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Concept Map: An effective graphic organizer tool in teaching and learning

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Abstract

Graphic organizers guide learners' thinking as they fill in and build upon a visual map or diagram. Graphic organizers are some of the most effective visual learning strategies for students. A concept map is a graphic organizer that can enrich learners' understanding of a new concept and allow them to connect new concepts to the knowledge that they already have. Using visual organizer like concept map in the school classrooms helps learners to build up knowledge through active and meaningful learning. This Article explains the concept map as a visual learning tool and provides a framework for using concept map for meaningful learning. It also includes a step- by–step guide to construct concept map in the classroom.

Keywords: Concept map, Graphic organizer, Visual learning tool

Introduction

Visual thinking is a learning style where the learner better understands and retains information when ideas, words and concepts are associated with images. Research tells us that the majority of students in a regular classroom need to see information in order to learn it. Some common visual learning strategies include creating graphic organizers, diagramming, mind mapping, outlining and more. These strategies help students or all ages better manage learning objectives and achieve academic success. As students are required to evaluate and interpret information from a variety of sources, incorporate new knowledge with what they already have learned, and improve writing skills and think critically, visual learning tools help students meet those demands. Paired with the brain's capacity for images, visual learning strategies help students better understand and retain information.

Graphic organizers

Graphic organizers guide learners' thinking as they fill in and build upon a visual map or diagram. Graphic organizers are some of the most effective visual learning strategies for students and are applied across the curriculum to enhance learning and understanding of subject matter content. In a variety of formats dependent upon the task, graphic organizers facilitate students' learning by helping them identify areas of focus within a broad topic, such as a novel or article. Because they help the learner make connections and structure thinking, students often turn to graphic organizers for writing projects.

In addition to helping students organize their thinking and writing process, graphic organizers can act as instructional tools. Teachers can use graphic organizers to illustrate a student's knowledge about a topic or section of text showing areas for improvement.

In recent years graphic organizers such as diagrams, webs, maps, charts and concept maps have become valuable educational tools. Both teachers and students are encouraged to use graphic organizers to organize and present information visually because this often allows them to convey meaning in a way that would not be easy through words alone. For example, elementary school teachers use them to help even the youngest students understand cause and effect in literature so that children can retell the stories in their own words. And high school teachers can use graphic organizers to help their students understand and explain complex scientific principles.

With the increased access to computers and the Internet in schools, software programs and Web resources have been designed specifically to help teachers bring this process of thinking and learning into the classroom. Computer programs such as Inspiration can be used to quickly, easily, and very neatly convey meaning to an audience.

Definition of a Graphic Organizer

A graphic organizer is a visual display that demonstrates relationships between facts, concepts or ideas. A graphic organizer guides the learner's thinking as they fill in and build upon a visual map or diagram. They are also informally used as a term to describe all visual learning strategies such as concept mapping, webbing, mind mapping, and more.

Types of Graphic Organizers

Webs, concept maps, mind maps and plots such as stack plots and Venn diagrams are some of the types of graphic organizers used in visual learning to enhance thinking skills and improve academic performance on written papers, tests and homework assignments.

Graphic Organizers can be used to promote higher order thinking skills. This chart can be referred to determine the type of organizer can be used to reach each level of Bloom's Taxonomy.

Bloom's Level	Type of Graphic Organizer	Purpose
Knowledge	Spider Maps Linear String	to describe item; to describe a sequence of events, continuum, storyboard, cycle
Comprehension	Hierarchy Diagram	to classify items
Application	Flowchart	to predict sequence of events
Analysis	Fishbone Map Concept Map	to identify causal relationships to explain relationships
Synthesis	Idea Map	to solve or plan
Evaluation	Venn Diagram Comparison Matrix	to compare/contrast two items to compare/contrast two or more items

Source: http://members.whro.net/~pterry/vwc/week7/Gos.htm

How to use graphic organizers?

Graphic organizers are tools that can be used to visualize and organize information. Because graphic organizers are often used as prompts for students to fill in the blanks, graphic organizers provide many benefits to students who use them including:

- Helping students structure writing project
- Encouraging students to make decisions
- Making it easy for students to classify ideas and communicate
- Allowing students to examine relationships
- Guiding students in demonstrating their thinking process
- Helping students increase reading comprehension
- Making it easy to brainstorm
- Encouraging students to organize essential concepts and ideas
- Making it clear how to break apart a story into the main elements (intro, rising action, climax, etc.)

