Mind Maps in Classroom Teaching and Learning

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Abstract

Mind Mapping is a learning technique which uses a non-linear approach that encourages the learner to think and explore concepts using visual-spatial relationships flowing from a central theme to peripheral branches which can be inter-related. The new millennium is being called the Millennium of the Mind, and Mind Mapping is becoming widely accepted in schools, industry and government. The great advantage of a Mind Map is that it literally "maps" the way a person's brain sees and creates connections; once mastered, it brings incredible clarity and ease to decision-making process, using all of the ways the brain processes information - word, image, logic, number, rhythm, colour and spatial awareness, so that the person is literally thinking with his or her whole brain. Because of these benefits, the use of Mind Mapping holds promise as a technique to aid students in learning.

Keywords: Learning technique, organized information, effective approach, tool of understanding, visual symbol.

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Introduction

Creating an environment that engages students in the learning journey is always challenging and not always easy. A Mind Map is a visual diagram used to record and organize information in a way which the brain finds captivating and easy to process. Thoughts, ideas or facts are laid out around a central theme so that a person can clearly 'see' their flow across different levels. Unlike linear methods for recording information, a Mind Map does not rely on large amounts of written text but instead uses lines, symbols, key words, color and images all according to simple, brain-friendly concepts. The technique was invented and popularized by author and expert Tony Buzan in the 1970s and is now used worldwide in business, at school or at home.

Mind Maps are built around several key elements which have been proven to play an important role in unleashing thinking capacity. Mind Mapping provides an effective approach for promoting better understanding in learning and training. Its flexibility also means that it possesses several uses when teaching. Mind Maps (or similar concepts) have been used for centuries, for learning, brainstorming, visual thinking and problem solving by educators, psychologists and people in general. People have been using image-centered radial graphic organization techniques referred to variably as mental or generic mind maps for some areas.

The term "Mind Map" was first popularized by a British psychologist and author Tony Buzan but the use of diagrams that visually map information using branching and radial maps traces back centuries. These pictorial methods record knowledge and model systems, and have a long history in learning, brainstorming, memory, visual thinking, and problem solving by educators, engineers, psychologists, and others. Buzan (1993) argues that traditional outlines rely on the reader to scan left to right and top to bottom, while what actually happens is that the brain

will scan the entire page in a non-linear fashion. He also used popular assumptions about the cerebral hemispheres in order to promote the exclusive use of Mind Mapping over other forms of note taking.

A Mind Map is a diagram used to visually organize information. It is hierarchical and shows relationships among pieces of the whole. It is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those. Mind Maps can be drawn by hand, either as rough notes during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available. Mind Maps are considered to be a type of spider diagram.

In a Mind Map, the hierarchies and associations flow out from a central image in a free-flowing, yet organized and coherent, manner. Major topics or categories associated with the central topic are captured by branches flowing from the central image. Each branch is labeled with a key word or image. Lesser items within each category stem from the relevant branches. Mind Maps consist of frameworks of concepts connected either in a radial, hierarchical, linear, or nonlinear manner. A typical mind map is a visual representation of a central main topic from which nodes, sub nodes, groupings, branches or areas are classified with the goal of representing semantic information. This learning technique promotes greater creativity for all learners. Besides using plain text and words, use of colors, images, symbols, codes, lines, and other dimensions throughout the map aid in conceptualization. Buzan (1993), the inventor of Mind Maps, claimed that Mind Mapping is vastly superior to traditional note-taking methods. Mind Mapping uses the full range of left and right human cortical skills, balances the brain, and taps into the alleged 99% of a person's unused mental potential, as well as intuition.

Mind Mapping was developed as an effective method for generating ideas by association.

In order to create a Mind Map, one usually starts in the middle of the page with the central theme/main idea and from that point one works outward in all directions to create a growing diagram composed of keywords, phrases, concepts, facts and figures.

Mind Mapping can be used for assignments and essay writing especially in the initial stages, where it is an ideal strategy to use for thinking. It can also be used for generating, visualizing, organizing, note-taking, problem-solving, decision-making, revising and clarifying a university course topic, so that the instructor can get started with assessment tasks. Essentially, a Mind Map is used to 'brainstorm' a topic and is a great strategy for students.

Related Literature

The value of Mind Mapping is noted throughout the literature. One teaching and learning strategy that has recently emerged in higher education as a means to support student critical thinking is the nonlinear learning technique of Mind Mapping (Pudelko, 2012). The radiant structure of a Mind Map with explicit branches promotes associations. The use of color for different categories can also make more powerful associations (Driscoll, 2000). It has been determined that if students are offered control over their map constructions, the maps have a positive impact on student achievement because they embody meta-cognitive models with certain structures (Mona & Khalick, 2008).

