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Neurodidactics and its utilization in the field of language teaching

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Abstract
Mastering one and more foreign languages is nowadays considered one of the key prerequisites in the life of every young person in order to obtain employment and to establish oneself as an expert in work. This task has to be fulfilled by schools, unless an individual has an opportunity to learn more languages in one´s native environment. Compulsory foreign language education depends on the given country circumstances. A traditional teaching model 'a teacher – a textbook – a student' is gradually replaced by some newer methods. Another interdiscipline was recorded in the field of education in the 1980s of the 20th century, which is known as neurodidactics. Neuropedagogy and neurodidactics are becoming more popularized nowadays and they are by many considered to be a revolution in education. Neuroscientific discoveries also mean a new view on education, personality of a learner, his or her motivation to learn foreign languages and to acquire foreign language competence.

Key words: *neurodidactics, foreign language, brain, stimulation of brain cells*

JEL Classification: *I23*

Introduction

Mastering one and more foreign languages is nowadays considered one of the key prerequisites in the life of every young person in order to obtain employment and to establish oneself as an expert in work. This task has to be fulfilled by schools unless an individual has an opportunity to learn more languages in one´s native environment. Compulsory foreign language education depends on the given country circumstances. It is an interesting fact that although Slovakia ranks among the developed countries, foreign language education was not, until recently, considered an important part of the curriculum. We can claim that less developed or even developing countries devoted much more attention to teaching foreign languages than we did. For example, English is compulsory in addition to the Arabic and French languages in the country of Tunisia, Spanish is a compulsory language in Morocco.Teaching English is taken for granted in the Asian countries of India, Nepal, Thailand, and many others. In the European countries, pupils are faced with compulsory teaching of foreign languages already during primary education. "Therefore, almost all pupils who begin secondary education have the experience with learning at least one foreign language. Depending on the conditions in a given country, learning foreign languages can begin either in early childhood or it conversely becomes part of the curriculum in the last years of primary education. The participation rate of the primary education learners on learning foreign languages, which depends on the relevant learning content, can significantly vary in individual states. Thus, a certain percentage of pupils on the primary education level is not taught a foreign language in a given period (in this case in the year 2006) in some countries, although all primary education pupils learn one or more foreign languages at the end of primary education. [1]."

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Results and Discussion

There are many opinions on how to learn a foreign language, but especially a lot of the so called "guaranteed" expert advice. One of the pioneers who paid much attention to the issue of foreign language teaching was J. A. Comenius. It was the Latin language that he considered the basis for how to achieve education. According to his opinion, education without Latin was impossible. In 1631, he published two textbooks: Grammatica Latina, a Latin textbook and The Door of Languages Open (Janua linguarum reserata). Comenius recommended that learning a foreign language should be based on one´s mother tongue. We can say that teaching foreign languages is experiencing „a great boom" in our schools nowadays. There appear newer and newer textbooks in bookstores enriched with audio and video recordings, rich illustrations, but unfortunately, they often cost a lot of money. Many language schools offer a lot of their „guaranteed" efficient courses, crash courses aimed to achieve excellent foreign language competence in the shortest possible time. A traditional way of teaching "a teacher – a textbook – a student ' is gradually replaced by some newer methods such as:

- Learning in the Alpha Level – through stimulation of brain waves and the brain by means of the light and sound tones, thereby improving the ability to learn and remember,
- The Callan Method (introduced by an English founder - Robin Callan) – teaching English through conversation based on questions and answers,
- The "Genki" Method (a Japenese word that means " fun", "lively", "energetic") – is a fun way learning,
- E –learning - using the information technology,
- The Lozan Method - listening to music in the background with the subject matter in the theta state (suggestology),
- Direct Method – focuses on the narrative,
- Distance learning - based on the online instructions, it requires a strong motivation of the learner,
- And others, e.g. the Inlingua Method, LCF Clubs, Helen Doron, Berlitz method [2].

In the 80s of the 20th century, another interdiscipline was recorded in the field of education, which is called neurodidactics. This term was for the first time used in Gerhard Preiß´s work, who was a professor of the "mathematical didactics" at the College of Education in Freinburg. Since 1988, neurodidactics has been regarded as a relatively new scientific interdisciplinary field of study that combines research of brain and didactics. It also represents a certain kind of connection between neuroscience, educational science, didactics and psychology. It is connected with brain research findings and provides suggestions for effective learning and teaching, which is brain-based. The last research results in neurodidactics show that there is no singular and unique brain-based way of learning and teaching.

There are more definitions of the term "neurodidactics" in practice. "Neurodidactics is an art to organize and improve education on the basis of knowledge regarding the structure and functions of the brain, sensory preferences, differences of the cerebral hemispheres, learning styles, suitable reactions responding to stressful situations and different kinds of memory. It combines and links various aspects of traditional teaching from the new perspectives. It focuses on education, a personality of a learner and his or her motivation to learn. It is a science in the sense of organizing the educational process, using the latest knowledge about the human brain" [3].

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According to the online Wörterbuch Dictionary, neurodidactics monitors the development of educational and pedagogical plans with regard to the important findings from the field of neuroscience, in particular to the more recent brain research. It uses neurobiological and psychological knowledge in education and by means of examining the brain it provides the information on what is happening in the brain and how one learns. [4].

According to W. Lehman, "neurodidactics combines didactic or eventually pedagogical - psychological concepts with modern knowledge of neuroscience and especially with more recent research of the brain" [5].

While neuroscience in didactics was not sufficiently explored in the past, neuroscientific knowledge plays a significant role in the educational field in the 21st century. Neuropedagogy and neurodidactics are becoming more popularized nowadays and they are by many considered to be a revolution in education. They give priority to organizing the educational process using the latest knowledge about the human brain. Neurophysiological findings became the subject of many neurodidactic papers and the areas dealing with brain research knowledge are also widely used in the sector of language education. Discoveries in the field of neuroscience also mean a new view on education, on a learner personality and his or her motivation to learn foreign languages in order to acquire a foreign language competence. One of the basic requirements of neurodidactics is an individual talent. Based on the discovered capability of an individual, we can develop his or her personality, broaden the horizons of his or her knowledge. On the website of the Neurolinguistics Magazine, multipolyglot, 64- year-old Leo Anders currently offers a multimedia program called *Ling Fluent* for learning foreign languages. It guarantees a 4 -week language learning flash method based on the current use of both hemispheres of the brain, thereby improving the memorization process [6].

The left hemisphere is the center of analytical thinking, speech and logic. The right hemisphere is responsible for our synthetic thinking. It reflects our creativity and imagination. Using it, we are able to perceive colors, pictures, music and rhythm. It is the seat of our emotions. By stimulating the brain cells, it comes to positive changes and development of the neural networks of the brain. The left and right brain hemispheres paralely work while learning new words. Verbal speech is heading into the left hemisphere, while the picture accompanying it is heading into the right one.

Left Hemisphere		**Right Hemisphere**
Analytical thinking		**Holistic thinking**
logic		emotions
numbers		music
language		phantasy
will		taste
facts		creativity
science		intuition
weights, measures		rhythm

Pictrure: http://www.totaltraining.sk/index.php/clanky/detailnejsi-zoznam/9-hemisfery

If several senses are simultaneously used during foreign language teaching, certain linguistic schemes are developed in the brain, which accelerates the process of remembering and prevents

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forgetting the vocabulary. Vocabulary is installed in the brain and is automatically and naturally used in speaking. The correct choice of textbooks is equally important so that especially both perception channels - ear and eye - are involved in learning. Therefore, it should not be forgotten about good acoustics and lighting in classrooms, print quality of the teaching materials and high-quality recordings without any side noise in the listening texts.

In learning, it comes to firm connection between neurons (neuronal cells) and formation of the neural networks. Each neuron has a number of nerve fibers at the end of which the so-called synapses are found. They transmit impulses and information to the other synapses and hence to the neurons. The impulses and information are accepted more slowly with the increasing age. A learner may indeed learn a lot but the information is not processed that quickly. It takes longer to store the information in one's memory, which slows down the entire process of learning [7].

Emotions are also important in the process of learning. The middle part of the brain is considered the center of emotions. Our memory and motivation are interrelated with emotions. It is sometimes interesting that we do remember our most positive and negative situations of our life and, in the contrary, we don´t remember our emotionally less significant situations. Many language teachers consider emotions a kind of the key to helping language learners learn new languages. They color our lives, strengthen our memories and they also function as strong motivators. The last findings have shown that emotions are a particular driving force in stimulating learning.

