

Comparative Effects of Teaching Methods Used for Teaching Skills in Radio Television and Electronics Servicing Trade

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Abstract

This study determined the comparative effects of cooperative and conventional teaching methods on students' skill acquisition in radio television and electronics servicing trade at technical college level. Two research questions and two hypotheses guided the study. The population of the study was 84 Senior Secondary School Students. The study adopted non-equivalent control group quasi-experimental and opinion survey designs. Instruments used for data collection were posttest and a 12-item Questionnaire. Findings of the study indicated that cooperative teaching method is comparatively more effective than conventional teaching method for teaching skills in radio television and electronics trade. Students in the cooperative group were also found to be relatively more socialized during the learning process than those in the conventional group. The study recommended among others that education practitioners should encourage radio television and electronics servicing teachers to adopt cooperative method of teaching for instruction.

Keywords: Comparative effect, Teaching Method, Electronics Service, Skill Acquisition, Technical College

1.0 Introduction

Methods of learning, which may either be teacher centered or student centered dominate teaching theories. The teacher centered approach is the traditional or the conventional method of teaching where the teacher plays an active role and the student passive role in the learning process. The student centered approach is a teaching method where both the teacher and the student play active roles in the learning process.

The traditional "chalk and talk" method of teaching which persisted for years is now acquiring inferior results when compared with the more modern and revolutionary teaching methods (Jackson, 2012). It has also been found in universities by teachers and students that the conventional lecture approach in classroom is of limited effectiveness in both teaching and learning (Damodharan & Rengarajan, 2013). The traditional passive view of learning involves situations where material is delivered to students using a lecture-based format, but a more modern view of learning is constructivism (Carpenter, 2006) where students build their own version of reality rather than simply absorbing versions presented by their teachers (Prince & Felder, 2006). Cooperative learning like constructivism places the learner in more active role during the learning process.

Cooperative learning is a teaching method which provides opportunity for students to develop skills in group interactions and teamwork (Sharan, 2010). Teamwork suggests that well-motivated students, who were taught using the cooperative learning method, come together from different academic background to make a difference in their academic pursuit (Abu & Flowers, 1997).

In cooperative learning, assignments, tests and scores are given to groups. Felder and Brent (1994) concluded from their study of cooperative learning in technical courses that, regardless of the objective specified, cooperative learning has repeatedly been shown to be more effective than the traditional individualized/competitive approach to education.

Radio Television and Electronics (RTVE) works is a technical course alongside Electrical Installation and Maintenance Work, Plumbing, Carpentry and Joinery, Block/Brick Laying and Concreting that are offered in technical colleges in the study area. RTVE works is designed to equip students with hands-on experience in installing, maintaining and servicing of electronic devices and systems (National Business and Technical Examinations Board, 2007). After three decades of implementing the National Policy on Education (NPE), Nigeria is yet to fully tap its benefits (Sambo, 2003) as the objective of the technical education component of the policy is yet to be fully attained. Among the numerous factors standing against the successful attainment of the objectives of technical education is the instructional strategies adopted by RTVE technical teachers in the technical colleges (Chinda, 2006).

Leighbody and Kidd cited in Chinda (2006) recommended several methods for teaching technical subjects. These include; lecture, discussion, questioning, demonstration, project and field trips among others. Each of these methods has its own advantages and disadvantages in terms of skill acquisition by students. In most times teachers have the option of structuring lessons competitively or cooperatively with each having its corresponding advantages and disadvantages. In a competitively structured classroom, students are engaged in a win-lose struggle in an effort to be the best with the perception that they can only reach their goals only if the rest of the students in the class fail to reach their own goals. Most societal ills can be traced to this competitive method of learning in the schools, which have been translated into inhuman treatment of one another (Abu and Flowers, 1997). This trend of negative development can be limited by selecting and implementing an appropriate teaching method in schools. This study compared the effects of cooperative and conventional teaching methods on RTVE students and also assessed the level of socialization of the students during the teaching and learning process.

2.0 Methodology

Two research designs were employed for the study. The non equivalent control group quasi-experimental design and opinion survey design. The non equivalent control group quasi-experimental design was used because intact classes and normal laboratory settings were used. In each of the four technical colleges, senior secondary (SS) II RTVE intact class was systematically divided into two groups: experimental and control groups. Also an opinion survey of the level of socialization of the two groups who were exposed to the cooperative and conventional teaching methods was carried out using a 12-item questionnaire.

The population of the study was 84 RTVE students from the four technical colleges in Taraba State who were split into experimental and control groups. Data was collected through the use of a researcher developed workshop practical test designed to measure the students' performance in RTVE workshop practical exercise. The second instrument was a 12-item questionnaire developed by the researcher to elicit responses from the students on their level of socialization. The test instrument was face and content validated by two specialists from the Department of Electrical Technology Education, Federal University of Technology, Yola. The instrument was trial tested on 20 RTVE students in Government Science and Technical College Yola. A reliability coefficient of 0.65 was obtained using the K-R 21 formula. The questionnaire was face validated by two specialists in Industrial Psychology, Department of Science Education, Federal University of Technology, Yola and an alpha coefficient of 0.71 was obtained using the Cronbach Alpha formula. The experimental group (cooperative learning group) was taught RTVE using cooperative teaching method while the control group (conventional group) was taught RTVE using the traditional/conventional method of teaching. The two research questions that guided the study are:

1. what is the difference between the posttest mean scores (in performance test) of students taught RTVE using cooperative and conventional methods of teaching and
2. what is the difference in the perceived level of socialization of students taught RTVE using cooperative and conventional methods of teaching?

Furthermore, the study hypothesized that;

1. There is no significant difference between the posttest mean scores (in performance test) of students taught RTVE using cooperative and conventional teaching methods and
2. There is no significant difference between the mean ratings of students taught RTVE using cooperative and conventional methods of teaching on their perceived level of socialization.

3.0 Results

To answer the research questions, measure of mean and standard deviation were used to explore the difference in the mean scores of students on the posttest performance test, while z-test of statistics was used to determine the existence of no significant difference between the posttest mean score of the students.

3.1 Research Question 1

What is the difference between the posttest mean scores (in performance test) of students taught RTVE using cooperative and conventional methods of teaching?

Measures of mean in Table 1 shows a difference ($66.19 - 48.41 = 17.78$) between the mean scores of the two groups; indicating that the cooperative group performed better ($x = 66.19$) than their conventional counterpart ($x = 48.41$) in performance test with a mean difference of 17.78. —

3.2 Research Question 2

What is the difference in the perceived level of socialization of students taught RTVE using cooperative and conventional methods of teaching?

The result in table 2 shows that, the students of cooperative learning group rated themselves higher ($x_{\text{grand}} = 4.42$) than the students of the conventional learning group ($x_{\text{grand}} = 2.66$). This implies that students of the cooperative group were more socialized during the learning process than their conventional learning group counterpart.

3.3 H₀₁

There is no significance difference between the posttest mean scores (in performance test) of students taught RTVE using cooperative teaching method and those taught RTVE using conventional teaching method.

Analysis in table 3 explores the significant difference existing between the scores of the two groups. The values of z-calc (-8.95) and z-crit (± 1.96) reveal the difference; hence the null hypothesis is therefore rejected, thus there is a significant difference ($p < 0.05$) between the cooperative and conventional learning groups in performance test.

3.4 H₀₂

There is no significant difference between the mean ratings of students taught RTVE using cooperative and conventional methods of teaching on their level of socialization.

Analysis in table 4 also explores the significant difference existing between the mean scores of the two groups. The values of z-calc (21.52) and z-crit (± 1.96) show that difference exists between the mean scores; hence the null hypothesis is rejected, thus, there is a significant difference ($p < 0.05$) between the levels of socialization of cooperative and conventional learning groups. This study revealed that students from the cooperative learning group were more sociable and democratic during the learning process than their conventional group counterpart.

4.0 Findings of the Study

On the basis of the research questions and the null hypotheses formulated to guide this study, the following findings emerged:

- i. The posttest mean score of the experimental group (i.e. cooperative group) was higher than the posttest means of the control group (conventional group) in the researcher-made performance test
- ii. The cooperative learning group had a higher mean rating on their level of socialization than the conventional learning group.
- iii. Significance difference exists between the mean ratings of the cooperative and the conventional learning groups in their level of socialization.

- iv. Comparatively, cooperative teaching method is more effective than the conventional teaching method in teaching skills in RTVE works.
- v. Comparatively, students exposed to cooperative teaching method socialized more during the learning process than the students exposed to the conventional teaching method.

5.0 Discussions

The posttest results of the two groups of learners confirm the superiority of cooperative learning over traditional method of learning in manipulative skill instruction. Felder and Brent (1994) concluded that regardless of the objective specified, cooperative learning has repeatedly shown to be more effective than the traditional individual/competitive approach to education. Findings from this study revealed the superiority of cooperative learning over the conventional learning as indicated by the significant difference between the achievements of the cooperative learning (experimental) group and the conventional (control) group. A carefully conducted and well controlled experimental research according to Campbel cited in Chinda (2006) is likely to have the experimental group performing better than the control group.

Findings of the study also revealed that there is a significant difference between the students' perceived level of socialization during the learning process. The cooperative learning group had higher grand mean rating of $\bar{x}_{\text{con}} = 2.66$ than the conventional learning group which has a grand mean rating of $\bar{x}_{\text{coop}} = 4.42$. This finding agrees with Abu and Flowers (1997) and Sharan (2010), which in their separate studies, discovered that students taught using the cooperative method of teaching were more disposed to working together and have more interactive spirit than those taught using the conventional classroom method. This could be so, because in the cooperative learning method, students work together in a group and the issue of competition does not occur.

6.0 Conclusion

The study compared the effects of cooperative and conventional teaching methods on students of Radio Television and Electronics works in Taraba State technical colleges. Based on the posttest results of the two groups of learners, the two teaching methods have positively affected the retention of knowledge of the students. However, students taught RTVE with cooperative teaching method performed significantly better than those taught RTVE with conventional teaching method. This signifies that cooperative teaching method is more effective than the conventional teaching method in training learners to acquire skills in radio television and electronics works.

7.0 Recommendations

On the basis of findings of this study, the following recommendations were made;

- 1) Education policy makers and practitioners in Taraba State should provide resources, which would prepare RTVE teachers to adopt cooperative teaching method for teaching their students.
- 2) Taraba State Government, through its Teaching Service Board, should from time to time organize seminars and workshops for technical teachers with the view to improving teachers' competency in selecting and applying appropriate teaching methods for effective skill acquisition in RTVE trade in particular and other technical trades in general.

8.0 Suggestion for Further Studies

Further study should be carried out to determine technical teachers' preparedness to adopt cooperative method of teaching in Taraba State technical colleges.

9.0 Tables

Table 1: Posttest Mean Scores and Standard Deviation of Conventional and Cooperative Learning Groups

Group	x	SD
Cooperative	66.19	0.93
Conventional	48.41	1.55

Table 2: Mean and Standard Deviations of the Responses of RTVE Students in Cooperative and Conventional Learning Groups on their Level of Socialization

S/N.	ITEM	\bar{x}_{con}	SD _{con}	\bar{x}_{coop}	SD _{coop}
1.	Care for each other	2.84	1.06	4.48	0.74
2.	Show affection for each other	2.97	0.93	4.48	0.55
3.	Concern about members absence	2.48	0.99	4.48	0.55
4.	Share things commonly together	2.81	1.04	4.38	0.01
5.	Share information together	3.15	0.85	4.55	0.74
6.	Share tools equipment and material	3.07	1.09	4.38	0.86
7.	Ability to make friends	2.57	1.13	4.24	0.76
8.	Share Knowledge	2.76	1.13	4.48	0.76
9.	Work Together Productively	2.36	1.11	4.55	0.81
10.	General Social Skills	2.57	1.11	4.50	0.67
11.	Share Personal Materials	2.48	1.04	4.22	0.93
12.	Customization of Larger Groups	2.57	1.11	4.36	1.06
	Grand mean	2.66		4.42	

Key \bar{x}_{con} - Mean rating of conventional group.SD_{con} - Standard deviation of conventional group \bar{x}_{coop} - Mean rating of cooperative groupSD_{coop} - Standard deviation of cooperative group**Table 3: A z-test of Difference between the Posttest Mean Scores (in performance test) of Students Taught RTVE Using the Cooperative and Conventional Methods of Teaching**

Source of Variance	N	\bar{x}	Sd	SE	Z-calc	Z-crit	Decision
Cooperative method	42	66.19	5.04	0.87	-8.95	±1.96	Reject
Conventional method	42	48.41	11.87	1.83			

Table 4: A z-test of Difference between the Mean Rating of Conventional and Cooperative Groups on their Level of Socialization

Source of Variance	N	\bar{x}	SE	Z-calc	Z-crit	Decision
Conventional	42	2.72	1.73	21.52	±1.96	Reject
Cooperative	42	4.43	1.03			

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