PSYCHOLOGICAL FOUNDATIONS OF MIND MAPPING STRATEGIES IN TEACHING ENGLISH

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Abstract. The present study investigates psychological foundations of mind mapping as one of the relevant tools in teaching and learning process. A Mind Map, the modern approach implemented and developed by Tony Buzan is viewed as a visual diagram used to record and organise information in a way which the brain finds captivating and easy to process. It is based on the conception of radial tree, diagramming key words in a colorful, radiant, tree-like structure. The study focuses on the theoretical analysis of brain's as well as cerebral hemispheres' functioning aiming to explain the claimed increased effectiveness of mind mapping over other forms of learning, understanding, remembering and performing. Much attention is devoted to the benefits and challenges of using mind maps. Thus, some sufficient mind mapping strategies for English teachers which can be effectively used in the classroom have been presented. The research confirms that mind mapping is a beneficial learning tool to help students brainstorm any topic and think creatively. It is a powerful way for students to reach high levels of cognitive performance.

***Keywords**: mind mapping, psychological foundations, teaching English, benefits, visual diagram, learning tool, students.*

Бучацька Світлана. Психологічні основи використання інтелектуальних мап у викладанні англійської мови.

Анотація. У дослідженні проведено аналіз психологічних основ створення інтелектуальних мап (ментальних карт) як одного з важливих та релевантних інструментів у навчальному процесі. Інтелектуальні мапи, як сучасний підхід у викладанні, розроблений Тоні Бузеном розглядається як візуальна схема, яка використовується для запису та організації інформації, що легко піддається обробці. Ідея інтелектуальної мапи заснована на концепції радіального дерева, у якому його окремі елементи, ключові слова поєднуються у барвисту, деревоподібну структуру. У дослідженні увага зосереджена на теоретичному аналізі функцій мозку загалом та півкуль головного мозку зокрема, який дозволяє пояснити високу ефективність використання інтелектуальних мап у порівнянні з іншими формами навчання, розуміння, запам'ятовування та виконання рішень. Велику увагу приділено перевагам та недолікам використання ментальних карт. Відтак, у статті представлені деякі стратегії використання карт для вчителів, які можуть бути ефективно використані у викладанні англійської мови. За результатами дослідження доведено, що інтелектуальні мапи є необхідним інструментом навчання, який допоможе студентам активізувати свій інтелектуальний резерв, обговорюючи будь-яку тему і мислити творчо. Це – потужний спосіб для досягнення високого рівня когнітивних функцій.

***Ключові слова**: інтелектуальні мапи, психологічні основи, викладання англійської мови, переваги, візуальні діаграми, засоби навчання, студенти.*

1. Introduction

Learning process proves to be successful only if it involves multiple strategies available for critical thinking, decision-making and creative studying. The greatest challenge expected is to change the education situational factors in the direction of teacher as coach and learner from the prevailing model of teacher as disseminator of

information and boss in the classroom. Therefore teachers and educators need to be engaged in training programs that can model the new educational approaches.

The next challenge lies in changing assessment practices that now rely primarily on multiple-choice tests that measure mainly rote recall of information, to performance-based projects that require students to demonstrate their understanding of basic concepts, ability of using them in topic discussions as well as visualizing and modifing their ideas. There exists plenty of room for acquisition of a variety of tools and techniques to generate and organize thoughts in order to hold large amounts of information and knowledge, such as mind mapping, concept mapping, diagramming and an endless list of accessible applications used today.

Being involved in teaching English and English language related courses we tend to intensify and improve the process of foreign language learning by seeking for a diversity of techniques, tools and methods to be performed in the class. The **purpose** of the present study is to investigate psychological foundations of mind mapping as one of the relevant tools of learning and analyse the benefits and challenges of using mind maps in teaching English.

2. Methods

Observational and opinion based research involved first and second - year students of a number of specialties in Vinnytsia pedagogical university who are not majoring in English. Engaging students from various departments and institutes (Philology, Journalism, Primary Education and Psychology) we supposed that they obviously possess different motivation towards learning English, which might influence their ability of foreign language acquisition.

