EFFECT OF CONCEPT MAPPING AS AN INSTRUCTIONAL STRATEGY ON LEARNING OUTCOMES OF SECONDARY SCHOOL STUDENTS

*Dr. Arjinder Singh **Rupinder Kaur Bajwa

Abstract

The present study was undertaken to investigate the effect of concept mapping instructional strategy on learning outcomes in social sciences subject of secondary school students. The sample of the study comprised of 80 students selected randomly from the private school of Pathankot district. The 60 items social sciences achievement test was constructed and validated. The present study had an experimental design, included an experimental group (N=40) and a control group (N=40) and used pretest and posttest measures. Statistical difference has been found in favour of the experimental group. The results strongly support the effectiveness of concept mapping as an instructional strategy in improving the learning outcomesof secondary school students. The present study will give innovative ideas and thoughts to curriculum framers and textbook writers.

Keywords: -Concept Mapping, Social Sciences Achievement Test & Learning Outcomes

Learning is fundamental to any education system. It contributes to people's lives by making them more productive. Researchers and Educators are interested to know what makes a learning process successful and how an outcome is achieved. Each individual is unique and different from others with respect to intelligence, creativity, achievement, cognitive styles etc. Therefore, emphasis is now shifting from teacher centered methods to new strategies as to meet the needs of individual learner and optimize learning. In order to improve instructional methods carried out in the classroom and improvement of students' learning, there has always been a search for more potential ways of instruction. One of the strategies that have evolved as a useful tool in leading students towards meaningful learning is 'Concept Map'. Concept Mapping is a good method for both teachers and pupils to avoid rote learning, and to learn and think meaningfully.Concept mapping promotes collaborative knowledge building and is one amongst a broad class of visual-spatial strategies that facilitate thinking and learning about the information by condensing, reorganizing, elaborating, and representing it externally (Holley and Dansereau 1984; Comek et.al. 2016).

Concept maps falls into the broad family of graphic organizing tools that include mind mapping and spider diagrams, and was firstly developed by Novak and his research group in Cornell University in the early 1970's as an approach to identifying knowledge structures of an individual learner derived from Ausubel's learning theory which places central emphasis on the influence of students' prior knowledge on subsequent meaningful learning. Novak (1998) defines concept map a perceived regularity in objects or events or in the representation of objects or events which is designated by a label. Huai and Kommers (2004) studied the cognitive styles and concept mapping approaches on learning outcomes. It was found that there was a relationship between cognitive style and type of memory. Serialist had a good short term memory and these learners adopt serialist concept mapping approach. Concept mapping improves the learning outcomes and enhances meaningful knowledge.Laurie (2009) investigated a meta analytical review of Novak's concept mapping. Based upon forty six effects from thirty eight studies, the results indicates that Novak's concept

^{*}Principal Innocent Heart College of Education, Jalandhar.

^{**}Asst Prof. Pathankot College of Education, Pathankot.

maps are effective for meaningful learning, concept maps enhance students learning outcomes in English as a second language, education, social sciences and sciences. NTI (2009) The National Teacher's Institute recommended that concept mapping is a new approach for teaching and learning of social studies in schools. This strategy is students centered. The student is not treated as an empty vessel. It suggested that teacher should adopt concept mapping strategy in teaching in the multicultural social studies subject. Sharma (2012) investigated the effect of concept mapping strategy on the learning outcome in relation to intelligence and study habits. The results of the study showed that concept mapping strategy was significantly superior to the traditional method in teaching and retention of social studies.Indumati (2012) investigated effectiveness of concept mapping in teaching environmental education subject. It was found that differences were existed between posttest mean scores of both the groups.Kumar and Mohd. (2013) studied concept mapping in social studies, itwas found that the experimental group students had significant higher scores as compared to control group.

Concept mapping is an innovative approach and significantly beneficial to promote learning achievements as well as the learning attitudes of students and it was also found that concept maps offer rich and detailed insight into the extent of meaningful learning resulting from class room instruction. Researchers studied the effect of concept mapping on students' academic achievement and attitude in science education and other subjects. Finding of the study revealed that concept mapping is an effective teaching strategy for students' academic achievement in science classes. Most of the researches showed significant effect of concept mapping on learning outcomes of the students in science, languages and mathematics(Novak, 1998; Kinchin and Hay, 2000; Liu, 2004; Jagadeesh, 2012; Sharma, 2012; Ram and Singh, 2013; Jonas, 2014; Chawla, 2015; Comek et al., 2016)

Most of the studies had been undertaken only in foreign countries almost in science subjects. As compared to advance countries very less research work has been done in India. Only few studies had been found in India (Kumar, 2009; Rani, 2011; Sharma, 2012; Indumati 2012; Kumar and Mohd. R. 2013 and Jena, 2014) on effectiveness of Concept mapping. But, no study has been found specifically done on the population of Punjab state school students on subject SocialSciences in C.B.S.E Board. Hence, there is the need to examine effects of concept mapping strategy on learning outcomes of Social Science Secondary School Students.

OBJECTIVES

- 1. To study the effect of concept mapping instructional strategy on learning outcomes of Social Sciences Students over conventional teaching.
- 2. To study effect of interaction between treatment and gender on learning outcomes of Social Sciences Students.

METHOD

The study in hand aimed to study the effect of concept mapping strategy on Social Sciences learning outcomes of secondary school students. Keeping in view the objectives and purposes of study, experimental method was used by the investigator. Pretest-Posttest non-equivalent group design with an experimental group and control group was used in the study. The data collected has been analyzed descriptively and inferentially.

SAMPLE

The sample of the study comprised of 80 secondary school 9th class students selected randomly from the Private School of Pathankot District. The school was compared with regards to the criteria that school has almost same classroom climate, physical facilities, teacher taught ratio, gender ratio etc. one school of district Pathankot was selected purposively for experiment and data was collected.

PROCEDURE

Students of Shri Guru Harkrishan Public School were divided into two groups i.e. experimental and control group. Before starting the experiment, pretest was administered on both the groups. The experimental group was taught by using concept mapping technique for three months at the rate of 40 minute period and control group was taught through traditional method. At the end of the treatment, post-test was administered on both the groups. Scoring of test was done.

MEASURES

- Concepts maps made by the researcher from 9th class C.B.S.E board.
- Social Sciences achievement test developed by the researcher. The content validity and face validity of achievement test have been ensured.

Results and Discussions

Only those items were included in the test which get consensus of the experts. The split half reliability (N = 100) of achievement test is estimated to be a good with 0.76 value.

Table1: Significance of Difference between Mean gain Scores of Experimental and Control Group on Social Sciences learning outcomes

Group	N	Mean Gain	Std.	Standard	t- Ratio	Level of
		Scores	Deviation	Error		Significance
Control Group	40	16.12	7.69	4 70		
Experimental Group	40	23.00	6.18	1.70	4.04	*Significant

** Significant at 0.01 level

It is revealed from the Table No 1 that the mean scores of gain scores of Learning Outcomes of experimental and controlgroup ninth class students as 23.00 and 16.12 respectively and their standard deviation as 6.18 and 7.69 respectively. The t-ratio was calculated as 4.04 which is significant at .01 level of confidence. Thisrevealed that a significant difference exists between gain scores of Learning Outcomes of experimentaland control group ninth class students. As the mean scores of experimental group is higher than that ofcontrol group, it may be concluded that concept mapping strategy has a significant effect on learningoutcomes of ninth class students. It indicates thatinstructional treatment has good effect on the experimental group.

Table 2: Comparison of Mean Scores of LearningOutcomes in Social Sciences ofExperimental andControl group in relation to Gender

Before applying the ANOVA Levene's test was used to check the data meets the homogeneity of variance test.

Table2: Levene's Test of homogeneity of variance

F	df1	df2	Sig
2.422	3	76	0.072

Table: 2 shows that value of Levene's statistics for test of homogeneity of value is 0.172, which is not significant at .001 level with df 3/76. It indicates that there is no variance and groups are homogeneous.

Source	Sum of Squares	Df	Mean Square	F	Sig
Group	1261.131	1	1261.131	27.431	.000
Gender	57.740	1	57.740	1.256	.266
Group*Gender	9.346	1	9.436	.205	.652
Error	3494.077	76	45.975		
Total	111634.000	80			

 Table 3: Interaction effect of group and gender on mean scores of Learning Outcomes in Social Sciences

From the Table 3it is reported that F value for mean scores of learning outcomes in social sciences is 27.431. Which is not significant at.001 level with 1/76, It means there is no significant difference in group variance. Further the mean scores of experimental group taught through concept

mapping (M= 40.43 ± 5.61) was significantly higher than the control group taught through traditional method (M = 32.68 ± 7.73). It may therefore conclude that concept mapping strategy was superior than the traditional method in teaching of social sciences.

Comparisonof mean scores of learning outcomes in social sciences of boys and girls

From the table 3 it is evident that reported F value for mean scores of learning outcomes in social sciences is 1.256, which is not significant at.005 level. It shows that there is no significant difference in mean scores of learning outcomes in Social Sciences between boys and girl students. The gender proves an insignificant factor in terms of students learning outcomes in Social Sciences.

Interaction effect of Group and gender on mean scores of learning outcomes in social sciences

From the table 3 it is clear that reported F value for interaction between group and gender is.205, which is not significant. It indicates that there is no significant difference in mean scores of learning outcomes in social sciences between boys and girl students belonging to experimental and control group. It may be concluded that there is no interaction between treatment and gender on learning outcomes in social sciences.

It can be concluded that Concept mapping strategy of teaching has a significant effect on the learning outcomes in social sciences over Conventional teaching, similar results were found in Social Sciences subject(Kumar and Mohd., 2013; Chamberlain, 2014; Olugbenga and Sobola, 2014; Schwendimann, 2015). In other words we can say the students who were taught with Concept mapping strategy gained significantly better than the other group who were taught with traditional teaching method, hence the importance of Concept mapping method can be established (Qarareh, 2010, Kumar and Mohd. R. 2013) but the method is beneficial irrespective of gender. Apart from this there is empirical support for the use of mapping in enhancing, retaining and improving knowledge (Davis, 2010; Kumar and Mohd. R. 2013 and Jena, 2014).

This study further strengthens that conceptmapping is one way to make knowledge relatively

Permanent, to store it in more organized mannerand is easy to retrieve the same when requiredand this is one reason that the students who aregood at concept mapping ability are able to score better in academics. Thus, itcan be said that if the teachers and the studentswant to learn things better and for longer durationthey should adopt conceptmapping strategy. Educational Implications

Finding of the study suggested that concept mapping strategy was found to be significantly superior to the Traditional Method in Teaching and retention of Social Study with carefully developed concept maps this approach promises an interesting way for Social Study teaching. It will be helpful to the authorities to adopt proper steps for improving the quality of teaching, and stay tuned to improve the students learning outcomes. Concept mapping instructional strategy shouldbe included in social sciences pedagogy of teacher training institutions to ensure that the teachers are adequately train on how to use the method.

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