Steve Aedy states that By using graphic organizers, students can learn to:

- Visualize the general concept and break it down into manageable, specific ideas.
- Analyze the correlation between two ideas or themes.
- Structure their writing projects better and make the entire process easier.
- Communicate their ideas.
- Visually represent their thinking process.
- Explore all possible options by brainstorming.
- Determine the validity, relevance, and correlation of evidence.
- Enhance understanding when reading and writing.
- Easily identify the main elements of a composition.
- Evaluate cause and effect.
- Compare and contrast ideas.
- Implement problem solving skills
- Enhance organizational skills
- Expand their vocabulary.
- Recognize sequences, hierarchies, and patterns.

Teachers can use graphic organizers to teach many things, including but not limited to:

- Cause and effect
- Note taking
- Comparing and contrasting concepts
- Organizing problems and solutions
- Relating information to main themes and ideas
- Organizational skills
- Vocabulary knowledge
- Sequencing

Concept mapping

Concept mapping is Used as a learning and teaching technique, concept mapping visually illustrates the relationships between concepts and ideas. It is often represented in circles or boxes, concepts are linked by words and phrases that explain the connection between the ideas, helping students organize and structure their thoughts to further understand information and discover new relationships.

Generally most concept maps represent a hierarchical structure, with the overall, broad concept first with connected sub-topics, more specific concepts, following.

Definition of a Concept Map

A concept map is a type of graphic organizer used to help students organize and represent knowledge of a subject. Concept maps begin with a main idea (or concept) and then branch out to show how that main idea can be broken down into specific topics.

Benefits of Concept Mapping

Concept mapping serves several purposes for learners:

- Helping students brainstorm and generate new ideas
- Encouraging students to discover new concepts and the propositions that connect them
- Allowing students to more clearly communicate ideas, thoughts and information
- Helping students integrate new concepts with older concepts
- Enabling students to gain enhanced knowledge of any topic and evaluate the information

Constructing The Concept Map

Concept maps are typically hierarchical, with the subordinate concepts stemming from the main concept or idea. This type of graphic organizer however, always allows change and new concepts to be added. The Rubber Sheet Analogy states that concept positions on a map can continuously change, while always maintaining the same relationship with the other ideas on the map.

Although there is not only one best method for constructing the concept map (different combinations of interactions, question styles and activities), but it can be easily constructed in the classroom by taking following steps:
A comprehensive and simple Example of Creating a Concept Map prepared by Gaur J, Surana is presented here

Determining the context (main idea, topic or issue to focus on):
A good way to define the context for a concept map is to construct a focus question that is, a question which clearly specifies the problem or issue that needs to be solved. A good focus question can leads to a much richer concept map. Once a topic or question is decided, it will help with determining the hierarchical structure of the concept map.

Identifying key concepts
After determining the context, the next step is to identify the key concepts that connect and relate to the main idea and listing of them.
Figure I, is an example of an initial set of concepts for a concept map about fish.

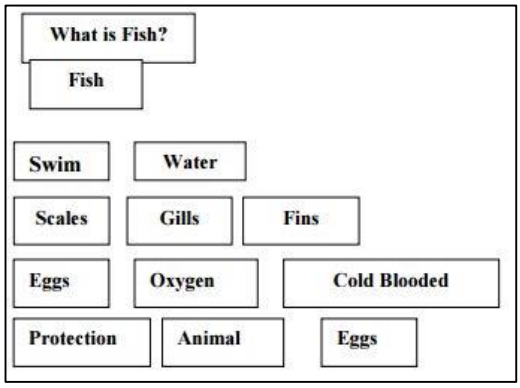

Fig 1: Concepts for a concept map about fish

Ranking the concepts
Concept maps tend to be hierarchical in nature, with more general concepts at top and more specific concepts to the bottom. The listed concepts (in Figure I) can now be ranked into an ordered list (with more general concepts at top and more specific concepts to the bottom).
This ranking can be in the form of a list, or an approximate location for some of the concepts on the map, as shown in figure II. It helps to begin the process of map construction.

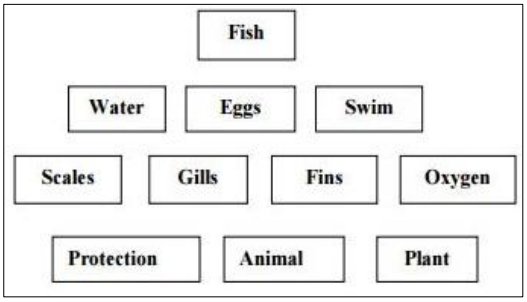

Fig 11: Concepts placed in approximate ranking (More general to more specific.