The use of emphasis in a Mind Map, for example with thicker main branches and larger printing, can also foster recall of information. The focus on using single key words can foster more expansive connections and confining the entire Mind Map to a single piece of paper allows one to see the entire picture at once and perhaps stimulate additional associations. Friedrich (1995) counts this method as one of the information processing strategies with which information is permanently stored in memory by sophisticated processing.

In his study on the improvement of critical thinking skills, Carl Savich (2009) noted that

the focus on critical and independent thinking was an effective way for teachers to maximize the engagement of the students in his class. Specifically, Savich utilized role-playing and simulations to convey material to the students - a process which required all students to be engaged in a more critical manner of thinking. Savich concluded that his inquiry method of teaching allowed even the least confident students in his class to feel connected to the material, which in turn allowed them to see "the bigger picture" of history. In the same manner, Thinking Maps allow for students to feel more connected to the material, as it forces them to map out their thought process on paper, which leads to an increase in connections between content and experience.

Goodnough and Woods (2002) discovered that students perceived Mind Mapping as a fun, interesting and motivating approach to learning. Several students attributed the fun aspect to the opportunity to be creative when creating Mind Maps through a great deal of choice in colour, symbols, key words and design. Drawing upon this idea, Al-Jarf (2009) investigated the impact of using Mind Mapping software on EFL freshman students' acquisition of English writing skills. The findings revealed that the written work produced by students using Mind Mapping included more relevant detail and better organized and connected ideas than the work of the control group. Mind Mapping raised the performance of students at all levels of ability as they became more efficient in generating and organizing ideas for their writing. The students also displayed a positive attitude towards using Mind Mapping as a pre-writing activity.

Buzan (1993) has always been passionate about using key words in Mind Maps rather than phrases or a collection of words. Buzan states that a key word is essentially a word that will trigger as much relevant meaning as possible. By using key words in a Mind Map, a student opens up his or her thinking and stimulate his or her mind to dig deeper and see greater detail on thoughts that were previously vague. This can be a difficult process when the key word is

trapped in a sentence. It is also far easier to remember single words and striking headlines than to remember long sentences.

How to Draw a Mind Map

According to Buzan (1993), a Mind Map should be drawn on blank paper that is larger than standard 8 ½ by 11 inch paper. The rationale behind using a large sheet of paper is that it allows the student the opportunity to break away from the boundaries established by standard sized paper. The medium for drawing the Mind Map is usually colored pens or pencils. Students begin by drawing an image in the center of the paper that reflects the central theme, or topic, of the Mind Map which is to be created. By placing this central image in the center of the paper, it allows the students 360 degrees of freedom to develop their Mind Maps. Next, the student draws main branches with key words extending from this central image. The branches represent different categories which the student perceives as being relevant to the content of the key concept of the mind map. From these main branches, sub-branches are created:

- Place the central theme/main idea or controlling point in the center of the page. It may be easier to place the page on the side, in landscape orientation, which is easier for drawing purposes.
- Use lines, arrows, speech bubbles, branches and different colors as ways of showing the connection between the central theme/main idea and ideas which stem from that focus. The relationships are important, as they may form essay paragraphs.
- Avoid creating an artistic masterpiece; draw quickly without major pauses or editing. Chances are, the first idea was fine and placed in the direction or on the branch you thought made the most sense. It is important in the initial stages of mind mapping to consider every possibility, even those you may not use.

- Choose different colors to symbolize different things e.g. choose blue for something that must be incorporated in the paper, black for other good ideas, and red for the things that need need to research or check confirmation from a tutor/ lecturer. Try to remain consistent so that better reflection on the mind map can occur at a later stage.
- Leave some space on the page. The reason for this is that one can continue to add to the diagram over a period of time. If A4 sized paper feels too small, may A3 be used.

Classroom Application

The adoption of Mind Maps in teaching has grown recently due to the benefits of using Mind Maps to learn and the availability of free online Mind Mapping software. Using Mind Mapping for lesson planning can help teachers or trainers identify a logical plan or teaching route and increases recall of the subject matter. This can boost teaching confidence and facilitate the smooth running of programs. As a pedagogical tool, the visibility of Mind Mapping provides an effective approach for promoting better understanding in students. Its flexibility also means that it possesses several uses in the classroom.

Boyson (2009) asserted that using Mind Mapping for lesson planning can help teachers or trainers identify a logical plan or teaching route and increases recall of the subject matter. This can boost teaching confidence and facilitate the smooth running of programs.

