

A. SADREIMOVA, A. ZHUMABAYEVA

Abai Kazakh National Pedagogical University (Almaty, Kazakhstan)

email: sadreim76@gmail.com

FORMATION OF SUCCESSFUL TEACHING OF YOUNGER SCHOOLCHILDREN BASED ON THE NEUROPEDAGOGICAL APPROACH

Abstract

The article analyzes the possibilities of using a neuropsychopedagogic approach for the formation of successful learning. Since neuropsychopedagogy presently is at an early stage of its development, the attitude towards it may be different. Neuropsychopedagogy offers a new perspective on the child's education, providing own teaching methods based on the features of the development of the brain and nervous system of a child. So, when working with primary school students, teachers are invited to apply methods of active learning, multisensory perception, consolidation of the practice of restoring cognitive resources of the brain, and learning based on the characteristics of the nervous system.

At the same time, neuropsychopedagogy does not require the exclusion of traditional teaching methods. It perfectly complements them, allowing educators to make the learning process softer, more interesting and more accessible for the child. In addition to the advantages, there are also a number of difficulties that arise when using neuropsychopedagogics: the lack of a scientific and methodological base and available methods. This is primarily due to the fact that the given branch of science is not fully formed and integrated in the system of education. Further investigation of the perspectives of using neuropsychopedagogics for teaching primary school children is relevant since it can potentially introduce progressive methods and views into the learning process.

Except the theoretical analysis of realization of neuropsychopedagogical approach in the educational process, the article evaluates the degree of primary school teachers' awareness of neuropsychopedagogy as a science, as well as the neuropsychopedagogical methods and techniques applicable in teaching children of junior school age. As a result, we may conclude that today's educators do not have enough knowledge and understanding of the theory and practice of neuropsychopedagogy and, therefore, need special trainings and methodological recommendations on the implementation of the neuropsychopedagogical approach.

Keywords: neuropsychopedagogics, junior classes, children, school, training.

Introduction. *Relevance of the study.* Given the increase in stress and anxiety, often passive lifestyle and the development of dependence on gadgets and social networks among children, it is crucial for a modern teacher to understand the peculiarities of cognitive and psychophysiological processes of students, in our case, primary school students, and creatively approach the solution of pedagogical problems.

Considering the complication of life circumstances, constantly changing requirements of society to education, and the development of new technologies, teachers are encouraged discover and implement various scientific achievements to successfully organize the educational process. One of the innovative ways of improving the quality of training is the realization of principles and methods of neuropsychopedagogy in teaching practice.

Neuropsychopedagogy, also known as educational neuroscience, is a new interdisciplinary field

of knowledge that explores the intersection of neuroscience and education. Neuropsychopedagogy implies the application of the ideas of neuroscience to improve teaching methodology and learning procedure (Sorochinsky, 2022). Following the neuropsychopedagogical approach, that agrees with the ideas of humanistic pedagogy, instructors can facilitate active learning and get better learning outcomes of their students.

From the perspective of neuropsychopedagogy, it may be claimed that knowing how the brain learns can significantly assist teachers in creating learning strategies that will be more successful, engaging, and tailored to particular students. For example, understanding the impact of stress on learning can provide information about how teachers build their classrooms and interact with students. Similarly, understanding the role of emotions in learning can help teachers design lessons and activities that are more captivating and meaningful to students.

The discipline of neuropedagogy is fairly young, and there is still much to learn about how the brain works during learning, as well as how these concepts can be used to design effective teaching strategies. Neuropedagogy should be considered as one of the approaches in the broader field of pedagogy that offers valuable perspectives and methods. Nevertheless, it is important to approach the integration of neurology and education with caution and skepticism, since not all statements made in this area are supported by rigorous scientific data (Hodykina, 2020).

As such, the *purpose of the study* is to analyze the perspective of using the neuropedagogic approach as a scientific and methodological basis for the formation of successful teaching of younger schoolchildren and conduct a survey to get an idea of what the university teachers know and think about realizing the neuro-pedagogical approach in pedagogical activity.

Main part. *Research methodology.* Neuropedagogy, which is the application of neuroscience research in education, can provide valuable information about how the brain learns, and how this information can affect the pedagogical process. Relying on the most recent findings in different fields of neurology, neuropedagogy takes a scientific approach to understanding the educational process and suggests innovative methods and technologies of learning. It can provide insight into topics such as the impact of stress on learning, the role of emotions in learning, and how the brain processes information. Using this knowledge and realizing the neuropedagogical approach to teaching, educators can develop more effective, engaging, and student-specific instructions (M.Kh. Malsagova & A.A. Malsagov, 2018).

