allowing students to learn to work as part of a team, improving performance and learning and developing interpersonal skills (Baena-Morales, 2020). Gillies (2016), opined that cooperative learning is a learning method aimed at organizing classroom exercise into educational and funny learning environment. Cooperative learning technique could enable learners to gain from one another and acquire vibrant interactive collaboration. In cooperative learning, the teacher prepares the learners learning activities with the mind of cooperation among the students, the teacher guides the learners by observing the learners process development in and out of the classroom. When student discuss together they tend to learn more deeply (Powell, Murray, Johal & Elks, 2019). Cooperative learning technique is a technique that is totally different from the generally known conventional teaching method used by teachers. Agus, (2017) proved that students involved cooperative learning group scores higher than those in the conventional teaching group.

Conventional teaching method have been used by many teachers during their long experience in education, the basic scientific information was conveyed by means of direct teaching and guide lines provided by teachers. This method have the teacher as the center of teaching during classes, emphasize teaching processes are led by teacher. In this method students are expected to listen to lecture and learn by them. To a large extent the students might be scared to ask questions and express their views. Awotua-Efebo, in Oviawe (2010), explained that conventional teaching method is a teaching method whereby the teacher transmits information (subject matter content) verbally to the students. Sometimes, it involves writing on the chalkboard or using instructional materials.

The pressure to produce competent students in the face of standardized testing has increased in recent years, creating concerns about the most effective methods of instruction in schools, particularly in technical institutions. Now that they have a variety of teaching and learning approaches at their disposal, educators can select from teacher-centered, learner-centered, or teacher-learner-centered approaches. Instructors that apply the cooperative learning technique in the classroom aim to improve each student by using dynamics. Individual responsibility is used to ensure a fair distribution of task and to monitor improvement and current level of success.

According to Geletu (2022), conventional teaching method has been proved to be less successful when compared with cooperative learning technique to the needs of higher rate of cognitive and creative attainment. While Trans, and Lewis, (2012) added that to increase intellectual and creative attainment of learners' a cooperative learning technique could act as a substitute to conventional teaching method could be.

## Statement of the Problem

Practical courses are designed to give students' specialized training that will enable them to become highly relevant members of society, of which carpentry and joinery work is an essential component. This is how development and growth boost a country's economy by establishing certain training standards for the younger generation of students. Students who fall short in theory or practical courses will be requested to retake them or be advised to drop out of school.

However, this standard of training seems compromised as the capacity of those who are educators and students in both theory and practical works cannot be guaranteed in either the theoretical or practical fields. This suggests that education standards are progressively slipping below the typical or anticipated level. CJW students are not excluded because of their unsatisfactory performance. Based on the most recent results for CJW NABTEB students, out of the 817 individuals who took the test over the previous five years, 27 (3.3%) passed at the A and B level, 99 (12.1%) passed at the credit (C) level, 236 (28.9%) passed with a passing grade, and 455 (55.7%) failed the test.

This report demonstrates how poorly students performed in joinery and carpentry works in Edo State's technical colleges. Since the introduction of CJW in technical colleges, several different teaching strategies have been implemented.

It is beneficial to provide students attending technical institutes with the knowledge-acquisition abilities and mindset necessary to meet upcoming technological challenges. A study on students' academic performance in several disciplines found that a key contributing reason to the underperformance was ineffective teaching strategies used by teachers (Pepple, 2010). Therefore, the study's issue is the low CJW performance of the students. Amidst this context, the researcher aimed to examine the impact of cooperative learning methods on students' performance in carpentry and joinery tasks at Edo State's technical colleges.

## Purpose of the Study

The goal of the study is to determine the effect of cooperative learning technique on the students' performance in Carpentry and Joinery works in Technical Colleges in Edo State. Specifically, the purpose of the study is to:

- Find the difference between the pretest and posttest results of students who were taught CJW in technical colleges in Edo State using the cooperative learning technique and the traditional teaching method.

## Research Question

The research question below was raised to guide the study;

- Are there any differences in the mean scores of the pretest and posttest for students who were taught CJW at Edo State's technical colleges using the cooperative learning methodology against the conventional teaching method?

## Hypothesis

The hypothesis below was formulated and tested at 0.05 level of significance;

**Ho:** There is no significant difference between the pretest and posttest mean score of students' taught CJW using cooperative learning technique and Conventional Teaching Method in Technical Colleges in Edo State.

## Significance of the Study

Policy makers, curriculum developers, parents, instructors, and students would all greatly benefit from the study's conclusions.

When cooperative learning is used to teach CJW principles, the findings will help the students grasp the

material better.

Since CJW teachers are the ones who primarily execute CJW curriculum, policies, and programs, the study's findings will be important in helping them understand the value of utilizing motivational strategies in Edo State's technical colleges.

### **Scope of Study**

The study's focus was on how cooperative learning methods affected students' performance in joinery and carpentry at Edo State's technical colleges. Because they are among the primary beneficiaries of the cooperative learning techniques utilized in technical college trade course instruction, CJW students were selected for the program.

## **METHOD OF STUDY**

### **Design of Study**

A quasi-experimental research design was used to carry out the design. In particular, the non-equivalent group design for the pretest and posttest. According to Nworgu (2016), a quasi-experimental design uses pre-existing groups or entire classes that are not all the same size. When experimental designs are implemented in real-world scenarios, the result is a quasi-experimental design. This is due to the fact that maintaining the classroom's reality and appropriate conditions is the goal. Since the study's intact classes (a non-randomized group) were divided into three groups, the design was deemed appropriate.

### **Population of the Study**

The 38 Vocational II students studying CJW at three of the six Technical Colleges in Edo State that provide CJW made up the study's population. Voc. II students are used for the study because Voc. III students are preparing for external examination and Voc. I is still an introduction class.

### **Sample and Sampling Technique**

For the study, 38 CJW students from Edo State's technical colleges were used. A Purposive Sample technique was utilized to pick Edo State's three technical institutions (Igarra, Afuze, and Benin) that offer CJW, as three (3) of the state's six (6) technical colleges do so. Every technical college served as a group for treatment. The three complete classes were used to choose the schools for the experimental or control groups. The two experimental groups comprised all 23 students from colleges A and B, whereas the control group consisted of all 15 students from college C. Cooperative learning was used to teach CJW concepts to the experimental colleges, while the control groups were taught the same concepts using Conventional teaching method.

### **Instrument for the Study**

The researcher created the Carpentry and Joinery Work Achievement Test (CJWAT) as the study's instrument. There were 35 multiple-choice questions on the CJWAT, each with five options split into two sections. Sections A and B. Part B served as the posttest, and Part A served as the pretest. The research assistants, CJW teachers, used the lesson note. The themes in CJW that were outlined in the NABTEB curriculum for Voc. II in technical colleges were the source of the items in CJWAT.

### **Validity of Instrument**

The instrument was subjected to content validity by three experts. Two of them are from the department of Vocational and Technical Education, Faculty of Education, Ambrose Alli University Ekpoma, and one from the department of Measurement and Evaluation, University of Benin (UNIBEN) both of Edo State. The experts were requested to assess the items in terms of appropriateness in addressing the problem of the study and research question under investigation. Their suggestions and recommendations were in-cooperated within

the instrument's final draft.

### Reliability of Instrument

To ascertain the instrument's dependability, the scores of 24 Voc. II CJW students in technical colleges in Delta State were used, who were not part of the study sample on two different occasions. The instrument was subjected to test retest reliability test technique. The reliability coefficient was calculated using Cronbach's Alpha and the reliability coefficient of 0.72 was

obtained for CJWAT instrument. An instrument used in a study or research project with a reliability coefficient of 0.72 is considered to have a moderate to high level of reliability. More specifically, it indicates that around 72% of the variation in the instrument's results can be ascribed to accurate and consistent measurement, with the other 28% potentially coming from random mistake or inconsistent results.

### METHOD OF DATA ANALYSIS

Analysis of Covariance (ANCOVA) and mean and standard deviation were used to analyze the study's data. The research issue posed for the study was analyzed using the mean and standard deviation, and the hypothesis was tested at the 0.05 level of significance using ANCOVA. To ascertain whether the differences were significant, ANCOVA was employed.

### RESULTS

**Research Question:** Are there any differences in the mean scores of the pretest and posttest for students who were taught CJW at Edo State's technical colleges using the cooperative learning methodology against the conventional teaching method?

Table 1: Descriptive Statistics of the Mean Performance Scores of the Students on the Pretest and Posttest Who Were Taught CJW Utilizing Both Traditional Teaching Methods and Cooperative Learning Techniques.

	Pretest			Posttest			Mean Diff.
	N	Mean	SD	N	Mean	SD	
<b>Experimental Group (Cooperative learning)</b>	23	30.92	5.85	24	53.03	9.00	22.11
<b>Control Group</b>	15	31.35	9.81	40	39.89	7.99	8.54

The descriptive data for the two groups (one experimental group and one control group) of students' performance mean scores are displayed in Table 1. Table 1's results demonstrate that the experimental and control groups' pretest mean scores were low, at 30.92 and 31.35, respectively. This suggests that prior to receiving therapy; the two groups' performance mean scores were low. Nonetheless, the posttest results indicate that the experimental group's performance mean scores increased from 30.92 to 53.03 following the use of the cooperative learning strategy. On the other hand, the treatment group scored 39.89 while the control group scored 31.35 on the posttest. Comparatively speaking, this suggests that at the posttest, the pupils in the treatment group outperformed those in the control group. The treatment groups increased posttest results could be attributed to the cooperative learning strategy that was used with them.

