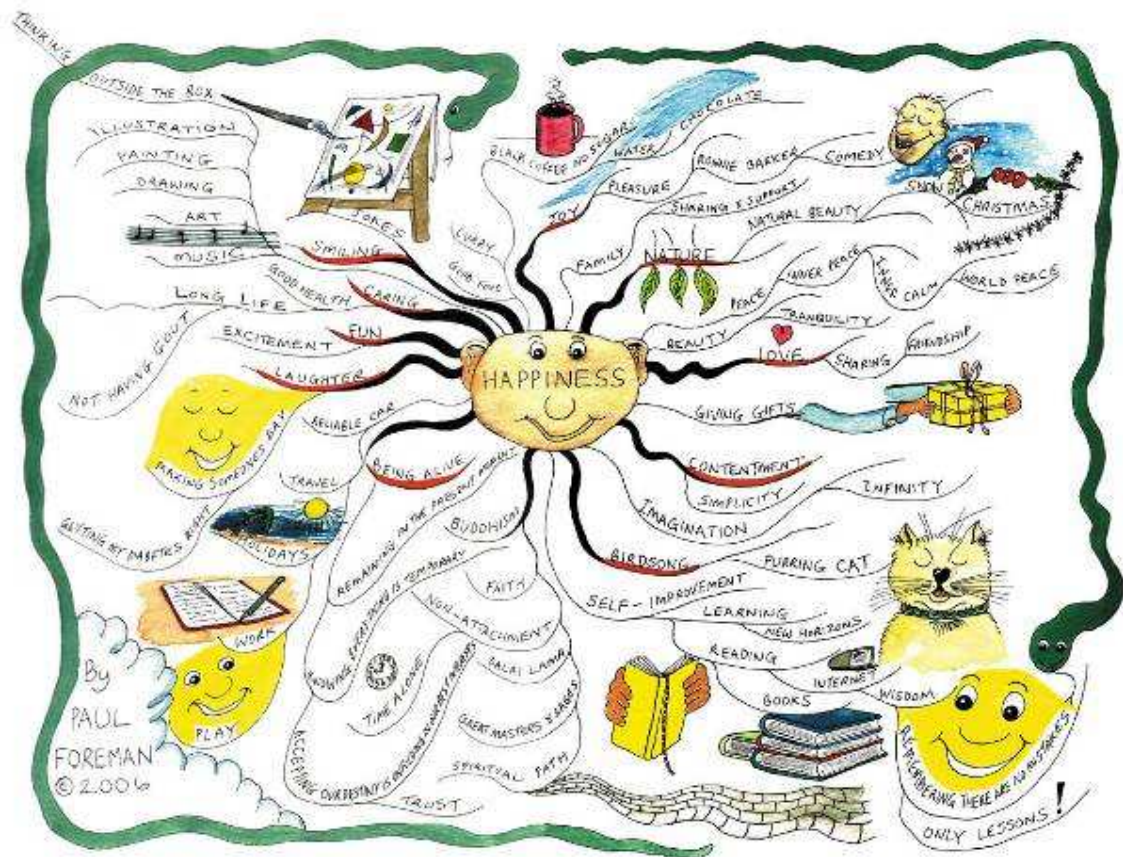


Mind-mapping in the EFL classroom



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April 2007

¹ Illustration by Paul Foreman

Preface

This graduation paper is about the use of mind-mapping in the EFL classroom.

This graduation paper is based on research I have done at my practice school Blariacum College in Blerick and has been written as a final assignment for my studies at Fontys Teacher Training College Sittard.

I would like to thank my colleague Rien Verkoeijen for inspiring me. Her workshop gave me the idea to write this paper. I would also like to thank Jennifer Goddard from the Buzan Centre Australia for answering my many questions and my pupils for their open mindedness.

April 2007

Carolien Hofland

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Introduction

During my fourth year teaching practice at Blariacum College in Venlo I noticed that despite the fact that the school is very progressive and is open to new ways of learning, I still saw a lot of unmotivated pupils in my English classes. As well as during my other traineeships they complained that the lessons were boring.

Since 'learning how to motivate pupils' is one of my learning targets for this year's school practice I am constantly looking for new ideas to stimulate my pupils' cognitive processes in the English classroom. Therefore I was immediately interested when the possibility to attend a workshop on the technique of mind-mapping occurred.

The workshop started with an association exercise. Ms Verkoeijen taught us how to memorize twenty new vocabulary items in less than ten minutes. She even claimed that we would be able to recall these words effortlessly after 6 months. This made me very curious.

We were asked to close our eyes. Ms Verkoeijen started to tell us a story containing the twenty vocabulary items. We were asked to visualize the story in our imagination. The story was very strange and didn't make a lot of sense to me then, but now, six months later I can still remember all the words in the exact same order by recalling the story and my own associations in my mind. After this we were taught how this association technique is also used in mind-mapping.

During this workshop I became so enthused by this technique that I decided that this was something that I would like to use in my own lessons. Unfortunately, the workshop only allowed time to discover the tip of the iceberg that is called mind-mapping.

I believe that we don't make the best use of our brains. At school pupils mainly use the left halves of their brains. The left half is used for rational and logical thinking whereas the right half is used for creative thinking. If we would use both halves together, we would make up to five to ten times better use of our brains. That is why I think we should stimulate pupils to use the right half as well as the left half. Mind-mapping is a technique that stimulates both parts of the brains.

I think that creativity enhances motivation. Subjects that involve a creative aspect - e.g. drawing, drama, music and art- are all time favourites. Most pupils like these subjects because they involve a certain level of freedom. They are free to use their minds in different ways and to create things or make things up that relate to their own feelings and experiences. Mind-mapping allows pupils to make a connection between the subject material and their own feelings and experiences. Wouldn't it be fabulous if we could use this aspect in the EFL classroom? I think that mind-mapping can contribute to learner's motivation because of its creative aspect.

As Edward de Bono, a leading authority in the field of creative thinking put it:

"Creativity is a great motivator because it makes people interested in what they are doing. Creativity gives hope that there can be a worthwhile idea. Creativity gives the possibility of some sort of achievement to everyone. Creativity makes life more fun and more interesting." ²

By adding creative assignments to your lessons, you can also address various intelligences. Mind mapping involves many aspects and partly overlaps the field of multiple intelligence. That is why I felt that, before using it in class, I needed to do some research to explore this technique thoroughly.

In this graduation paper, I will explore the topic further.

² de Bono, E. The Mechanism of Mind

In the first chapter, I will look into the theory behind mind-mapping. I would like to find out how the brain works and why mind mapping helps you to memorize things.

In the second chapter I will describe the correct way to make a mind map.

In the third chapter I will explain the connection between mind-mapping and multiple intelligence.

In the fourth chapter I will describe various advantages and possibilities of mind-mapping.

In the fifth chapter I will explain how mind mapping can be used to organize classroom activities in general and in the last chapter I will write about using mind-maps in the English foreign language classroom.

At the end of my paper I will state my conclusions.

Chapter 1 How do mind maps work?

§ 1.1 Possibilities of the human mind.

The human brain contains about one hundred billion neurons and about five to ten times more glia cells.

Neurons are nerve cells which are very important parts of our nerve system. They process information and are able to receive and pass on signals. Glia cells are brain cells that take care of neurons.