3. The study

Having made a profound investigation in the field we draw a conclusion that the use of diagrams that visually "map" information using branching and radial maps traces back centuries. The pictorial methods used by Porphyry of Tyros (3rd century), Ramon Llull and others helped them record knowledge and model systems as well as permit us today understand the principles of human cognition. The modern approach which is more known as Buzan's specific approach is based on the conception of radial tree, diagramming key words in a colorful, radiant, tree-like structure.

Although Tony Buzan is considered to be the founder of Mind Mapping he grounded his ideas making a deeper insight into the theories underlying the above notion and analyses the earlier studies of the key mechanisms of brain functioning. In the book “The Mind Map Book: How to use radiant thinking to maximize your brains untapped potential” (1993) the authors focus on the scientific discoveries, made by Dr. Roger Sperry whose “initial findings indicated that the two sides or hemispheres of the cortex tend to divide the major intellectual functions between them. The right hemisphere appeared to be dominant in the following intellectual areas: rhythm, spatial awareness, gestalt (wholeness), imagination, daydreaming, colour and dimension. The left hemisphere appeared dominant in a different but equally powerful range of mental skills: words, logic, numbers, sequence, linearity, analysis and lists” (Buzan & Buzan, 1993:32). Sperry claimed that the more

activities were integrated, the more the brain's performance became co-operative, with each intellectual skill enhancing the performance of other intellectual areas.

The immense abilities of human brain were investigated by Professor Petr Kouzmich Anokhin in 1973 who concluded that "each of the ten billion neurons in the human brain has a possibility of connection of one with twenty-eight noughts after it. If a single neuron has this quality of potential, we can hardly imagine what the whole brain can do" (1993:30) which actually proves that the potential of our brain is unlimited. Still, the human brain looks for patterns and completion that may be satisfied by Mind Mapping technology.

Buzan (1993:59) defines a Mind Map as a visual diagram used to record and organise 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 you can clearly 'see' their flow across different levels. The fundamental idea of Buzan & Buzan's (2010:37) observations is that a mind map resembles the brain's neuronal structure with infinite connections. The brain is a big "associative machinery" and mind mapping "mimics thought processes" by naturally calling to mind associations to recorded words and images on the map as you progress through the task. They observe that the brain—unlike a sequential processing computer—uses multilateral thinking, going in many directions at once in a holistic manner, using both sides of the brain. This they label "radiant thinking."

According to Anokhin (1973), information in a Mind Map is structured in a way that mirrors exactly how the brain functions – in a radiant rather than linear manner. The brain likes to work on the basis of association and it will connect every idea, memory or piece of information to tens, hundreds and even thousands of other ideas and concepts. Therefore radiant thinking can be seen as a natural and efficient way of using our brains. It should be taken into consideration that mind mapping derives from huge information processing ability and learning capacity. In other words brain's r*adiant thinking* pattern may thus be seen as a gigantic branching association machine - a super bio computer with lines of thought *radiating* from a virtually infinite number of data nodes.

There is still relatively little known about memory processes and how knowledge finally gets incorporated into our brain, but it seems evident from the diverse sources of research that our brain works to organize knowledge in hierarchical frameworks and using imagery, visualization as it helps to acquire concrete concepts, such as object identification, spatial relationship, or motor skills where words alone are inefficient. Thus, human ability to mental imagery which is always understood to function as a form of mental representation, visual mental imagery, was thought to be caused by the presence of picture-like representations (mental images) in his mind or brain.

Earlier studies prove a very large, even pivotal, role of mental imagery in both memory (Yates, 1966; Paivio, 1986) and motivation. It is also commonly believed to be centrally involved in visuo-spatial reasoning and inventive or creative thought, providing background for all thought processes, and the semantic grounding for language respectively. It is commonly admitted that mental imagery is a familiar aspect of most people's everyday experience.

Obviously, because the mind map constructively uses the tools of Imagination, Association and Location, as well as the tools of the left and right brain, we can consider it as the ultimate thinking tool that incorporates all the significant and potent ways of thinking into its own structure.

There is an increasing amount of recent research that suggests mind mapping can improve learning and memory by 10 to 15% versus conventional note-taking and studying techniques. Creating new methods of observing or recording events learners open up new opportunities for their new knowledge creation.

Cunningham (2005) conducted a user study in which 80% of the students thought "mind mapping helped them understand concepts and ideas in science". Farrand, Hussain, and Hennessy (2002) also reported on positive effects of mind mapping (spider grams) on memory recall in undergraduate students (a 10% increase over baseline for a 600-word text only) as compared to preferred study methods (a 6% increase over baseline). Abi-El-Mona and Abd-El-Khalick (2008) found that 8th grade students assigned to a Mind Mapping group showed substantial gains in conceptual and practical understanding on a science achievement test than those assigned to a note summarization group.

A brief review of studies suggests that mind mapping produces comparable or superior results to traditional note-taking strategies. Much evidence can be found to confirm a broad usage of mind maps in all spheres of human activity.

4. Results and discussion

Considering the great value of mind mapping in the process of human learning and human knowledge creation, we tend to implement some technologies which we suppose significantly enhance the learning capability of all learners. At the same time one must realize that learning should be thinking and meaning centered. In other words, students don't simply record information but build up their knowledge structurally. Gardner's Theory of Multiple Intelligences, thus, may make an essential ground for personality's further development. Although there are obvious differences between individual's abilities which were manifested by Gardner (1993:7-8) in his theory, still "there is not just one form of intelligence based on verbal and reasoning abilities, but that there are seven different intelligences, each having a unique neurological pattern and course of development".

In this case Mind Mapping can be successfully used as it brings together left brain (words, logic, numbers, linearity) and right brain skills (curves, colour, rhythm, images, space) making brain's performance more synergetic. This means that each cortical skill enhances the performance of other areas so that the brain is working at its optimum. Experimenting with Mind Mapping we encourage students to enhance their competence in English as well as develop their creativity, critical thinking and what is more, teach them how to structure their thoughts and sort out information they work with.

In the previously conducted research Buchatska (2015:7) claimed that prevailing difficulties and therefore the students' negative experiences in foreign languages communication are determined by a high degree of speech fluency, difficulty in understanding spoken language and grasping the meaning of an utterance. As the conducted correlation analysis showed, the failure to understand a

foreign speaker adequately is mainly related to the lack of vocabulary and low skills in expressing opinions. Thus, we focused on the formation of students' speaking skills using the technology of mind mapping on the basis of topics "English as a Universal Language" (Appendix A), "Practical Pieces of Advice on How to Learn a Foreign Language" (Appendix B) and "Choosing a Career" (Appendix C). The purpose of teaching speaking through the above technology is to make students be able to use language communicatively and meaningfully incorporating words, images, numbers, and color; generate ideas; outline and summarise large amounts of information.

Once the topic is given, the students are supposed to work out the text, that is to say, read it, write down all unknown words and outline the text. For example, while studying the topic "Choosing a career" (Appendix C) we pointed out four paragraphs which actually represented "The main steps" in choosing a career:

Step 1→ Define your requirements for the career;
Step 2→ Look for a job;
Step 3→ Apply for the job;
Step 4→ Go through the interview.

Further, the students are asked to expend on the following steps using key words or expressions and at last to design a mind map introducing details and relationships among these details. The learners are free to choose the technique of their mind maps.

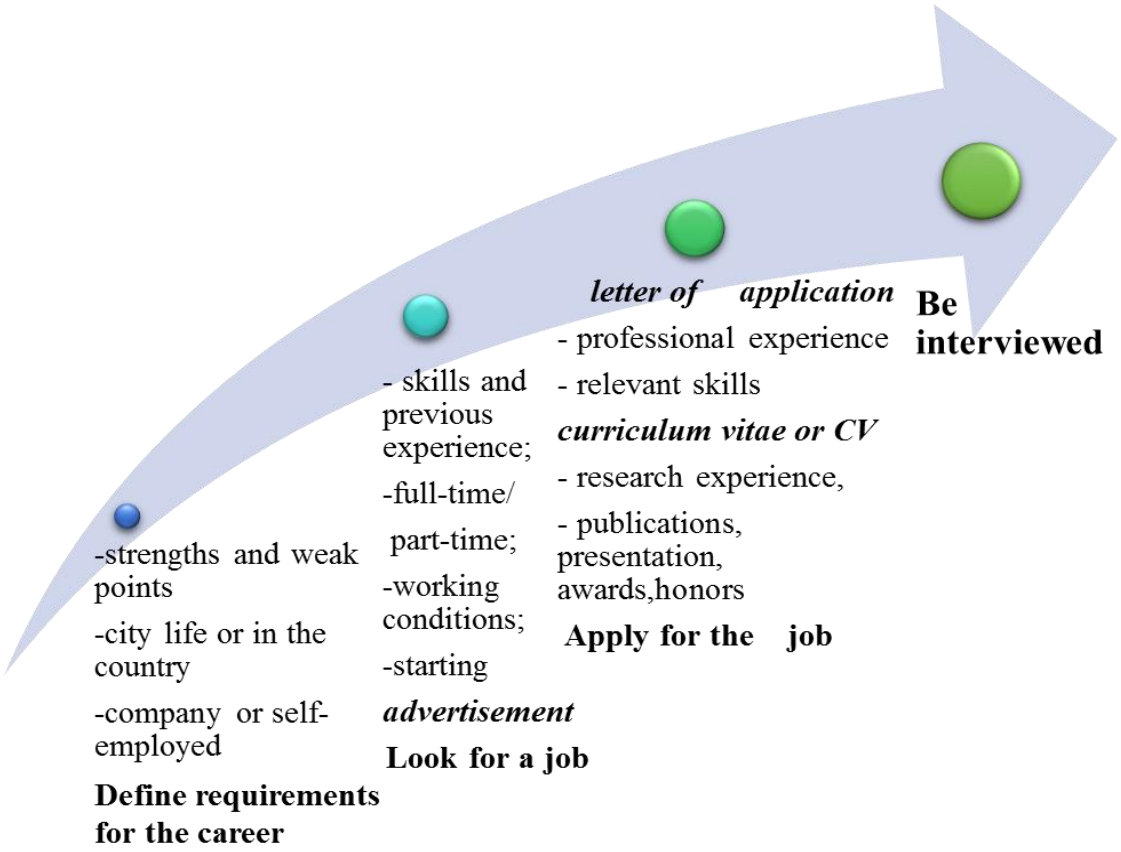

Fig. 1. *A Mind Map to the topic "Choosing a Career" supported by SmartArt graphs*

