EFFECTIVENESS OF RETENTION RATE THROUGH COOPERATIVE AND TRADITIONAL LECTURE METHOD ON THE PERFORMANCE OF STUDENTS IN SUBJECT OF STATISTICS

Hira Feroz*, Dr. Rahmat Ullah Shah**

ABSTRACT

This paper aimed to report the findingsof retention rate on theperformance of students through cooperative and traditional lecture method. In order to pursue the objectives of this study Post test and Retention test was used. Being experimental in nature, the experimental group was given a treatment of the cooperative method, whereas the lecture method was given to a control group. The 40 students were randomly selected as total participantsfrom F.G. Degree College for women Bannu Cantt and were divided in two groups of 20 each as a sample. Two lecturers of statistics were chosen for this study. Treatment was given for 4 weeks. The dependent t-test was applied as statistical technique to compare the means of two related groups to determine whether there is a statistically significant difference between these means. The findings of the study proved that by using the cooperative teaching method, more significant and effective results were obtained by experimental group in post test in contrast with the traditional lecture method. It was also found that the retention of the knowledge of the pupils in the experimental group was extensively superior than the control group. Based on findings it was recommended that thecooperative teaching method should be utilized in teaching learning process.

Keywords: Traditional lecture, Cooperative teaching, Statistics, Retention

*M.Phil Scholar, Email: hiraferoz24@gmail.com

**Assistant Professor, Email: rahmatullahshah@gmail.com

Institute of Education and Research, University of Science and Technology, Bannu, Khyber Pakhtunkhwa, Pakistan

INTRODUCTION

The knowledge of statistics is pervaded in all phases of society. Different methods are used to get better results for the effectiveness of statistics by various professors. They are employing technologies and focusing on the concepts (Aliaga*et al.,* 2010). At the higher secondary level, the subject of statistics is getting more common. In an educational context to select a teaching technique is very dominant. To select a teaching method in an educational context is really prevalent (Garfield, 2002). An effective teaching is founded on various aspects like advance organizer, response, higher order questioning, cooperative learning and the positive classroom atmosphere (Wolfensberger and Canella, 2015). You can find more than 150 coaching methods that can be utilized to educate statistics whiz, cooperative teaching method, presentation method, debate method, seminar method, lecture method, study assignment method etc. At intermediate level, both methods collaborative and lecture method are used. At a higher-level professor mostly apply traditional lecture method which is an old technique. The instructor addresses his lecture and the learners listen only his instructions in this technique. In traditional lecture method the teacher notifies the learners what to manage instead of triggering them to see for themselves (Miles, 2015).As, it is one way information in which students get concepts very slow and don't understand the concepts clearly (Hejazi,2006).Beside this, cooperative learning consists of a small group of students in which students participate and cooperate with their group fellows and help them in their learning as well. It is two way information in which students have given a task. The students understand the task first and then discuss with their fellows which enable them to grasp the topic (Giraud, 1997). In this method as a presenter has much time, so he clears the concepts of students while giving the answers to questions. As it provides a pleasant learning environment in which students gain information from each

other efforts. At the end their efforts are facilitated by incentives (Keramati,2001). Numerous investigators preferred that the ideal group size of cooperative learning should be 4-5 students, by doing this the students may be easily controlled. The different opinion and experience of student about any topic can also be accomplished. And they have successfully worked if the group consists of 2-7 group fellows (Wright, 1994). But the students more than 5 in a group can restrain the students to express their feelings (Oakley *et al*., 2004).

In traditional lecture method the students feel shy and do not raise their question which arises in their mind while in cooperative learning it does not happen to them and presenter also notice students learning (Giraud, 1997). The GAISE rules appear a few proposals, expressing that as an instructor ought to not center on giving addresses. He should focus much more on the options such as giving presentations, assignments, doing lab work and presenting such an activity that they may resolve their actual life problems in some extent (Franklin and Garfield, 2006). The educators of statistics find those ideas which may easily implement in a classroom because presenting these ideas is so easy but applying is so hard. According to seventh ICOTS, the cooperative learning method ought to really be connected to education of statistics (Morettin and Rossman, 2007).

Objectives of Study

The following werethe objectives of the study:

1. To study the impact of cooperative teaching method and traditional instructional method on the academic performance of pupils.

2. To examine whether the students can retain the learning for a long time when they are taught through cooperative teaching method or traditional lecture method.

Research Hypotheses

The following null hypotheses of this study were:

H_{01}: There is no significant difference between the performance of control and experimental groups on post-test.

H_{02}: There is no significant difference between the performance of low achievers of the control and experimental group on post-test.

H_{03}: There is no significant difference between the performance of higher achievers of the control and experimental group on post-test.

H_{04}: There is no significant difference between the performance of the control and experimental group on retention test.

H_{05}: There is no significant difference between the performance of low achievers of the control and experimental group on retention test.

H_{06}: There is no significant difference between the performance of high achievers of the control and experimental group on retention test.