The neuropedagogic approach presumes using knowledge of general neurology, organization of mental mechanisms, as well as the findings of neuropsychological and psychophysiological sciences to create favourable conditions for the harmonious cognitive development of the learners. Neuropedagogy considers such questions as:

- How the child’s brain develops and works?
- How the mentality of boys and girls differs?
- What are the features of thinking of the left-handed and right-handed?
- What happens in the brain of a child during schooling?

–What method of teaching language skills or mathematics is more suitable for the learner in terms of individual developmental characteristics, etc? (Moskvitin & Moskvitina, 2001).

Literature review. One of the great Soviet psychologists, A.Luria is a founder of neuropsychology, the development of which contributed to the emergence of neuropedagogical science. The researcher in his book “Fundamentals of Neuropsychology” provided a detailed explanation of psychic processes and bases of mental activity (Luria, 2013) . His model of three blocks of a human brain is helpful not only for neurologists and psychologists but also for inclusive teachers and neuropedagogues.

Let us get acquainted with the model of three sectors of a brain (see Fig. 1). The 1st sector, also called an energy unit, regulates the brain tone and wakefulness. It is mostly in charge of the emotional “reinforcement” of psychic activity (sense of success and failure). This brain block is involved in the organization of the individual’s attention, memory and emotional state.

The 2nd one is about receiving, processing and storing information from the external environment. It comprises primary, secondary and tertiary cortical zones of the cerebrum. The lesion of these zones respectively leads to difficulties in perception and analysis of information, disorders of single (agnosia, aphasia) and complex synthesis of stimuli (spatial apraxia).

The last sector is responsible for programming, regulation and control of psychic activity. It includes the frontal lobe of the brain, responsible for the expediency of behavior in general by means of accumulation of rules and algorithms. The development of this part of a brain which starts in the age of 7-8 is critical for personality’s self-control and self-discipline (Luria, 2013).

The American scientist O’Dell is credited with coining the term “neuroeducation” in 1981. He is the author of the first significant publication on the discipline – “Neuroeducation: Learning Strategies Compatible with the Brain”. After him the term was used by L. Hart in “Human brain, human learning.” The author supposes that creating an educational experience without understanding the structure and functioning of the brain is like creating a glove without

understanding the architecture and properties of the human hand (Dudko, 2020). This suggests that purely pedagogical and specialized knowledge is not sufficient to form a successful training.

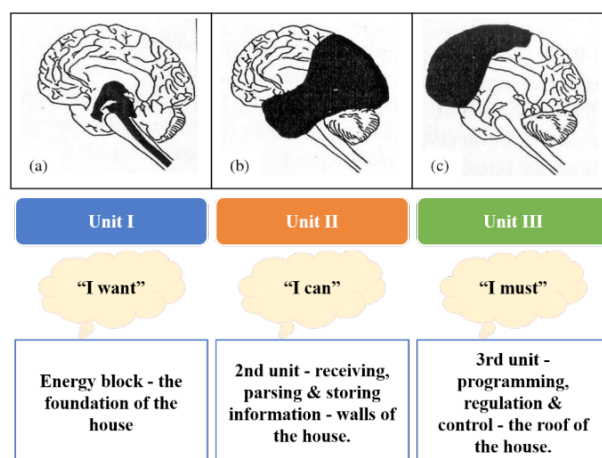


Figure 1. *Three functional units of a human brain according to A.Luria*

In the work “Neuropedagogy as an Applied Direction of Pedagogy and Differential Psychology”, V.A. Moskvitin and N.V. Moskvitina outlined the aims and objectives, essential provisions and instruments of the new direction of pedagogy. The United States, in turn, suggested their own views of neuropedagogy, which resulted in the formation of the greatest worldwide initiative, “Brain and Learning.” This project brings together researchers from 30 different nations, and aims to increase teachers’ awareness of how the brain works (Glushchenko, 2017).

In the years 2005 and 2016, psychologists, neurobiologists and educators in the conference in Delphi reviewed the contemporary findings in the sciences they represent and together came up with the name for the new discipline of interdisciplinary research - the Mind, Brain and Education Science (MBE). The new interdisciplinary field of study can be viewed as a more complete and relevant collaboration of sciences being an intersection of neuropsychology, educational psychology and neuropedagogy (Chojak, 2019).

M.J. Hermida and his collaborators emphasized the significance of investigating teachers’ conceptions and misconceptions about neuroscience which may greatly influence the decision of the educators to integrate the achievements in neuroscience into the pedagogical process. The authors found out that the study participants had a lack of understanding of features of memory, plasticity and the potential of brain usage capacity (Hermida, 2016).