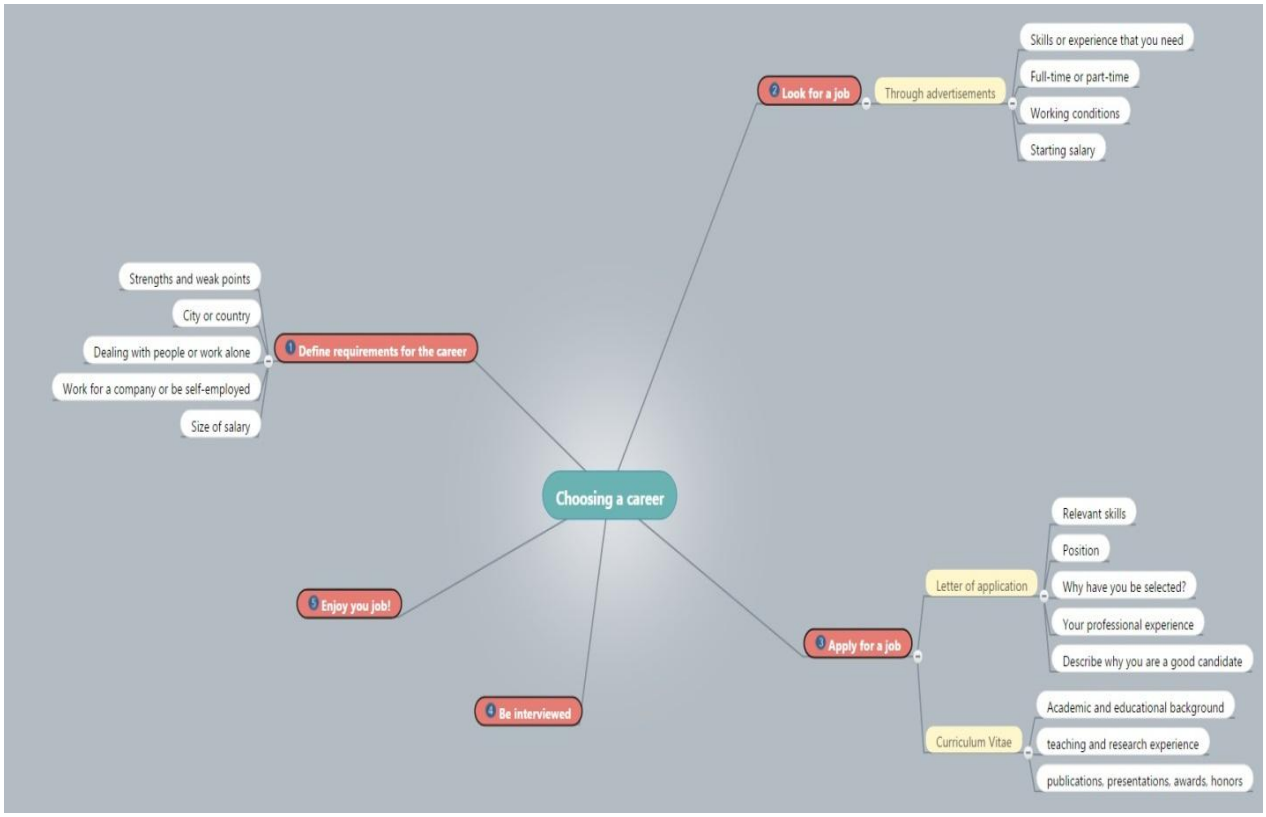

Fig. 2. *A Mind Map to the topic "Choosing a Career" supported by Mind Meister*

Figure 1 and Figure 2 above represent two different mind maps created by second-year students which illustrate two approaches and peculiar abilities in visualizing and organizing information.

While observing students mind mapping we have found that many of them have difficulty identifying the important concepts and key notions in a text, lecture or other form of presentation. Part of the problem, as concluded by Novak & Cañas (2008:24) stems from a pattern of learning that simply requires memorization of information, and no evaluation of the information is required. Such students fail to construct powerful maps by recording the ideas, where they fit in terms of context and content and organize their notes by categories and relationships while mapping.

For these students, the subject matter of most disciplines, and especially science, mathematics, and history, is a cacophony of information to memorize, and they usually find this boring. Many feel they cannot master knowledge in the field.

Although the benefits of mind mapping have long been established, one of the most important aspects of making ideas visible using both words and images, is that our very process of thinking can become visible. Once our ideas exist outside our brains we can explore them in greater depth. This capacity to work with ideas made visible is an important aspect of visual intelligence.

While mapping their ideas the students realize that this process allows them to see the whole picture, the parts and the whole and notice the relationship between

them. Lacking the ability to understand some notions at first, they then move from detail to detail to see the entire system. It became evident that starting point from which the map is constructed can vary depending on the expected previous understanding by the students, the difficulty and novelty of the topic, and the teacher's confidence in mastering the topic.

As mentioned before the process of mind mapping trains them in summarizing information efficiently, pointing out the key elements or notions and organizing thoughts, bouncing ideas off of each other, rather than thinking linearly.

Most of students manage to talk more confidently conveying basic meanings, following the structure they perform in their mind maps. In addition, we have found out that students' involvement in mind mapping while learning English and their language practice improvement significantly reduce anxiety they usually suffer from. Thus, these positive changes in students influence and raise their motivation.

It was also discovered that students feel better and communicate more effectively in situations when their speech is supported by visual map. Mind mapping ideas help students select, structure, synthesize and integrate information, improve their foreign language communication. It proved to be even more important for the first-year students while studying the topic "English as a Universal Language" (Appendix A), "Practical Pieces of Advice on How to Learn a Foreign Language" (Appendix B).

