Title: **Universal Access using Mind Mapping & Flow Charting Software**
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Software: Mind Mapping, Planning Organisation and Flow Charting Software
Category: Creating text with Mind Mapping, Planning Organisation and Flow Charting Software Supports

1. Introduction

Mind mapping (or creating a brainstorming diagram) involves writing down a central idea and generating new and related ideas which radiate out from the centre. By focusing on key ideas written down in the student's own words, and then looking for branches out and connections between the ideas, he or she is mapping knowledge in a manner which will help in better understanding and remembering new information. Icons and graphics can be used in some software programs, with linking arrows and tools to clearly show connections and relationships. Use of colour, text-to-speech, hyper linking, spell checkers and word guides also assist in the creation of maps and webs.
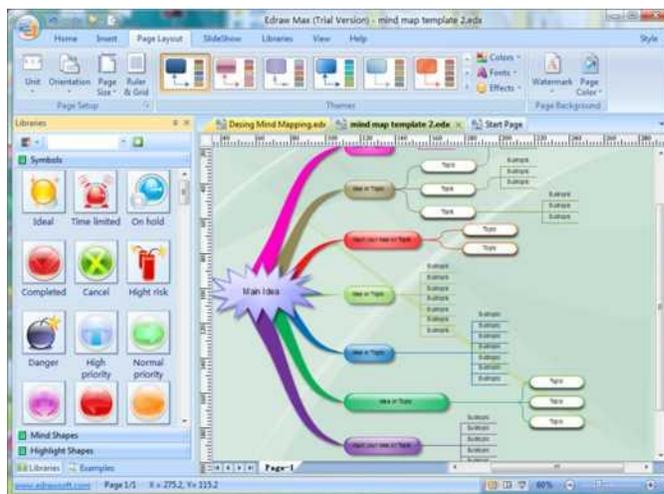
Programs differ in how they present the information. The graphical nature and representation appeals to some students as they can see part or the whole project, essay, assignment or research model that they are constructing, dissecting, studying, critiquing or analysing.

Some software companies predominantly offer tools that are involved with use of specific symbols, shapes and colours. Others provide clip art, graphics, photos and picture-based symbol palettes. *Kidspiration V3* provides tools for younger children where its sibling package, *Inspiration V8* extends the level of complexity and skills required, along with an expanded set of tools and more adult looking interface. Free programs such as *Edraw Min Map, Vym* and *XMind* offer students a chance to experiment with this genre of software, with portable apps such as *XMind* and *Freemind* (the latter two available on the *AccessApps* suite of programs that operate and launch from a USB drive).

2. Background and Definition of a Mindmap

'Mind mapping software is used to create diagrams of relationships between ideas or other pieces of information. It has been suggested that the mind mapping technique can improve learning/ study efficiency up to 15% over conventional note taking.
Some mind mapping software is 3D, though full 3D functionality is difficult to achieve with the forms of interface devices readily available to users. Some mapping programs incorporate other learning optimisation techniques including electronic flashcard style testing.'
[Source: http://en.wikipedia.org/wiki/List_of_mind_mapping_software]
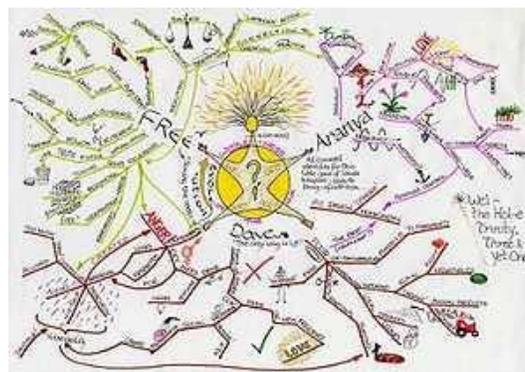
'A mind map is a diagram used to represent words, ideas, tasks, or other items linked to and arranged radially around a central key word or idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. The elements of a given mind map are arranged intuitively 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 recall of existing memories.

By presenting ideas in a radial, graphical, non-linear manner, mind maps encourage a brainstorming approach to planning and organizational tasks. Though the branches of a mindmap represent hierarchical tree structures, their radial arrangement disrupts the prioritising 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. 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, whereas concept maps are based on connections between concepts in more diverse patterns. [Source: http://en.wikipedia.org/wiki/Mind_Map]

3.   Implications for Users who Struggle When Creating Text

Students have been encouraged to write essays and school assignments in *MS Word* or other word processing programs such as *MS Works, AppleWorks* or *ClarisWorks*. It is a linear approach to note taking. Information can be arranged using numbering and bullets, with use of headings and sub headings and embedded text. Illustrations can be inserted in the form of digital media including photographs, clip art, maps and drawings.

