CONCEPT MAPPING IN PHYSICS:
The present study was undertaken to find the usefulness of concept mapping strategy in the learning of physics. Concept mapping can be done for several purposes in physics.

- To generate ideas (brainstorming, etc.);
- To design a complex structure (long texts, hypermedia, large websites, etc.);
- To communicate complex ideas;
- To aid learning by explicitly integrating new and old knowledge;
- To assess understanding or diagnose misunderstanding.

The present study was undertaken to find the usefulness of concept mapping strategy in the learning of physics.

HOW TO BUILD A CONCEPT MAP IN PHYSICS:

- Identify the key and associated concepts from a particular topic of physics subject.
- Create groups and sub groups of related items according to hierarchy.
- Think in terms of connecting the items in a simple sentence or a visual symbol that shows the relationship.
- Make sure that important concepts are highlighted, relationships are appropriate.
- Check the neatness and order of the connectivity.
- To create the interest and to be creative, use different shapes, colours and fonts etc.

OBJECTIVES OF THE STUDY:
The Objectives of the study are as follows,

- To study the scientific attitude of the students towards concept mapping in Physics.
- To develop the scientific skills of the students belonging to different groups of intelligence.
- To study the differences in science achievement process skills and attitude towards concept mapping among students.
- To find out the effectiveness of concept mapping on academic achievement of class VIII students in Physics.

HYPOTHESES FORMULATED FOR THE STUDY:

- The concept mapping strategy does have a positive effect on concept attainment in Physics of VIII grade students.
- There is no significant difference in concept attainment between boys and girls as a result of concept mapping as a teaching strategy.
- The concept mapping does have a positive effect on attitude towards Physics of VIII grade students.
- There is no significant difference in attitude towards Physics between boys and girls as a result of concept mapping as a teaching strategy.

REVIEW OF RELATED LITERATURE:
A study conducted by Novak, Gowin and Johansen (1983) on the...
use of concept mapping found that the strategy is effective in bringing about changes in scientific knowledge and problem solving skills. Leman J.D and Kahle J.D (1985) found that concept mapping enhances achievement by using concept mapping as a teaching strategy in order to teach science concepts. A study by Melon. J and et.al (1984) revealed that concept mapping significantly enhances achievement. In the analysis of Fraser and Edwards (1986) the data discovered that over 50% of the students who achieved a high level of concept mapping mastery showed achievement. Beyer Back and Barbara Ann (1985) conducted a study on the use of concept mapping as an approach to the assessment of student’s representation of structural knowledge. It was reported that more advanced students adopted concept mapping as a strategy in learning. In a study, Franklin Carl Edward (1991) conducted an experiment testing the effects of concept mapping on science anxiety and acquisition of scientific knowledge among VIII grade students in integration, complexity revealed through multivariate analysis that concept mapping makes a significant difference in science achievement but not in science anxiety. In a longitudinal study Novak and Musanda (1991) demonstrated that concept maps can be used effectively in analyzing conceptual change. Thus there is a gain in achievement. Hanna Barenholz and Pinchas (1992) found that concept mapping helped in assessing students understanding the concepts in science. In a study, Marvin Willeman (1991) the results indicated that concept mapping used as an advance organization significantly improved VIII grade science achievement. NCERT (Eric) in Rl (2002) revealed that concept mapping is effective in improving the achievement and process skills in science. The study also extended to attitude of student’s efforts in concept mapping.

METHODOLOGY

a) Design of the study:
The present study is experimental in nature. Pretest, post test, control group and experimental group was employed for the study. Non verbal intelligence test developed by Raven (Raven’s progressive matrices) was used for equating the groups.

b) Sampling:
In this study, Simple Random sampling technique was used to draw the sample which consists of 160 children, among the 160 children 80 were boys and 80 were girls from four secondary schools of Mysore city.

TOOLS USED FOR THE STUDY
i) Raven’s progressive matric ii) Attitude scale developed by Dr. Sridevi (2004)

PROCEDURE
The present study is experimental in nature, with pretest-post test design. Students were divided into experimental and control group by matching cases based on the scores of intelligence which was found to have correlation with the dependent variable of the study.

The investigator established a good rapport with students and administered the tests. Firstly, pretest was conducted then treatment was given later on post test was given. The data collected was tabulated, analyzed using suitable statistical techniques.

STATISTICAL TECHNIQUES:
The pre-test and post-test answer sheets of both the experimental and control groups were scored as per the guidelines and scoring keys of each test. These gain scores were computed and considered as raw scores for further statistical analysis. The following statistical techniques were used to analyze the collected data with the view to test the hypotheses.

• Mean
• Standard Deviation
• t test

RESULT AND FINDINGS OF THE STUDY

The scores obtained by both the groups of students in the pre test and post test were analyzed using appropriate quantitative statistical techniques. The marked hypotheses were tested through “t” test.

Table-1: Academic achievement score of the experimental group in Physics

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of students</th>
<th>Treatment</th>
<th>Mean score</th>
<th>S D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>Concept mapping</td>
<td>17.97</td>
<td></td>
</tr>
</tbody>
</table>

Table-1 shows the achievement test scores of experimental group of students in Physics. By referring the norm of the achievement test, it was found that the group’s mean score falls in high category. This indicates that the group of students taught through “Concept mapping have high achievement.

Table-2: Academic achievement score of the control group in Physics

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of students</th>
<th>Treatment</th>
<th>Mean score</th>
<th>S D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>30</td>
<td>Traditional method</td>
<td>16.00</td>
<td>4.10</td>
</tr>
</tbody>
</table>

Table-2 shows the achievement test scores of control group of students in Physics who are taught through traditional method. By referring the norm of the achievement test, it was found that the group’s mean score falls in average category. This indicates that the group of students taught traditional method has average academic achievement in Physics.

Table-3: Academic achievement score of the both the groups based on gender

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Male</td>
<td>16.80</td>
<td>4.87</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>19.13</td>
<td>4.34</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17.97</td>
<td>4.69</td>
<td>30</td>
</tr>
<tr>
<td>Control</td>
<td>Male</td>
<td>14.27</td>
<td>4.92</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>15.00</td>
<td>3.21</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14.63</td>
<td>4.10</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>Male</td>
<td>15.53</td>
<td>4.98</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>17.07</td>
<td>4.30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>16.30</td>
<td>4.68</td>
<td>60</td>
</tr>
</tbody>
</table>

Table-3 shows that there is no significant difference in concept attainment between boys and girls as a result of concept mapping as a teaching strategy. There is no significant interaction of ‘group’ and ‘gender’ on concept attainment as a result of concept mapping.

CONCLUSION
In the study an attempt was made to explore the effectiveness of concept mapping technique on academic achievement of secondary school students in Physics. This study provided opportunities for generating ideas to design the innovative strategies; it also throws light on the emerging trends and applications of new technique in teaching learning process.

REFERENCES

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