CONCEPT MAPPING: AN INNOVATIVE EDUCATIONAL TOOL

Vandana Singh
Assistant Teacher, Sitapur, Lucknow

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Abstract

Today Concept map is one of the popular techniques which can be used as educational tool. In this paper the researcher reports the use of concept map in education. In the study researcher selected 80 students randomly of class XI C.B.S.E. randomly, two groups has been formed by the researcher and each group consists 40 students and labelled as Control group and experimental group. Students in the experimental group were subjected to treatment using Concept maps while students in the control group were taught using the traditional method of teaching for Biology. Pre-test and Post-test for both the groups was conducted. The data was analysed using t test. Result revealed that the score of mean and standard deviation of post-test of experimental group is more than the score of mean and standard deviation of post-test of control group and there is a statistical significant effect of concept map over traditional teaching method on academic achievement of students.

Keywords: *Concept Map, Traditional Teaching, Academic achievement, Biology*

Concept maps were first introduced by Novak as a researcher tool. They are also geographical tools for organizing and representing knowledge. Concept maps include concepts usually enclosed in circles or boxes of some type and relationship between concepts indicated by a connecting line linking two words on the line. It also referred as linking words or linking phrases that specify the relationship between the two concepts.

Meaning: A concept map is a diagram of nodes, each containing concept labels which are linked together with directional lines. The concept nodes are arranged in hierarchical levels that move from general to specific concepts. Concept map is not only visual tool for organizing ideas but also a method to trigger quick association.It is also a nonlinear approach and a way to investigate the aspects of a multifaceted topic.The biology concept maps drawn at the conclusion of instructional units to elicit further collaboration with school students. Concept map is one of the effective methods of assessing student knowledge, comprehension, synthesis and evaluation. Concept maps stresses key areas of scientific thinking that influencestudent's ability to solve problems scientifically.Concept map helps learner to learn , researcher to create knowledge, writer to write and evaluator to assess learning and also scientific thinking, reasoning and effective communication which are more desirable skills to succeed in biology learning.

Steps:*Prepare Project:*The first step is preparation step where one will initiate and focussed on the project , issue or topic.Focus on participant and make a schedule.*Generate ideas:*The second step is to generate the statements that explain all activities that address the focussed topic or issue.*Structure ideas:*The third step is including two steps where one will sort out the similar statements and piled up them and name them with their description. Each statement is rated on 1-5 scale.*Compute maps:*In this step the sorted and rating inputs are represented in the map form. Two major statistical analyses are used, the first is multidimensional scaling that takes the sort data across all participants and develops the basic map where each statement is a point on the map and statements that were piled together by more people are closer to each other on the map. The second analysis is cluster analysis that takes the output of the multidimensional scaling and partitions the map into groups of statements or ideas, into clusters.*Interpret maps:*This is fifth step in which one will interpret the various maps.*Utilize Maps:*The sixth and last step is utilize map where one can address the original focus. With the help of using maps.The maps not only used as a visual framework for operationalizing the program. But also used as the basis for developing measures and displaying results.The concept maps not only help the individual but also help the certain group of people to learn the various skill and techniques. It also helps the students to understand biology subject in depth and in easy way.Concept maps make the biology topics more interesting, clear and easily understandable.

Advantages: It helps to organize information on a topic effectively.It fascinates meaningful learning.It allows to indicate clearly the relative importance of each idea.It is an active evaluation.It can be used in a large class setting either individually or collaboratively, by giving the students a partially filled concept map, or a few concepts to fill on the maps.

Disadvantages of Concept Map Assessment: Students are not familiar with concept mapping evaluation and may find it scary.Concept mapping issued either as a quick evaluation in class to check students' conception on a topic or as an overview of an evaluation, this may frustrates some students.Individual feedback can be time-consuming, clear assessment criteria and grading are required for all parties so that students and assessors are fully aware of how the performance will be judged.

Objectives: To develop concept maps for teaching biology subject for class XI C.B.S.E board.To study the effectiveness of concept maps in terms of achievement in biology subject of class XI. To compare the academic achievement of students studying through concept map & traditional method for teaching biology

Hypothesis: There will be no significant effect of concept maps in terms of academic achievement of students.There will be no significant difference between the academic achievement of students studying through concept map and traditional method for teaching Biology.

Research Design: For the present study sample of 80 students was drawn from XI grade students from two schools at Nagpur city of Maharashtra state, India Both the schools were affiliated to Central Board of Secondary Education, New Delhi. In the study two tools are used as such Self developed test and Concept maps. In self developed test, researcher asked objective questions to the students of class XI.Researcher made test of 20 marks from the topics. In the test each question had four options & child had to tick the correct answer. In concept maps, researcher shown the topics in the form of diagrammatic representation to the students.Researcher selects a topic and identifies related keywords or phrases. Rank the keywords from the theme on paragraphs and arranged concept in diagrammatic representation and added linking lines.

Data Collection & Analysis: In present study the sample was selected using purposive random sampling technique Pre-test- Post-test Control group design was employed. The subjects were assigned to the experimental & control group by random procedure. The self-developed criterion reference test was used as pre and post-test to know the achievement of both the group. The control group was taught through traditional method of teaching whereas experimental group was taught using concept map. After completion of unit the same criterion reference test was administered as post-test.The t-test was used to test the significance of the difference between two means scores of the students on criterion reference test for achievement

Table 1 - t-test analysis of the performance of students of Experimental group

Group	Test	Number of students	Mean	Standard deviation	T value
Experimental Group	Pre test	40	7.325	2.73	8.89
	Post test	40	14.65	3.07	

Table 2 - The performance of students of control and experimental group on post test

Group	Test	Number of students	Mean	Standard deviation	T value
Control Group	Post test	40	8.95	2.78	6.77
Experimental Group	Post test	40	14.65	3.07	

The Table no 2 indicates that mean value mean of Post-test of control group is 8.95 and experimental group is 14.65. The calculated value of „t is 6.77 is significant at .01 level and .05 level. The student of the experimental group achieved more score at Post-test than control group. The comparison between groups revealed that the performance of Experimental group was better than that of Control group. Hence it proves the effectiveness of concept map in terms of achievement.

Conclusion: The concept mapping method for teaching biology to the students of class XI has proved more effective on the achievement of students. The develop concept mapping for teaching biology subject for class XI has proved more effective. Post-test proves more effective that the pre-test of experimental group. The result also revealed that the post test score of experimental group is also more than the post test score of control group which proved that concept mapping techniques is more effective than the traditional method in teaching biology to class XI of C.B.S.E board.

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