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**A Comparative Study of 2 Strategies namely Concept Mapping & Lecture Method on learning
Concepts of Nobel Prize in Physics**

By Dr.G.Kumuda

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Bluetooth technology in computers and WAP (Wireless Applicatio Protocol) in electronics and human genome in medical science are just a few of the numerous advances that have taken place recently. These advances indicate that science plays a vital role in modern society. Hence it becomes essential for the science educationist to enhance meaningful learning, as today's students are future architects of modern society. Hence the investigator has adopted Concept Mapping as one of the strategies to introduce the concepts Semiconductor Heterostructures, IC for which Nobel Prize has been awarded during the year 2000.

Concept Map

A Concept Map is a schematic device for representing a set of concept meanings embedded in a framework of propositions. In a Concept Map, the more general, more inclusive concepts should be at the apex of the Concept Map, with progressively more specific, less inclusive concepts arranged below them. Since the concepts are arranged hierarchically, meaningful learning precedes more easily as new concepts or concept meanings are subsumed under broader more inclusive concepts.

Present Study

the same time through Concept Mapping Method.

Objectives of the Study

1.To find the effectiveness of Concept Mapping strategy over Lecture Method on achievement in Physics of XI standard students.

2.To study the effect of Scientific Attitude on achievement in Physics of students learning through Lecture Method.

3. To study the effect of Scientific Attitude on achievement in Physics of students learning through Concept Mapping Method.

Data Collection

A pre–test was administered for both the groups to assess the students' initial knowledge. Then the two concepts were introduced by two different methods to respective groups. Finally a post–test was administered to both the groups. The Experimental Design, which is pre–test– treatment – post–test is shown in Table 1

Experimental Design

Table 1

Group S.S.pretest T.M.Posttest

EG20A.T C.M.M.A.T

CG20A.T L.M.A.T

where SS means Sample Strength, TM means Teaching Method, AT means Achievement Test in Physics, C.M.M means Concept Mapping Method, L.M. means Lecture Method

The two B.Ed. trainees carried the research programme simultaneously at the same time and were given one hour to complete the programme. By simultaneous implementation of the programme any error due to fatigue etc is neglected. A Science Attitude Scale developed by Dr. Mrs. Avinash Grewal was also administered at the end of the session.

The tools used in the study are

1.Achievement Test developed by the investigator

2.Science

Attitude Scale

3.Concept Maps

4.Lesson Plan

Achievement Test

The Achievement Test consisting of 25 multiple-choice questions was developed by the investigator and each question carries one mark. The Achievement Test served as both pre-test and post-test. The investigator utilized the Scientific Attitude Scale (SAS) developed by Dr. Mrs. Avinash Grewal to determine the attitudes of XI standard students participating in the research programme. The Science Attitude Scale (SAS) consisted of 20 items where 10 positive items (S.No 2,4,6,8,10,12,14,16,18,20) and 10 negative items (S.No. 1,3,5,7,9,11,13,15,17,19) are present.

Scoring

Each of the 10 positive items on the scale is assigned a weight ranging from 4 (strongly agree) to 0 (strongly disagree). In the case of 10 negative items the scale scoring is reversed ranging from 0 (strongly agree) to 4(strongly disagree). The attitude score of a subject is the sum total of scores in all twenty items in the scale. Thus a maximum of eighty scores can be obtained by the subject.

Concept Maps

Seven Concept Maps pertaining to the 2 concepts under consideration were developed by the investigator.

Lesson Plan

A Lesson Plan according to which the concepts were introduced by Lecture Method was also developed by the investigator.

Data Analysis

The analysis was performed by teaching the two concepts to two groups namely Control Group (CG) and Experimental Group (EG) through Lecture Method and Concept Mapping Method. Before commencing the lesson the pre-test was given and after the

lesson was taught the post-test was again administered.

The Gain Score of Lecture Method is given by $GL = LPO - LPR$
where GL is gain score of Lecture Method LPO is post-test score
of Lecture Method LPR is pre-test score of Lecture Method

The Gain Score of Concept Mapping Method is given by $GC = CPO - CPR$
where GC is gain score of Concept Mapping Method CPO is

post-test score of Concept Mapping Method CPR is pre-test score
of Concept Mapping Method

Analysis of Critical Ratios

Critical Ratios were calculated to test the significance of
difference between the pre-test and post-test scores in Lecture
Method and Concept Mapping Method.

Critical Ratio between the
pre-test and post-test scores in Lecture Method

The Critical Ratio calculated in respect of pre-test and
post-test scores of Control Group taught by Lecture Method is
given in Table 2.

Table 2

Test Mean S.D. t-value L.S.

Pretest 8.151.27610.49 P

Posttest 14.952.519

Where L.S stand for Level of Significance.

The results of Table 2 indicate that there is significant
difference between the post-test and pre-test scores of students
of Control Group taught by Lecture Method. Since the post-test
score is greater than the pre-test score we can conclude that
the performance of students is significantly higher than their
performance in pre-test.

Critical Ratio between the pre-test and post-test scores in
Concept Mapping Method

The Critical Ratio calculated in respect of pre-test scores of

Experimental Group taught by Concept Mapping Method is given in Table 3.

