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Concept Mapping: Teaching Science through Two Dimensional Method

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Abstract: -Present day teaching learning process is shifted from Teacher centred approach to learner centred approach. It was a time when Teacher played an active role and learners were the passive listener. The process of teaching and learning was unidirectional. But with the shift of teaching learning process from teacher centred to learner centred approach, the role of both teacher and learner has changed. This learner centred approach is based on constructivism. Which believes that knowledge is a process of construction and every individual constructs their own knowledge by connecting their previous knowledge with present experience. There are numbers of teaching method, which supports constructivism, where children play the key role and the process of communication is two ways. One such method is named as concept mapping method. Which was first invented by Joseph D.Novak during 1970s at Cornell University. Concept mapping constitutes concept map. It is a graphical method which organises and represents knowledge in hierarchical fashion and the most general concept is written at the top and most specific concept is written below the most general concept. Here the concepts are presented with a box, which may be of circular in shape or of other shape. Two concepts are linked together through a connecting line linking the concepts and word on the connecting line is called linking word or linking phrases which specify the relationship between two concepts. Thus, in this research article author has intended to highlight on concept mapping and its multiple utility for in an area of teaching and learning.

Key Words— Concept mapping, Constructivism, Hierarchy, linking word, Connecting line.

I. INTRODUCTION

Innovation brings novelty to the stock of knowledge. Many time innovations bring better alternatives in the desired field. Invention of concept mapping introduces both innovation, opportunities as well as better option in the field of teaching and learning. Numbers of commissions and committees have been formulated time to time which suggested various measures to enhance learning and making school education more effective and meaningful. The way teacher transacts the lesson to the children has lefts a long lasting impact. Thus, selection of right kind of method for dealing the lesson in the classroom is one of the deciding factor. Secondary education commission (1952-1953) mentioned that "Good methods which are psychologically and socially sound may raise the whole quality of their life; bad methods may debase it" (pp.102-103). Therefore, teacher must select a method which not only focus on delivery of lesson but also centered round to develop the various capacity (creative thinker, ability of analysis and synthesis etc.) of child.

II. IMPORTANCE OF SCIENCE IN SCHOOL CURRICULUM

There are numbers of subjects which are taught at various school stages. Each and every subject which is taught in school has some reason that it is selected to taught in schools as subject. Likewise teaching of science also has some intention that it is chosen to taught in schools as subject. Teaching and learning of science develops scientific attitude among children, making them open minded with the development of critical thinking and unbiased and impartial thinking. It enhances problem solving ability of students. National policy on education (1992, as modified in 1986) emphasized to strengthen science education so that children develops the well-defined abilities and values such as spirit of inquiry, creativity to question and an aesthetic sensibility. Further it added that science education programmers will be designed to enable the learner to acquire problem solving and decision making skills. Infect, NCF (2005), has mentioned that in a progressive forward - looking society science can play a truly liberating role, helping people from escape from the vicious cycle of poverty, ignorance and superstition. Thus, science education not only improves the quality of life at personal/individual level but it also helps to boost against various social education and in their removal from the society.

Moreover, the various technological advancement which may be related to health and medicine, may related with nuclear power generation, missile technology, space technology, robotics, constructions, advancement in agriculture and many more. All these technologies are associated with one or more scientific principle/theory/laws.

Therefore, science as a subject, taught in schools to laid the foundation to understand the scientific methods. Teaching of science helps to develop basic cognitive and psychomotor skills by engaging learners in various kinds of exploratory activities so that they can develop various science process skills. Such as skill of observation, skill of classification, drawing, estimation and measurement. Teaching of science makes its pupil scientifically literate.

III. CONSTRUCTIVISM: SHIFTING APPROACH OF TEACHING LEARNING PROCESS

Constructivism is an approach which believes that every individual constructs their own knowledge on the basis of their prior knowledge. It believes that knowledge is subjective rather an objective. Thus, knowledge is a process of construction. Earlier teachers were considered as a chief source of knowledge and the teaching methods were centred round teachers. Teachers played an active role and children had to keep playing the role of passive listener. But, presently the paradigm shifted from teacher centred approach to child centred approach (Constructivism). Role of teacher is shifted. Now teachers are in role of facilitator and helper. Concept mapping is a method which is based on constructivist approach, which is supposed to use by children to construct their own knowledge. NCF (2005), mentioned that learning is the process of construction of knowledge. Learners actively construct their knowledge by connecting new ideas to existing ideas on the basis of materials/activities presented to them. Thus, it is a dire need of today to replace one-way transaction of knowledge through a two-way transaction where student also have an opportunity to express their view and share their ideas.

IV. CONCEPT MAPPING: A TWO DIMENSIONAL METHOD

Concept mapping is based on constructivist approach. It constitutes concept map/maps. Concept maps organises and represents knowledge in graphical form. It was first invented by Joseph D.Novak in 1970s at Cornell University. The concept maps constitute knowledge in hierarchical manner in which most general concept is written at the top and most specific and inclusive concept is written below the most general concept. Here, concepts are represented within a box which may be circular or of other forms. Further, two concepts are connected through a connecting line linking the concepts and word/words on the line is called linking phrase or linking word. Concept mapping is a two dimensional method, as it represents concepts in hierarchical form showing the most general concept and most specific concept below the most general concept. Secondly, the connecting links shows the relationship between concepts. Hence, concept mapping is a two dimensional method.

V. TEACHING OF SCIENCE THROUGH CONCEPT MAPPING METHOD

Undoubtedly, science is a subject of paramount importance. But when it comes to learn concepts of science, pupil found it difficult as science constitutes numbers of abstract concepts, difficult terms and terminologies which is hard to remember and most importantly, science is highly conceptual in nature. Presently, teaching of science is quite challenging task. However, numbers of researches showed the potentiality of concept mapping method. Kumar (2009) reported that in order to acquire science concept, concept mapping is superior instructional strategy over traditional lecture method. Further, Sharma (2014) investigated effectiveness of concept mapping on achievement and retention in organic chemistry with respect to intelligence. The researcher has reported that concept mapping strategy is more effective in order to enhance student's achievement as well as retention of concepts in organic chemistry of students having higher intelligence level in comparison to pupil with lower intelligence level.

Why concept mapping in classroom?

Concept mapping has multiple uses. It provides a visual road map of concept, which leaves a long lasting impact on learners as researches showed that students taught through concept mapping method retained the concept for longer time period in comparison to those who taught through lecture/traditional method. Concept mapping can be used in numbers of ways. It can be used for multiple purposes. Such as for evaluation purpose. Further, concept map constructed by learner, helps teacher to identify misconceptions of learner. In addition, concept mapping can have used by students as a quick revision tool as it shows concepts in simple and condensed form.

VI. CONCLUSION

As the process of teaching and learning is shifted from teacher centred approach to learner centred approach, teachers need to adopt such strategy of teaching which enable students to become an independent learner. Concept mapping method is

among those strategies which is based on constructivism and children plays an active role in the process of learning. Further, concept mapping has multiple uses as apart from using it as an instructional strategy it can be used as an evaluation tool as well as for quick revision of lengthy concept. Thus, the use of concept mapping should be promoted for making children an independent learner, for enhancing their achievement, for identifying misconceptions as well as for gain in retention.

REFERENCES

[1]. Govt. of India. (1992). Revised national policy on education (1992). New Delhi: MHRD.

[2]. Govt. Of India. (1953). The Secondary education commission (1952-53). New Delhi: Govt. of India.

[3]. NCERT. (2005). National curriculum framework. New Delhi: NCERT.

[4]. Kumar, V. (2009). Relative effectiveness of concept mapping and concept attainment model of instruction

[5]. In relation to study habits and style of learning and thinking. Panjab University.

[6]. Sharma. (2014). Effectiveness of concept mapping strategy on achievement and concept retention in

[7]. Organic chemistry. Indian educational review. 52(1), 111-127.