

Educational Needs of Society: Neuropedagogy as One of the Main Aspects of Motivation in Learning within Formal and Non-Formal Education

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Abstract: *The article addresses the major education trend as a continuous, lifelong process. Evolution is an integral process underlying human life while also reflecting the progress of human activity in various domains. Human life is believed to remold historical development. It is a major factor in progress that results from the implementation of new ideas. This aspect is relevant for the study of the functions of education in the context of civilizational progress of society and man in particular.*

The study sets forth with the major theoretical and methodological approaches to the basic principles of formal and non-formal education. Neuropedagogy is also highlighted as one of the main aspects of motivation for learning both in formal and informal education reflecting the educational needs for society. The article also explores the impact of physiological aspects on personality motivation structure. The concepts of neuropedagogy, formal education and non-formal education are revealed. The article defines the basic concepts of education of the 21st century, in particular, in the context of formality. The results of the research suggest that the educational process is no less relevant in adulthood whereby people actualize their potential by responding and adapting to societal challenges. The article identifies the educational needs of people of different ages within the innovational society framework. The given research helps form the idea of neuropedagogy as a science.

Keywords: *Information society; globalization; integration; competence; world outlook.*

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Introduction

Active human life predetermines the accelerated development of society providing a fruitful environment for self-development, identifying the needs that, in their turn, stimulate societal progress. Evolution becomes a product of accumulated life experience. This experience forms the historical and cultural heritage of human society. When considered at an individual level, the relevant experience becomes a key driving force for further self-development of a person who strives for fulfilment and wellbeing. Such interrelated factors determine a person's need to acquire competencies and values that enable achieving personal goals. Therefore, neuropedagogy as one of the aspects of the educational process is relevant to our study.

Excess to education is an indicator of a developed, functioning, lawful society. Every individual should be entitled to pursue education for it enables people to meet their needs, achieve their goals and exercise their right to a life of dignity and respect. Therefore, there is a need for research in general and higher education in the context of professionalization as well as in the context of adult education.

A need arose in a profession related to continuing education. Education was supposed to develop as a social interaction that would determine the basis for human self-realization and the formation of civil society. Neuropedagogy has been found to be a key feature in motivation to pursue lifelong learning. Neuropedagogy combines physiological, psychological and pedagogical factors of educational activity and human motives in the context of acquiring new knowledge and skills. Education characterizes a developed civil society, granting an opportunity to generate and decently allocate resources in the state.

The purpose of this article is to explore and examine the impact of neuropedagogy within the formal and non-formal education framework.

The research used methods of image structure synthesis and analysis. To form an idea of education in the context of neuropedagogy we relied on research, scientific and descriptive methods. We applied interpretive methods to reveal the impact of neuropedagogy on human educational activities.

Theoretical principles of formal and non-formal education

The development of a state necessitates and preconditions the corresponding environment for the development of society. If the necessary conditions are provided we witness the formation of public administration in various fields, including education. The trend of professionalization of education is a global problem for society, so the main approaches to the implementation of education are specified in international regulations, UN and UNESCO resolutions. These documents provide the framework for the observance and implementation of the aforementioned regulations in the education system throughout the world.

The world community found itself at the watershed of dramatic changes, which requires decisive measures to update the current frameworks and adapt to the rapid changes in socio-economic systems. Therefore, we need to address the urgency to modernize the educational process, in particular, in the context of ensuring the right to education for every adult through formal or non-formal education. This right has to be ensured by every state.

Education is an investment in human capital, which is assessed through such performance indicators as skills, abilities, motivation, etc. Human capital is the main factor in creating an innovative economy. As is known, innovative economies are driven by knowledge and information. They keep developing fueled by a creative human approach to innovation and the formation of new ideas. Implementing ideas provides new opportunities that further stimulate results necessary for the improvement of public life. The implementation of ideas forms the relevant knowledge, which is the basis for the transformation of humanity into a society that develops throughout life. This feature is an essential trend of education and, accordingly, forms the directions and objectives for educational activities.

To substantiate educational activity theoretically, we analyzed the basic approaches of scientists and investigated normative-legal acts governing the educational activity. Using the analysis of regulations, we identified the main approaches to the development of formal and non-formal education. From this perspective, we examined some aspects of the pedagogical context of formal and non-formal education, the main functional features of educational activities, determining the role of formal and non-formal education in terms of continuity of educational activities, as well as the main similarities and differences of formal and non-formal

education. We have analyzed the role of education in the rapid development of the information society.

Research on formal and non-formal education provides grounds for conclusions regarding the basic theoretical foundations of education. In particular, Ananyev (1980), Batishev (1981), Berne (1992), Vozniuk (2019) and others outline the theoretical approaches for the creation of proper conditions for non-formal education. Unfortunately, teachers' research on formal and non-formal education does not fully reveal the essence of such learning. In particular, theoretical and methodological conceptual provisions are not clearly defined; the specifics of adult learning are not sufficiently studied. The conclusions made by Gurevych et al., R. S. (2011), Mykytenko (2016), Vdovytch (2013) are the basis for the study, but the authors mainly highlighted some features of non-formal education as a result of a human factor, which can be the basis for further formation of educational activities.

This trend contributes to the idea of developing and implementing non-formal education institutions, as well as highlighting the basic principles of formal education.

Formal education is made possible through state funding and grants, which determines the major requirements for the educational field. The educational standards represent conceptual rules for proper assessment of the level and quality of the educational activity. Formal education is carried out within general education institutions, preschool and out-of-school educational institutions, and higher education institutions, Rudenko (2015). Formal education reflects the needs of the state to provide society with the necessary conditions.