The information is difficult to organise or reorganise for some students with skills in cutting and pasting required. The automatic and 'intuitive' bullet creation and numbering conventions can be frustrating and confusing in MS Word at times! Younger students thrive on programs such as *TextEase CT Essentials* [http://www.edsoft.com.au/shop/p14870/Textease-CT-Essentials-Single-User/product_info.html] as they can place their cursor anywhere and type. They can also drag onto their page a photo, video or sound file and rearrange them merely by clicking and dragging. It is a more natural and intuitive process.

4. Benefits of Mind Mapping and Flow Charting Software

The mind mapping, flow-charting and brainstorming programs that are available for free or at a cost provide a more visual and graphical interface. By simply clicking on the screen display, students can type text into a designated box or symbol. Dragging these ideas about, linking and unlinking them, deleting, moving, duplicating and rearranging them is more akin to working on a whiteboard with a Texta and eraser.

Their ideas, thoughts, opinions, suggestions and content is readily editable, albeit electronically. With the use of external drawing tablets (e.g. wireless *Wacom Cintiq*, *Bamboo* or *Graphire* models) and Interactive Whiteboards, these programs become even more powerful and inviting to users of all ages.

Lecturers, teachers, instructors and trainers can deliver content in more dynamic ways and provide greater interaction between the content and students. The capacity to link ideas to other pages as well as web pages and external programs provides for real time interaction with live data from spreadsheets and web sites (e.g. news broadcasts, sport, share prices or other volatile data).

Students enjoy being able to associate data types and like-thoughts to each other. Discussion and debate can take place with information being transformed immediately before their eyes using a variety or pre-formatted icons, symbols and coloured shapes. This data can then be saved as a map or web or converted to text for further editing in other online or offline word processing tools.

This genre has a place in current educational institutions with the new display media of LCD and plasma screens and monitors that provide large, clear displays. Use of data projectors onto walls, screens and particularly interactive devices provides for small group to 500-member audience presentations. Previously, educators have presented text in *MS Word* or *PowerPoint*. Manipulating information is so much faster and more intuitive using mind mapping software. It is dynamic and can be fun for everyone involved.

5. **Commercial and Free Mind Mapping Software**

Commercial Software for Younger Students:

Draftbuilder   www.donjohntson.com or www.spectronicsinoz.com - – predominantly text based organisational and planning with templates for structured writing scaffolding and supports, TTS and use of colour

Kidspiration V3   www.inspiration.com or www.edsoft.com.au - mind mapping using multiple templates and webs. Ideal for planning and organisation with extensive graphic library, thesaurus and TTS, caters to children Prep-Year 3 and those with special learning needs - (30 day free trial is available)

Kidspark   http://www.spark-space.com/edkidspark.shtml www.spectronicsinoz.com - Kidspark is a simplified version of the program for children up to the age of 10

Commercial Software – Secondary Students and Adults:

Inspiration V8   www.inspiration.com or www.edsoft.com.au (30 day free trial available)

It is a very powerful yet easy-to-use tool to visualize, think, organize and learn and has been widely used throughout the various states and territories in Australia for many years.

Inspiration is a very well regarded visual thinking and learning tool. Students rely on it in many Australian schools to plan, research and complete projects successfully. With the integrated *Diagram* and *Outline Views*, students create graphic organizers and expand topics into writing. This powerful combination encourages learning in multiple modes. As a result, most students gain and retain a better understanding of concepts and demonstrate knowledge, often improving their performance across the curriculum.

Students use Inspiration to:
  ❖ Plan and organize
  ❖ Research and evaluate
  ❖ Comprehend and communicate

