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The involvement of neuro-linguistics and mind mapping in the development of a holistic perception of language education

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Abstract

The majority of people who have experienced institutionalized education have found it extremely laborious, slow and a necessarily repetitive process. The authors of this paper focus on and present possibilities for making the teaching of a foreign language more effective through mind mapping: the implementation of neuro-linguistic knowledge and mind maps into the learning process.

Key words: neuro-linguistics, mind mapping, coding, learning strategies, keyword, concept.

Introduction

As Petty (2006, p. 27) has it: "the aim of the brain is to remember only useful facts and thoughts, but, unfortunately, it has the tendency to consider the information as long lasting and useful only if it is applied regularly".

This could be taken as one of the most important reasons why, after their school attendance, only very few learners can acquire and use a foreign language. Teachers most often tell learners that the words are combined in different types of sentences. Subsequently, the sentences are arranged in such way that it is possible to interpret ideas, opinions and thoughts. It is a great disadvantage that teachers do not teach learners how to apply all of the acquired knowledge. They do not explain how different pieces of information could be interconnected with one another in branched semantic networks.

For a deep understanding of a foreign language it is important that learners understand implicit knowledge of its structure, that they know the meaning of individual words and sentences in order to be able to decode their meaning in spoken utterance as well as to interpret the meaningful relationships between individual concepts. It is necessary to show learners how they can process and decode the information they use either in spoken or written language.

1 Neuro-linguistics and metacognitive regulation

Neuro-linguistics explains the relationships between brain and language structures, i.e. the way that the linguistic system operates in human brain (localization and activation of language representations in human brain as the language is an abstract matter of the mind concept; moreover, language areas of the brain are specialized – especially for individual representations of symbolic communication).

Neuro-linguistics, as a discipline on the border between humanities and natural sciences, belongs to cognitive sciences. Cognitive science deals with the issues of cognition, memory and perception, information processing, problem solving, evaluation, planning, mental operations. The connection between individual disciplines (Philosophy, Linguistics, Anthropology, Neuroscience, Artificial Intelligence, Psychology) is shown in the heptagram of cognitive science below Figure 1.

Fig. 1: Heptagram of Cognitive Science (Miller, 2003)
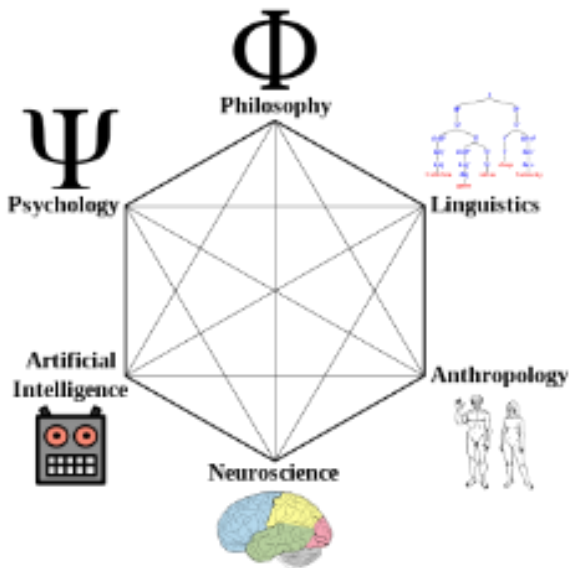
In several recent decades there has been almost a cognitive revolution in educational contexts. Miller (2003) depicts a historical view of gradual changes in psychology that brought today's cognitive revolution. The origin of cognitive science dates back to September 11, 1956 which was the second day after the symposium organized by the Massachusetts Institute of Technology.

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Nowadays cognitive sciences are viewed as a stream of the most dynamically developing scientific disciplines. The main role of cognitive science is considered to be the demystification of the functions, reflection and nature of human mind. It is primarily about mental states such as attention, emotion, memory, perception and thinking, but also includes the latest knowledge in cognitive research in relation to language, brain, consciousness, behaviour, and the mind.

In cognitive science, researchers constantly try to find answers to the questions: How do we learn? How do we remember? How is perception organized? Why can we solve problems? How do we interpret reality? How does our brain get information?

Neuro-linguistic coding is a concept that has been developing since the 1970s. It is based on an alternative psychotherapeutic method known as NLP founded by the linguist Grinder and mathematician Bandler (1981). These authors modelled the thinking patterns of successfully learning experts from various fields, and applied them into solving common problems in standard life situations. The aim of neuro-linguistic coding is to increase learning efficiency, to improve the work performance and creative potential of every person.

The concept of neurolingual coding is based on the fact that success in any educational pursuit could be achieved through active application of three basic components in learning processes:

- neurological – our brain, the nervous system and the senses through which we receive information from the outside world;
- linguistic – communication, language;
- coding – a summary of procedures which make it possible to create a stable internal knowledge structure for each human.

Neuro-linguistic coding can be defined as an effective model of thinking. Basically it is about working with metastrategies of learning, so that we think about thinking. Its foundation lies in the removal of isolated information and the storage of information in the human brain by transcoding of individual knowledge into an easy memorable form. Metacognitive learning strategies are marked as processes in which the subject reflects upon his or her own cognitive processes, plans and controls them (Foltynová, 2009).

The strategies PQRST, SQ4R, MURDER and the method of using a cognitive activity pattern are the usual choices within the educational process. By practicing and applying metacognitive strategies learners become good readers able to work with any text for any subject.

Understanding according to Gavora and Zápotočná (2003) is the formation of hierarchical relations between text elements (at the level of words, sentences), in other cases extra-textual factors that represent the relations between them are considered. The differentiation of multiple layers of understanding is a prerequisite for considering a shift to the next level, part of the superstructure

above understanding known as metaunderstanding (Magulová & Zápotočná, 2007).

Several studies have confirmed that it is easier for children to use metacognitive strategies while learning foreign languages. This is so especially in less demanding tasks when they have sufficient learning capacity because they can then use the learning strategies correctly and thus explain their usefulness in learning.

Unfortunately, in our schools there has always been less time than necessary for the development of learners' metacognition in foreign language learning process. This is related (among other factors) to an overdesigned school curriculum. The work with metacognitive strategies for learners' thinking is still not a common part of learning and teaching.

Metacognition cannot be understood as a general concept, but rather as a term which can be developed in each subject. The development and support of metacognition can contribute to an improved quality of education.

2 Mind mapping

A countless number of theories and research findings indicate that the vocabulary in a foreign language is an indispensable attribute of the acquisition of language knowledge (Oxford, 2003; Vlčková, 2005). However, it is not only important for learners to have memorized as many new concepts as possible but to have the ability to use these words in communication, and to keep these words in long-term memory. There are many memory and compensation strategies (for instance: sounds, movements, image ideas, learning errors, repetitions, acronyms, analyzes) that are helpful for the learning and retention of new concepts.

In addition to the importance of various compensatory strategies, Oxford (1990; in Jenpattarakul, 2012, p. 572) also confirmed the importance of visual imagination when memorizing individual concepts: "Firstly the majority of learners prefer visual learning. Secondly the brain capacity for visual information is higher than for verbal material. Thirdly the clusters of information most effectively go into long-term memory through visual images. And finally the images are effective for recall." The work with mind mapping seems to be very helpful when visualizing and decoding the received information.

Pictorial methods for the recording of different pieces of knowledge have been used in education for centuries. They were first identified in 1940 by a team of experts from the University of California, Berkeley, led by Tolman (1948, p. 191-192) who claimed that "the cognitive map is a type of mental representation which serves an individual to acquire, code, store, recall, and decode information about the relative locations and attributes of phenomena in their everyday or metaphorical spatial environment".

Another type of pictorial portrayal that we encounter in history in learning processes is the semantic network. This type of portrayal was developed around 1950 as theory for the understanding of human education. Among the most prominent experts who were involved in the research of semantic networks were Collins and Quillian (1969).

In 1972 mental maps with various recorded concepts appeared for the first time. Mareš (2011) draws attention to the fact that in literature the name of J. D. Novak is linked to the establishment of mind maps, but this is an American point of view. Similar efforts appeared in Europe much earlier, for instance in the works of Kulič (1971).

Based on the available literature, it can be said that there has been a significant shift in the area of mental mapping in our country as well. Contemporary authors who pay attention to cognitive mapping are: Fishera (1997), Pupala and Osuská (1997), Škoda and Doulík (2011), Mareš (2001), Gunišová (2012), Duchovičová and Gunišová (2015), Petrová and Kozárová (2015) and others.

Mareš (2011, p. 224) understands the mapping of concepts as "a metastrategy of education when a learner learns to find concepts in the curriculum and identify the relationships between them".

According to Fisher (2004, p. 107), mental mapping refers to "all procedures that represent thinking by some images." It is an effective tool that captures information and ideas, identifies key concepts and visualizes knowledge in a meaningful structure.

We characterize the mental map as a concept of mapping, a graphic representation – where nodes represent concepts and bonds represent the relationships between concepts. References that mark kinds of relationships between the concepts may be one-directional or bi-directional. We can classify concepts and references, and based on this fact the conceptions of maps show either the time or causal relationships between individual concepts. The concept of mapping is particularly useful in the process of idea creation. In the design of a complex structure, it helps with learning and incorporates new and old knowledge into a cognitive structure.

