

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

CHAPTER IV

RESULTS AND DISCUSSION

4.0.0 INTRODUCTION

The introduction, background of the study, descriptions on the collaborative concept mapping, significance of the study along with the objectives, hypotheses and the delimitations of the present investigation are given in the chapter- I. Chapter-II is devoted to the review of related literature. The chapter –III dealt with an outline of the steps followed by the researcher during the course of the study. The objective-wise results and their interpretations are given under different captions in the present chapter.

4.1.0 Effect Of Collaborative Concept Mapping on the Comprehension Of content of Class VIII students in Science

The first objective of the study was to study the effect of collaborative concept mapping on the content comprehension of class VIII students in science. The data for comprehension of content in science were collected with the help of an achievement test, developed by the investigator. The test was administered to both the groups after the eight days treatment. Both the groups were also pre-tested through the administration of an achievement test which was also developed by the investigator. The experimental and control group were taught through the collaborative concept mapping and traditional method, respectively. The collected data were analyzed with the help of one-way ANCOVA. The results are presented in table 4.1, below.

Table - 4.1: Summary of ANCOVA for Comprehension of Content in Science

Sources of Variance	Df	Sum of Squares	Mean Sum of Square \bar{x}	F-Value
Among	1	6264.61	6264.61	31.348
Within	51	10192.04	199.84	
Total	52	371796.0		

Table-4.2: Mean, SD and N for Comprehension of Content in Science of Experimental and Control Group

Group	Mean	Std. Deviation	N
Control	67.04	23.933	27
Experimental	92.59	12.534	27
Total	79.81	22.900	

Table 4.1 indicates that the F-value of 31.348 for comprehension of content in science with df equal to 1/52 is significant at 0.01 level. It signifies that the treatment, that is, collaborative concept mapping produced a significant differential effect on the comprehension of content in science of class VIII students. Therefore, the alternative hypothesis, namely, “The students taught through collaborative concept mapping will gain significantly higher score as compared to students taught through traditional method”, is accepted.

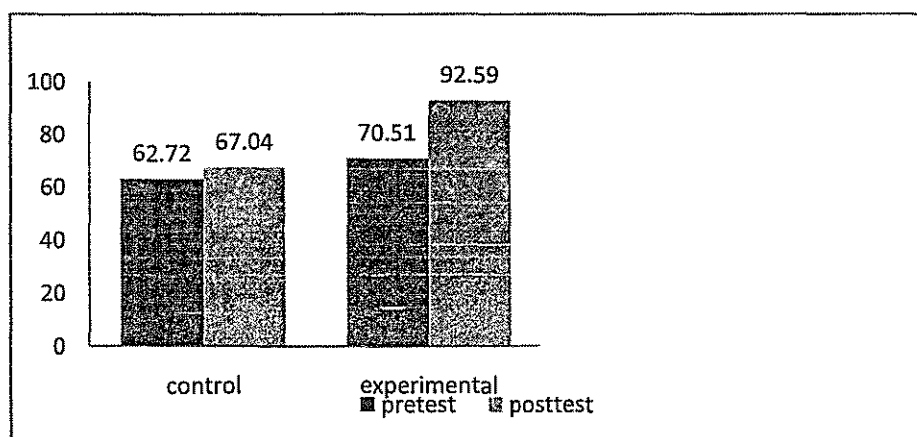


Fig.1: Graph Showing the Pretest and Posttest Scores of Experimental and Control Group

Table 4.2 also demonstrates that the mean values of experimental and control group is

67.04 and 92.59, respectively. It, also, demonstrates that the SD values of experimental and control group is 23.933 and 12.534, respectively. It can be

inferred that there are more variations among the scores of control group. The experimental group achieved significantly more than the control group.

Comparing the means of the control and the experimental group, it was found that there is a little difference between the means of pre-test of experimental and control group. But, the difference is enlarged when we compare the means of pretest and post-test of experimental group. Therefore, it is concluded that the difference between the posttest scores of the experimental and control group is significant at 0.01 level.

Finding: Teaching students with the collaborative concept mapping is found to be effective in terms of comprehension of content in science of class VIII students than the traditional approach of teaching.

Discussion:

The experimental group taught through collaborative concept mapping scored significantly higher than the control group taught through traditional method in terms of comprehension of content in science. The results so gathered are supported by the following:

Kwon, So Young et al (2009) who observed the comparative effect of individually-constructed vs. collaboratively-constructed computer-based concept maps. The students who collaboratively constructed concept maps created significantly higher quality concept maps than those who individually constructed concept maps indicating deeper conceptual understanding.

Bramwell-Lalor, Sharon et al (2014) while observing the effects of using concept mapping for improving advanced level biology students' lower- and higher-order cognitive skills . The students in the concept mapping experimental groups performed significantly better than their peers in the control group on both the lower-order cognitive items of the biology test. A mean effect size of 0.56 was calculated representing the contribution of treatment to the students' performance on the test items.

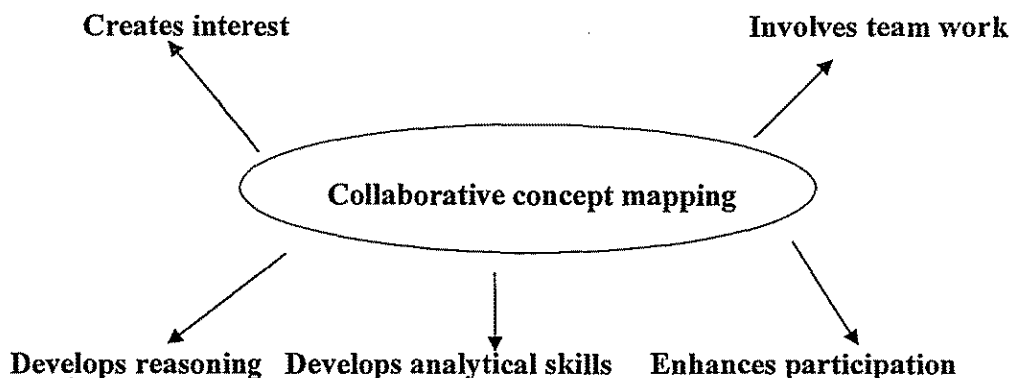
Sungur, Tekkaya and Geban (2001) carried an experimental research on the contribution of conceptual change texts accompanied by concept mapping to students' understanding of the human circulatory system. multiple regression

correlation analysis revealed that science process skill, the treatment, and previous learning in biology each made a statistically significant contribution to the variation in students' understanding of the human circulatory system. It was found that the conceptual change texts accompanied by concept mapping instruction produced a positive effect on students' understanding of concepts.

Okebukola (1990) worked on attaining meaningful learning of concepts in genetics and ecology. An examination of the potency of the concept-mapping technique. The results showed that the 63 students in the experimental group who employed the concept-mapping technique performed significantly better on the test of meaningful learning in genetics.

This may be attributed to an altered technique of teaching and representing the content. Students have always been fascinated by the effective, dynamic teaching strategies used by the teacher in the diversified classroom. The collaborative concept mapping as techniques involves the division of the students into groups and then the formation of concept map in a collaborative fashion. This technique proves to be effective because it evokes the interest of the student as the content is learnt in a very creative way. Also it involves a greater participation from the students leaving teacher with the task of a facilitator. So the students work not only independent of the teacher but also with interdependence with the classmates. Therefore, the students not only apply their mind in linking the concepts logically but also analyze and criticize each other for a better result. Collaborative concept mapping thus helps in the development of reasoning and logic leading to a better comprehension of the subject matter.

Also the teacher is able to present the content in a more refined and comprehensive way to the students which help them in linking the concepts with each other and thereby achieving better.



4.2.0 Effect of Gender and its Interaction with the Treatment (Collaborative Concept Mapping) on the Comprehension of Content in Science of the Students of class VIII

The second objective of the study was to study the effect of gender and its interaction with the treatment (collaborative concept mapping) on the comprehension of content in science of the students of class VIII. The data for comprehension of content in science were collected with the help of an achievement test, developed by the investigator. Here the collected data were analyzed using 2X 2 Factorial Design ANCOVA of Unequal Cell Size. The gender (independent variable) has two levels. Also the treatment has two levels that are collaborative concept mapping and traditional method of teaching. The results are presented in table 4.4, below.

Table4.3: Mean and Standard Deviation of the Boys and Girls of Experimental and the Control Group for the Comprehension of Content in Science

GROUP	GENDER	MEAN	STD. DEVIATION	N
CONTROL	GIRL	71.38	18.46	16
	BOY	60.73	30.06	11
	Total	67.04	23.93	27
EXPERIMENTAL	GIRL	90.25	15.25	16
	BOY	96.00	6.16	11
	Total	2.59	12.53	27
Total	GIRL	80.81	19.22	32
	BOY	78.36	27.82	22

Table4.4: Summary of ANCOVA for the Effect of Gender and its Interaction with the Treatment

Source of variance	Df	Sum of squares	Mean sum of square.y.x	F
Group	1	6337.57	6337.77	31..96
Gender	1	325.02	325.02	1.63
Group x gender	1	142.79	142.79	.72
Error	49	9715.85	198.28	
Total	52	371796		

4.2.1 Effect of gender on comprehension of content in science

Table 4.4 indicates that the F-value of comprehension of content in science for gender is 1.639 with df equal to 1/52 is not significant at 0.05 level. Hence null hypothesis namely, “There is no significant effect of gender on the comprehension of content in science of class VIII students”, is not rejected.

Finding: It can be inferred that there is no significant effect of gender on the comprehension of content in science.

Discussion

It shows that achievement is independent of the gender. It is not influenced by gender of the learner. This finding is supported by Mahapatra (1991),Arya (1999), Ojha (2000), Rathnabai and Vishwanathappa (2013) and Jaiswal (2014). Achievement depends upon many factors such as, intelligence, study habit, creativity, mental development, attitude towards learning, interest and motivation of the learner, etc. Irrespective of the gender, i.e., boys and girls, the students achieve the scores.

4.2.2 Effect of interaction of gender and treatment on comprehension of content in science

indicates that the F-value of comprehension of content in science for interaction of gender and the treatment at df equal to 1/52 is 0.720 which is not significant at 0.05 level. Hence null hypothesis namely, “There is no significant effect of interaction of gender and treatment on the comprehension of content in science of class VIII students”, is not rejected. Thus, it can be inferred that there is no significant effect of interaction between gender and treatment on comprehension of content in science.

Finding:

There is no significant effect of interaction of gender with collaborative concept mapping on the comprehension of content in science of students of class VIII.

Discussion

There is no significant effect of interaction of gender and collaborative concept mapping on comprehension of content. The findings are supported by Chun-Yi; Chen, I-Jung (2012) Fatokun, K. V. F.; Eniayeju, P. A. (2014) Palmer, Jessica; Boon et al (2014). Gender as carries no independent effect on the achievement of students may not interact with the treatment.