Scientists officially state that these cells just support the neurons but over the last six years more evidence has come up to prove that these glia cells play a crucial part in the cognitive process ³.

Consider the following list of things a bee can do. A bee has ten thousand glia cells.

# fly	# navigate
# find new colonies	# regulate temperature
# learn	# build a nest
# remember	# count
# distinguish differences from each other	# care for other bees
# fight	# reproduce
# hear	# build a beehive and community
# see	# communicate by buzzing
# smell	# collect nectar
# feel	# dance
# taste	

Now think of all the things a human being is capable of when you consider we have hundreds of billions of these glia cells. It must be possible to make better use of our brains than most of us are doing at the moment.

§ 1.2 Memory & associatons

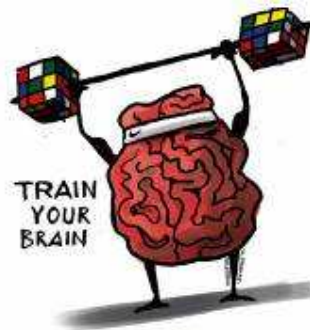
The human memory has an associative nature. This means that everything you think about is linked to a certain context. You automatically compare new experiences to similar prior experiences. Your brain 'googles' your

Dr. Restak, R. The New Brain

circuits for hints and triggers of past successes and failures to guide it. Association and mental visualization combine skills and structures of the left and right brain halves.⁴

For example, when you think about ‘groceries’, your mind can make thousands of associations. These are very personal. One person might think about a supermarket while the other might think about a little greengrocer or about a market. Some might think about a shopping cart, the butcher’s, a shopping bag or their local deli.

The more associations you make, the better you use your brain and this makes it easier to make new connections, get new ideas. It is even possible to see on a scan if someone makes good use of their brain. Their neurons will have more ‘branches’.



In prehistoric times, this was how people were able to remember important information. The taste and smell of food, the colours of plants and insects, the temperature of water, the sounds and movements of predators, everything was associated with colours, sounds, tastes, smells and motion.

The ancient Greeks already used association techniques 2000 years ago. For instance the Greek system of mnemonics, known as ‘topical’ mnemonics, which involves the use of mental places and signs or pictures, had the concept of association at its core. The most common method is to choose a

⁴ Bernard Wechsler, H. Speed learning for professionals

large house, of which the apartments, walls, windows, statues, furniture etc., are associated with certain names, phrases, events or ideas, by means of symbolic pictures. To recall these it is only necessary to search over the apartments of the house until the particular place is discovered where they had been deposited by the imagination⁵. Back then, these techniques were considered tricks but thanks to science we now know that they match the functioning of the human brain almost perfectly. These ancient mechanisms are still working today.

§ 1.3 Thinking in pictures

It is easier to remember pictures, photographs or drawings than words or sentences. When someone says the word 'apple', most people see a green apple, some see a red apple and some people have more unusual associations like the apple computer logo or Gwyneth Paltrow's daughter Apple. Only three percent of one hundred people I asked said that they actually saw the word a-p-p-l-e spelled out in their minds. It's easy to try this yourself. When thinking about your own house, what comes up in your mind? A visual image of your house or the word 'h-o-u-s-e'? ⁶

In fact, it usually takes a lot of effort to remember words and sentences whereas when you visualize them they automatically pop up in your mind when you try to remember them. Of course, it is possible to learn by hearing or reading but it's much easier to learn when you visualize and associate because these techniques suit the way your mind works.

This is how we communicate all day. Words activate pictures in our mind⁷. This process comes so naturally you hardly notice it consciously. And this is exactly what mind-maps do. They are a reflection of our mental images and help the cognitive process. They connect our mental images to the network of associations in our mind and the process of making a mind-map closely

⁵ Encyclopaedia Britannica

³ Buzan T. Mind maps for kids

⁷ Nelson, D. L. Remembering pictures and words: Appearance, significance and name.

resembles the way the brain works. When you strip a mind-map of its words and symbols and look only at the shape, it even resembles a brain cell. This is not a coincidence.



Brain cell⁸

A mind map organizes information in your mind in a similar way the brain saves information. Therefore it is easy to review or revise the saved information.

§ 1.4 Learning lines.

The following quote illustrates the different functions of both halves of the brain:

“The left hemisphere is responsible for verbal, abstract, symbolic activities. The right hemisphere serves for synthetic, holistic, intuitive perception and information processing. Under normal circumstances, the left hemisphere is the more active of the two.”⁹

Professor Roger Sperry discovered that the right and the left half of your brain are specialized in different tasks. In 1981, he won a Nobel prize for this discovery.

These are some more functions of each side of your brain.

Left half:

- Words

⁸ Illustration taken from www.schooltv.nl

⁹ Edwards, B. Drawing on the Right Side of the Brain

- Time
- Logic
- Numbers
- Sequence
- Linearity
- Analysis
- Lists
- Conscious thinking
- Reading
- Language

Right half:

- Rhythm
- Awareness
- Syntheses
- Imagination
- Daydreaming
- Colour
- Pictures
- Dimension
- Unconscious thinking
- Intuition
- Senses

Few people ever use colours or drawings once they have left primary school. Most information we have to process as teens or young adults is written or printed in black ink. We make less and less use of the right half of our brains. When we have reached the age of maturity, most of our creativity has faded away because we are not stimulated to make use of this quality anymore.

At school pupils mainly focus on the left side of the brains. They use lined paper and usually write on it in black or blue ink. They often have to study lists of words or take notes in lists. These lists are usually structured by numbers. They usually use words to take notes, hardly ever pictograms, pictures or drawings. These are all left brain skills. On top of all that, in many schools the desks are still organized in lines.

§ 1.5 Why do mind maps work so well?

Because the brain thinks and remembers in pictures, Mind-mapping is a brain-friendly way to study, memorize and take notes. It uses both left and right brain skills in order to make the best use of the brains and is based on the results of modern brain research. This research¹⁰ states that we do not function very well if our two brain halves are not stimulated to work together.

As a child we use our left- and right brain halves in a natural way. As adults we are often astonished when we look at how fast and easy small children learn new things. How do they do it? They look, feel, smell, taste and listen. They use all their senses to discover and learn.

Research by Tony Buzan has proved that geniuses like Da Vinci, Edison, Einstein and Michaelangelo integrated both halves of their brains. He studied their note-taking techniques and discovered that they resemble the techniques of mind mapping very closely. Integrating both halves of your brain makes your brain work more effectively and improves your memory.

When both halves of the brain cooperate well, it shows in many ways. Among other things, in the way body parts work together, whether or not mind and body are connected and in the ability to talk about and express feelings. Western society and education have an opposing effect rather than a

¹⁰ Farrand et al, 2002

stimulating effect on the development of collaboration between both halves of the brain because they tend to focus on the left part of the brain only.

§ 1.6 Breaking the habit

Our brains work in patterns. Once they are used to one way of working, they tend to stick to this one way. People often do not realize it but the human brain needs a meaningful context to remember.

For example, when someone reads a newspaper article about an earthquake in California they might be moved or shocked by it but will probably not be conscious of it or give it a second thought the next day. Suppose someone the reader knows is in California at that moment. Now the context is much more meaningful for the reader and they will remember many more details concerning the event.

At school, pupils usually sit at the same desk, writing in the same notebook, with the same colour ink, all year long. This is not very stimulating to the mental capacity. It makes it harder for the brain to keep different subjects apart.

In general, people in Western civilisation are completely focussed on working with their left brain skills. Here, the general opinion regarding right-brained achievement is that it is non-academic and a sure invitation for economic-earning doom.¹¹ Although children are born creative beings, as demonstrated by their ability to artistically fantasize and their storytelling skills, western culture represses acknowledgment of their brain's right hemisphere and deny their spontaneous, intuitive cognition. Rather, rational and logical thinking proven by empirical knowledge, is the cornerstone of the child's public school evaluation in his educational endeavours¹².

¹¹ Cameron, J. The Artist's Way

¹² Silverstone, L. Art Therapy The Person-Centered Way.

This already starts at a very young age when we learn how to read. We are taught to read with a foveal vision, a narrow concentration on a point in front of us. When we activate our foveal vision, we filter-out what is located lateral-left and lateral-right. When you write a letter or play a video-game, your eyes and brain are triggered-and-sustained by narrow foveal-vision. Peripheral - refers to the area outside of the center, the boundary. It is called lateral-left and lateral-right, and is your side-view. Foveal vision is about 6-letters wide, the size of a standard word, while peripheral vision is up to 36 letters wide, or six-average-words. Foveal vision is a left brain skill and peripheral vision is a right brain skill. When combining the two you are able to speed read and thus use right and left brain skills together.¹³

Therefore people who think differently are easily called creative. Creativity involves breaking out of established patterns in order to look at things in a different way¹⁴. Great inventions were discovered by exploring new ways and methods, by breaking existent patterns and making new connections. The Wright brothers got their idea for building an aeroplane from working on their bicycles.

Mind-mapping stimulates the making of new connections and visual thinking, so I will now move on to the next chapter in which I will describe how mind-maps are actually made.

¹³ Bernard Wechsler H. Speed learning for professionals

¹⁴ de Bono, E. Maltese psychologist and writer, leading authority in field of creative thinking.

Chapter 2 How to make a mind map.

§ 2.1 The mind map tool kit.

You need very few tools to make a mind map:

- Paper
- Coloured pens or pencils
- Your brain

This makes it a very easy technique to use in class. It needs little preparation and the tools are easily found in every school and do not take up a lot of classroom space. Some people like to use A3 paper or even a bigger size to mind-map a whole book or subject but A4 paper will do fine in the classroom.

Basically every classroom is suitable for mind mapping activities. There are however some things to take into consideration which can improve the atmosphere in the classroom.

§ 2.2 The alpha state of mind

There are four types of brain frequencies. With beta waves we are awake. With alpha waves we are relaxed and alert, this is the learning mode. Theta waves are active when we dream or meditate and delta waves are active during our sleep. In the classroom we aspire for our pupils to be in the learning mode when alpha waves are active. This is when studying is easy; the person is concentrated, is not paying attention to time and is fully absorbed by the subject matter. It takes about 15 minutes to get into this mode so it is very important to eliminate distractions to a minimum.



The state of mind we are in is also influenced by our breathing. When we breathe fast and shallow our brains are in a high frequency. By breathing deep and slowly your brain frequencies will descend to the lower alpha level, which is the preferred frequency for pupils at school.

At the beginning of a lesson, especially after a break or a physical education lesson children usually are very vibrant and animated. This is not a good mood to start mind-mapping. In order to draw a mind-map pupils need to be calm, relaxed and concentrated. That is why it might be useful to practise some breathing techniques with pupils as a before mind-mapping activity.

Here are three examples of different calming breathing exercises.

Elevator Breathing¹⁶

Begin by having the children observe the natural inhalation and exhalation of their breath without changing anything, then proceed with the directions below.

Your breath is an elevator taking a ride through your body.

Breathe in through your nose and start the elevator ride.

Breathe out and feel your breath go all the way to the basement, down to your toes.

Breathe in and take your elevator breath up to your belly.

Hold it. Now, breathe out all your air. (Pause)

This time, breathe in and take your elevator breath up to your chest.

Hold it. Now breathe out all your air. (Pause)

¹⁵ Illustration by Robert Neubecker

¹⁶ Teel, P. The floppy sleep game book

Now breathe in and take your elevator breath up to the top floor, up through your throat and into your face and forehead.

Feel your head fill with breath. Hold it.

Now breathe out and feel your elevator breath take all your troubles and worries down through your chest, your belly, your legs, and out through the elevator doors in your feet.

(Repeat)

Abdominal breathing¹⁷

Abdominal breathing is a useful breathing technique. It may take a little practice to master but be patient and it will happen.

Place one hand on your tummy so that the belly button is below the centre of the palm. Now place the other hand on the top of the first hand. Take a slow deep breath in and imagine the diaphragm, a large band of muscle below your lungs, moving down as your lungs expand, and causing your tummy to rise gently under your hands. As you breathe out your lungs contract, the diaphragm moves back up, and you can feel your tummy gently fall. Breathe in slowly and deeply, feel your tummy rise. Breathe out slowly and feel your tummy fall. Don't force your breathing; just make it deeper and slower.

Continue breathing in this manner for at least 10 cycles.

Visualization¹⁸

Visualisation is thinking in pictures, images and sensations. Visualisation is a powerful technique as it enlists the imagination to problem-solve, to provide a haven to calm and nurture the soul and stimulate creativity.

Visualisation is very absorbing, and tends to stop or slow down the "chatter of the mind", giving time out from the everyday worries, concerns and negative thoughts.

¹⁷ Allan, D. Occupational therapist, New South Wales, Australia

¹⁸ idem

Imagine there is a butterfly sitting on your chest .

It has its wings spread and it is preparing to take flight. It seems more and more likely to do so every time you breathe in and out but it remains sitting on you chest for some time. Look at this butterfly carefully, look at its colours and shape. Soon the butterfly will take flight. Imagine following the butterfly to a pleasant place. A place where you feel relaxed, comfortable and safe. Pay careful attention to the sights and sounds, smells and sensations of this place, how it feels and how you feel being there. Allow yourself to enjoy being there and to relax as fully as possible. You have 1 minute to enjoy this place and it is all the time that you need. Remember that you carry this peaceful place inside you and you can come here and visit any time you wish.

I have tried these and other breathing exercises in my classes. At first especially the third year pupils were quite skeptical and didn't take part in the exercises in a serious manner. But I kept trying and I gradually managed to convince them of the benefits of breathing exercises by explaining how it would help them concentrate and they were willing to give it a try.

I made notes on pupils behaviour during mind-mapping activities when they hadn't done a breathing exercise before starting to work on their mind maps and when they had. I noticed that the pupils were more concentrated when they had done a breathing exercise. They were less talkative, appeared to be more absorbed in their work and paid less attention to classmates or their environment. Also they didn't look at their watches as much.

§ 2.3 Mind maps & music

Another stimulating factor is background music. This helps to concentrate and focus and stimulates the creative process which is necessary to make a mind-map. Especially music with a 60 bpm rhythm is useful for this purpose. This is the rhythm of our heartbeat when we are relaxed and so it works well with alpha waves.

The music has to be instrumental and melodious. Baroque music has this rhythm and although this is probably not to the average high school pupil's taste, this does not matter. Pupils are not required to listen to the music actively. The music playing softly in the background is enough to make it work. The Bulgarian professor Lozanov who discovered this, has developed a complete language learning method based on these principles.

I must confess that I was quite sceptical myself when I first heard about this theory. I did not expect it to cause noticeable change in pupils behaviour. To examine if this would really work I borrowed a CD with Baroque music¹⁹ from my uncle who is a music teacher. I played the CD during four lessons in which pupils worked on their mind-maps, with two different classes. During these lessons I didn't do any breathing exercises because then I wouldn't be certain if the pupils' behaviour would be influenced by the breathing exercises or by the music.

As with the breathing exercises, the pupils were sceptical at first. As soon as I pushed the play button they started to giggle and some started imitating a choirmaster. I told them that they didn't need to listen to the music and that it was just soft background music. They suggested some of their own CDs but when I refused to play these they gave up and started working on their mind-maps.

I observed their behaviour and noticed that after five minutes nobody paid attention to the music anymore. As with the breathing exercises, the pupils seemed to be absorbed in their own mind and were relatively quiet. I noticed that some started swaying a little and some started to swing a leg to the rhythm of the music. I also realized that although I am not a fan of classical music at all and I did not like the music, it did make me feel relaxed. After class some of the pupils told me that they were surprised that they did not hear the music after a while.

¹⁹ Various artists, Baroque treasures

Although I did not expect it, after this test I must conclude that baroque music does seem to have a positive influence on the behaviour of pupils. They appear to be more concentrated and more focussed on their assignment.

§ 2.4 Mind-map rules

Now that I have explained the conditionals that could support the activity of mind-mapping, I will now describe the actual procedure.

Tony Buzan, a British author and psychologist who invented mind-maps, has defined seven rules for mind mapping. Tony Buzan discovered the mind-mapping technique when he was teaching psychology at university. During his lectures, he realized that as he was teaching about the impact of association and images on memory and learning, his own lecture notes were devoid of that. So in trying to bridge the gap between theory and practice, he studied the learning process of the brain and developed the mind-mapping technique.

Many people consider these the basic guidelines and sometimes adjust them to make their mind-maps even more personal.

1. Make sure your paper is placed sideways (landscape) so you do not bump into the margins as quickly. Always use blank paper, pre-drawn lines restrict the natural flow of your thoughts.
2. Draw a picture in the middle of the page that represents your main topic. Thoughts start in the centre of our mental world. The Mind Map reflects this. Allow the image to create its own shape (do not use a frame) and use at least 3 colours. Colours stimulate the right cortical activity of imagination as well as capturing and holding attention.

3. Draw some thick, curved, connected lines coming away from the picture in the middle of the page, one for each of the main ideas you have about the subject. These central branches represent the main sub-topics. Curved lines give visual rhythm and variety, are easier to remember, more pleasant to draw and less boring to look at. In nature there is only one straight line; the crystal.
4. Always start at the same point and work in the same direction. Right-handed people usually start at two o'clock. Left-handed people often prefer to start at 10 o'clock. This makes it easier to revise previous mind maps because you know where you started. Sometimes the order can be important.
5. Name each of these ideas and, if you want, draw a little picture of each – this uses both sides of the brain. Only use keywords. Use pictures, pictograms and symbols for each branch you add. You do not have to finish one branch before moving on. Make sure all the lines are connected to the main topic.
6. From each of these ideas you can draw other connected lines, spreading like the branches of a tree. Connected lines create associations and structure. Add your thoughts on each of these ideas. These additional branches represent the details.
7. You can add as many branches as you like and you can add third level branches off the second level branches. This can go on forever. Use different colours and styles. Make each Mind Map a little more beautiful, artistic, colourful, imaginative and dimensional. Your eyes and brain will be attracted to your Mind Map. Your brain will delight

in getting the maximum use and enjoyment from this process and will therefore learn faster, recall more effectively and think more clearly.

§ 2.5 Weird science

In chapter one, I explained that our mind has an associative nature. This is a feature that comes in very handy when drawing a mind-map. Try to associate every key word with something strange and draw a picture or image to symbolize it.

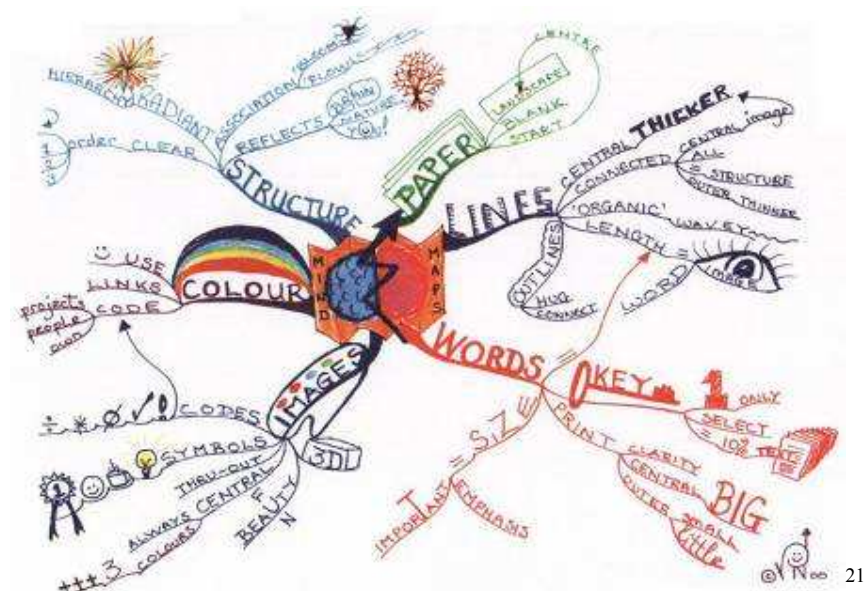
It is a fact that we remember strange, weird or bizarre things best. That is why it is important to associate the key words in the mind map with strange, crazy, weird, or abnormal things. This is called the “Von Restorff-effect²⁰” and that is a very important memorizing technique. The right half of the brain is used to transform ‘normal’ information into ‘abnormal’ information. Things that are ‘normal’, boring or difficult to us tend to fade from our memory quite fast. Things that are strange or unusual tend to stick. That is why this technique enables us to memorize information by associating it with something else that stands out.

This is the technique that was used during the workshop I mentioned in the introduction. I decided to explore the technique using a group of nineteen third year pupils at an ICT-integrated course. I asked them if they would like to take part in an experiment and explained to them that I would teach them a new vocabulary list in a way that might make it easier for them to memorize the words. Eight of them were willing to take part.

I taught the vocabulary list to these eight pupils by making up a strange story with the words. I asked them to close their eyes and visualize every detail of the story. The eleven pupils who did not want to take part in the test studied the words as they normally did with a programme called wrts.

²⁰ Von Restorff, H. The effects of field formation in the trace field.

When I tested the vocabulary, the results of the eight students who studied the wordlist by using the association technique were not per se better than those of the pupils who had studied like they usually did but their results *were* better than the results of their last vocabulary tests. So their own achievements did improve and none of them got an insufficient mark. Even when I run into one of them now, 4 months later and ask them they can still remember most of the words and start to tell me the story.



§ 2.6 Mind maps and ICT

It is possible to use special software to make a mind map on the computer. These can be useful for ICT courses or for teachers who want to make more use of ICT in their classrooms.

These are some examples of mind mapping programmes:

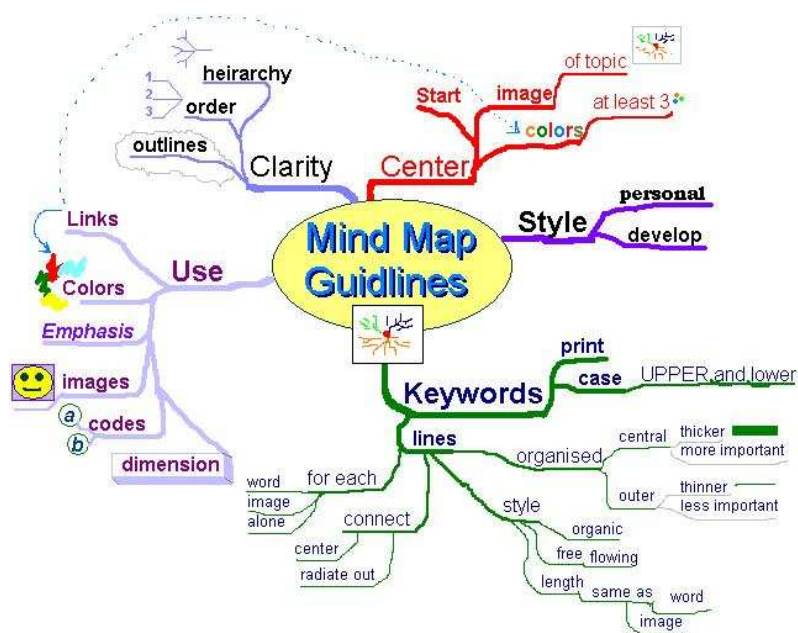
- Mind Mapper
- Imindmap
- Mind Manager

²¹ Illustration by Buzan Centres

- Novamind
- Visual Mind
- Freemind
- ConceptDraw

It is possible to download demos but these are only valid for a limited period of time. On www.brainstudio.nl you can find a demo which is usable indefinitely. Although this is a stripped version it is perfectly usable because you can add your own symbols or images.

Mind mapping software is not suitable for developing the right half of the brain because the creative process of drawing and colouring is so important. Combining the software and your own drawings to use both halves of the brain is a good idea when the mind map needs to look neat and tidy, for example when it is used in a school test. Moreover it is much easier to make some small changes to a branch without making a mess of the mind map.



Mind map made with a computer programme.²²

²² Illustration by Danny Stevens

Chapter 3 Mind-mapping and multiple intelligence

§ 3.1 Learning styles

In this chapter I will explain the theory of multiple intelligence because mind-mapping and multiple intelligence are closely related. Both techniques try to address learning styles which are usually not rewarded in the traditional school system.

There are four main learning styles and most people prefer to use one of these when learning something new:

Concrete perceivers (right brain) absorb information through practical experience, doing, acting, sensing and feeling.

Abstract perceivers (left brain) take in information through analysis, observation and thinking.

Active processors (right brain) make sense of an experience by immediately using the new information.

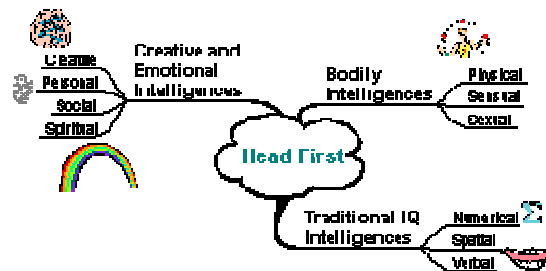
Reflective processors (left brain) make sense of an experience by contemplating and thinking about it.

Traditional schooling favours abstract perceiving and reflective processing. Other kinds of learning are not reflected in the curriculum and assessment nearly as much. The different learning styles show that how much individuals learn depends more on whether the educational experience fits their learning style than whether or not they are smart. Mind-mapping and multiple intelligence are both teaching techniques which try to identify with both right and left brain learning styles and they go together well.

§ 3.2 Multiple intelligence

The theory of multiple intelligences was developed in 1983 by Dr. Howard Gardner, professor of education at Harvard University. It suggests that the

traditional notion of intelligence, based on I.Q. testing, is far too limited. Dr. Gardner originally proposed eight different intelligences. However, the latest research has uncovered the fact that there are 10 intelligences²³:



The creative and emotional intelligences

1. Creative intelligence

Creativity was once thought to be a 'magic gift' possessed by only the few. Thanks to easy to use creative thinking techniques like mind-mapping and many others, we now know that it is a magic gift possessed by everyone.

2. Personal intelligence

This involves your 'Satisfaction-With-Yourself' IQ. It is possible to rank very highly in certain intelligences, but still to be unhappy within yourself. By exploring the nature of Personal Intelligence your brain can become its own best friend.

3. Social intelligence

Your 'Communication' IQ. Social Intelligence refers to your ability to use all your other intelligences to relate in a positive way to those most complex of all creatures – other human beings!

4. Spiritual intelligence

²³ Buzan, T. Head first

Spiritual Intelligence is concerned with being part of the bigger scheme of things. It involves seeing the 'big picture'. Spiritually Intelligent people are motivated by personal values that involve reaching beyond their own interests to those of the community at large.

The bodily intelligences

5. Physical intelligence

Physical Intelligence is the remarkable coordination of intention, muscle, motor and perception systems. A healthy body equals a healthy mind.

6. Sensual intelligence

It was once thought that your five senses were static and unchanging receptors of information from the world around you. State-of-the-art science now shows us that each sense is a fabulously dynamic, sophisticated and adaptable system. Each one can be developed to your advantage. Our senses adapt to various situations and can either be dulled or heightened. For example a person who becomes blind increasingly relies on his or her other senses such as smell, touch and even sixth sense.

7. Sexual intelligence

Sexual Intelligence is a 'Super Intelligence'. It is a combination and manifestation of all your other Intelligences. It is not, as has been commonly supposed, a genital-led lust; it is a great driving energy which marshals all your intellectual and physical resources to ensure your survival, your family's survival, and not to mention the survival of the human race.

The traditional intelligences

8. Numerical intelligence

This intelligence involves your knowledge of the alphabet of numbers but also the ability to explore patterns, categories and relationships by manipulating objects or symbols, and to experiment in a controlled, orderly way.

9. Spatial intelligence

Spatial Intelligence is your ability to see the relationships of shapes to each other, and to see the relationship of things in space. This intelligence also includes the ability of your body to negotiate successfully the environment and the world around you.

10. Verbal intelligence

This intelligence forms a major part of standard IQ testing, and consists of your vocabulary and your ability to see relationships between words and their concepts. It is vital to general levels of success in life and can be easily improved.

§ 3.2 Preferred ways of learning

According to dr. Gardner, schools focus most of their attention on linguistic and logical-mathematical intelligence. Children who have other intelligences do not receive much stimulation in schools. Many of these children are labelled underachievers while their unique ways of thinking and learning are not addressed in a heavily linguistic or mathematical classroom.

Howard Gardner suggests that teachers should present their lessons in a wide variety of ways using music, cooperative learning, art activities, role play, multimedia, field trips, inner reflection, and much more²⁴. This way, children with different kind of intelligences are able to develop to their highest potential because they learn through their own most preferred

²⁴ Thomas Armstrong, Multiple Intelligences in the Classroom. Alexandria, VA: Association for Supervision and Curriculum Development, 1994.

method. In an ideal situation there is something for each kind of intelligence in every lesson.

§ 3.3 Multiple intelligence & mind maps

In the English language classroom, the focus is mainly on verbal/linguistic intelligence. Using mind-maps is a way to address other intelligences as well. It is possible to match and stretch. Matching involves using particular activities to adapt to well developed intelligences. For example, a word-grid activity for a pupil who has a strongly developed numerical intelligence. The exercise fits the pupil's intelligence. Stretching involves stimulating less developed intelligences by using particular activities. For example, a role-play activity for a pupil who has a strongly developed personal intelligence but whose social intelligence is less developed. The exercise is used to improve the pupil's less developed intelligence.

Making a mind map is a great matching activity for pupils who have a highly developed spatial intelligence. By expressing their insights on a particular subject visually, they discover how related ideas can be connected to the main subject.

Pupils with highly developed personal intelligence also benefit from making a mind-map. They usually enjoy the process of exploring their own inner thoughts and experiences. Because they are consciously connected to their own thoughts and feelings, it is easy for them to use associations to remember.

It is also a way to stretch pupils' creative, spatial or personal intelligence. By using colours and shapes and using their fantasies to find associations pupils are stimulated to break their usual thinking patterns find new connections and ideas.

Chapter 4 Advantages and disadvantages of mind-mapping

§ 4.1 Advantages

Through my research I have discovered that mind-maps have many advantages over classical note-taking techniques. As I mentioned in the previous chapters, the main benefit is that you use both halves of the brain which makes it easier to remember. Moreover, making a mind-map is fun. It is a creative process and a natural way to organize your thoughts. Most pupils like it because it is not boring.

Making mind-maps saves time. If you would like your pupils to use this technique in class, you will first have to invest some time in teaching them the technique and practising it. However when they have mastered the technique you will see that it saves a lot of time because you only use key words and so do not have to write a lot. It will also save time because pupils will memorize the subject material much faster so it will take less time to teach it to them.

Mind-maps make revision easier and faster because they are compact and brain-friendly. When you use a mind-map to revise, cramming for a test takes less time. In general it takes about two to three minutes to revise a previously made mind-map. It only takes a glance to see what the main theme is, to grasp the structure and to realize what is most important. The branches immediately give insight in what is related.

A mind map makes it possible to look over and think over the different relations between key topics. This is very useful when writing an essay or developing or working out an idea.

When new information is given, it is easy to add it to the mind-map. Just add a new branch. Written notes usually don't allow you to squirt in new information.

§ 4.2 Disadvantages

Unfortunately I found that there are also some disadvantages to mind-mapping.

When you first start using the technique, it can be a bit awkward to make one. I discovered this when I used mind-mapping in a lesson for the first time. The third form I used it with thought it was a bit childish and started giggling and laughing about it. They thought it was weird and didn't really see the point until I told them that mind-mapping is a technique frequently used by Microsoft's Bill Gates²⁵ and other multinationals. This impressed them and after that they were much more serious about it and wanted to learn the technique. Now I always use 'the Bill Gates story' in my introduction. Mind-mapping can also be quite time-consuming in the beginning. There is only one solution to this; practice makes perfect. The more you use the technique, the easier it becomes.

Because you use associations, a mind-map is very personal. The best mind-map is a mind-map that is made by yourself because it is the creative process of making it that makes it work so well. A mind map made by someone else will probably not work at all so it is not possible to use a mind-map to teach knowledge to someone else.

Although the technique is not new, it is not yet used a lot in schools. At the moment it is mainly used by managers. It is taught and used in virtually every Fortune 500 company throughout the world e.g. IBM, Hewlett Packard, BBC, Microsoft, Walt Disney and many others but for some reason it is not yet common in education. This could make it difficult to get some pupils to use it. They might feel uncomfortable using coloured pencils or crayons when other pupils are writing in their notebooks. Especially older pupils might find it strange or childish so it may take some getting used to. I found that telling them that mind-mapping is a technique used in every Fortune

²⁵ Gates, B. The road ahead: how 'intelligent agents' and mind-mappers are taking our information democracy to the next stage, Newsweek magazine, Dec. 19 2005

500 company throughout the world usually makes it more interesting and serious for them.

A disadvantage of computer-made mind maps is that most mind-mapping programmes are copyrighted. This means that mind maps can only be viewed on a computer on which the same programme is installed. This could mean that a pupil who made a mind-map at home may not be able to open it at school.

Chapter 5 Classroom organisation and study skills

§ 5.1 A school-tool

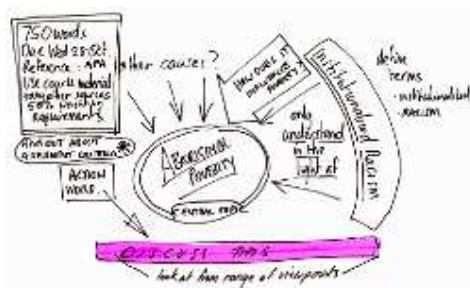
During my research I discovered that there are many possibilities to use mind-maps in class and I was surprised that the technique is used so little in schools. There are many possibilities for every school subject but in this paper I will restrict myself to general usage for study and specific usage in the English language classroom.

§ 5.2 Mind maps & study skills

Since one of the most important study skills is being organised, mind-mapping which is a technique to organize thoughts, is an ideal way to improve this skill.

Mind-mapping is a technique that needs a bit of practice in the beginning. A fun way of getting the hang of the technique is to have pupils make their first mind-map about themselves. They can draw a picture of themselves or use a photo as a central image. Branches could include hobbies, interests, family and many other things. The results can be used in a game to guess which mind-map belongs to which pupil. I used this activity as an introduction activity with new classes to get to know each other. Because the mind-maps are so personal, they give a lot of information about a pupil and it doesn't take a lot of time to guess to whom they belong.

A mind-map can be used instead of or beside an agenda. Take a notebook and draw a mind-map for each week. This might seem like a lot of work but it actually takes you about ten minutes a week and it is more fun because it becomes a customised agenda which gives a clear overview of the week.



Draw a mind map with seven main branches, one for each day of the week and draw connected branches for appointments, notes, homework and other reminders that normally fill an agenda. Of course these branches can be divided again and again. The appointment branch for instance could have what, where and when branches.

Teachers can either recommend this way of keeping an agenda to their pupils or have them make a mind-map in class at the beginning of the week to plan their tasks and homework. The teacher can check the mind-maps regularly at random during the week to see if the pupils update their mind map.

Mind-mapping can also be used for revision for a test or exam. Pupils can draw a mind-map instead of take notes while the teacher goes over the most important items for the exam.

§ 5.3 Mind maps & classroom organisation

A way of using mind-maps for classroom organisation is to draw a big mind-map on the whiteboard or a flip-over and use it to visualize the lesson plan. This gives pupils a clear overview of what is to be expected. Especially pupils who have a disorder in the autistic spectrum benefit from this because it is very important for them to know what will happen during the lesson.

Mind-maps can also be used to divide tasks. The teacher can draw a mind-map on the board, each branch representing a group of pupils and the connecting branches representing the tasks for that particular group. The teacher could also have each group make their own mind-map to divide the

tasks and then discuss them and fill in the one on the board according to the result of the discussion. A mind map can also be used this way to divide tasks within groups.

