

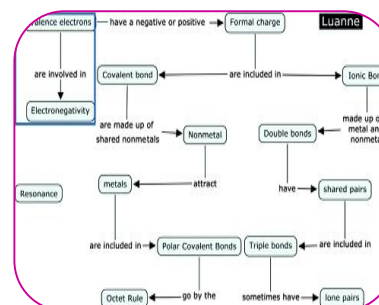


EFFECT OF CONCEPT MAPPING INSTRUCTIONAL PACKAGE IN CHEMISTRY ON SECONDARY SCHOOL STUDENTS OF BANGALORE

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ABSTRACT:

The present research study is to investigate the effect of concept mapping instructional package on achievement in Bangalore secondary schools. In the study concept mapping instructional package has been specifically prepared on the school subject Chemistry. The present research study adopted the experimental design to carry out the study. The sample selected for the study had represented both male and female students from secondary schools of Bangalore. The present study had control group and experimental group. The concept mapping instructional package in chemistry was used on experimental group to compare it with the control group taught in traditional method. The present study found that, the experimental group significantly performed better than the control group.

KEY WORDS: - Concept Mapping, Concept Mapping Instructional Package.

INTRODUCTION:

Science education plays an important role as it is the root cause of all the inventions and discoveries that the present generation is seeing. Therefore teaching and learning science takes a pivotal position all over the world. Teaching and learning of science has always been experimental but at the same time certain concepts which are very abstract are to be dealt with various other method of teaching. Chemistry is well known as a subject to cram and educators all over the globe have tried their best in finding ways and means to learn Chemistry without cramming. One of the well-known scientific method of learning is inquiry based learning and gradually these days blended teaching have also been introduced teach sciences in class room (Dean 2008). Concept mapping as a strategy to learn sciences to avoid rote memory has achieved its finding in many researches these days (Novak, 2004). However in India not many have tried to assess the achievement through this method. Therefore the present study has been taken up to see the improvement in learning when taught through self-developed concept mapping instructional package by the researcher.

NEED FOR CONCEPT MAPPING INSTRUCTIONAL PACKAGE

In teaching and learning process of science subject concepts are fundamentals upon which various results are derived. Concept is an idea which can be verifiable some times and sometimes it is abstract and not easy to visualize. Studies based on Piaget's concept formation, Bruner's concept attainment, and Gagne's stimuli-response have explored various ways of improving science instruction and yet newer theories of learning integrated with technology are to be explored until we find instructional methods which makes science teaching easy. This study is an attempt to explore concept mapping instructional strategy to teach concepts in Chemistry. It falls under the category of graphic organizers.

Concept map as a teaching strategy has been used since 1980's (Novak, 1984, 1990). It was derived from Ausubel's meaningful learning theory. Concept mapping is a representation of knowledge structure in a

two-dimensional diagram which has hierarchy and links. This diagram is breakthrough instructional strategy as it eliminates cramming of subject matter and acts as an antidote to rote memory. It works well as per the Piaget's developmental model, students can easily learn and remember various science concepts be it abstract or concrete. When concepts are represented using concept map learning becomes more meaningful and easy (All & Havens, 1997).

METHODOLOGY

Concept mapping instructional package in the present study comprised of concepts from the subject Chemistry. Some of the concepts chosen are from 8th standard level of secondary school syllabus viz., Structure of Atom, more about atoms, chemical reactions and their types, chemicals in our daily life etc. In order to test this instructional package researcher had chosen a sample of 72 students of which 36 students belongs to the experimental group and 36 students belongs to control group. Both experimental and control group had boys and girls students who are almost equally distributed. The study follows experimental design with two groups control and experimental. The students in each group were randomly chosen. The study design follows a pre-test and post-test method to both control and experimental group. Experimental group were instructed based on the concept mapping instructional package developed by the researcher and the control groups were instructed as usual with traditional approach. Experimental group was also administered with delayed post-test to check the consistency in improvements if any due to the treatment.

Statistical test conducted to test the significant difference between the experimental and control group and within experimental group pre-test and post-test are paired sample t-test using SPSS software version 21. Independent sample t-test was conducted to test the significant difference among the boys and girls.

Results

Table 1: t-test output between Pre-test And Post-test of Experimental Group

Experimental Group	Paired Differences					t	df	Sig. (2-tailed)
	Mean	SD	SED	95% CI				
				Lower	Upper			
Pre & Post-test	21.472	9.440	1.573	18.278	24.666	13.648	35	0.000

Table 2: t-test output between Control Group and Experimental Group Post-Test

Post-test	Paired Differences					t	df	Sig. (2-tailed)
	Mean	SD	SED	95% CI				
				Lower	Upper			
EXPT –Control	7.778	11.837	1.973	3.773	11.783	3.942	35	0.000

Table-1 shows that there is a significant difference between pre-test scores and post-test scores of experimental group. It shows that there is a considerable improvement in the learning due to teaching done using concept mapping instructional package.

Table-2 clearly explains that there is a significant difference between experimental group post-test and control-group post-test. When means of these two were observed mean of experimental group was

found to be 35.56 and mean of the control group was found to be 27.78 which show that the teaching done using concept mapping instructional package has shown significant improvement in achievement of chemistry.

CONCLUSION

Findings of the present study show that there is an improved learning in Chemistry when instruction is done using concept mapping strategy over the traditional teaching method. Researcher has also explored the differences in learning between boys and girls and is not part of this article. The results were in concurrent with the results explored in the reviews by the researcher on other science subjects such as Physics, Biology, and Nursing etc. Researcher finds that concept mapping instructional strategy as one of the best methods to teach abstract concepts of sciences and learners can easily achieve well and give up on rote learning, rote memory, and cramming. Researcher also suggest that future researchers have to explore further taking large and radial sample and also in terms of other concepts of Chemistry.

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