It provides numerous curriculum-orientated templates for use in literacy, science, SOSE and mathematics. New features in Version 8 included improved text-to-speech, a word guide, more powerful and intuitive symbol finder as well as improved export facilities to MS Word and MS PowerPoint. Some extra online 'lessons and ideas' templates are freely downloadable. From http://www.inspiredlearningcommunity.com/node/730.
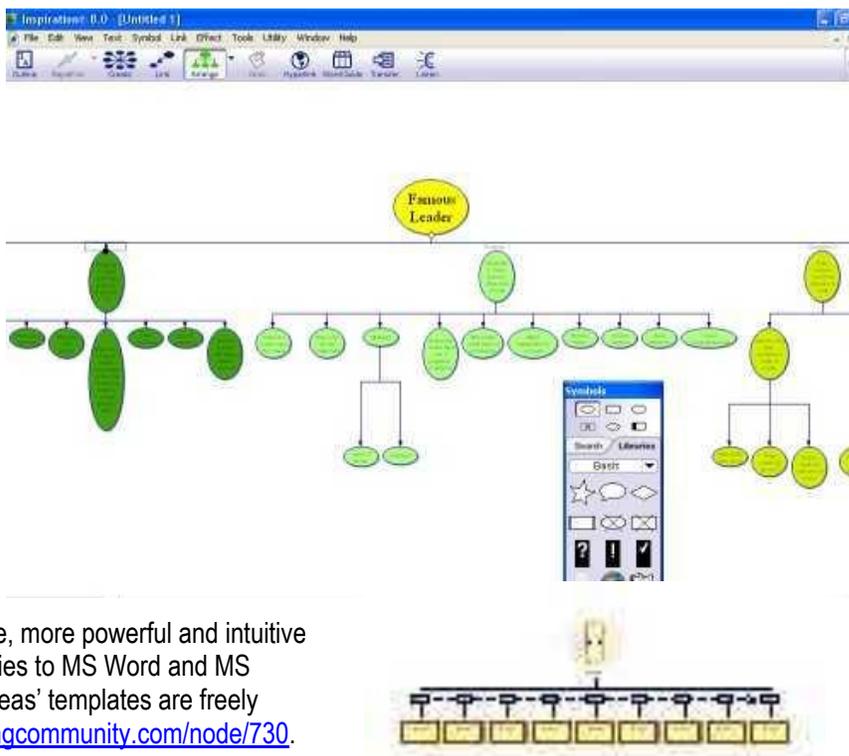
Inspiration can be introduced to students at Year Prep level, yet it caters to older students in Secondary and Tertiary levels as well. It has matured over the years and the current =version has a number of important features that cater to our students' needs.

Spark Space Education   http://www.spark-space.com/education.htm or www.spectronicsinoz.com

This set of programs was specifically designed to support people with dyslexia. It has a number of unique features.

Spark Educator captures all learning styles in the class and accelerates learning by presenting a lesson in conceptual and sequential format. Spark-Space's unique 3D view allows students to prioritise and maintain concentration.

Spark Educator is a teaching tool that works with a whiteboard allowing all learning styles and ability levels in a classroom to learn together.

Spark Educator has been designed for simple, uncomplicated use by teachers, with built in templates and animated tutorials to allow mastery in minutes. It harnesses the potential of all learners and accelerates learning.

Spark Learner helps the student to understand concepts, organise ideas and produce a finished, structured document. Spark-Space allows the student to learn independently or self-check work through its built in text-to-speech feature. Spark Learner is also an extremely useful tool for those with hidden disabilities such as dyslexia, often improving the learning process.
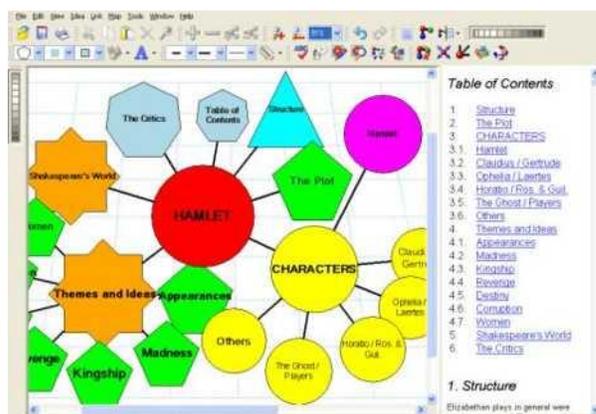
Spark Student has all the features of Spark Learner but also adds *Idea* and *Link Styles*, making dealing with large mind maps easier.

Spark-Space is available in Languages English (US), English (British), French, German, Dutch, Spanish, Portuguese and Japanese on Windows, Mac OS X and Linux/x86.

Rationale V2.05   http://rationale.austhink.com/ or www.edsoft.com.au

Rationale is an effective software tool for building students' critical thinking skills. It can be used throughout all curriculum programs at tertiary, secondary and primary levels of education.

Based on locally published research at *The University of Melbourne*, *Rationale* uses *argument mapping* to help students organise, structure and evaluate their reasoning, and communicate it with structure and clarity. In addition, it assists teachers by providing built-in guidance, critical thinking exercises and essay templates to make students' learning tasks easier, more engaging and enjoyable.

