Effect of Concept Mapping Strategy on the Learning outcome in Relation to Intelligence and study habits

Sonia Sharma
Lect. Commerce
G.S.S.S Model Town, Ludhiana

Guide: Dr Gurmit Sigh

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Abstract

The student population as whole is already an exceptionally heterogeneous one and promises to become much more than at present. In the complex world importance of method of teaching cannot be neglected or over looked. Some students seek simple method other the complex some are interested in known others in unknown. In this study, researcher studies the effect of concept mapping strategy on the learning outcome of students of 9th class in relation to intelligence and study habits. The sample for this study comprised 200 students of 9th class one group was randomly assigned to experimental group and other group constituted control group. The student from experimental group was taught through concept mapping strategy. The result of study shows that concept mapping strategy were significantly superior to traditional method in teaching retention of Social Studies.

Keywords: Concept Mapping Strategy, Relation to Intelligence,

Introduction:

The student population as a whole is already an exceptionally heterogeneous one and promises to become much more than at present. The 'elegantly put' and the 'patently stated' must be tempered so that the broad difference in the abilities, interest and goals of students, as well as, the diversities, in the needs of society are recognized. Some students seek the simple; others the complex; some pursue the concert; others the abstract; some are interested in the known; others in unknown. The very heart of the learning revolves around the strategy of teaching put to use. A strategy is the art of conducting a campaign. In education, it is a scientific way of presenting the subject, keeping in mind the psychological and physical requirements of children. The teachers who use the traditional method exclusively on the presentation of the contents to be learned, with all the imperfections which Ansubel points to the expository teaching, which is used in schools (Ansubel, 2003) in which the teacher uses "pure verbal techniques" too early, presenting information very often in a tactful and arbitrary way, without realizing at all if the students have the necessary cognitive readiness, or if they can learn meaningfully.

CONCEPT MAPPING

A concept map can be considered as somewhat similar to a spider chart, an organization chart of a flow diagram. The most useful from of a concept map for teaching and learning is one arranged in a hierarchical organization which the more inclusive concepts at the top of the map and the more concrete and specific ones at the bottom. Originally developed by Novak concept maps are used as teaching tools and have generated many positive results in the classroom.
(Novak 1980, 1981) Concept maps are frequently employed in the classroom because they offer a “complementary alternative to natural language as a means to communicate knowledge” (Ganes and Shaw 1995) this visual approach has proven to be of great benefit to diverse student groups. According to Asan (2007), Concept mapping is a method to visualize the structure of knowledge. Since the knowledge expressed in the maps is mostly semantic, concept maps are sometimes called semantic networks.

LEARNING OUTCOME

Learning outcome means the knowledge we attain from teaching process it also known as achievement. Achievement may be defined as the act of achieving or successful performance. Oxford Advanced Learner’s Dictionary (2000) defined that Achievement is a thing that somebody has done successfully especially using his/her own efforts and skills. According to Merriam Webster’s Collegiate Dictionary (2001) ”Achievement is an act of achieving a result gained by efforts, the quality and quantity of student's work.” According to Dictionary of Education (2008), ”Academic Achievement is a measure of knowledge gained through informal education usually indicated by test scores, grade point average and degree.”

INTELLIGENCE

The word intelligence came from the Latin word used by Cicero to translate the Greek word used by Aristotle to explain the cognitive process. Often intelligence is considered as a general capacity to understand and meet satisfactorily with any situation that life may pos various psychologists have taken intelligence in their own way. Some talked of it at biological or psychological level while other thought at mental level. Some define intelligence solely as cognitive or intellectual operation the ability to think in abstract terms to deal with symbols to perceive relationship to reason out and to reach correct generalizations. In every general term, intelligence may be defined as an adjustment or adoption of the individual to his total environment or to any limited aspect of it. According to Columbia Encyclopedia, sixth edition (2006), ”the general mental ability involved in calculating, reasoning, perceiving relationship and analogies, learning quickly, storing and retrieving information, using language fluently, classifying, generalizing, and adjustment to new situations.

STUDY HABITS

The task of learning is not dependent on teacher alone. It is not only teacher's responsibility of the learner. Efficient learning depends not only on good teaching but on satisfactory learning procedures also. Efficient learning depends on learner's ability to schedule his time, the plan of his study the habit of concentration, note taking, mental review, over learning, the judicious application of whole and part method, massed and distributed learning and so on. In other words learning involves the development of study habits.

REVIEW OF RELATED LITERATURE

One experimental study (De Wispelaere & Kossnck, 1996) in a junior high and high school Spanish as a second language class found that concept mapping tool improved student's higher order thinking skills as measured by performance on chapter quizzes, tests, and student projects.