RESEARCH METHODOLOGY

The nature of the Study

The present study was done experimentally by using a Post test and a retention test.

The population and sample of the Study

The population of the study was those students studying statistics at intermediate level in FG degree college for women Bannu. F.Sc part II undergraduates of F.G. Degree College for women, Bannu Cantt were chosen as the sample. They were divided in two groups; Experimental and Control groups.

Research Instruments

Data was gathered using an academic achievement test and the Retention test in this study.

The Data Analysis

The data analysis was completed by computing the arithmetic mean, S.D, t test and p values.

Analysis and Interpretation of data

The SPSS version 16 was utilized for analysis and interpretation of the information. The data analysis procedure is given below.

H_{01}: There is no significant difference between the performance of experimental and control groups on the posttest.

Table 1: Results of Experimental and Control groups on posttest

Groups	N	Mean	S.D	d.f	t-value	p-value
EG(exp.group)	20	90.27	2.42			
				38	**13.69**	**0.00**
CG(control.group)	20	69.26	3.37			

Significant	t_{tab} 0.05 = 2.011

Table-1 demonstrates the results of Experimental andControl groups on the posttest. The mean and S.D of the EG are 90.27, 2.42 and control group are 69.26, 3.37. Which shows significant results because the p-value is less than 0.05 and t value is 13.69. On the basis of significant consequences, we reject the null hypothesis and conclude that the students of experimental group performs brilliantly in class than the students of control group.

H_{02}: There is no significant difference between the performance of low achievers of the experimental and control group on the post test.

Table-2: Results of low achievers of experimental and control group

Groups	N	Mean	S.D	d.f	t-value	p-value
EG(exp.group)	05	80.1	1.48			
				08	**17.01**	**0.00**
CG(control.group)	05	70.2	1.58			

Significant	t_{tab} at 0.05 = 2.10

Table-2 shows that the mean and SD of the experimental group are 80.1, 1.48 and control group are 70.2, 1.58. This shows significant result as the p-value is less than 0.05. Therefore, we reject the null hypothesis. Hence low achievers of

the experimental group show a high performance than low achievers of the control group.

H_{03}: There is no significant difference between the performance of higher achievers of experimental and control group on the post test.

Table-3:   Results of higher achievers of experimental and control groups

Groups	N	Mean	S.D	d.f	t-value	p-value
EG(exp.group)	15	95.13	1.39			
				28	**20.13**	**0.00**
CG(control.group)	15	80.8	1.76			

Significant	t_{tab} at 0.05 = 2.048

Table-3 represents that high achievers of experimental and control groups on the post test. The mean and SD of the experimental group are 95.13, 1.39 and control group are 80.8, 1.76. This shows the significant p-value less than 0.05 and t value 20.13. Therefore, we reject the null hypothesis. It is deduced that the high achievers of the experimental group demonstrated more beneficial solution when contrast with the higher achievers of the control group on the posttest.

H_{04}: There is no significant difference between the performance of experimental and control   group on retention test.

Table 4:   Result of Retention test of experimental and control group

Groups	N	Mean	S.D	d.f	t-value	p-value
EG(exp.group)	20	92.73	2.10			
				38	**13.71**	**0.00**
CG(control.group)	20	80.01	3.29			

Significant	t_{tab} at α(0.05) = 2.048

Table 4 shows the results of the retention test of the experimental group (EG) and control group (CG).The mean and SDof the experimental group are 92.73, 2.10 and control group are 80.01, 3.29. These show the significant result as the P-value is 0 and the calculate value of t is 13.71. On the basis, we reject the null

hypothesis and deduce that the undergraduates of experimental group demonstrate admirable result as contrast to the control group on the retention.

H$_{05}$: There is no significant difference between the performance of low achievers of experimental and control group on retention test.

Table-5: Retention test results of Low achievers of experimental and control group.

Groups	N	Mean	S.D	d.f	t-value	p-value
EG$_{(exp.group)}$	05	89.1	1.21			
				08	**17.36**	**0.00**
CG$_{(control.group)}$	05	71.4	1.86			

Significant	t$_{tab}$ at 0.05	= 2.10

Table-5 demonstrates the results of low achievers of experimental group (EG) and the control group (CG) on the retention test. The mean and S.D. of experimental group are 89.1, 1.21 and control group are 71.4, 1.86. On the basis of significant result, we reject the null hypothesis and infer that the low achievers of experimental group show superior result than the low achievers of the control group on retention test.

H$_{06}$: There is no significant difference between the performance of high achieversof experimental and control group on retention test.

Table-6: Retention test results of high achieversof experimental and control group

Groups	N	Mean	S.D	d.f	t-value	p-value
EG$_{(exp.group)}$	15	92.1	1.02			
				28	**24.5**	**0.00**
CG$_{(control.group)}$	15	80.1	1.43			

Significant	t$_{tab}$ at 0.05	= 2.048

Table-6 represents the results of high achievers of experimental and control group on the retention test.The mean and SD of (EG) are 92.1, 1.02 and

(CG) are 80.1, 1.43. This show significant result as the P-value is 0 and t value is 24.5. On the ground of this result, we reject our null hypothesis. In this mode, it is guessed that the high achievers of the experimental groupshowed a better effect than the high achievers of the control group on the retention test.