Rationale helps accelerate the development of rigorous critical thinking skills by providing a visual framework to organise information, structure reasoning and   evaluate evidence.

Freeware - programs

*Edraw Mind Map Freeware*   http://www.edrawsoft.com/freemind.php

Students can create mind maps (graphical representations of thought processes) for brainstorming, problem solving, rational analysis, and decision marking. *Edraw Mind Map* is a vector-based freeware with numerous practical examples and templates. It also offers easy to create basic flow charts, mind maps, brainstorming diagrams and sketch maps.

Benefits:
- Look for relationships - Use lines, colours, arrows, branches or some other way of showing connections between the ideas generated on the student's mind map. These relationships may be important in the student understanding new information or in constructing a structured essay plan. By personalizing the map with symbols and designs the student will be constructing visual and meaningful relationships between ideas that will assist in him or her recalling and understanding content.
- Draw quickly on unlined paper without pausing, judging or editing. All of these things promote linear thinking and the idea of mind mapping is to think creatively in a non-linear manner. There will be plenty of time for modifying the information later on but at this stage it is important to get every possibility into the mind map. Sometimes it is one of those obscure possibilities that may become the key to a student's knowledge of a topic.
- Some students find that using capital letters encourages them to get down only the key points. Capitals are also easier to read in a diagram. They may, however, wish to write down some explanatory notes in lower case. Some students do this when they revisit the mind map at a later date while others write in such things as assessment criteria in this way.
- Most students find it useful to turn their page on the side and do a mind map in "landscape" style. With the main idea or topic in the middle of the page this gives the maximum space for other ideas to radiate out from the centre.
- Some of the most useful mind maps are those where data is added to over a period of time. After the initial drawing of the mind map students may wish to highlight things, add information or add questions for the duration of a subject right up until exam time. For this reason, it is a good idea to leave space so as to further build the map and refine it.

CmapTools - http://cmap.ihmc.us/conceptmap.html
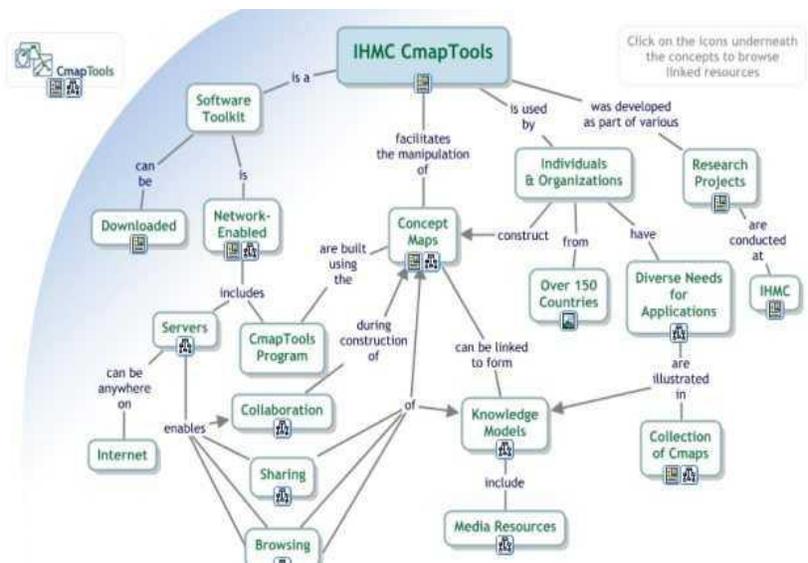
The CmapTools program empowers users to construct, navigate, share and criticize knowledge models represented as concept maps. It allows users to, among many other features, construct their *Cmaps* in their personal computer, share them on servers (CmapServers) anywhere on the Internet, link their Cmaps to other Cmaps on servers, automatically create web pages of their concept maps on servers, edit their maps synchronously (at the same time) with other users on the Internet, and search the web for information relevant to a concept map.

CmapTools has been translated into seventeen (17) different languages. It runs in Catalan, Chinese, Czech, Dutch, English, Basque, Finnish, French, Galician, German, Italian, Japanese, Kuna, Portuguese, Spanish, Swedish, and Turkish. Cmaptools defaults to the language of the operating system, but can be changed in the Preferences menu item. The IHMC CmapTools client is free for use by anybody, whether its use is commercial or non-commercial. In particular, schools and universities are encouraged to download it and install it in as many computers as desired, and students and teachers may make copies of it and install it at home.