Promoting a multidimensional approach to treating brain disorders, Joseph Taylor and his colleagues compared the neurological and psychiatric classification of brain disorders to cubism in art, denoting it the Neural Cubism. They believe that it does not give in-depth understanding of neuroscience, since all brain disorders are complex and multifaceted, with psychopharmacological effects as alterations in behavior, affect, mood, or cognition of patients (Taylor et al, 2015). Complete knowledge of types and causes of brain dysfunctions may clarify circumstances of a child with mental disorders, and help in developing an appropriate individual learning trajectory.

Research materials and methods. In order to achieve the aim of the study the following methods were used by the authors:

- 1) The theoretical analysis of literature on the problem of implementation of neuropedagogical approach to teaching students of primary school;
- 2) A survey dedicated to the elementary school teachers for indicating their awareness of neuropedagogy and its methodology.

The survey “The evaluation of primary school teachers’ awareness of neuropedagogy and neuropedagogical methods” was conducted among 40 teachers of junior school students from Gymnasiums №12 and №159 in Almaty. It consists of 40 questions of different types (single and multiple choice, close and open questions, and a scale)

Results and Discussion.

1. Theoretical Study. Learning implies a complex activity of several parts of the

brain. It should be noted that the processes of learning and cognition naturally accompany the brain development. A human brain relies on the previous experience of a person to build connections with the new information. Memorization and comprehension occur when the mind finds support in previously learned material and updates the system of knowledge and concepts to the last version.

Aware of that, the well-known scientists, Jean Piaget and Lev Vygotsky proposed the theory of constructive learning, each from their own viewpoint but based on the common fact that learners are not empty minds and build new knowledge on the previously received one (S.Mcleod). Their approaches to the learning process, called cognitive and social constructivism, contributed to the development of neuropedagogy and keep fulfilling a significant role in education and encouraging teachers to consider psychological peculiarities of the students.

The critique of the «full absorption» paradigm in the perspective of psychophysiology is one of the most intriguing investigations of ICE SGA. Today's educational programs and curricula are made in line with the indicator «time of mastering the learning material,» which assumes that the learner will fully absorb a particular subject in a definite amount of time. The problem of certain participants' incapacity to completely absorb was revealed in a series of tests where subjects were instructed to memorize 20 pairs of words after spending a limited period of time. A detailed psychophysiological investigation of these individuals revealed intriguing health characteristics, including flat or low-amplitude EEG and alteration of alpha rhythm depression (Karpenko, 2018).

A common neurobiological “denominator” among these EEG characteristics was poor activating brain system function. Such dysfunction may be brought on by physical illnesses, functional abnormalities, or peculiarities of the higher nervous activity. However, it always leads to an increase in anxiety, which is accompanied with cognitive activity abnormalities. As a result, the breach of complete memory is an outward expression of an intricate process (Karpenko, 2018). This phenomenon may be one of the possible factors of learning failure of pupils.

Regarding applying the neuropedagogic approach to teaching primary schoolchildren, it starts with the understanding of typological characteristics of the learners at this age and peculiarities of their mental development, in particular. For instance, neuropedagogue is a specialist who can identify the cause of learning failure and difficulties (frequently due to the incorrect functioning of a certain area of the brain or its immaturity) and develop an individual correction program for the learner that contains the suitable subject matter (Mambetalina et al, 2019). Analysis of the cognitive theories of learning would help teachers dive in the bases of neuropedagogy.

Swiss psychologist J. Piaget has developed a model of cognitive development that covers four stages corresponding to the maturation period of cognitive schemata. According to the author, children at this age range (7-11) are usually at a concrete operational stage of cognitive development. This means that they are able to think logically and solve problems, but their thinking is still based on specific, tangible experience, and not on abstract concepts [(Börnert-Ringleb & Wilbert, 2018). Important characteristics of the development of young children include the following:

1. *Concrete operational thinking.* Junior schoolchildren often struggle with abstract thinking and understanding complex processes and phenomena. They tend to perceive information in actual, literal terms, and may not be able to imagine hypothetical situations and draw conclusions of what is said by the teacher without a vivid example. Therefore, visualization of the learning material is highly recommended in junior classes.

2. *Regarding problem-solving skills,* learners in the concrete operational stage, may encounter with the difficulty of systematic and consistent solution of problems. They find it challenging to plan out all the steps necessary for completing the task and execute them in the most efficient order. Still, young learners demonstrate improvement in problem-solving and can apply their knowledge and experience in new situations. They are also more able to reason logically and be critical of the world around them.

3. *Enhancing inductive reasoning.* Furthermore, juniors show the ability to use inductive logical thinking in real life situations.

They can recall a specific experience and come to a generalized conclusion. For instance, a child notices that his or her father does not eat an ice cream even when they have extra one, and based on this regular observation, concludes that he is not attracted to sweets.