The progress in mastering the language acquisition is individual. No brain is able to process the information immediately. Every mind influenced by one´s own experience and anatomic peculiarities processes and evaluates the information in a different way. The question is: How do we perceive the world and how do we interpret our perceptions? We know from the testimonies of people who speak more foreign languages that the hardest part was to learn the first foreign language. The more languages they mastered, the more easily they were able to learn other languages. If we don´t master the second language well, besides the mother tongue, or if we don´t learn it easily, the particular brain centers will be best activated when we speak or read more in the second language.

The latest neuroscientific as well as psychological findings provide us with more information on how we learn. There isn´t any unique way of learning, not even in learning foreign languages. Each learner has his or her personal style or form to learn. If we were able to recognize how our brain learns, to understand the mechanism of learning, it would be very beneficial in order to improve the teaching and learning process. Many performed researches have shown and highlighted the existing neuro-functional networks that are only specialized in processing some special language aspects during the process of language acquisition.

Are Older People Able to Master a Foreign Language?

There are many suggested ways dealing with how to prevent some premature sclerotic changes in the brain. One of the best brain trainings is considered learning a foreign language. Until recently, learning foreign languages was especially considered a privilege of the young generation, but an increasing interest of older people has been recorded in the last years. A seventy-year old person, active and eager to learn, can often master a foreign language more successfully than a less ambitious twenty-year old learner. Thus, an age is only one of many and less relevant variables such as, for example, learning experience, experience with teaching the language and motivation. However, there are also some aspects teachers should be conscious about in their teaching. While many young people have their own strategies in learning foreign languages, middle aged people dispose of a rich base of knowledge and experience they can rely on while learning. They prefer cognitive learning, they are more

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flexible in communication. A strong motivation is often considered a priority of the middle-aged people, which is mostly based on one´s job retention and career promotion. The advantage of the older people, the retirees, is that they have enough time. They are hard-working, intensively prepared and they have the sense of responsibility. While many young people use the grammar knowledge, a fun-form tuition is recommended in older learners. The progress is slower, frequent repetition is important in order to affirm the already acquired competences. Older people prefer the literal text translation while practicing the reading comprehension skill. Despite the wealth of knowledge and experience, communicative methods cause problems to them and it is necessary to leave them sufficient time space in this specific part of the course tuition. The principle of small steps is applied here, the language is taught concurrently with grammar and translation. It is also important to bear in mind that each individual has his or her own style and individual approach to learning.

Our brain is supposed to be neuroplastic, which is caused by one of the brain features that it is constantly readjusting to new conditions, especially to environment. Every human being can keep learning during his or her whole life. The difference between children and adults is that the speed of learning is very high in children, while it is not the case in older people. On the contrary, they can learn through their analogical thinking, which is not so developed in children.

Conclusion

We place the greatest emphasis on the ability to communicate in teaching foreign languages in order to make oneself understandable and to meaningfully communicate in a foreign language. In this respect it is important that teachers are the acceptable language models for their students through their expertise, combining the teaching methods and authenticity of teaching materials. If a teacher does not have sufficient foreign language certainty and is not able to be of fluent target language communication, then he/she cannot relevantly enter into the tuition and substantially motivate his/her students. On the other hand, it is necessary to take peculiarities and particularities of the learners into account. What are their linguistic, motivational and relationship - attitudinal goals? What is their relationship to a foreign language, to culture of a particular country? What is his or her age, self-assurance, intelligence and intellectual givenness? All these important aspects are considered the basis for mutual success of teachers and learners.

Neuroscientific research has gained a lot of attention in the last few years in many countries of the world. A new model called "neurodidactics" has been introduced. Neurodidactically oriented researchers keep saying they want to help the teachers to realize the so called „brain-adequate learning". They also claim that an emotional basis is the core of the learning process. Many questions regarding neurodidactics and neuroscience have remained open. Neuroscientists can see for example the neuronal foundations of the learning process, but they cannot see the entire complexity of the tasks teachers have to solve every day. The future of teaching and learning foreign languages, not excluding the relations between teachers and students, is full of questions.

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