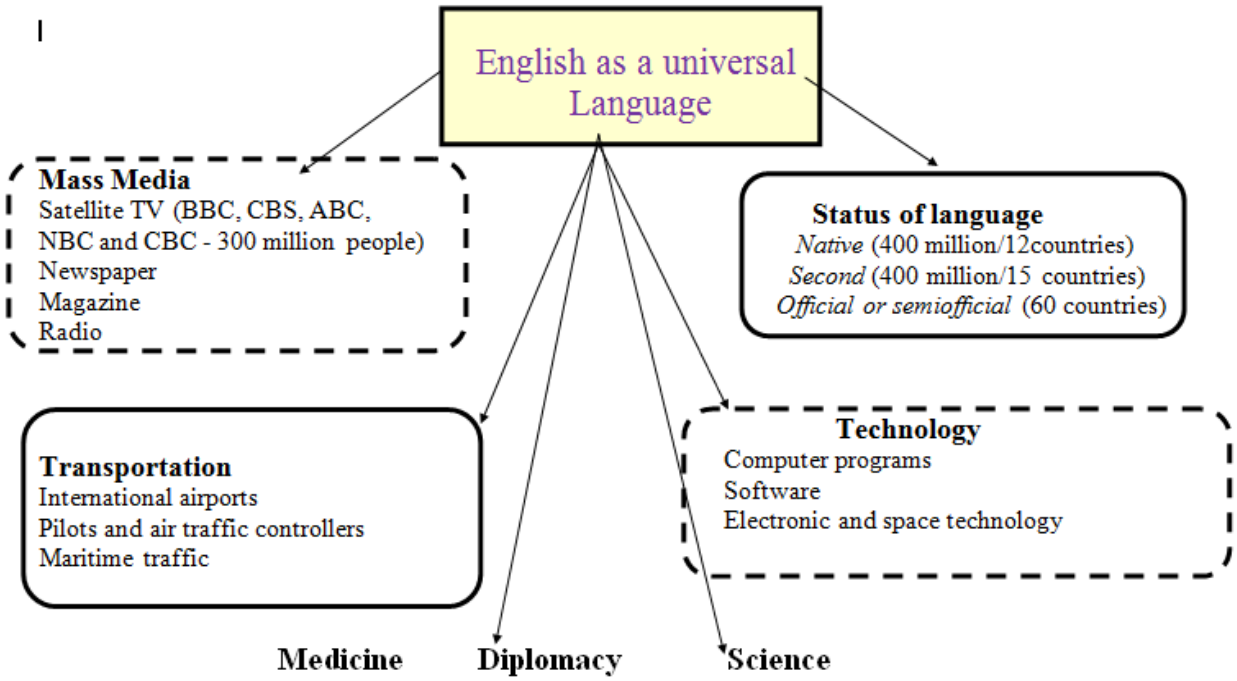

Fig. 3. *A Mind Map to the topic "English as a Universal Language"*

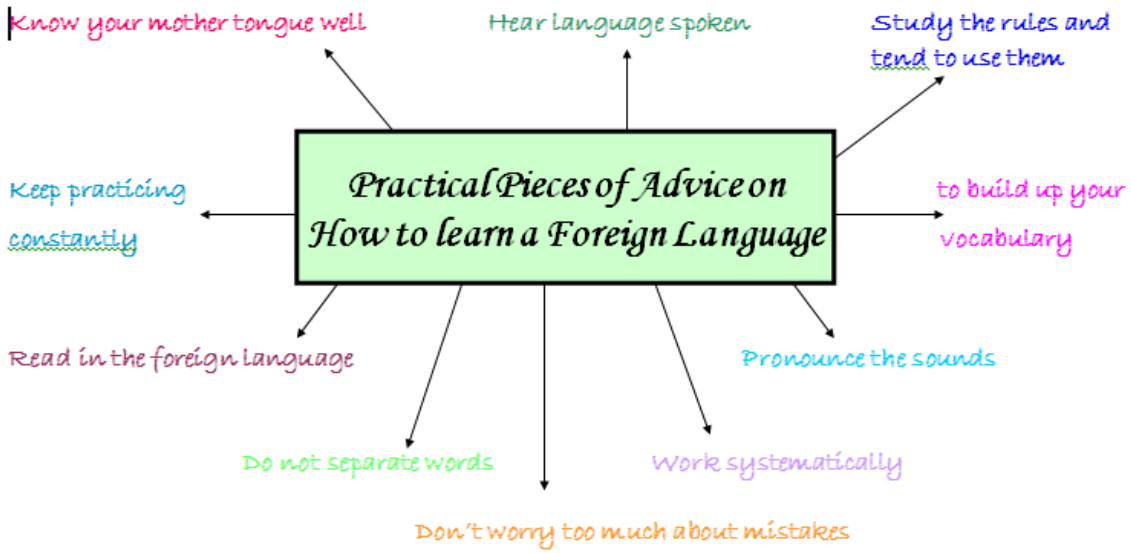

Fig. 4. *A Mind Map to the topic "Practical Pieces of Advice on How to Learn a Foreign Language"*

As indicated earlier mind mapping is a powerful way for students to reach high levels of cognitive performance, an ideal evaluation tool for educators measuring the growth of and assessing student learning. As students create maps, they interpret ideas using their own words and help identify incorrect ideas and concepts; educators provide an accurate, objective way to evaluate areas in which students do not yet grasp the notions fully.

The observation research confirmed that Mind Maps also provide teachers with insight into their students' thought process regarding a specific topic. By asking students to create mind maps demonstrating their comprehension of main ideas, teachers are able to understand what a student's prior knowledge was and how well the student understands the assignment or the material being taught. This is a very effective way of evaluating students' understanding.

In order to facilitate the learning atmosphere Mind Mapping can also be a class effort, using a projector, where all students give their opinion and participate in the construction of the map. In this case a teacher must be alert to evaluate the individual participation of every student.

5. Conclusions

The above analysis of theoretical foundations of Mind Maps proves that it is truly profound and powerful learning tool. Mind Mapping has been shown to help learners learn, researchers create new knowledge, educators to better structure and manage their learning process, and evaluators assess learning. As a beneficial tool, it

can help students brainstorm any topic, facilitate the learning process and capitalize on students' natural creativity.

In addition, it is required to develop special mind mapping techniques and implement them in educational environment to sufficiently benefit from usage of all possible visual tools.

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Appendix A

ENGLISH AS A UNIVERSAL LANGUAGE