During my research I observed a cooking lesson in which mind-mapping had a double purpose. First of all planning and dividing the tasks but as a useful circumstance, the mind map forced pupils to read the recipe carefully. The teacher told me that before they had used mind-maps, the pupils didn't read the recipe and just started to cook. The consequence was that the dish often went wrong. Now they have to start by reading the recipe carefully because they need the information to complete the mind-map. The teacher uses the mind-map to check whether or not the pupil has read the recipe well enough.

First each pupil had to read the recipe and draw a mind-map to determine the tasks that had to be done. The teacher had drawn a blank mind-map on the board and randomly picked pupils to fill in a branch. Each mind-map was checked by the teacher to see if they had read and understood the recipe and only if all the tasks were in the mind-map they could go on.

The next step was to compare mind-maps with the cooking-partner and use it to divide the tasks. Again, after the division was made the teacher checked this and only after his approval, the pupils could start cooking. I think this is a good example of how mind-maps can help teachers to organize their lessons.

§ 5.4 Mind maps & projects

During my school practice at an ICT-integrated course, in which pupils are expected to plan and work more independently than in regular education, I discovered that pupils' main problem with projects is the planning and organizing. They often complained that they didn't have an overview of what they were supposed to do.

That got me thinking. What would be a better tool to plan, organize and get an overview than a mind-map? A mind map helps them to plan out the project in six steps. This can be used for any project, no matter what the topic might be. During my research I used the project helpdesk, in which pupils have to set up an English speaking helpdesk for their virtual companies, to find out if mind-maps could make planning easier for them.

Each project group of four pupils made one mind-map together because I wanted them to have one plan for their group.

As usual, pupils started with a central image that represented their own association with the project. The project mind map gets six branches, one for every step the pupils need to follow.

The first branch is called purpose. What is the project for? It might be part of the coursework, the open day or maybe for a charity cause. In this case, it was part of the coursework.

The second branch is named 'target'. It is very important that pupils have a target at which they can aim. It is motivating to work towards a target because it gives them a feeling of achievement when the target is achieved. Of course the target has to be clear to all group members.

What is the 'theme'? This is a very important branch because it can lead to several further branches of mind-map thoughts as more ideas might occur. A theme could be for instance historic, social or concerning a holiday. Of course there are many options.

The fourth branch is called 'contents'. What are the pupils going to do or make? Which approach suits the project best? Are they going to write an article, make a model, a scrapbook or a brochure? What materials do they need?

Another very important part of doing a project is the 'research'. This makes the fifth branch. What resources are the pupils going to use? Key word might be the internet (websites could be added later on), library, data etc.

Last but not least the 'timing'. When will the project start? When is it due? It might be a good idea to break down each of the stages into an achievable timetable to make it seem more manageable.

After each group had made their mind-maps according to the six steps described above, they started working on the project. During the four weeks of the project, the mind-maps hung on the walls of the classroom so that they were always in the picture. As I observed the groups it became clear to me that the mind-maps improved their cooperation. Whenever there was a disagreement, the pupils reminded the other group members of the mind-map they had made. They would point out that they had agreed to certain aspects; "look, it says so on the mind-map".

During the evaluation of the project pupils told me they had liked working with the mind-maps because it gave them an overview of the whole project and reminded them to their initial agreements whenever there was a quarrel.

I must conclude that a project mind-map will make the project more creative, organized and easier to keep control of and will save time but most important they help pupils to see the whole picture.

Chapter 6 Mind-mapping in the ELT classroom

§ 6.1 Using mind maps for foreign language learning

It is obvious that memory has an important role to play in learning and acquiring a foreign language. Especially in the communicative approach, pupils have to become familiar with and internalise words and sentences to use them effectively.

Mind maps are memory tools which use personal associations to make it easy to remember new information and to visualize the thinking process. That is why mind maps have proven to be a very useful technique to master a foreign language. Although it may cost time to teach the technique it will eventually speed up the learning process when pupils get the hang of it.

In the following paragraphs I will go into different language skills and how mind-maps can be used to acquire and practise those skills more effectively.

§ 6.2 Mind maps & reading skills

Reading is a very linear process, a typical left brain skill. When we read, we process words or sentences one after the other. The human brain is not very good at linear processing. Even the simplest calculator beats it in linear 'thinking'. However, the human brain is extremely good at parallel processing tasks like recognizing faces or identifying patterns. Not even the newest fastest computer can match our brain in this capability.

That is why it might be a good idea to use mind-maps to improve pupils' reading skills. Mind-mapping explores the parallel processing ability of the brain. When you think of a word, for instance 'sun', doesn't it immediately trigger a line of associated thoughts? Images, associations, ideas and pictures will run through the mind just by thinking the word.

Mind-maps can be used to help pupils understand a text, for instance an article, story or even a whole book. I tried this out by having four classes

read the same text. In two classes I did a mind-mapping activity, the other two classes were allowed to take notes.

I told pupils that they would be asked to recite what the text is about to help them focus their minds.

Before reading, I had pupils in the mind-map classes have a look at the title and made them draw a central image for their mind-maps. This central image should represent their association to the title. This helps them to predict what the text will be about.

Then I made them add six branches to the central image; “what?”, “where?”, “when?”, “who?”, “why?” and “result”.



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I told the pupils to ask these questions as they read and to draw the answers in their mind-map. The idea is that when they have finished they will only need one look at their mind-map to get an overall idea of what the text is about and it can support their talk about the text.

In the other two classes I asked pupils to have a look at the title and make a prediction of what they thought the text would be about. Then they read the texts and made some notes about the content.

After having read the text I asked some pupils to tell me what the text was about. This went well in all four classes.

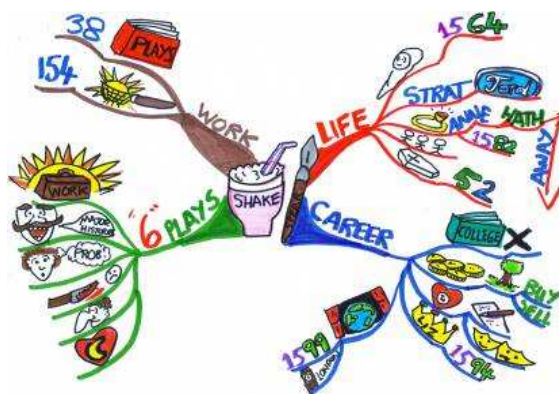
After two weeks I asked some pupils to tell me what the texts was about. They were allowed to look at their mind-maps or notes. The pupils who had

²⁶ Illustration taken from www.mind-mapping.co.uk

made the mind-maps could easily recall the content and even details of the text.

The pupils who had made notes found it hard to remember details and had to interrupt their talk in order to search through their notes.

By drawing a mind-map pupils visualize a text which gives them a clear insight into the contents. Surprisingly, while all pupils were able to summarize the text immediately after they had read it, the pupils who had made a mind-map seemed to have remembered many more details after two weeks and had a clearer view of what was important.



Mind map on the life of Shakespeare²⁷

§ 6.3 Mind maps & writing skills

One of the problems with writing assignments is that pupils complain that they ‘can’t think of anything to write!’. They procrastinate starting on the writing assignment, staring at a black sheet of paper or just do not do it.