RESULTS AND DISCUSSION

The findings achieved from t-test of the statistics post test scores indicated a substantial difference (t= 13.69, p= 0) between the experimental group (Mean= 90.27 and S.D = 2.42) and the command/control group (Mean= 69.26 and S.D =3.37). The magnitude of the difference in the means was 21.01, which was very large. The results showed that the experimental group generated a higher overall improvement in scores on the statistics post test scores. This finding sustained the first hypothesis which states that students who were taught by cooperative method will have superiorperformance in the statistics course than those taught through lecture-based teaching. This study results are reliable with previous findings(Sahin, 2010).

The average difference of low achievers (Mean= 80.1) and high achievers (Mean= 95.13) of experimental group and low achievers (Mean= 70.2) and high achievers (Mean= 80.8) of control group on post test was really big. It was deducted from this difference that cooperative teaching method was more significant than lecture based method. This finding affirms the second and third hypothesis.

The solution bears out the fourth hypothesis that students who are taught by cooperative teaching method had greater retention of information taught in the statistics course than those taught through lecture based instruction.This finding corroborates the effects of previous research work (Tanel and Erol, 2008).

The average difference of low achievers (Mean= 89.1) and high achievers (Mean= 92.1) of experimental group and low achievers (Mean= 71.4) and high achievers (Mean= 80.1) of the control group on retention test was also large, which designates that the cooperative teaching method promotes greater long term retention achievement than lecture based method. This finding supports fifth and sixth hypothesis and also reliable with the findings of earlier studies (Slavin, 2011).

CONCLUSIONS

Cooperative teaching strategy in statistics is more dominant and efficient when compared with the traditional lecture method. Pupils of the experimental group showed a wonderful performance than the pupils of the control group. The students of the cooperative teaching were more mindful and induced. Their association and energy level was so high.

The low achievers of cooperative teaching method showed significant results when compared with the low achievers of traditional lecture method. The cooperative teaching policy in the field of statistics was found to be a more dominant method for teaching to the low achievers than the traditional lecture method.

The high achievers of the collaborative strategy showed transcendence over high achievers instructed by lecture method. Thusly, collaborative method, on account of statistics was inspected to be a more effective procedure for teaching to high achievers when appeared differently in relation to address technique. The maintenance of learning in under studies of the experimental group was basically more than the under studies of the control group as well as for the low and high achievers.

REFERENCES

Aliaga, M., Cobb, C., Cuff, C., Garfield, J., Gould, R., Lock, R., ... &Velleman, P. (2010). Guidelines for Assessment and Instruction in Statistics Education (GAISE): College Report. American Statistical Association.

Franklin, C., & Garfield, J. B. (2006). The GAISE Project: Developing statistics education guidelines for pre K-12 and college courses. In G. Burrill (Ed.), Thinking and reasoning with data and chance: 2006 NCTM yearbook (pp.435-375). Reston, VA: National Council of Teachers of Mathematics.

Garfield, J. (2002). First courses in statistical science: The status of educational reform efforts. *Journal of Statistics Education*, 10 (2), 456-467.

Giraud, G. (1997). Cooperative learning and statistics instruction. *Journal of Statistics Education*, 5 (3), 1-9.

Hejazi S. (2006). *Teaching methods in education.* (2nd Ed.), Tehran: Boshra.

Keramati, M.R., (2001). Competition or companionship. *Journal of Psychology and Education Sciences,* 31(2), 139-155.

Miles, R. (2015). Tutorial instruction in science education. *Cypriot Journal of Educational Science*, *10*(2), 168-179.

Morettin, P. A., & Rossman, A. (2007). The challenges for cooperation in statistics education. *In Panel discussion at the 7th International Conference on Teaching Statistics, Salvador, Bahia, Brazil.*

Şahin, A. (2011). Effects of Jigsaw III technique on achievement in written expression. *Asia Pacific Education Review*, *12*(3), 427.

Slavin, R. E. (2011). Instruction Based on Cooperative Learning. In R. E. Mayer & P. A. Alexander (Eds.), Handbook of Research on Learning and Instruction (pp. 344-360). New York: Taylor & Francis.

Tanel, Z., & Erol, M. (2008). Effects of Cooperative Learning on Instructing Magnetism: Analysis of an Experimental Teaching Sequence. American Journal of Physics and Education, 2(2), 124-136.

Wolfensberger, B., & Canella, C. (2015). Cooperative Learning about Nature of Science with a Case from the History of Science. *International Journal of Environmental and Science Education*, *10*(6), 865-889.

Wright, D. (1994). Using learning groups in your classroom: A few how-to's. *Teaching at UNL (University of Nebraska–Lincoln)*, *15*(4), 1-2.