English is becoming the world's first truly ***universal language***. It is the native language of some 400 million people in twelve countries. That is a lot fewer than the 800 million people or so who speak ***Mandarin Chinese***. But another 400 million speak English as a second language. And several hundred million more have some knowledge of English, which has official or ***semiofficial status*** in some sixty countries. Although there may be as many people speaking the various dialects of Chinese as there are English speakers, English is certainly more ***widespread geographically***, more genuinely universal than Chinese. And its usage is growing at an extraordinary pace. Today there are about 1.5 billion English speakers in the world. By the year 2020, that figure **is likely to** exceed 2 billion.

Media and Transportation

English ***prevails in*** transportation and the media. The travel and communication language of the international airwaves is English. Pilots and ***air traffic controllers*** speak English at all international airports. ***Maritime traffic*** uses flag and light signals, but «if vessels needed to communicate verbally, they would find a common language, which would probably be English».

Five of the largest broadcasters – CBS, NBC, ABC, the BBC, and the CBC-***reach a potential audience*** of about 500 million people through English broadcast. It is also the language of satellite TV.

The Information Age

The language of the information age is English. Computers talk to each other in English.

More than 80 percent of all the information ***stored in*** the more than 100 million computers around the world is in English.

Eighty-five percent of international telephone conversations ***are conducted*** in English as are ***three-fourths*** of the world's mail and e-mail. Computer program instructions and the software itself are often supplied only in English.

Science

German was once the language of science. Today more than 80 percent of all ***scientific papers*** are published first in English. Over half the world's technical and ***scientific periodicals*** are in English, which is also the language of medicine, electronics and space technology.

Diplomacy

English is replacing the dominant European languages of centuries past. English has replaced French as the language of diplomacy being the official language of international aid organizations: such UNICEF, UNESCO, NATO, and the UN.