4. *Formation of conservation skills.* Kids start to understand the fundamentals of logical thinking and demonstrate various abilities of conservation like reversibility (understanding that the position of numbers or objects can be manipulated) and decentration (simultaneous consideration of diverse properties of an object or problem aspects). However, conservation of volume may be quite troublesome compared to conservation of number and mass.

5. *Doing arithmetical operations.* Pupils of junior school learn the basics of mathematics and are able to solve simple computational tasks. Also, they are good at sorting and classifying objects, identifying classes and subclasses. Thus, solving mathematical problems with different people and items does not provide children with special difficulties.

6. *Adopting a viewpoint.* For children of primary school age, it is easier to perceive the point of view of other people than before, which can be regarded an important social and emotional skill. They become more able to understand and accept the thoughts, feelings and opinions of others, which helps them develop empathy and form positive relationships with peers and adults. Analyzing a given situation from another perspective can be envisaged in some tasks on literature and so on.

7. *Dealing with contradictions.* It should be noted that kids at the age of 7-11 may feel confused and stuck when they observe something that contradicts with their understanding of the world. The reconciliation of these contradictions takes a long time. Also, if the primary schoolchildren are asked to think from another person or character's perspective, it may be normal for simple tasks but not for complex ones.

So, these are major facts about cognitive development of children, studying at elementary school, according to Piaget's theory. The awareness of these characteristics allows teachers to understand the general trajectory of cognitive development in this age range and direct them to selecting appropriate activities. Nevertheless, the fact that every kid is unique and develops at

their own rate should not be overlooked. There may be noticeable individual variances in the development of the cognitive mechanisms among children of the same age.

Besides, there are other significant factors of intellectual and emotional development of primary schoolchildren that should be considered:

– *Increasing amount of memory.* Notably, in this age range, children's memorization capacity gets better, while the volume of memory of their brain gets wider. They are better at comprehending and retaining what they have learnt since they can remember more information and organize it in more meaningful ways. Apparently, teachers should offer learning activities that ease the process of memorization using pictures, cards, associations, etc.

– *Metacognition.* Children begin to develop metacognitive skills, which include the ability to reflect and regulate their own thought processes. This includes skills such as self-control, self-assessment, and planning. Nevertheless, these tendencies may be false in case of individual students, since progression through the stages of cognitive development may take place at different rates.

– *Increasing independence.* Children in this age range are becoming more independent and can take on more responsibility. This includes making decisions, taking care of themselves, going out, as well as managing the time and resources more effectively.

To enhance teaching and learning strategies in primary schools, neuropedagogy can provide insightful information and practical techniques. Among them we would like to mention the strategies of structuring the educational process that allow children use their cognitive resources as efficiently as possible:

• *Active learning.* Incorporating active learning strategies such as project-based learning and inquiry-based learning can engage students in their own learning and activate different areas of the brain. These approaches provide students with opportunities to collaborate, create, and solve problems, which can improve their understanding and retention of information. The use of active learning methods will allow schoolchildren not only to get familiar with theoretical material, but also, if possible, to directly interact with it and develop social interaction skills (active listening, storytelling, etc.).

Active learning for younger grades is an accessible means due to the nature of their educational program. The study material is adequately graphic, giving educators several opportunities to visualize the learning process. Children of primary school age enjoy taking part in a range of group activities and can show growth in their ability to explore their environment through such activities.

Neuropedagogy emphasizes the importance of active learning, which involves engaging students in hands-on activities that help them connect new information with their previous knowledge and experience. For children with special educational needs, active learning can be especially useful, as it can promote engagement and make learning more meaningful and memorable (Melnyk et al, 2022).

–*Multisensory learning.* The use of multisensory learning, which involves the use of multiple senses (such as sight, hearing and touch), can help consolidate learning and make it more memorable for students. For instance, using visual aids such as videos, images, and diagrams along with oral instructions can help students better understand and memorize concepts.

The neuropedagogic approach considers multisensory learning as one of the key methods of effective learning. Stimulation of several associative zones at the same time does not cause discomfort in children, which is a significant neurophysiological advantage of this age. Neural plasticity makes it possible to organize multisensory learning with greater efficiency for children of primary school age compared to more mature ages.

– *Resource recovery practices.* Pupils' stress levels can be reduced and their ability to regulate their emotions can be enhanced by the use of relaxation techniques including breathing exercises, physical activity, and cognitive games. This can create a more positive learning environment and help students focus better on their studies. Moreover, the organization of such activities does not take long.