### Hypothesis

**Ho:** There is no significant difference between the pretest and posttest mean score of students' taught CJW using cooperative learning technique and Conventional Teaching Method in Technical Colleges in Edo State.

Data for testing the hypothesis are represented in table 2.

Table 2: Results of the ANCOVA study on how traditional teaching methods and cooperative learning techniques affect students' performance mean scores.

Test of Between-subject effect

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1665.313 <sup>a</sup>	1	16665.313	20.449	.000	.208
Intercept	3933.845	1	3933.845	48.305	.000	.382
CONTROL GROUP	1665.313	1	1665.313	20.449	.000	.208
Error	6352.175	78	81.438			
Total	110907.000	80				
Corrected Total	8017.487	79				
Corrected Model	8.314 <sup>b</sup>	1	8.314	103.736	.000	.693
Intercept	.223	1	.223	2.782	.102	.057
COOPERATIVE LEARNING	8.414	1	8.314	103.736	.000	.693
Error	3.686	46	.080			
Total	120.000	48				
Corrected Total	12.000	47				

R Squared = .208 (Altered R Squared = .198)

R Squared = .693 (Altered R Squared = .686)

Control Group:  $F(1,79) = 20.449, p=.000$

Cooperative Learning Technique:  $F(1,48) = 103.736, p=.000$

To determine whether there is a significant difference between the pretest and posttest mean scores of students who were taught CJW utilizing cooperative learning and traditional teaching methods, analysis of covariance statistics (ANCOVA) was performed. The control group's  $F(1, 79) = 20.449, p = .000$ , and the treatment group's  $F(1, 48) = 103.736, p = .000$ , were both significant according to the ANCOVA statistics. As a result, the null hypothesis is rejected, and we draw the conclusion that there is a significant difference between the pretest and posttest mean scores of students who were taught CJW in Edo State's technical institutions utilizing cooperative learning approach and traditional teaching method. The experimental group, which was taught using the cooperative learning strategy, outperformed the control group, which was taught using the traditional way, in terms of scores. Thus, the noteworthy variation in mean scores can be attributed to the implementation of the cooperative learning technique.

## DISCUSSION OF FINDINGS

The experimental group, which was taught cooperative learning techniques, outperformed the control group, which was taught conventional methods, according to the study question's findings. The hypothesis's results

also supported the idea that, in Edo State's technical colleges, there is a significant difference ( $p < .05$ ) in the mean performance scores of students who were taught CJW through cooperative learning techniques compared to traditional teaching methods. The results of the study are consistent with those of Simesso, Gutu, and Tarekegn (2024), who found no significant differences in the performance mean scores of students taught CJW using cooperative learning approach and traditional teaching methods between the pretest and posttest. The study's findings indicate that, in comparison to the traditional approach, cooperative learning techniques improve student performance. In comparison, the cooperative learning approach is likely superior since it provides pupils with greater attention, which fosters the development of effective communication and problem-solving abilities. Increased student-teacher relationships have been shown to improve students' cognitive development through the use of cooperative learning techniques (Padugupati, 2017).

## CONCLUSION

The study looked at how students' performance in joinery and carpentry at Edo State's technical institutes was affected by the cooperative learning approach. The results have given empirical support for the idea that cooperative learning approaches are a workable instructional strategy for achieving the goals that direct the instruction of carpentry and joinery work in Edo State's technical colleges. Students in technical colleges would undoubtedly perform better in Carpentry and Joinery Work (CJW) as a result of being exposed to cooperative learning techniques. Based on the results, it was determined that the experimental group's performance mean scores differed from the control groups due to the cooperative learning technique administered.

## RECOMMENDATIONS

1. Given the positive effects of cooperative learning methods on students' performance, it is advised that instructors of carpentry and joinery work courses often employ cooperative learning methods in technical colleges.
2. Cooperative learning strategies should be frequently employed by instructors teaching carpentry and joinery work in technical colleges.
3. It is advised that instructors of Carpentry and Joinery Work (CJW) at technical institutes comprehend how the type of contact affects the quality of learning.
4. Lawmakers ought to pass laws encouraging teachers to use the cooperative learning approach with students more often.

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