Researchers, Goodnough and Long (2002), found Mind Mapping to be a useful strategy for introducing new concepts, providing a whole-class focus for a large research project, assessing learning of individuals and offering greater choice in how people chose to complete assignments and projects.

D'Antoni and Pinto Zipp (2005) recommend that educators incorporate Mind Mapping into their curricula since it is easy to use and involves no cost. There are several options for utilizing the technique - 1) pre-lecture format – integrating concepts from assigned readings prior

to review by instructor; 2) post-lecture format – integrating concepts from assigned readings and material previously reviewed by instructor; and 3) case presentations.

While researching the applications of Mind Mapping in executive education, Mento et al (1999) observed that a number of executive students made clear and compelling presentations using only a transparency of their Mind Map, without fumbling about with notes. These students were able to handle challenging questions with confidence. Their ability to handle the presented material in such an effective way was attributed to better recall of the information because it had been captured and stored in an integrated, radiating manner rather than linearly. Students could internalize it better because it was their unique representation of the information.

Planning

A teacher must design her class curriculum for the school year or planning an assignment timeline. Mind Maps gives her a clear and visual overview of what needs to be covered. Mind Maps are the perfect tool to create structure and organization of a topic. By using Mind Mapping to plan her teaching, a teacher can reduce the amount of notes she takes into clear, concise plans which are easy to follow. She can also use a Mapping software tool, using which she can make organized teaching plans even easier, as she can access all of her notes, files and education website links from within one Mind Map.

Teaching

Mind Maps are ideal for teaching and presenting concepts in the classroom as they provide a useful focus for students, delivering an overview of the topic without superfluous information. Online Mind Maps can be used in class to brainstorm and generate discussions. This will encourage students to participate but also to fully understand a topic and its nuances by creating connections between ideas. Perfect for introducing a new subject in a way which is accessible and easy to follow, Mind Maps are an excellent way to present concepts and ideas. A

teacher can be sure to keep her students engaged and amazed as her branches smoothly animate to show her next point. Mind Maps that have been created online can easily be printed and shared with students as handouts. Notes in the Mind Map can built on by students in class.

Classroom presentation is a brilliant way to develop student's communication skills. However, students can easily become bored listening to others present. Mind Maps act as visual information providers and encourage the audience to engage with the material that is being presented. Mind Maps have been embraced in the realm of education as a learning tool which help students reinforce knowledge by making connections between different areas and delving in-depth into an area.

A great way to use Mind Maps for assessment is to ask students to express their ideas about a topic in a Mind Map before and after a class. Students will retain the information better and it will also reassure teachers that students remember and understand the knowledge. It is important to assess knowledge at the beginning of a topic and after to monitor students' understanding. Mind Mapping is a key tool for this concept, of preview and review/pre and post learning. Mind Maps encourages students to express ideas, from special needs and highly gifted students, and provides an accurate barometer of topic adoption.

A Mind Map is an excellent tool for collaborating with others to develop plans or implement key projects. It allows one to harness the input of all members of a group in a dynamic and creative way. When used for group brainstorming sessions, Mind Mapping enhances critical thinking and co-operation as well as providing a solid basis for collaborative problem-solving.

Using Key Words

Buzan (1993) has always been passionate about using key words in Mind Maps rather than phrases or a collection of words. He states that a key word is essentially a word that will

trigger as much relevant meaning as possible. So by using key words in a Mind Map, one opens up his or her thinking and stimulates the mind to dig deeper and see greater detail on thoughts that were previously vague. This can be a difficult process when the key word is trapped in a sentence. It's also far easier to remember single words and striking headlines than to remember long sentences.

Research on note-making and note-taking conducted by Howe (1970) revealed that key word notes personally made or given to students were far more effective in terms of the understanding and recall they engendered than complete transcript notes or sentence summary notes. He points out that by trying to choose a word to most appropriately convey a subject, we are forced to think more actively than if we are just copying or gathering information. The discipline of selecting a key word helps to focus the mind on the analysis and processing of the subject whereas there is a tendency to slack on our thinking while using sentences. All in all, using key words turns note-taking into a selective process which minimizes the volume of words written down and maximizes the amount recalled from those words.

Mind Maps are based on associations and connections. Once ideas are displayed in Mind Map form, patterns of thought can be easily examined revealing similarities and linkages between information in different parts of the map. By encouraging people to link apparently different ideas and concepts in this way, Mind Mapping actually promotes divergent and highly creative thinking.