– Resource recovery and relaxation are relevant in conditions of overload of the cognitive sphere of primary school students. Changing the focus of attention will allow the attention of children to get the necessary respite for further education. Exercises aimed at restoring resources take only 1-5 minutes, while

significantly stimulating the cognitive activity of the child.

–*Differentiated learning.* Adapting learning strategies to meet students' diverse learning needs can be an effective way to promote successful learning. Neuropedagogy assumes that the brain of each primary school student processes information differently, and therefore learning strategies must be adapted to different learning styles. For example, in one classroom may be present audial, visual and kinesthetic learners. There are a number of tests and educational games that allow to identify the preferable learning style.

At the same time, considering the neurophysiological features of the brain of 6-10 years old, it is worth to mention the significance of maintaining a balance between the educational load on the child and his cognitive abilities. This indicator is essential in the development of individual training programs. If the chosen learning strategy does not match the child's capabilities, then his learning abilities will decrease along with the degree of assimilation of the material. Violation of the motivational component of teaching a junior is one of the most serious issues in traditional pedagogy. Nonetheless, neuropedagogy offers a solution to this problem in the form of specialized learning models based on the strength of the child's nervous processes and the plasticity of his brain (Avdeeva & Leonova, 2019).

•*Individual learning.* One of the basic principles of neuropedagogy is that each child is unique, with their own set of strengths, challenges and learning styles. This way of learning involves adapting instructions to the needs and interests of each individual child. Using techniques such as adaptive learning software and customized lesson plans can help students learn at their own pace and in the most effective way (Gejdoš, 2019).

In terms of inclusive education, personalized learning is a key method of supporting children with special educational needs. This may include customized learning programs, adaptations such as extra time or a quiet workplace, or other strategies tailored to this or that category of students. There are many neuropedagogical techniques and neurogames that can be used to support children with disabilities and added to the individual learning trajectory.

– *Scaffolding*. Another key method of supporting children with special educational needs is scaffolding, which involves breaking down complex concepts into smaller, more manageable chunks of knowledge. This can help ensure a clear understanding of the material by children with SEN and the opportunity to make progress in learning. Applying this technique, the teacher offers progressively less assistance as the pupils pick up new ideas and develop new skills.

The realization of scaffolding in the classroom can be clarified by the phrase “I do, we do, you do,” when the instructor demonstrates, guides, then hands the responsibility for the task completion to the students. The theory was first introduced by a psychologist J. Bruner in the 1950s. Some scholars also distinguish Vygotsky’s scaffolding that is based on the zone of proximal development Vorotyntseva et al.

– *Positive Reinforcement*. This psychological strategy entails the introduction of gratifying or enjoyable stimuli following the accomplishment of a particular activity (certain behavior). It is based on the theory of operant conditioning of B.F. Skinner, according to which useful habits and patterns of conduct can be developed through regular encouragement (Koc’ & Yatchuk, 2018). The use of positive reinforcement for teaching children can facilitate the formation of necessary skills in the learners and growth of motivation to study.

Neuropedagogy emphasizes the importance of positive reinforcement, which includes providing feedback and encouraging students to reinforce positive behaviors and achievements. For children with special educational needs, the given teaching strategy can be especially beneficial, because it can help build confidence and motivation and make the learning process more rewarding.

Thus, the given teaching strategies were brought into the field of education thanks to the integration of scientific knowledge and achievements in psychology, neurology and physiology. The neuropedagogical approach considers the features of students’ cognitive and psychophysiological development and suggests optimal methods and techniques that suit different categories of learners.

Despite the prospects for the development of neuropedagogy for the formation of successful teaching of primary school students, there are also a number of scientific and methodological problems that currently need to be solved. Although neuropedagogy can offer valuable information about how the brain learns, there are some issues and limitations associated with this approach, such as oversimplification of brain processes, lack of clear evidence for some practices and limited availability (Zhurat & Lipshyts, 2020).

To sum up, the problems associated with the use of neuropedagogy to improve the effectiveness of training do exist, although they can be solved by means of a thorough study of the evidences of favorable effects of the neuropedagogical methods and activities, as well as the procedure of their implementation. By taking a critical and cautious approach to the use of neuropedagogy methodology, teachers can achieve higher learning results of their students.

II Empirical Study. In order to analyze the results of the survey carried out among primary school teachers we highlighted several categories of questions as criteria of awareness and comprehending of neuropedagogy and its methodology:

1. Knowledge and understanding of neuropedagogy and neuropedagogical approach;
2. Awareness of psychologists’ contribution to neuropedagogy;
3. Understanding the mechanisms of learning and cognition;
4. Knowledge of structural and functional parts of the brain;
5. Knowledge and understanding of cognitive or psychic processes;
6. Awareness of neuropedagogical methods and techniques;
7. Awareness of types of mental disorders and dysfunctions;
8. Knowledge of teaching strategies that agree with neuropedagogy;
9. Realization of significance of implementing neuropedagogical approach.

