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USE OF CONCEPT MAPPING STRATEGY AS ADVANCED PEDAGOGY FOR FUTURE TEACHER EDUCATION

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Abstract

Advanced pedagogies are more comprehensive than teaching methods. Teaching methods include only the presentation of contents while Advanced pedagogy includes educational philosophy, teaching objectives, learning principles, desired activities, feedback and motivating tactics. Advanced pedagogy is the way to enhance teaching and learning performance. It is a skillful planning of working system by which objectives can be achieved conveniently. Different innovative teaching methods are used now across the globe. It is the discipline that deals with the theory and practice of education; or the study and practice of 'how best to teach'. Concept mapping strategy is one such advanced pedagogy for future teacher education as it equips learners for life in its broadest sense, engages learner with valued forms of knowledge, recognizes the importance of prior experience and learning, requires learning to be scaffold. It also needs assessment to be congruent with learning, promotes the active engagement of the learner and fosters both individual and social processes and outcomes. Concept Mapping has proven to be an effective pedagogical tool and a metal earning strategy useful for many subjects (Ritche and Volkl, 2000; Gardgill and Jitendra, 1999; Novak, 1990).

Introduction:

Advanced pedagogy is the way to enhance teaching and learning performance. It is a skillful planning of working system by which objectives can be achieved conveniently. Different innovative teaching methods are used now across the globe. Itis the discipline that deals with the theory and practice of education; or the study and practice of 'how best to teach'. The word pedagogue actually relates to the slave who escorts Roman children to school. In Denmark, a pedagogue is a practitioner of pedagogy. The term is primarily used for individuals who occupy jobs in pre-school education (such as kindergartens and nurseries) in Scandinavia. Advanced pedagogies are more comprehensive than teaching methods. Teaching methods include only the presentation of contents while Advanced pedagogy includes educational philosophy, teaching objectives, learning principles, desired activities, feedback and motivating tactics. Concept mapping strategy is one such advanced pedagogy for future teacher education. Education must be organized around four fundamental types of learning according to report to UNESCO, which will be the pillars of knowledge. These are:

- Learning to know
- Learning to do
- Learning to live together
- Learning to be

Learning to know implies learning how to learn by developing one's concentration, memory skills and ability to think. From infancy, young people must learn how to concentrate – on objects and on the other people. This process of improving concentration skills can take different forms and can be aided by the many different learning that arrives in the course of people's lives and facilitates lifelong learning, for this it is very crucial to learn how to learn.

Due to advanced technology, we are able to get huge quantity of knowledge and information which was not possible in earlier times. The facilities for communication have been immensely increased, which have helped us to share knowledge. We can share our knowledge with persons in any corner of the world. As we know that more amount of information can produce more new knowledge, it is obvious that our future generation shall see relatively more intense knowledge explosion than what we see today.

To face the knowledge explosion the development of ability to think, memory skills are necessary. The human ability of associative memorization has to be carefully cultivated. In the agencies of education family comes first and then school. To develop problem solving ability and abstract thinking education must use constructivist approach to teaching.

Efforts are being made by the educationists as to how to improve teaching-learning methods so as to result in better understanding of the concepts and better learning skills. This has led to *'constructivism'* as a trend in the pedagogy where teacher's role is that of a facilitator and the students 'construct' their own understanding and are made responsible for their own learning. Bruner, Ausubel and Vygotsky are the psychologists who advocate constructivism.

Constructivism holds that learning process is active and interactive. Information may be imposed, but understanding cannot be, for it must come from within. Von Glaserfeld (1984) states, "……. *Learners construct their understanding. They do not simply mirror and reflect what they are told or what they read. Learners look for meaning and will try to find regularity and order in the events of the world even in the absence of full or complete information."*

Learners look for meaningful learning. Meaningful learning means the learning that makes a difference – in one's mind and one's life. We should facilitate meaningful learning which changes one's brain structure, forces one to think. J. Novak states, "…..*Meaningful learning underlies the constructive integration of thinking, feeling and acting leading to empowerment for commitment and responsibility".* Meaningful learning occurs when the learner chooses to relate new information to ideas the learner already knows. Rote learning occurs when the learner memorizes new information without relating it to prior knowledge. Meaningful learning has three requirements, viz., relevant prior knowledge, meaningful material and learner's choice to learn meaningfully. Only high levels of meaningful learning lead to creative work.

The good learning of specific scientific subject requires not only the knowledge of different concepts that the subject contains, but also the adequate relation among such concepts in order to obtain a satisfactory meaning of them. In this sense, it makes necessary to look for methodologies to achieve an effective instruction, that is, a teaching that conduces to meaningful learning. Concept mapping is one such effective constructivist approach to teaching of science.

Concept maps are two-dimensional graphical representation of a knowledge in a given domain (Novak and Gowin, 1984) developed for achieving meaningful learning in classroom

(Ausubel, et.al. 1978). According to Ausubel, meaningful learning involves a conscious effort on the part of the learner to relate new knowledge in a non-arbitrary way to relevant existing concepts in the learner's cognitive structure while rote learning results in arbitrary incorporation of new knowledge into cognitive structure of the learner. Concept mapping has been developed based on the cognitive assimilation theory for classroom learning proposed by Ausubel with the fundamental assumption: "*The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly*" (1978). Meaningful learning helps to retain the concepts for longer time, makes learning easier, enables learner to build a useful knowledge structure which is valued over rote learning. Concept maps give a global picture of student's conceptual understanding rather than a piecemeal depiction of isolated facts (Mintzes, Wandersee and Novak, 1998).

Why to use Concept mapping strategy as Advanced pedagogy?

1. Effective pedagogy equips learners for life in its broadest sense. Concept mapping strategy helps individuals and groups to develop the intellectual, personal and social resources that will enable them to participate as active citizens, contribute to economic development and flourish as individuals in a diverse and changing society.

2. Effective pedagogy engages with valued forms of knowledge. Concept mapping strategy engages learners with the big ideas, key skills and processes, modes of discourse, ways of thinking and pracicing, attitudes and relationships, which are the most valued learning processes and outcomes in particular contexts.

3. Effective pedagogy recognizes the importance of prior experience and learning. Concept mapping strategy takes account of what the learner knows already in order for them, and those who support their learning, to plan their next steps. This includes building on prior learning but also taking account of the personal and cultural experiences of different groups of learners.

4. Effective pedagogy requires learning to be scaffold. Teachers, trainers and all those, including peers, who support the learning of others, should provide activities, cultures and structures of intellectual, social and emotional support to help learners to move forward in their learning. Collaborative concept mapping strategy serves this purpose.

5. Effective pedagogy needs assessment to be congruent with learning. Concept mapping strategy helps to advance learning as well as determine whether learning has occurred.

6. Effective pedagogy promotes the active engagement of the learner. Concept mapping strategy promotes the learners' independence and autonomy.

7. Effective pedagogy fosters both individual and social processes and outcomes. In collaborative concept mapping strategy learners are encouraged and helped to build relationships and communication with others for learning purposes, in order to assist the mutual construction of knowledge and enhance the achievements of individuals and groups. Consulting learners about their learning and giving them a voice is both an expectation and a right.

Concept Mapping: An Advanced Pedagogy for Future Teacher Education

Concept mapping was developed by Novak and his team of researchers at Cornell University, Ithaca, New York. The concept mapping was developed based on Ausubel's (1968) Assimilation theory of cognitive development. Concept mapping is a technique for representing knowledge in graphs. Knowledge graphs are networks of concepts. Networks

consist of nodes (points/ vertices) and links (arcs/ edges). Nodes represent concepts and links represent the relations between concepts.

Concepts and sometimes links are labeled. Links can be non-, uni- or bi-directional. Concepts and links may be categorized; they can be simply associative, specified or divided in categories such as causal or temporal relations. Concept mapping can be done for several purposes:

- to generate ideas (brainstorming, etc.);
- to design a complex structure (long texts, hypermedia, large web sites, etc.);
- to communicate complex ideas;
- to aid learning by explicitly integrating new and old knowledge;
- to assess understanding or diagnose misunderstanding.

Concept mapping is a process of meaning making. A concept is a perceived regularity in events or records of events or objects, designated by a Label (Nov 1984). Key to the construction of a concept map is the set of concepts on which it is based.

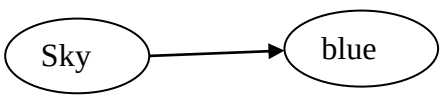
Coming up with the list of concepts to include in a map is really is just an issue of retrieving from long term memory. It is the process of linking the concepts to create meaningful propositions within the structure of concept map that is the difficult task.

Ausubel assumes that meaningful learning requires that the learner's cognitive framework contain relevant ideas to which new material can be related. He argues that the most important factor influencing learning is what the learner already knows. Meaningful learning results when the learner makes a conscious effort to relate new knowledge to be learned with relevant knowledge they already possess. In contrast, rote learning results when the learner memorizes the new information and makes little or no effort to relate and integrate this with their prior knowledge. Information learned by rote is soon forgotten and there is little chance for the application of this knowledge in new problem solving contexts (Nov 1998).

