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APPLICATION OF CONSTRUCTIVIST EVALUATION APPROACH IN SCIENCE TEACHING : CONCEPT MAP

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Abstract:

A major theme of Science education research throughout the past three decades has been student's misconceptions of scientific phenomena. Research has shown that misconceptions among pupils are resistant to change, and they persist even with formal science instruction.This paper highlights student's thinking and exploration of concepts using visuospatial relationships flowing from a central theme to peripheral branches which can be interrelated, i.e. concept map

In this present study, an investigator gave detailed information to IX standard students about the method of drawing a concept map with illustrative examples. Then students gave the opportunity to draw concept maps of simple concepts. After that the topic selected for concept map was 'Life around You' from IX standard 'Science and technology' textbook published by Maharashtra State Board of Secondary and Higher Secondary Education, Pune. The topic was discussed in the class with the help of a power point slide show which included various thought provoking questions. At the last, various concept maps were collected form IX standard students. After collection, an investigator evaluated every group of students from that concept map and gave appropriate suggestions to each group of students.

Keywords: *Misconception, concept map*

Introduction :

Schools are expected to transmit knowledge to younger generations. They, however, also increasingly criticized for distributing so called inert knowledge. The traditional classrooms sometimes resemble a one man show with a captive but often uninvolved audience. To improvise the instruction, various strategies like problem solving, discovery learning, joyful learning, Inquiry based learning and recently experimental learning were introduced.

The process of evaluation also undergoes transformation. It is no longer a test of memory, testing how much is retained. Since the assessor is interested in finding out the processes used by the learner for meaning making, the process of meta-cognition and not the information accumulated, the techniques used for evaluation also are different from semester end 3 hour written test. Many techniques such as portfolio, projects, concept map, assignments (individual as well as group) and many such activity based techniques.

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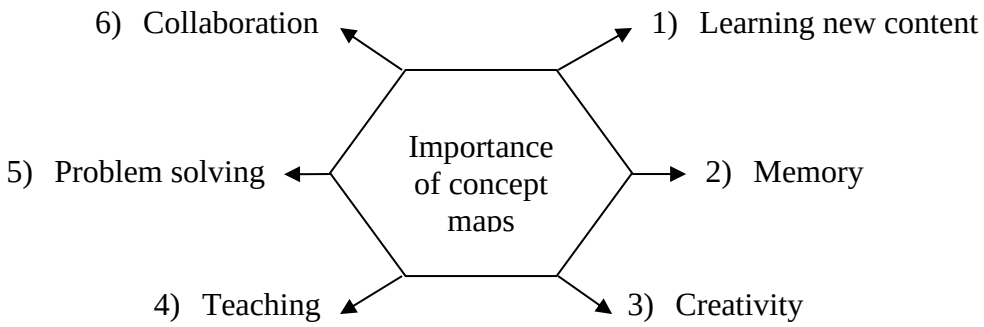
In this research study, concept map is used for evaluation of IXth standard students.

Concept maps are a way to develop logical thinking and identify connections and help learners understand how individual elements form a larger system. This can enrich students'understanding of a new concept. This can be used as a formative assessment as they reveal what students already know about a concept and make plain whatever misconceptions they have .Also used as summative assessment.Constructing a concept map is associated with higher retention when it is done at the end of a unit as opposed to the beginning.

Importance of concept maps in learning :



Methods of drawing a concept map :

1. Identify the important terms and concepts that you want to include on your map .
2. Arrange concepts in a pattern that best represents the information.
3. Use circles or ovals to enclose an important term or concept within the topic .
4. Use straight lines with arrows (single or double headed)to link terms that are related .
5. Use a word or phrase of words as labels along the lines to designate the relationship between two connected terms.

Plan and Implementation of constructivist evaluation technique.

Objective:

1) To provide training to the IXth standard student about concept mapping.
2) To study perceptions of IXth standard students regarding the topic.
3) To evaluate student's perception with the help of concept map collaboratively.

Implementation details :

- Textbook Analysis of IX standard Science and Technology textbook
- Selection of the content.
- Discussion of topic with the help of power point slide show including thought provoking questions.
- Training regarding concept mapping to IX standard students from Late Kishabapu Kondopant Gulavani Secondary School, Vita (40 students)
- Facilitating students for preparation of concept maps.
- Evaluation of concept maps.
- Suggestions for improvement of scientific concepts and concept maps.

Procedure:

Forty students of IXth standard from Late Kishabapu Kondopant Gulavani Secondary School, Vita were divided into eight groups. All the group members were asked to sit together for discussion. The representatives were supposed to prepare a concept map on paper. Concept maps were analyzed and qualitatively evaluated.

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Analysis and qualitative evaluation of concept maps :

The concept maps prepared by the groups were analyzed on the basis of following points.

Sr. No.	Main points Included	Group-1	Group-2	Group-3	Group-4	Group-5	Group-6	Group-7	Group-8
1	Concept of Animal Classification	√	√	√	√	√	√	√	√
2	Classification of Animals								
	a) Phylum Porifera	√	-	√	-	√	√	√	√
	b) Phylum Coelenterata	√	-	√	√	√	√	√	√
	c) Phylum Annedida	√	-	√	-	√	√	√	√
	d) Phylum Arthropoda	√	√	√	√	√	√	√	√
3	Direct Experience								
	a) Slide of species	√	√	√	√	√	√	√	√
	b) Various animals	√	√	√	√	√	√	√	√
	c) Power point slide show	√	√	√	√	√	√	√	√
	d) Teaching aids	√	√	√	√	√	√	√	√
4	Co-operative learning	√	√	√	√	√	√	√	√
5	Teacher's role	√	√	√	√	√	√	√	√
6	Key words	√	√	√	√	√	√	√	√
7	Linkage of each word	√	√	√	√	√	√	√	√

Observations:

Concept of Animal Classification :

All the groups mentioned about concept of animal classification.

Classification of Animals:

- Characteristics of animals of Phylum Porifera were mentioned by six groups correctly i.e. group 1,3,5,6,7,8 groups.
- Characteristics of animals of Phylum Coelenterata were mentioned correctly by seven groups except group-2
- Characteristics of animals of Phylum Annelida were mentioned correctly by six groups i.e. group 1,3,5,6,7,8
- Characteristics of animals of Phylum Arthropoda were mentioned correctly by all groups.

From above observations and concept maps, every group tried to draw concept map in a correct way. Some mistakes were done in their concept map i.e. name of Phylum.

- Co-operative learning was included by all the groups.
- All the groups used different styles.
- All the groups used correct key words.
- All the groups were mentioned correct linkage word.

Use of analysis :

The investigator could study perceptions of the IXth standard students and got such detailed qualitative information through these concept maps and hence she could provide supportive learning material for concept enhancement.

Conclusions :

- All eight groups could prepare concept maps. It can be said that innovative practice of concept map training was found to be successful.
- Concept maps can be used to study perceptions of students and get feedback about teaching- learning process.
- All were excited about this innovative evaluation strategy.

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- All were participated enthusiastically to draw concept maps.
- This way of evaluation found to be interesting. It decreased stress of the students about evaluation.
- Student's confidence had increased.

In this way, for quality enhancement in education everyone had to apply various innovative, constructivist strategies for teaching, learning and evaluations.

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