Appendix B

PRACTICAL PIECES OF ADVICE ON HOW TO LEARN A FOREIGN LANGUAGE

1. If you know your **mother tongue** well, you can learn ***a foreign language***.

2. If you want to speak a language, you must hear it spoken, and it is very good if you have a teacher who ***speaks this language well and fluently***. ***In case*** there is no teacher whom you can imitate, a record or a tape recording might be ***of great help***.

3. Every language has its own ***grammar rules***. You must always remember that each language is organized according to its own grammar. Study the rules and tend to use them. Do a lot or grammar exercises. Some people believe that learning a foreign language is just ***a matter of memorizing words.*** You certainly have ***to build up your vocabulary***, but you will never speak or read a language unless you know grammar rules and are able to use them.

4. Say words, phrases, sentences over and over again until they ***come automatically***. You have to practice just as a pianist has to play the piano for hours. You must ***keep practicing constantly*** or you will get out of practice. The more you learn, the easier it is for you to learn still more. Your knowledge of a language is like a rolling snowball.

5. You must ***read journals and newspapers in the foreign language*** you are learning. You should even read children books or other easy-reading series books you have ***at your disposal***. The more you read, the sooner you will ***get the feel of the language***.

6. Learn the language ***by ear***. Listen to records. Listen to tapes. Turn on radio and listen.

7. Pronounce the sounds of the language you are learning, especially the sounds that are different from the sounds of your ***mother tongue***. Imitate as close as possible the intonations.

8. You must try to learn and memorize whole sentences and phrases - not just words! Do not separate words that are put together.

9. ***Work systematically***. You should learn systematically whether you are taking a class or studying on your own. These who do not work hard enough cannot expect to get good results.

10. ***Do speak up***. He who keeps thoughts to himself may well be blessed but you will do better if you don't go by this principle when speaking a foreign language. Remember it is always better to say something than not to speak at all.

11. ***Don't worry*** too much about mistakes. You will make them anyway — there is no getting away from them. A brilliant idea will still be brilliant even if it is expressed against all rules of grammar and pronunciation.

12. And finally, remember that learning a language is ***a never-ending process***. When is the best time to start learning a foreign language? You can learn it at any age but it is much easier when you start young. - So the best time to start learning is NOW. Good luck!

Appendix C

CHOOSING A CAREER

Choosing one's career is an important step in everybody's life. Most children have only vague ideas of what they want to be. Some children admire their parents and want to follow in their footsteps or at least they take their parents' advice, others prefer to go their own way.

The best idea is to define clearly what your **requirements for the career** are. This involves taking a realistic view of your **strengths** and **weak points**. You should also answer some important questions. First: what sort of life do you want to live: in the country or in the town? Is the size of your **salary** important to you? Second: what sort of work do you want to do? For example, do you like working alone or **dealing with people**? Do you want **to work for a company** or **be self-employed**? Does teaching **appeal to** you? Do you want to be **an organizer** of other people's activities?

The next step is looking for a job. Most people find jobs through **advertisements** in newspapers or on the Internet. They look through "Help Wanted" or "Employment Opportunities" in the classified section of a newspaper or on the website. Job advertisements may include the information on what **skills** and **previous experience** you need, whether it is a **full-time** or **part-time** position, describe **working conditions** and indicate the **starting salary**. They may also inform you what you should do if you are interested in **applying for** this job.

Having found a suitable position a person usually writes a **letter of application**, also known as **a cover letter**. Your application letter should let the **employer** know what position you are applying for, why the employer should select you for **an interview**, and how you will follow-up. When writing the letter you should include details of the position you are applying for, explain the reasons for your interest in the specific organization, describe your **professional experience** and most **relevant skills**, say why you think you are a suitable **candidate**. When applying for academic, education, scientific or research positions a **curriculum vitae or CV** is written. A **CV** includes a summary of your **educational and academic backgrounds** as well as teaching and research experience, publications, presentations, awards, honors and other details.

Be prepared to work hard before you get a job. You may spend long hours and lots of energy just looking for a job. But anyway, a good **occupation** is worth all the efforts. You must think about your future, because if you don't think about the future you don't have one.