A mind-map can activate the pupils’ thinking ability and creativity. The central image of the mind map should be a drawing that they associate with the title of the writing assignment. It should have lots of colour and it can be as elaborate as the pupil wants it to be. This is a good way to get their imagination working.

²⁷ Illustration taken from www.mind-mapping.co.uk

A good way of organizing the writing assignment is to use the wh-questions as a starter again, each branch representing a wh-question. Another option would be to first draw three main branches for introduction, content and conclusion. It is important to use symbols, pictures and colours to let the imagination run wild.

The next level of branches can be used to fill in the details of the essay, story or other writing assignment. Adding more details will make the story become alive and clear in their minds.

Writing an English letter is an important part of the curriculum for Dutch senior pupils. That is why I chose this activity to find out if mind-mapping could have a positive influence on the writing skill.

I first asked them to draw a central image. Many drew an envelope but some draw all the letters of the alphabet or a mailbox or mailman.

A letter-writing mind-map consists of four branches. Who is the recipient of this letter? This is the first branch. It is important for the pupil to visualize to whom he/she is writing the letter. This might give him/her ideas for the content and helps to verify the right manner of addressing the recipient and whether to sign it off formally or informally.

The second branch is called purpose. What is the purpose of the letter, why does it have to be written? This part helps to plan the first paragraph and gives the pupil a motivation. For instance, to thank someone, an invitation, complain about something, describing an event, etc.

The next branch covers all the details. Wh-questions can be used for the sub-branches. This helps the pupil to plan the content. For instance, what are they asking for, where or when will it take place, etc. Further branches can be added to work out new ideas or more details.

The last branch can be used to round off the letter and is called 'ending'. This branch should be the last to be drawn because, that way, pupils can

look at everything they have come up with on the mind-map to sum up and use it as an ending.

After the activity some pupils told me they thought it was nice to think about all aspects of the letter before beginning to write because they would have an idea of what to write before they started and because they could use the mind-map afterwards to check if they had included all aspects.

There were also some pupils who told me they didn't see the point of drawing a mind-map and who preferred to start writing as soon as they got the assignment.

Writing a summary also becomes easier when pupils process the information in a mind-map because they organize their thoughts in a way that makes it easy to review and - not unimportant - easy for the teacher to check their work. Again, the wh-questions are a good way to start.

Without mind-maps, writing assignments can be tough for pupils, producing low grades in return for hard work and stress. Planning a writing assignment this way will save time in the long run and will help pupils to be organized and write well. A mind-map can help pupils to plan out exactly what they are going to write and stimulates their creativity to write a brilliant letter.

§ 6.4 Mind-maps & Speaking skills

Pupils can draw a mind-map to prepare a topic for their oral exam. During the exam this can be used as a reminder. Of course there are not supposed to be any sentences on the mind map, just key words and symbols.

I have used mind-maps while teaching pronunciation. I used a mind-map to make a clear overview of words that have the same sound on the white-board or a flip-over. These can be grouped together, each group its own branch. I used symbols and drawings of familiar rhyme words to make it easier to remember the right pronunciation and the mind map gives a clear overview of which words have a particular sound.

§ 6.5 Mind maps & Vocabulary

Drawing a mind-map is a technique that is very suitable to elicit vocabulary. During my research I observed a German teacher who used mind-maps to elicit vocabulary for a German restaurant from her pupils.

She told the pupils that they were going to set up a tiny German restaurant in class. Just one or two tables. She started by going over the basic rules for mind-mapping again and asked them what the main branches should be about. The pupils came up with the following:

- Furniture
- Menu
- Kitchen
- Atmosphere
- Personnel

Sitting in groups of four or five, each pupil worked out the details on their own mind maps. After they had finished they compared their work with the others in their groups and added what they thought was missing so that in the end everyone had the same vocabulary. This way, they learn from each other.

The teacher discussed the mind-maps of the groups and showed the group mind-maps she thought were really well done. Although in the end all pupils had used the same vocabulary (because it is so easy to add a new word to the mind-map) they had used various symbols and pictures. The ‘personnel’ branch featured a sub-branch called ‘money’. Some pupils had drawn a cash desk, some had drawn coins and some had drawn paper money.

Some of them had associated the foreign word with a similar sounding word in Dutch or with a strange symbol that meant nothing to me but for some reason made them think of the word. This is why a mind-map is an excellent way to remember new vocabulary. It uses associations that are very personal and unique which makes it easy to remember.

It is easy to add new words so it can be used in several lessons. When the mind-map is finished, pupils can take it home to study for a test.

When I tried to teach vocabulary using mind-maps I found out that using mind-maps to study vocabulary works best when the vocabulary is grouped in themes so pupils can draw a central image of the main theme and subdivide it into branches. This was not a problem for me because at the ICT-route where I did my school practice, pupils do not have books so I was free to teach them list of vocabulary which I had compiled myself. However, when teaching vocabulary using a method like for instance Stepping Stones it might be necessary to regroup the vocabulary items according to a certain theme.

Most vocabulary studied by secondary school pupils refers to everyday things. This makes it easy for pupils to link the foreign words to images in their minds. For instance, food-related words can be associated by visualising a supermarket and animal-related words can be associated by imagining a zoo. This way, the teacher can cover different every-day vocabulary topics and reinforce the vocabulary thoroughly.

Conclusion

I hope that with this graduation paper I have made it clear that mind-mapping is a technique that offers many possibilities for teachers of English as a foreign language, that it can be used to support various language learning activities and that it enhances learner motivation involving creativity into tasks which are usually focussed on the left half of the brain.

In the first chapter I discussed the theory that lies behind the technique. I think it is important for teachers to have some idea of how the brain works because the mind-mapping technique is based on brain research and that is why it works so well. During my research at Blariacumcollege I discovered that mind-mapping adds creativity to my lessons and helps my pupils to use both halves of their brains.

While practising mind-mapping for my research I discovered that associations, pictures and even colours really help to organize thoughts. Even when looking back and reviewing this paper, I don't think about the numbers of the chapters but the colours have stuck in my mind. For instance, when I want to read about multiple-intelligence I scroll back to the red chapter without having to stop to read chapter numbers.

In the second chapter I explained how to make a mind-map. Because the technique is so easy, there are just a few basic rules to take into consideration and because there are not many materials required and the materials that are required are not expensive, I think the technique is very suitable to use in schools.

Chapter three was all about mind-maps and multiple-intelligence. Multiple-intelligence has become a topic in which many modern teachers are interested. By focussing on different kinds of intelligences in one lesson teachers nowadays hope to interest different pupils and to sustain their attention by using tasks and activities which address various types of intelligence. Mind-mapping is an activity which can be used to address them.

In the fourth chapter I discussed the advantages and disadvantages of mind-mapping. Overall I found the disadvantages of mind-maps are far outweighed by their advantages. In my opinion, the best thing about mind-maps is that they are so easy to make while they have so much possibilities.

Although I have just started using mind-maps myself, I have used the fifth and sixth chapter to describe the ways I have used mind-maps in my lessons up to now. I have found that although they might obstruct at first, many pupils like the creative aspect of mind-mapping and benefit from these activities. Not every mind-mapping activity may be suitable for every class or teacher but I think there are mind-mapping activities to suit different teaching styles and it is definitely worth it to give the technique a try. I will keep using mind-mapping activities in my lessons and I think that there are many more ways to use mind-maps for me still to discover.

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