The work with a mental map is really necessary for a person. As Buzan (2007, p. 7) claims, the map helps one to easily add new information to the information that is already stored in his/her semantic network. Due to the mind map the new as well as older information is sorted out in a natural way. When designing a mental map one engages both brain hemispheres. The left one is employed for logical order, words, concepts and numbers, and the right one for imagination and visualization. When learning a foreign language it is possible to use mental mapping as:

- • a tool to detect possible errors and misconceptions;
- • a tool for the identification of key concepts;
- • a tool for the creation of a structure and hierarchization between individual concepts;
- • a tool for the implementation of new information into a wider context;
- • a tool for the engagement of both brain hemispheres into learning processes;
- • a tool for the development of higher cognitive skills;
- • a tool for the development of convergent, divergent and complex thinking;
- • a tool for the development of the strategic and critical thinking;
- • a tool for simple transcoding of information into an easier memorable form;
- • a tool for the development of metacognitive skills.

3 Work with concepts

Amongst the large number of memory and compensation strategies, the "key word" method in the process of retaining knowledge related to foreign language learning is the most discussed (Atkinson & Raugh, 1974; Hauptmann, 2004; Shapiro & Waters, 2005; Jenpattarakul, 2012). This method consists of combining visual association with auditory association (Vlčková, 2005). The basic step of this method is the recognition of a keyword in the mother tongue that has a similar pronunciation as a foreign word, hence the creation of an auditory association. The second step is the formation of a notion for a certain relationship between the key word and a foreign one, hence the creation of a visual association (Solso, 1998; Shapiro & Waters, 2005).

For the purposes of this article, we draw on the definition of Atkinson (2003, p. 697) who claims that a concept is "a set of properties that we associate with a particular class of objects and phenomena."

The process in which we assign a concept to an object is called categorization. Through concepts we can divide anything into smaller units, due to their so called "predictive power" with which we can categorize objects even when such information cannot be directly perceived.

Bloom (2015) points out that the learning of words is not easy at all because a child´s learning requires individual mental abilities (conceptual, social, linguistic). The concepts are learned using a special mental mechanism in which of great importance is the ability to acquire concepts, to show intentions to others, to possess the ability to understand syntactic structure and have memory abilities.

Conceptual learning can be characterized as a relatively demanding issue with two basic paths leading to it, that is, the formation and assimilation of concepts. Under spontaneous formation of concepts is understood the process used by the learner as "trial and error" through which he/she discovers things and assigns them the denotation taken over from adult individuals. The second method is to search for the meaning of words and, at the same time, construct new concepts. An inseparable part of the theory of meaningful learning are the so-called "advance organizers" which can be described as tools that help a learner to integrate new knowledge into his/her ever growing cognitive structure.

First and foremost for each teacher should be the investigation of how a learner processes new information – how he/she learns and thinks. These cognitive processes can in later interpretation determine what teachers can change, improve, modify, to make the learning result have as high quality as possible. Therefore, a learner's habitual status cannot be ignored – teachers should build on the information and knowledge that has already been acquired by a learner (the information and knowledge have a stable position in his/her cognitive structure) and take into consideration to what extent cognitive functions have already been developed by the learner.

We cannot require learners to apply critical thinking and interdisciplinary links while learning foreign languages when their teachers do not interconnect new knowledge in one particular subject with those that learners already know. It is also important that learners themselves work on the development of their own cognition so that they understand their mental activity.

Scholars have tried for decades to find out if the result of conceptual learning is the proper understanding of the meaning of each concept or the correct understanding of complex concepts and relationships between them. The explanation and interpretation of concepts while learning a foreign language as well as the learning of any subject are immensely important. Learners do not always understand, or they do not understand at all, what adults mean when they give a thing a precise name. One way we can express and illustrate our understanding of a concept is to express it through a mind map.

Concepts are modified so that they gradually become more demanding. In the present school, when learning a language teachers should try to outline the broadest range of options that learners can use to help them. One option is the use of mind maps in the learning process. It is generally known that the most difficult to remember is a specific information – a knowledge that is isolated without any logical link, so it cannot be associated with other elements of the curriculum.

Conclusion

The main aim of the paper was to show that there are further options for the development of learners' work in foreign languages. It is important that each teacher during his/her lessons shows different strategies through which learners can work effectively in a foreign language. The more strategies they use the better level their knowledge of the foreign language will be at.

It is evident that the inclusion of mind mapping into the education process shifts the learning of foreign languages more towards the acquisition of informal language knowledge which implies the ability to use languages to solve problems of a different nature. We believe it is important to help learners to be able to independently create such learning strategies through which a foreign language would become part of their everyday life.

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