Concept mapping is the process of organizing concepts and relationships between concepts in a hierarchical manner, from more inclusive concepts to more specific, less inclusive concepts (Novak &Gowin, 1984). Concept maps are hierarchical in that the more general, more inclusive concepts are at the top of the map, with progressively more specific, less inclusive concepts arranged below them. The hierarchical organization of concepts in a concept map is supposed to reflect the hierarchical organization of knowledge in cognitive structure while links between concepts demonstrate the manner in which new concepts are integrated with existing knowledge structure.

Concept maps are intended to represent meaningful relationships between concepts in the form of propositions. Propositions are two or more concept labels linked by words in a semantic unit. Concept map simply means concepts connected by a linking word to form a proposition. e.g. "Grass is green" would represent a simple concept map forming a valid proposition about the concepts "grass" and "green".

is



A concept map is a schematic device for representing a set of concept meanings embedded in a framework of propositions**. *Concept maps make the key ideas clear to both students and teachers.*** It is a kind of visual road map. After a learning task has been completed, concept

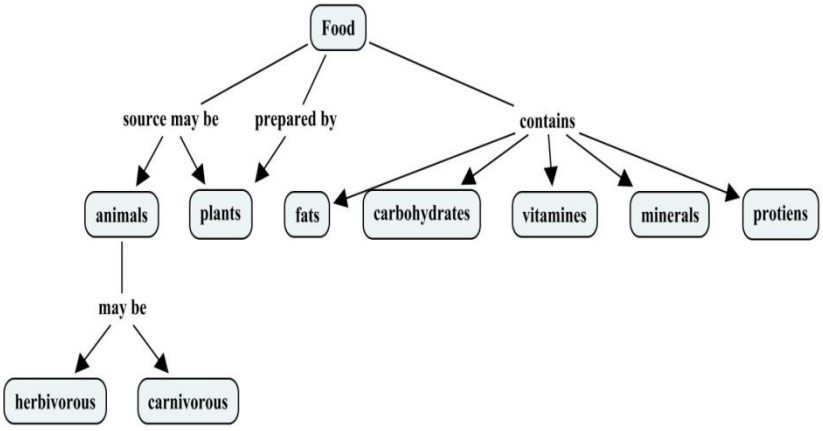
map provide a schematic summary of what has been learned. Meaningful learning proceeds most easily when new concepts are included under broader, more inclusive concepts. Concept maps are hierarchical; that is, the more general concepts are at the top of the map with progressively more specific concepts arranged below them. Concept mapping can be a creative activity and may help to foster creativity as students and teachers recognize new relationships and hence new meanings can be recognized.

In understanding the value and purpose of concept mapping, an awareness of the important role of the language in exchanging information is central. When we recognize that we have grasped a new meaning and feel the emotion educative value is experienced. Usually the feelings are positive, but sometimes they may be negative feelings if we recognize how wrong our previous conceptions may have been.

The making and remaking of concept maps and sharing them with others can be seen as a team effort in thinking. Concept maps allow teachers and learners to exchange views on why a particular proportional linkage is good or valid, or to recognize missing linkages between concepts. ***Concept maps are effective tools for showing misconceptions***. Misconception means a linkage that misses the key idea relating to two or more concepts.

Concept maps are also helpful for negotiating meanings. Negotiate means to arrange for or bring about through conference, discussion and compromise. Learning the meaning of concepts requires exchange, sharing and sometimes compromise. Meaning can be shared, discussed, negotiated and agreed upon. ***When concept mapping is done in small groups it can lead to lively classroom discussion.*** Students always have something of their own for the negotiation; they are not as empty containers to be filled. Both the teachers and students need to recognize the value of prior knowledge to acquire new knowledge. Concept maps are helpful to students for negotiating meaning with their mentors.

Concept map on Food



Conclusion

Concept Mapping has proven to be an effective pedagogical tool and a metalearning strategy useful for many subjects (Ritche and Volkl, 2000; Gardgill and Jitendra, 1999; Novak, 1990). Based on assimilation theory the concept maps are rooted in the principle that the single most important factor influencing learning is what the learner already knows (Bayram, 1995).

Researches have suggested that concept maps can be used to facilitate meaningful learning. (Abram, 2001). The educators can find multitude uses of concept maps in their classrooms.

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