The given criteria comprise from 4 to 5 questions and allow us to identify the aspects of neuropedagogical awareness. The comparative analysis of the survey results according to 9 factors is provided below.

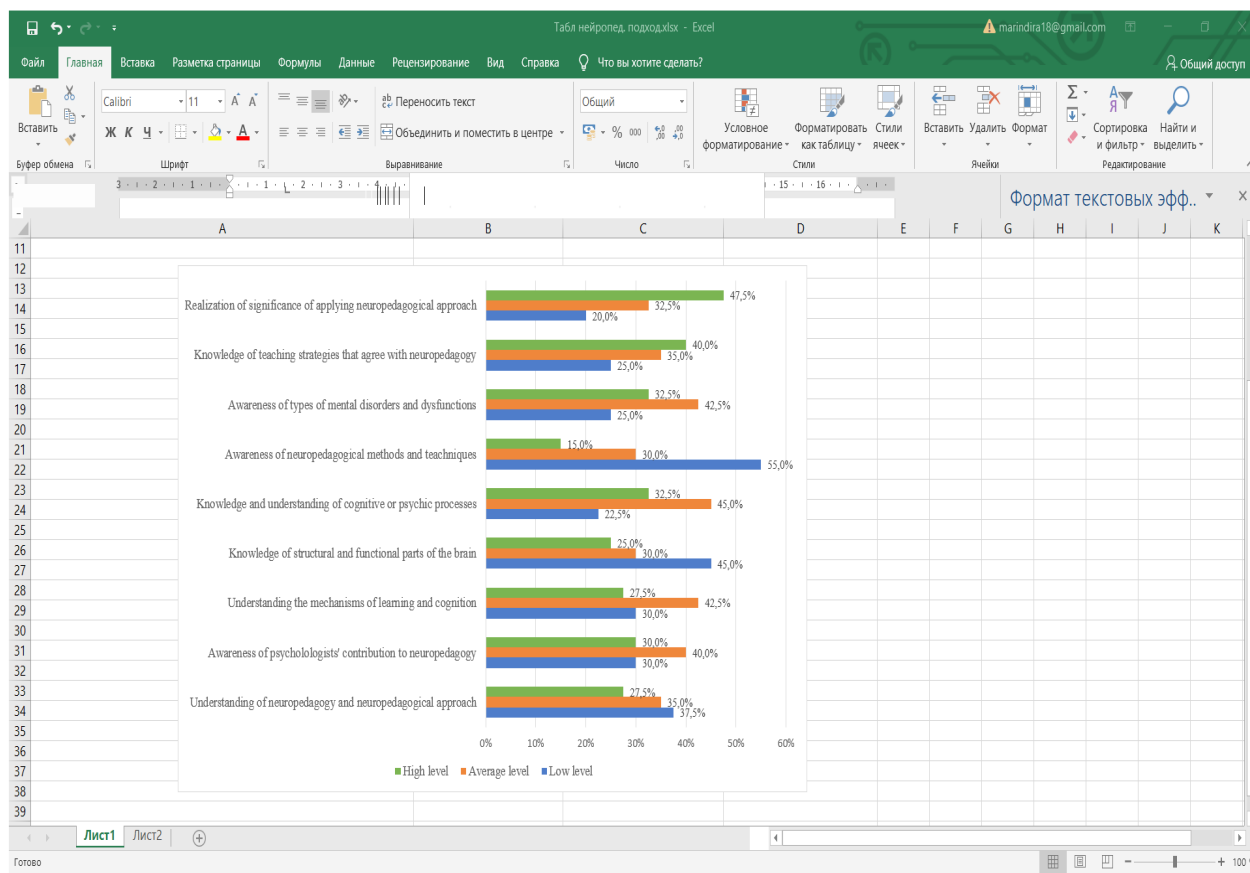


Figure 2. Level of neuropsychological awareness according to the criteria

The analysis of responses on these categories of questions shows that a few teachers have heard of neuropsychology, and few can say for sure what a neuropsychological approach implies. 35% of survey participants have average level of understanding neuropsychology and its connection with other sciences. 15 persons have less idea of what neuropsychology is, mostly because it is a relative new field of interdisciplinary research and was not taught in higher educational institutions before.

Considering the awareness of authors of cognitive and psychophysiological theories integrated into neuropsychology, 30% of educators have shown a high level of knowledge. On the other hand, the same percentage of people could not give a correct answer to most questions. 16 primary school teachers recalled the basic theories that are close to educational psychology but got confused in the details.

In terms of understanding the processes of learning and cognition, the majority of respondents have a general idea of how brain learns and accumulates knowledge. The number

of teachers with highest and lowest indicators is nearly the same. For instance, 11 individuals responded correctly to the multiple-choice question "... how does a human brain learn?", whereas 12 persons chose wrong variants of answer.

Analysing the results on the category "Knowledge of structural and functional parts of the brain", ¼ of the survey participants are well aware of the cerebrum structure and functions of different parts of the human brain. Almost the half of the school teachers do not know about three blocks of the human brain according to A. Luria and do not remember the brain lobes. 30% of the surveyed individuals have demonstrated an average level of knowledge on this topic.

Regarding knowledge and understanding of cognitive processes, 13 elementary school teachers know well what processes are considered psychic and can tell which one simple or complex. A few people have shown a low level of awareness of mental processes, while 45% of the surveyed educators have satisfactory results, being able to differentiate between lower and higher psychic functions.

However, considering the methodology of neuroeducation, the majority of primary school teachers are not familiar with neuropedagogical methods and techniques at all. Only 6 individuals out of four chose existing neuropedagogical techniques. 12 persons could logically respond to the questions and identify what methods recommended by neuropedagogy can help improve the learning process in this or that cases.

In terms of the seventh criterion, 32.5% of the surveyed instructors demonstrated a high level of awareness of types of mental disorders and dysfunctions, such as aphasia, apraxia, and autism. 42,5% of the respondents know the causes of some types of mental dysfunctions, whereas only 9 individuals are not informed about possible neurological problems of children.

The data analysis of the eighth factor are comparatively better than those of the previous criteria: 40% of the teachers of younger schoolchildren were able to distinguish teaching strategies that agree with the ideas of neuropedagogy, 35% and 25% of the surveyed educators demonstrated an average and low levels of understanding the interconnection of neuropedagogical approach and the given teaching strategies.

Regarding the last factor of neuropedagogical awareness, most teachers of junior classes realize the benefits of applying the neuropedagogical approach. Only 8 persons deem using this approach in the educational process unnecessary, since they are not inclusive or special educators. Some people are not sure whether to use neuropedagogical techniques or not, because they lack knowledge of their procedure, and neuropedagogy, in general.

Conclusion. Neuropedagogy is a relatively new approach to teaching compared to the traditional ones. Traditional approaches usually focus on the teacher as an authoritative figure, with an emphasis on accumulating knowledge, mechanical memorization and repetition of the learning material. On the contrary, neuropedagogy is a relevant strategy that adapts the teaching methodology to the most recent findings in the field of neurosciences. Promoting active learning, engagement, and individual learning, this approach aims to create a learning environment that is more student-oriented.

To sum up the results of the empirical study, it is clear that current teachers lack knowledge and understanding of neuropedagogy, its methods and techniques. Since the given branch of science is yet to be completely developed and a few numbers of educators are familiar with it, there should be organized the special trainings on the realization of the neuropedagogical approach in teaching practice. As for higher educational institutions, they may introduce a new discipline to the future teachers, providing basic knowledge about neurosciences integrated in pedagogy.

Teachers should always consider the needs of their students and use proven methods to provide a supportive and engaging learning environment. Neuropedagogy can be an effective approach to educating both healthy children and children with mental disorders. Considering recent studies on brain activity during learning, neuropedagogy can help educators develop more effective learning strategies tailored to the specific needs of each individual child. As such, it can be considered a broader and deeper view of learning theory and practice.

References

- Börnert-Ringleb & Wilbert (2018). The Association of Strategy Use and Concrete-Operational Thinking in Primary School. *Front. Educ.* 3:38. doi: 10.3389/educ.2018.00038
- Chojak, M. (2019). Neuropedagogy as a scientific discipline: interdisciplinary description of the theoretical basis for the development of a research field. 12. 1084 - 1087. 10.5281/zenodo.1474341.
- Dudko, S. A. (2020). Stages of Formation and Trends in The Development of Neuro Education in The World // *Humanitarian studies. Pedagogy and psychology.* 2020. No.2. URL: <https://cyberleninka.ru/article/n/etapy-stanovleniya-i-tendentsii-razvitiya-neyroobrazovaniya-v-mire> (accessed: 25.09.2023).
- Gejdoš, M. (2019). Modern trends in education // *International Journal of New Economics and Social Sciences*, 2019. №10 (2). R. 223-233.
- Glushchenko, A.A. (2017). Neuropedagogy as the newest direction of pedagogy: technologies, principles, methods / A.A. Glushchenko. — Text: direct // *Innovative pedagogical technologies: materials of the VII International Scientific Conference (Kazan, October 2017).* — Kazan: Buk, 2017. — pp. 67-69. — URL: <https://moluch.ru/conf/ped/archive/271/13013/> (accessed: 25.09.2023).

- Hermida, M.J., Segretin, M.S., García A.S. & Lipina S.J. (2016) Conceptions and misconceptions about neuroscience in preschool teachers: a study from Argentina, *Educational Research*, 58:4, 457-472, DOI: 10.1080/00131881.2016.1238585
- Hodykina, A.M. (2020). Teoreticheskie aspekty neyropedagogiki // *Voprosy pedagogiki*, 2020. №5-2. S. 380-383.
- Karpenko, M. P. (2018). “Teleobuchenie” / SSU Publishing House/ 2018/797 p.
- Koc', M.O. & Yatchuk T.M. (2018). Features of Psychological Correction of the Emotional-volitional Sphere of Children of Primary School Age with Special Educational Needs // *Psihologiya: real'nist' i perspektivi*, 2018. #10. P. 86-91.
- Luria, A.R. (2013). Fundamentals of neuropsychology: textbook. manual for students. institutions of higher Prof. education / A.R.Luria. - 8th ed., ster. — M.: Publishing Center “Academy”, 2013. — 384 p. ISBN 978-5-7695-9819-7
- Mambetalina A.S., Mambetalina M.M., Zhumagalieva Z.N. (2019). Application of neuropedagogic approach in the learning process in Kazakhstan and abroad // *Pedagogy: history, prospects*. 2019. No.5. URL: <https://cyberleninka.ru/article/n/primeneniye-neyropedagogicheskogo-podhoda-v-protsessе-obucheniya-v-kazahstane-i-v-zarubezhnyh-stranah> (accessed: 25.09.2023).
- Melnyk O., Petryk O., et al. (2022). Current Approaches to Organizing the Educational Process in Primary School: A Neuroscientific Approach // *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 2022. №13. R. 1-21.
- Moskvitin, V. A. & Moskvitina, N. V. (2001). “Neuropedagogy as an applied direction of pedagogy and differential psychology” / *OSU Vestik/ Issue No. 4/ 2001/p.34–38*
- Sorochinsky, M.A., & Koryakin P.I. (2022). Neuropedagogy as a direction of transformation of pedagogical science based on methods of neurotechnologies // *Pedagogy. Psychology. Philosophy*. 2022. No.2 (26). URL: <https://cyberleninka.ru/article/n/neyropedagogika-kak-napravlenie-transformatsii-pedagogicheskoy-nauki-na-osnove-metodov-neyrotehnologiy> (accessed: 25.09.2023).
- Taylor, J.J., Williams, N.R.; George, M.S. MD. Beyond Neural Cubism: Promoting a Multidimensional View of Brain Disorders by Enhancing the Integration of Neurology and Psychiatry in Education. *Academic Medicine* 90(5): p 581-586, May 2015. | DOI: 10.1097/ACM.0000000000000530.

IRSTI 14.35.07

DOI 10.51889/2960-1649.2023.15.4.011

A.B. MEDESHOVA¹, M.A. ÖZERBAŞ², S.M. AKIMOVA¹, D.N. KURMASHEVA¹

¹M. Utemisov West Kazakhstan University (Uralsk, Kazakhstan)

²Gazi Üniversitesi (Ankara, Turkey)

email: medeshovaa@mail.ru

INNOVATIVE PEDAGOGICAL STRATEGIES FOR EFFECTIVE DIGITALIZATION OF EDUCATION IN THE UNIVERSITIES

Abstract

The article discusses the pedagogical possibilities and tasks of creating favorable conditions for the organization of part-time education in higher education institutions in the context of digitalization of education. The article examines the close relationship between the concepts of “distance learning”, “full-time learning” and “part-time learning”.

The features of distance learning in vocational education in various countries are analyzed, as well as the transformation of this concept in modern realities. The article examines pedagogical research to identify the difficulties of part-time learning, both on the part of students and on the part of teachers. In addition, the study formulated pedagogical conditions for the implementation of part-time learning using digital technologies in higher educational institutions of Kazakhstan.

The study shows opportunities for students to improve their professional knowledge or obtain an academic degree without interrupting their work. It was concluded that part-time education can be implemented on the basis of distance learning technologies, open online courses and online communication.

Keywords: digitalization of education, distance learning, part-time study, online education, time management.

Introduction. The daily increase in the time study, distance learning, online education, capabilities of computer network services is likely short-term study, etc. appeared in the education to influence all spheres of society. To be precise, system as a result of digital capabilities advances new concepts and terms such as part-time/full- most especially during and post-COVID era