Constructing a concept map
The next step involves connecting the concepts, using linking words or linking phrases to create propositions (meaningful statements).
For example:

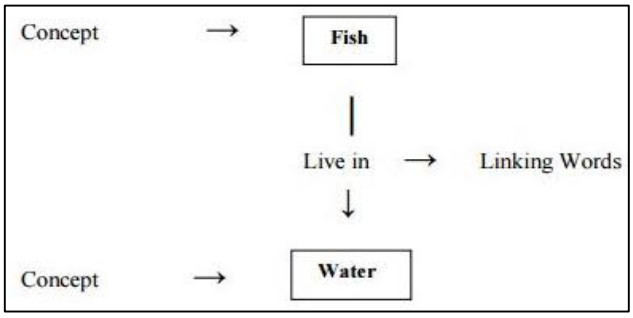

Fig 3: Shoking concepts and linking words

"Fish" and "Water" are concepts and "lives in" are linking words, and together they form the proposition- "Fish live in Water". It needs to be noted that in concept mapping there is no predefined or fixed list of linking words.
As the concept map is created, concepts are moved around, added, removed and redefined.
Figure IV shows the few linking words added to the concepts forming propositions

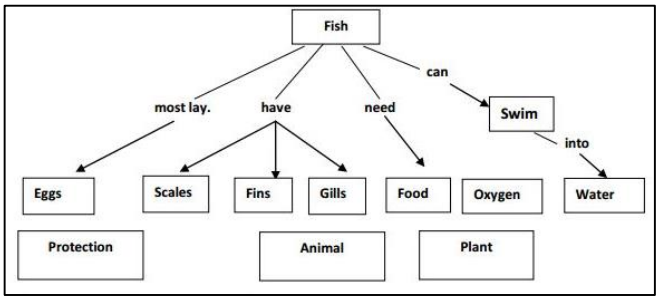

Fig 4: linking words are added to join concepts forming propositions

The process of constructing the concept map continues by linking the rest of the concepts with the help of linking words, adding other concepts as showing in figure V.

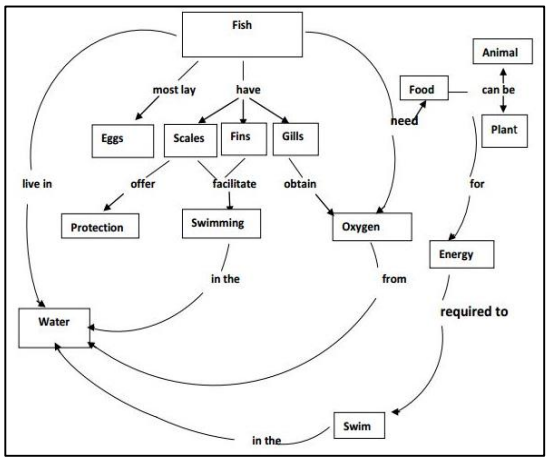

Fig 5: completed (but not find) concepts map about fish

Figure V shows a completed but never finished concept map. It is noticeable that, compared to figure IV, some more concepts have been added, others have been move around and cross links have been added.

Thus, above mentioned concept making process can make abstract knowledge and understanding visible to underpin its utility. It is beneficial for both students and teachers. Students are helped to understand the topic and also to learn what is expected of them (i.e. the grasp of understanding and the construction of meaning). Teachers are able to find out whether or not their teaching facilitates meaningful learning, and, if not, what needs to be changed so that it does.

Concept Maps in Education

When created correctly and thoroughly, concept mapping is a powerful way for students to reach high levels of cognitive performance. A concept map is also not just a learning tool, but an ideal evaluation tool for educators measuring the growth of and assessing student learning. As students create concept maps, they reiterate ideas using their own words and help identify incorrect ideas and concepts; educators are able to see what students do not understand, providing an accurate, objective way to evaluate areas in which students do not yet grasp concepts fully

Conclusion

Visual symbols are quickly and easily recognized, and this can be demonstrated by considering the large amount of logos, maps, arrows, road signs etc., that most of us can recall with little effort. Visual representation also allows the development of a holistic understanding that words alone cannot convey, because the graphical form allows representations of parts and whole in a way that is not available in sequential structure of text (Lawson, 1994). Thus, we can say that, concept map which is one of the types of graphical organizers, can work as a powerful tool for visual learning that helps to encourage meaningful learning, development of a holistic understanding and to create new knowledge.

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