Four studies (Alvermann & Boothby 1983; Alvermann & Boothby, 1986; Armbruster et al, 1991; Griffin et al, 1995) in the area of social studies used concept mapping tool to help students organize information from expository texts and comprehend content area reading. All our studies
were conducted with either fourth or fifth-grade students. Findings from these studies concluded that concept mapping too helped students select, organize, and recall relevant information, as measured by posttests. Students were also able to transfer thinking and learning skills to novel situations and content. Clark (1983) Urban and rural Aboriginal - and Anglo-Australian children were tested for reading and math achievement, for nonverbal psychometric test intelligence, and for three cognitive styles. Psychometric intelligence was clearly a more powerful predictor of the effects of culture and location on school achievement than was cognitive style. Buddhisagar (1991) concluded that there was a significant effect of interaction between treatment and Intelligence on the overall achievement of the students. There was significant effect of interaction between Intelligence and attitude towards the teaching profession on the overall achievement of the students. There was a significant effect of interaction between treatment, Intelligence and attitude towards the teaching profession on the overall achievement of the students. Singh (1984) found that (i) adolescent boys had significantly better study habits than adolescent girls, (ii) study habits were related to the academic achievement significantly and (ii) study habits of adolescent boys and adolescent girls differed significantly at different levels of academic achievement and intelligence i.e. high, middle and low. Patel (1986) conducted a study and has reported that the better and greater the number of good study habits, the higher was the achievement.

OBJECTIVES OF THE STUDY

The study will be designed to attain the following objectives:

1. To develop the Concept Maps for teaching Social Studies Concepts from the curriculum of IX class.
2. To prepare the achievement test of the selected topics of Social Studies to measure the Learning Outcome of students of IX class.
3. To check the effectiveness of Concept Mapping strategy in Learning Outcome in Social Studies.
4. To study the difference between high and low Intelligence groups in Learning Outcome in Social Studies.
5. To study the difference between good and poor Study Habits groups in Learning Outcome in Social Studies.
6. To study the first and second order interaction between/among Teaching Strategies, Intelligence and Study Habits.

HYPOTHESES

The study will designed to test the following hypotheses:

1. There will be no difference in Achievement in Social Studies of the group taught through Concept Mapping and Conventional teaching.
2. There will be no difference in Retention of the group taught through Concept Mapping and Conventional teaching.
3. There will be no interaction between Teaching through Concept Mapping and Achievement in Social Studies in relation to Intelligence.
4. There will no interaction between Teaching through Concept Mapping and Retention in relation to Intelligence.
5. There will be no interaction between Teaching through Concept Mapping and Achievement in Social Studies in relation to Study Habits.
6. There will no interaction between teaching through Concept Mapping and Retention in relation to Study Habits.
Method/Procedure

Sample of 200 students of 9th class were taken. They were given the test of intelligence and study habits test and a list of question prepared by investigator from Social Studies syllabus. A Homogenous group of 200 group wear formed with same intelligence and study habits. They one group were taught through.One group of 9th class contributed the experimented group where as another of 9th class formed control group. The permission was taken from the principal of these schools. The students of experimental group were taught through concept mapping strategy. The rapport was established with the students. The students were explained the objectives of study. To begin with concept maps of different topics were taught to students everyday 35 minute period was devoted for this purpose.

Analysis: The objective -wise data analysis was given below.

Significance of the Difference between Means of Pre-test-post Test Scores of Learning Outcomes of Experimental Group Ninth class students (N=100)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>S.D</th>
<th>SE</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pre-test</td>
<td>100</td>
<td>7.60</td>
<td>3.68</td>
<td>.58</td>
<td>42.90**</td>
</tr>
<tr>
<td>2.</td>
<td>Post-test</td>
<td>100</td>
<td>27.20</td>
<td>2.45</td>
<td>.39</td>
<td></td>
</tr>
</tbody>
</table>

**Significance at 0.01 levels

Table revealed that the mean pre-test and post-test scores of Learning Outcomes of experimental group ninth class students as 7.60 and 27.20 respectively and their standard deviation as 3.68 and 2.45 respectively. The t-ratio was calculated as 42.90 with $d_f = 39$ which is significant at .01 level of confidence. This revealed that a significant difference exists between pre-test and post-test scores of Learning Outcomes of experimental group ninth class students. As the mean score of post-test is higher than that of pre-test, it may be concluded that Concept Mapping Strategy has a significant effect on Learning Outcomes of ninth class students.

Therefore the hypothesis 1 stating that there exists no significant difference in pre-test and post-test mean scores of Learning Outcomes of ninth class students through Concept Mapping Strategy stands rejected.

Significance of the Difference between Means of Gain Scores of Learning Outcomes of Experimental Group and Control Group Ninth class students (N=200)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>S.D</th>
<th>SE</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Experimental</td>
<td>100</td>
<td>19.60</td>
<td>2.89</td>
<td>.46</td>
<td>13.84**</td>
</tr>
<tr>
<td>2.</td>
<td>Control Group</td>
<td>100</td>
<td>9.43</td>
<td>4.74</td>
<td>.75</td>
<td></td>
</tr>
</tbody>
</table>
International Multidisciplinary e-Journal / Sonia Sharma, (44-52)

**Significance at 0.01 levels

Table revealed that the mean scores of gain scores of Learning Outcomes of experimental and control group ninth class students as 19.60 and 9.43 respectively and their standard deviation as 2.89 and 4.74 respectively. The t-ratio was calculated as 13.84 which is significant at .01 level of confidence. This revealed that a significant difference exists between gain scores of Learning Outcomes of experimental and control group ninth class students. As the mean scores of experimental group is higher than that of control group, it may be concluded that concept mapping strategy has a significant effect on learning outcomes of seventh class students.