Using Colours

Using colour makes the Mind Map far more interesting to look at and therefore much more engaging. It is an element of fun and it makes learning more enjoyable and also induces thinking activity. Having different coloured branches on the Mind Map will help to differentiate the different themes, topics and ideas and the colours are used to classify. Coloured Mind Maps

stimulate the memory and are easier to recall. Colour tends to be processed by the right side of the brain and instead of using single colour, the multi coloured Mind Maps stimulate the brain more. Colours make Mind Maps more effective and doing a Mind Map in 'monotone', as Buzan likes to refer it as monotonous, will still give tremendous benefits. Psychologists have documented that colour helps us to process and store images more efficiently than colourless (black and white) scenes and remember them better as a result.

There are several research studies that demonstrate the value of colour**.** For instance**,** a study conducted in the realm of business by Xerox Corporation and International Communications Research in 2003 uncovered the following results from participants:

• 92% believe colour presents an image of impressive quality.

• 90% feel colour can assist in attracting new customers.

• 90% believe customers remember presentations and documents better when colour is used.

• 83% believe colour makes them appear more successful.

• 81% think colour gives them a competitive edge.

• 76% believe that the use of colour makes their business appear larger to clients.

Using Symbols and Icons

It has been said that a picture is worth 1,000 words. A symbol or icon, attached to a topic within the mind map, can convey much more meaning and context, which can be quickly understood by the brain. Symbols and icons are also a powerful way to categorize the contents of the map, Icons and images stimulate associations and creativity.

Mind Mapping emphasizes visual imagery so, to get the best out of the technique, it's highly recommended that one add fun and descriptive pictures, drawings, symbols and doodles to the Mind Maps. Using imagery stimulates the brain's visualizing capacity which brings enormous creative benefits and enhances the memory's storing and recalling capabilities.

Words and images together make Mind Maps a rich visual medium for creative expression. The Wharton School (1981) completed a study that proved the benefits of utilizing visual elements in presentations and tightly integrating them with words. By comparing visual presentations with verbal presentations, the results were vastly in favour of visualizations. Presenters who used visual language were perceived by the audience as more effective than those using no visuals – they were clearer, more concise, more interesting, more professional, more credible and better prepared. Icons add clarity and contextual meaning to topics and can be quickly understood by the brain. These small visual symbols such as ticks, crosses, circles, triangles or more detailed and descriptive symbols etc., reinforce the benefits of using imagery in the maps.

Research On Using Images

According to Anglin, Hossein and Cunningham (2004), our ability to remember images is far better than our memory for words. This picture superiority effect is validated by our research. Haber (1970) also supports the value of imagery. Haber showed his subjects a series of 2,560 photos. Later, subjects were shown 2,560 pairs of photos and asked in each case to identify which photo had been in the original group. The success rate for this test averaged between 85% and 95% showing that humans have an almost photographic memory when it comes to the recognition of pictures. McArdle (1993) found that adding visuals like maps or photos to a presentation increases the amount of retained information by as much as 55%.

Various Uses for Mind Mapping

- For taking notes in a lecture and listening for the most important points or keywords.
- For showing links and relationships between the main ideas in your subject.
- For brainstorming all the things already known about an essay question.
- For planning the early stages of an essay by visualizing all the aspects of the question.

- For organizing ideas and information and making it accessible on a single page.
- For stimulating creative thinking and creative solutions to problems.
- For reviewing learning in preparation for a test or examination.

Benefits of Mind Map

To achieve higher levels of concentration and creativity, together with greater organization and more concise communication, mind mapping might be an effective strategy for you to consider. The benefits of mind mapping are many and varied. It is giving an overview of a large subject/broad topic and allowing one to represent it in a more concise fashion. It is encouraging one to see the bigger picture and creative pathways. It is enabling one to plan/make choices about the selection of resource material one has for an assignment and where one is going to place it. It provides one with a more attractive and enjoyable form for the eye/brain to look at, muse over and remember. Mind maps are effectively used by these people.

The following might find mind maps useful:

- Parents wanting to aid their child's learning.
- Teachers looking to improve teamwork and communication in the classroom.
- Writers wanting to create original stories, articles and joke.
- Project managers wanting to present their ideas clearly to their team.
- Consultants and advisors trying to visualize their clients' situations.
- Entrepreneurs wanting to create a dynamic business plan.
- Marketers exploring potential avenues for promoting a product or service.
- Collaborative teams working on a project together.
- Event planners wanting to organize every aspect of an event.
- Students studying for exams, wanting to boost their learning capacity.

- Trainers preparing and presenting their materials using Mind maps which make their job easier and much faster.
- Brain storming in which more thoughts are generated and appropriately assessed.

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