FreeMind   http://en.wikipedia.org/wiki/Mind_map

FreeMind is a free, mind-mapping software program written in Java. The recent development has turned it into high productivity tool. The operation and navigation of FreeMind is faster than that of MindManager because of one-click "fold / unfold" and "follow link" operations.

Current users of *FreeMind* use it for the following purposes:

- ❖   Keeping track of projects, including subtasks, state of subtasks and time recording
- ❖   Project workplace, including links to necessary files, executables, source of information and of course information
- ❖   Workplace for internet research using Google and other sources
- ❖   Keeping a collection of small or middle sized notes with links on some area that expands as needed. Such a collection of notes is sometimes called knowledge base.
- ❖   Essay writing and brainstorming, using colours to show which essays are open, completed, not yet started
- ❖   Use of size of nodes to indicate size of essays.
- ❖   Keeping a small database of something with structure that is either very dynamic or not known in advance. The main disadvantage of such approach when compared to traditional database applications are poor query possibilities
- ❖   Commented internet favourites or bookmarks, with colours and fonts having the meaning required

ThinkGraph is a French product. Using the site [http://ets.freetranslation.com/] the French to English translation of their promotional blurb reads '*ThinkGraph* is a software program that allows for Drawing 2D oriented towards the production of Conceptual Cards. A conceptual card is a destined diagram to represent Ideas (every idea being represented by a basic form such as rectangle, ellipse or picture). This diagram becomes a conceptual card when relations are created between these ideas and that of the links. Hypertext links are associated with these ideas in order to relate towards other ideas (e.g. a definition, a diagram, another conceptual card). *ThinkGraph* is therefore the intermarriage result between an application of Drawing 2D and an editor of conceptual cards.'

This program may prove very useful for speakers of French or students creating essays in the French language - http://www.thinkgraph.com/#bodyMenu

View Your Mind (vym) - www.insilmaril.de/vym/
The diagram *(to the right)* was exported directly from *vym*. It shows some of the features *vym* offers to collect and present ideas and data. Editing the content of the page in vym is easy and intuitive. The user just 'grabs something' with the mouse and moves it to another place. Usually the user will work with two windows:

- •   The *Mainwindow* shows the map as seen in the image above
- •   The Note editor is used to edit larger text like this one (shown in grey boxes). The *note editor* always shows the content of the branch selected in the *mainwindow*.
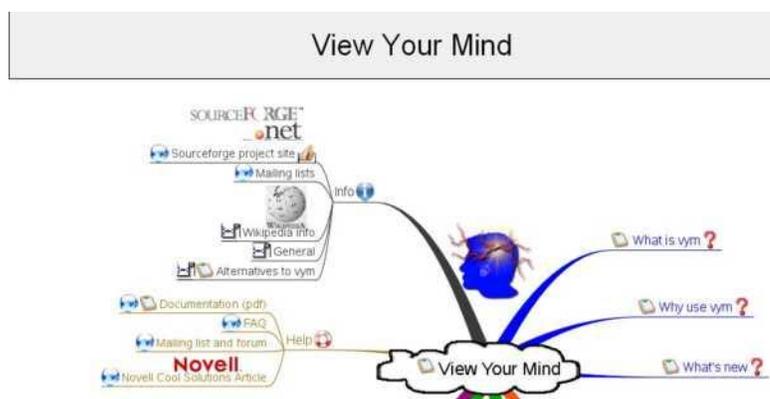
VYM (View Your Mind) is not another drawing tool; it is a thinking tool. It is also a planning tool. It can also be used as a kind of database, too. The idea is to use it dynamically, by changing the map when a user's thoughts or plans change. The possibility to export the content e.g. to a website, was recently added. Another new export filter allows users to easily create a presentation in Open Office.

VYM is a tool used to generate and manipulate maps that graphically show users' thoughts. Such maps can help students to improve creativity and affectivity. Students can use them for time management, to organize tasks, to get an overview over complex contexts or to sort out or reorganise and experiment with ideas. Maps can be drawn by hand on paper or a flip chart and help to structure thoughts. While a tree like structure can be drawn by hand or any drawing software *vym* offers more features to work with such maps.

Semantik   http://freehackers.org/~tnagy/kdissert.html

Semantik is a mind mapping-like tool to help students to produce complicated documents very quickly and efficiently, including presentations, dissertations, assignment plans, drafts, thesis and reports. While targeted mostly at students, *Semantic* can also help teachers, decision maker, engineers and businessmen. *Semantik* is also available exclusively for Linux and other free operating systems. Although this application shares some similarities with general-purpose mind mapping tools like *Freemind* or *Vym*, the very first goal of *Semantik* is to create general-purpose documents through the use of mind maps.
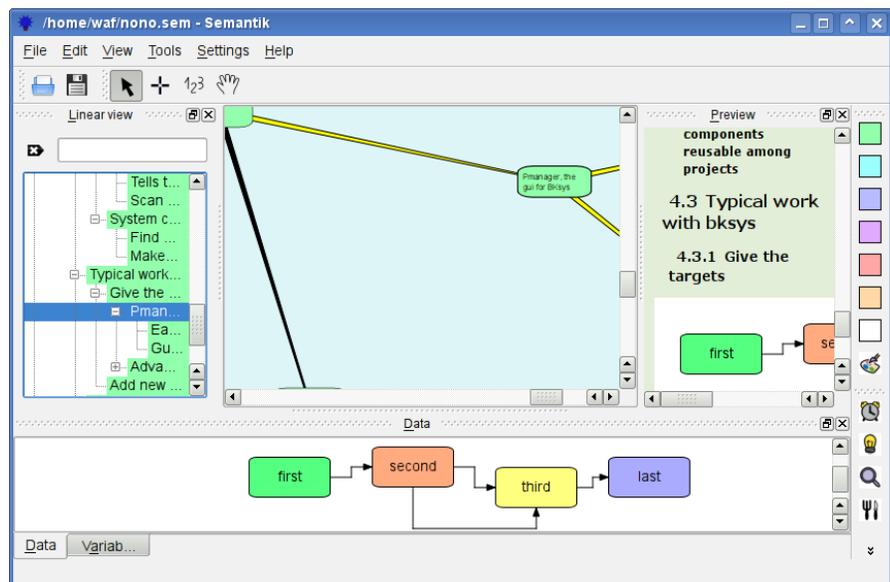
5. Portable Solutions

Freemind and *Xmind* are available as part of the AccessApps suite. These programs will run on any *MS Windows* computer, fully operational from a USB thumb drive. *AccessApps* is freely available to download and use: http://www.rsc-ne-scotland.ac.uk/accessapps/. The Xmind application will be added in March 2009 to the previous full version of AccessApps.

The *Fact Folder* and *Fact Mapper* in *textHELP Read & Write* have really matured in Version 9. The *Fact Mapper* can be used by lecturers to brainstorm ideas with a group of people and can be gainfully used by students to create essay plans or revision notes. It is also now available as an online application. The mobile USB version of Read & Write V9 is now available, being released in early 2009.

In Conclusion

Mind Mapping is a much discussed and debated genre of software. It is many different things to different people and audiences. It accommodates students in various ways. Users seem to either respond very favourably to this type of software or dismiss it. Schools have traditionally under utilised it and relegated it to certain areas of the curriculum or pigeon holed it.

Whether it is termed as mind mapping, charting, webbing, brainstorming, planning and organisational software is not the key issue. It is whether it will accrue benefit and be used expeditiously to encourage students of all persuasions and abilities to negotiate tasks using tools that are different from the word processing model of old.

The argument for the efficacy of software is in the mature approach by educators to ascertain and meet specific or generic needs of their students. Young people respond favourably to these types of programs, in my experience. They are visual learners and partake and enjoy in the online YouTube experience of rich video and movie content. Use of graphics and symbols supports and helps qualify the text. The creation of mind maps and webs provides holistic representations of data.

Programs such as *Spark Space* provide supports for users who are dyslexic. This program has been specifically designed for this audience. A great deal of research was undertaken to deliver *Spark Space* and it has unique features that caters to learners who struggle with traditional "flat text" formats.

It is a matter of introducing the programs and providing some basic skills. All programs offer a set of ready-made templates. By exploring and experimenting with them, students can begin to see how they might assist them in organising and presenting data.

The mind map or web can then be exported to MS Word for assessment or appraisal or copied and pasted into other presentation programs, such as MS PowerPoint or Open Office Impress.

Resources:

An interesting article that discusses the implications and ramifications of using mind mapping can be located at http://www.ami.ac.uk/courses/topics/0101_mmp/index.html. Some helpful hints and a guide to create a mind map can be found at http://www.buzanworld.com/Mind_Maps.htm.

A description of a mindmap and background information, located at http://www.12manage.com/methods_mind_mapping.html. It has some very interesting reading with illustrations and examples of alternate approaches to mind mapping.