Therefore the hypothesis 2 stating that there exists no significant effect of concept mapping strategy on learning outcomes of ninth class students stands rejected.

Summary of 2X2 Analysis of Variance on Learning Outcomes of Social Studies Students through Concept Mapping Strategy and Traditional Technique in relation to Intelligence

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Technique (A)</td>
<td>45.16</td>
<td>1</td>
<td>45.16</td>
<td>16.03**</td>
</tr>
<tr>
<td>Intelligence</td>
<td>0.16</td>
<td>1</td>
<td>0.16</td>
<td>0.06</td>
</tr>
<tr>
<td>First Order Interaction (AXB)</td>
<td>9.51</td>
<td>1</td>
<td>9.51</td>
<td>3.37</td>
</tr>
<tr>
<td>Learning Technique X and Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Group (Error)</td>
<td>101.43</td>
<td>36</td>
<td>2.82</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>156.24</td>
<td>39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence

INTERPRETATION

MAIN INFLUENCES

Main Influence A:
Main influence of Learning Technique (Concept Mapping Strategyand Traditional Method) on variable of learning outcomes of mathematics students. Table reveals that the F-ratio on the variable of learning outcomes of social studies students with Concept Mapping Strategy and traditional method came out to be 16.03 which significant at the 0.01 level of confidence. This reveals that learning outcomes of mathematics students with Concept Mapping Strategyis significantly different from that with traditional method.

Main Influence B:
Main influence of Intelligence (High and Low) on the variable of learning outcomes of social studies students reveals that the F-ratio on the variable of learning outcomes of social studies students with high and low R Style of Learning and Thinking came out to be 0.06 which is not significant at the 0.05
level of confidence. The means of the groups having high and low intelligence on the variable of learning outcomes of social studies students were found to be 1.18 and 1.05 respectively. This reveals that there is no significant difference in learning outcomes of social studies students with high and low Intelligence.

Summary of 2X2 Analysis of Variance on Learning Outcomes of Social Studies Students through Concept Mapping Strategy and Traditional Technique in relation to Study Habits

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Habits (A)</td>
<td>49.0</td>
<td>1</td>
<td>49.0</td>
<td>17.10**</td>
</tr>
<tr>
<td>Learning Outcomes (B)</td>
<td>0.10</td>
<td>1</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>First Order Interaction (AXB)</td>
<td>0.10</td>
<td>1</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Study Habits X Learning Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Group (Error)</td>
<td>103.30</td>
<td>36</td>
<td>2.87</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>152.50</td>
<td>39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of confidence

INTERPRETATION

MAIN INFLUENCES

Main Influence A:

Main influence of Learning Technique (Concept Mapping Strategy and Traditional Method) on variable of learning outcomes of social studies students reveals that the F-ratio on the variable of learning outcomes of Social Studies students with Concept Mapping Strategy and traditional method came out to be 17.10 which significant at the 0.01 level of confidence. This reveals that learning outcomes of mathematics students with Concept Mapping Strategy is significantly different from that with traditional method.

Main Influence B:

Main influence of Study Habits (High and Low) on the variable of learning outcomes of Social studies students reveals that the F-ratio on the variable of learning outcomes of social studies students with high and low Study Habits came out to be 0.04 which is not significant at the 0.05 level of confidence. The means of the groups having high and low L Style of Learning and Thinking on the variable of learning outcomes of social studies students were found to be 1.18 and 1.05 respectively. This reveals that there is no significant difference in learning outcomes of social studies students with high and low study habits.
INTERACTIONAL INFLUENCE (A X B)

First order interactional influence of Learning Technique and Study Habits on the variable of Learning Outcome of Social studies Students

Table 4.10 reveals that the F-ratio on the variable of learning outcomes of social studies students due to interaction between learning technique and study habits came out to be 0.04 which is not significant at 0.05 level of confidence. Therefore the hypothesis stating that there exists no significant difference on the interactional effect of learning technique and study habits on learning outcomes of social studies students stands accepted.

Discussion:

The results of the study showed that concept mapping method were significantly superior to the Traditional method in teaching and retention of Social Studies. The result of this study are consistent with finding of previous research study of Novak (1995), Sowa (200), Asan (2007). The improved results on achievement test in the experiment group may be explained by concept maps used with this group individualistic, interactive, illustrative, and Cooperative learning in the experimental group enhanced critical thinking and higher level processing skills of the students. At the same time, students with control group learned individually without the use of these strategies. The lower achievement of the control group may be explained by this factor. Student in the experimental group, while working with concept map strategies were expect to use a discovery approach to accomplish the goals of the activity. Student learn quickly and deeply as they use cognitive and critical thinking skills. They master learning skills and gain confidence in their own abilities. These factor explain higher achievement test scores in the experimental group.

Implications:

Concept mapping strategy were found to be significantly superior to the Traditional Method in Teaching and retention of Social Study with carefully developed concept maps these approach promises an interesting way for Social Study teaching.

References:


