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MIND MAPPING: AN INNOVATIVE TECHNIQUE FOR ENHANCING SCIENCE TEACHING

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Abstract

Teaching is a demanding profession, requiring multi=dimensional skills. patience, committeemen and continuous growth to face the challenges of the modern education system of India.. Teachers must be equipped with the modern techniques while delivering the process of teaching and learning and must take the initiate to strengthen and improve the teaching profession on a regular and continuous basis. In order to bring about the desirable changes in students, there has been demand for competent and committed teachers. Therefore, preparation of highly competent teachers became the priority and concern of all teachers--training institutions. Competency based education encourages each student to develop his or her own full capacity and prepares them to perform essential tasks at stated standards. Mind mapping is a technique and strategy for helping students, especially science students so that they can order and structure their thinking through mentally mapping words and concepts. Mind maps were developed by Tony Buzan as a way of helping students make notes that used only key words and images. Mind maps are much quicker to make, and because of their visual quality they are also much easier to remember and review. Mind maps are used to generate, visualize, structure and classify ideas, as an aid to studying and organize information, solving problems, making decisions and writing. Mind maps provide and effective study technique when applied to written material. However, before mind maps are generally adopted as a study technique, consideration has to be given towards ways of improving motivation amongst users in order to enhance science teaching competencies among science teachers. The present paper focuses and discusses the technique of mind mapping and its application. The paper further highlights the role of mind mapping in enhancing science teaching competency among teachers, especially in science teachers.

Keywords: *Science, Science teaching, Competency, Mind mapping, Effective teaching, strategies. Tony Buzan*

Introduction

Teaching is a noble as well as demanding profession, which requires multi-dimensional skills, patience, dedication, commitment and continuous growth so as to face the multiple challenges of the present era. Teachers must take the initiative to strengthen and improve the teaching profession on a daily basis and support its high standards. In order to bring about desirable changes in students, there has been demand for competent and committed teachers. Therefore, preparation of highly competent teachers became the priority and concern of all teachers------training institutions. Cognitive neuroscience is an academic field concerned with the scientific study of biological substrates underlying cognition with a

specific focus on the neural substrates of mental processes. It addresses the questions of how psychological/cognitive functions are produced by the brain. Competency based education encourages each student to develop his or her own full capacity and prepares them to perform essential tasks at stated standards. Mind maps are used to generate, visualize, structure and classify ideas, and as an aid to studying and organizing information, solving problems, making decisions and writing. Mind pals provide an effective study technique when applied to written material. However before mind maps are generally adopted as a study technique, consideration has to be given towards ways of improving motivation amongst users in order to enhance teaching competency and especially of science teachers.

Mind Mapping and Teaching Competency

The teaching of science should enable student to develop and enjoy personal interests, some of which are related to science. The student should be able to recognize and enjoy some scientific aspects of their material and made environment. The student should feel encouraged by excluding in the science curriculum varied activities like science clubs, exhibition, excursions and the like teacher education, therefore has to be change and adopt new techniques and methods to keep pace with the changing concepts of learning and education. Science teaching is one of the most difficult tasks in the world. Highly competent and dedicated teachers are required to fulfill the criteria of high quality and higher standards. Quality science teachers have become a necessity who are well versed in information and communication technologies and are accustomed to using all modern techniques of teaching.

It is now no longer a secret that there is a range of learning styles. Many teachers find that their science teaching style doesn't match the learning style of some of their students. While the lesson presentation follows our natural teaching style, students can create a mind map that matches their learning style. Instead of trying to fit a mould, they can take notes that feel natural, are easily remembered and suited to their individual style. The ultimate organizational thinking tool, the easiest way to put information out of our brain. It is a creative and effective means of note taking that literally "Maps out" your thought. Tony Buzan states that, "A mind map is a diagram used to represent words, ideas, tasks or other items linked to arrange around a central key word or idea. Mind maps are used to generate, visualize, structure and classify ideas, as an aid to studying and organize information, solving problems, making decisions and writing. The elements of a given mind map are arranged institutively according to the importance of the concepts, and are classified into groupings, branches, or areas, with the goal of representing semantic or other connections between

portions of information. Mind maps may also aid in recall of existing memories. The mind map can be contrasted with the similar idea of concept mapping. The former is based on radial hierarchies and tree structures denoting relationships with a central governing concept, where concept maps are based on connections between concepts in more diverse patterns.

By presenting ideas in a radial, graphical, non-linear manner, mind maps encourages a brainstorming approach to planning and organizational tasks. Though the branches of a mind map represent hierarchical tree structures, their radial arrangement disrupts the prioritizing of concepts typically associated with hierarchies presented with more linear visual cues. This orientation towards brainstorming encourages users to enumerate and connect concepts without a tendency to begin within a particular conceptual framework.

Mind Mapping Strategies

Mind maps organize the information in the same way that our brain organizes information. This makes it very natural and easy to understand the concepts. Our brains like thinking in pictures. The smooth curves and colourful pictures that are created when mind mapping create powerful images for our brain to remember. We have two halves of our brain which think in different ways. The left half thinks linearly following direct linkages to related ideas. Our right brain likes to see the whole picture with colours and flow. A mind map caters to both sides of the brain at the same time, which makes to a very good way of storing and recalling information, presenting things to other people, and brainstorming new ideas. A mind map program gives us a lot more than basic mind mapping, including things like re-colouring of branches, reorganizing the mind map, drag and drop images and so much more. Mind maps are used all around the world, in education and in business. In education, the mind maps serve three powerful functions:

1. As a student presentation tool
2. As a pre-writing tool.
3. As a teaching tool (By chunking language, mind mapping makes English more accessible to non-native English speakers.)

Mind Mapping and Teaching of Science

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branches, or areas, with the goal of representing semantic or other connections between portions of information. Mind maps may also aid in recalling of existing memories, especially in science teaching. Mind maps are a great tool to consolidate information from reading material, whether the information is coming from one source or multiple sources, and look at it from varied perspectives in a highly visual, interactive format. Mind mapping allows for better organization and clearer connections among concepts and topics, which in turn, allows for more thorough examination, understanding, and presentation of subject matter. There are several steps in constructing a mind maps which are: 1. Planning; 2. Organizing information; 3. Classifying; 4. Visualizing; 5. Structuring;
6. Grouping; 7. Recall; 8. Retrieval; 9. Spatial organization; 10. Solving problems;11. Hierarchical Structuring; 12. Node Folding; 13. Generating.

Mind Maps Enhancing the Effectiveness of Teaching:

Tony Buzan claims that the mind map is a vastly superior note taking method because it does not lead to a "*semi-hypnotic trance*" state induced by other note forms. Buzan also argues that the mind map uses the full range of left and right human cortical skills, balances the brain, taps into the alleged "*99% of our unused mental potential*", as well as intuition (which he calls "*super logic*"). However, scholarly research suggests that such claims may actually be marketing-hype based on misconceptions about the brain and the cerebral hemispheres. Critics argue that hemispheric specialization theory has been identified as pseudoscientific when applied to mind mapping. Farrand, Hussain, and Hennessy (2002) found that spider diagrams (similar to concept maps) had a limited but significant impact on memory recall in undergraduate students (a 10 percent increase over baseline for a 600 word text only) as compared to preferred study methods (a 6 percent increase over baseline/). This improvement was only robust after a week for those in the diagram group and there was a significant decrease in motivation compared to subjects' preferred method of note taking. Farrand et al. suggested that learners preferred to use other methods because using a mind map was an unfamiliar technique, and its status as a "memory enhancing" technique engendered reluctance to apply it.

Teaching Competency

Competency based education encourages each student to develop to his or her own full capacity and prepares them to perform essential tasks at stated standards. The component of competency based education is competency. The term "Competence is a generic word the represents the following three levels of human functioning" (i) Knowledge (ii) Attitude and

(iii) Performance Skill. A Program could be based on Competency Statement in one or more of the following components (a) its planning and design (b) it training materials (c) its training procedures and (d) its evaluation. The word Competency is taken in the broad sense of knowledge, attitude, Skills and behaviors that facilitate intellectual, social, emotional and physical growth in children (Weber, 1972).

The intensive interactions with teachers, teacher educators, curriculum developers, evaluators and experts of different categories, NCTE has identified the following ten inter-related competencies as essential for making competent teachers: (i) Contextual competencies (ii) Conceptual competencies (iii) Content Competencies (iv) Transactional competencies (v) Competencies related to other educational activities (vi) Competencies to develop teaching-learning material (vii) Evaluation competencies (viii) Management competencies (ix) Competencies related to working with parents (x) Competencies related to working with community and agencies.

Conclusion

In the teaching learning process, the functioning of the brain facilitates information processing, restoration and retrieval of information. The teachers should be fully aware of all the brain functions to make the teaching effective and systematic. Besides, the teachers are fully conscious about the problems of the slow learners. teachers have to concentrate on the gifted children's as well as on the slow learners. By identifying each group, they can plan their teaching strategy accordingly. The neuro-scientific development have provided chance to explore the problems in learning and the causes which are all left to unknown and are unavailable to the teachers. A trend has now come to revisit the teacher's competencies and also learning achievement among learners with special reference to cognitive neuroscience. Mind mapping is a wonderfully easy-to-learn, easy-to-use, and powerful technique to engage students in the process of learning. it can be particularly useful for teachers who are working with students with different language backgrounds. Simply use "Mind mapping" as a search term, and we will find ample resources to get started. The effectiveness of the teacher programme would largely depend upon the effectiveness of teacher-educator, who are expected to implement the various recommendations and reforms. It is therefore essential for them to make themselves aware of the recent developments in the field of cognitive neuroscience. This calls for an effective approach on the part of teacher education. Mind mapping can be used effectively to organize large amounts of information, combining spatial organization, dynamic hierarchical structuring and node folding. Mind maps provide an

effective study technique when applied to written material. However before mind maps are generally adopted as a study technique, consideration has to be given towards ways of improving motivation amongst users in order to enhance the teaching competency of teachers and especially of science teachers.

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