Table 3

Test Mean S.D. t value L.S

Pretest 9.40.8 19.60 P

Posttest 19.72.147

The results of Table 3 indicate that there is significant difference between the post-test and pre-test scores of students

of Experimental Group taught by Concept Mapping Method. Since the post-test score is greater than the pre-test score, we can conclude that the performance of students in post-test is significantly higher than their performance in pre-test.

Analysis of Gain Scores

The Critical Ratio calculated in respect of Gain Scores of two groups subjected to two different methods of teaching is presented in Table 4

Table 4

Groups Mean S.D. t value L.S

L.M 6.81.3646.675 P

C.M.M. 10.31.792

where L.M. stand for Lecture Method C.M.M. stand for Concept Mapping Method

The results indicate that there is significant difference between the gain scores of two groups namely Lecture Method and Concept Mapping Method. Since the gain score of Concept Mapping Method is significantly greater than the gain score of Lecture Method it may be concluded that teaching through Concept Mapping strategy has helped students in the Experimental Group to achieve high scores in the test.

Coefficient of Correlation 'r' between the gain scores of Lecture Method and Science Attitude Scale

The product moment coefficient of correlation 'r' calculated in respect of gain scores of Lecture Method and Science Attitude Scale (SAS) scores is given in Table 5.

Table 5

Scores Mean S.D. r

G.S.L.M. 6.81 3.64 0.9181

SAS Score 5.85 5.598

where G.S.L.M. stand for Gain Score of Lecture Method

The high value of positive correlation indicate that Science Attitude and performance of students are positively correlated. That is, students with better attitude in science score better marks in science.

Coefficient of correlation r between the gain scores of Concept Mapping Method and Science Attitude Scale

The product moment coefficient of correlation r calculated in respect of gain scores of Concept Mapping Method and Science Attitude Scale is given in Table 6

Table 6

Scores Mean S.D. r

C.M.M. 10.3 1.79 20.8049

SAS Score 66.4 3.904

where

C.M.M. stand for Concept Mapping Method

The high value of r indicate that Science Attitude and performance of students are positively correlated. That is students with better attitude in science score better marks in science.

The findings of the study

- 1.The gain scores of students taught through Concept Mapping Method is significantly higher than the gain score of students taught through Lecture Method.
- 2.The students with better attitudes in Science have scored better marks in their Achievement Test in Control Group taught by Lecture Method
- 3.The students with better attitudes in Science have scored better marks in their Achievement Test in Experimental Group taught by Concept Mapping Method
- 4.It was observed that the time factor involved in teaching / learning through Concept Mapping Method was less than the time taken for Lecture Method. Hence considerable time could be saved apart from enhancing teaching / learning through Concept Mapping

Method.

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The author is a science educationalist as she has done M.Sc. in Physics and Ph.D. in Science Education. She is a gold medalist as she has obtained I Rank during M.Phil (Education) of University of Madras and is a First Prize Winner of the BOLT (Broad Outlook Learner Teacher) Award organized by Air India, The Hindu & Dina Malar and is teaching Physics for Higher Secondary classes in Chennai, India.

How Will You Be Remembered?

By John Boe

How Will You Be Remembered? by John Boe

Have you ever wondered about your own funeral? How many people will attend and what do you imagine they will say about your life? Recently I read a story about a man named Alfred who had the rare opportunity to read his own obituary. Apparently the newspaper in Alfred's hometown mistakenly believed that he had died and prematurely published his obituary. Alfred was a philanthropist who had made a fortune by inventing dynamite in 1866. In his obituary his invention was blamed for the death and mutilation of thousands of people. He was shocked and dismayed by the harsh manner in which he was portrayed. Alfred was determined to improve his public image and leave a better legacy. He wanted to be remembered as a man of science and of peace. When Alfred died in 1896, his will provided the major portion of his \$9 million estate be set up as a fund to establish yearly prizes for merit in physics, chemistry, medicine and physiology, literature, and world peace.

Alfred's last name you ask? Noble, Alfred Noble. The prize that bears his name is an international award given annually since 1901. Previous recipients of the Nobel Peace Prize include; Mother Teresa, Martin Luther King, Jr., Albert Schweitzer, Henry Kissinger, and Theodore Roosevelt. Alfred did a remarkable job reestablishing his legacy. One century later we no longer associate the name Noble with destruction, but rather, with peace. What if Alfred Noble had never read his obituary? I believe it is never too late to improve your legacy. In India many years ago, a newspaper reporter interviewed Mahatma Gandhi. He asked Gandhi to give his readers a message that would inspire them. Gandhi smiled at the young reporter and replied, "My life is my message!" Consider what message you are giving your coworkers, customers, friends and family. Unlike Nobel, you may not be given the unique opportunity to read your own obituary, however, you are in a good position to influence what it will say. How do you choose to be remembered?

John Boe, based in Monterey, CA, helps companies recruit, train and motivate top-quality people. To view his online Video Demo or to have John Boe speak at your next event, visit www.johnboe.com or call (831) 375-3668.



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