However, in the conditions of rapid changes in the technological, informational and social space of human activity, society needs non-formal education, which would stimulate effective human adaptation to new challenges, modernization and innovation.

Serving as an alternative to formal education, the non-formal learning mode enables people to continue studying throughout their lifetime in a customized environment, Vatamaniuk (2014). Non-formal education demonstrates impressive results because a person can show their talents and satisfy their needs that arise throughout life.

Thus, we analyzed the main theoretical principles for the formation of formal and non-formal education outlining the trends in the implementation of different types of education in the modern information society.

Research of neuropedagogy in the context of formal and non-formal education

To analyze the optimal conditions for educational activities, we conducted a study on the most important factors necessary to acquire competencies in formal or non-formal education, which is motivation. Motivation is a driving force for implementing approaches and achieving goals with regard to the individual needs of the education activity. Modern innovation and information society necessitates fast human adaptation to the virtual environment, information and communication technologies and media space (Gygli et al., 2019). The challenges of modern society contribute to the new approaches to the understanding of how important the acquired knowledge and skills are for a fulfilling life. Thus, it becomes clear that the new societal challenges encourage the idea of adult education. This aspect encourages a deeper analysis of the basics of educational activities.

Non-formal education calls for psychological and pedagogical justification. Neuropedagogy combines the pedagogical, psychological and physiological capabilities of man in the process of educational activities. Neuropedagogy embodies neurological aspects and didactic approaches to the formation of a competency-based approach to the goals and objectives of education.

The essence of education, when considered within the neuropedagogy framework, implies taking into account the activities of the human brain. The human brain has been proved to demonstrate strong potential for the realization of human needs. Therefore, the organization of activities in the context of formal and non-formal learning should introduce technologies that stimulate cognitive activity, Gardner (2019). It is necessary to take into account the peculiarities of the load on the brain. Insufficient brain stimulation can be the same harmful to brain performance as mental overload.

It is natural for a human brain to stay in the condition of continuous problem solving, which is why neuropedagogy forms such educational tasks that involve a constant process of solving them. This trend is a natural human need. When solving tasks, a person spends energy, so it needs to be renewed, Giddens (1991). Thus, neuropedagogy provides an appropriate model of the educational procedure. To achieve cognitive goals, it is necessary to study the experience of the societal evolution and the definition of the essence as the basis of the essence of the brain.

When the human brain establishes a nature of things it previously never encountered it learns to do it by developing certain chains and congruencies, Federighi (1999). Tackling intellectual barriers in the process of solving the problem, as well as in the process of organizing the information environment to meet the needs of brain activity is, in fact, the most powerful type of mental activity.

Neuropedagogy can also represent and demonstrate emotion within the learning framework. Emotions contribute to the active stimulation of the brain because they form a factor of satisfaction with the achieved result, Fordham (2020). Neuropedagogy is based on a combination of pedagogical principles and the physiological potential of brain activity.

One of the important principles of the neuropedagogical approach to educational activities is the production of dopamine. It is a substance that is present in the human brain and elicits a sense of satisfaction with the results of human activity. This approach combines emotional satisfaction and intellectual problem-solving.

Emotional intelligence is important in achieving the goals of educational activities. Emotions in the context of learning activities are also the result of the perception of information ambiguity or uncertainty. It facilitates the understanding of educational and developmental goals of personal development, Imel (2016). Each person individually solves problems and tasks that arise during studying because they have their unique features of the brain.

A human cognizes the world through the prism of their perception of environmental processes depending on which feelings are better developed. Yes, some people find it easier to perceive information by ear, others have a brilliant visual memory, and someone else may be effective in perceiving the information kinesthetically, Gray (2008). The neuropedagogical aspect involves a combination of all types of perception of external factors of life.

The cognitive process takes place not only as a part of a learning activity but also naturally, through the emotional perception of environmental events (Smith & Schwartz, 1997). Therefore, it is important to combine different aspects of human social life when shaping the educational environment, including political, social, and sensual. The interaction of such factors requires empathy in various spheres of life. Neuropedagogy identifies key trends in the educational process that can be implemented in both formal and non-formal education. The central task

with regard to the neuropedagogical aspect of education is the development and organization of educational activities based on technologies that provide personality-oriented, interactive learning while promoting positive emotions in the process of education.

An important task of educational activities lies in creating proper conditions for adults in learning. This task is effectively implemented through non-formal education, which has such leading technologies as training, project, information and communication technologies, Vuckovic (2019). These tools cater for all the needs of the contemporary global digital community.

We have conducted a survey to determine the motivation of educational achievements in the implementation of neuropedagogical approaches within formal and non-formal education (Rizzolatti & Arbib, 1998). The effectiveness of learning activities can be increased through innovative learning approaches, especially in the context of non-formal education.

100 respondents took part in our survey, 50 of whom study at formal educational institutions, whereas the other 50 are representatives of non-formal education and develop their educational skills for personal needs. In the course of the research, an online Google questionnaire was created using questions based on the methodology of Milman's motivational structure of personality, V. E. Milman (2018).

The respondents were selected using the "Snowball" method, where the user data from social networks were analyzed. The selected respondents from higher education institutions attracted their acquaintances from non-formal institutions.

The neuropedagogical aspect identified the main motivational trends based on the method by known as "Diagnostics of the personality motivation structure". The method implies a survey comprising 65 questions and answers that are assessed using a 4-point system. The attention of the research was focused on those motivational profiles that form learning competencies (fig. 1, 2).

Based on the study, we formed indicators of motivation of the participants using neuropedagogical approaches in the context of innovative technologies of educational activities.

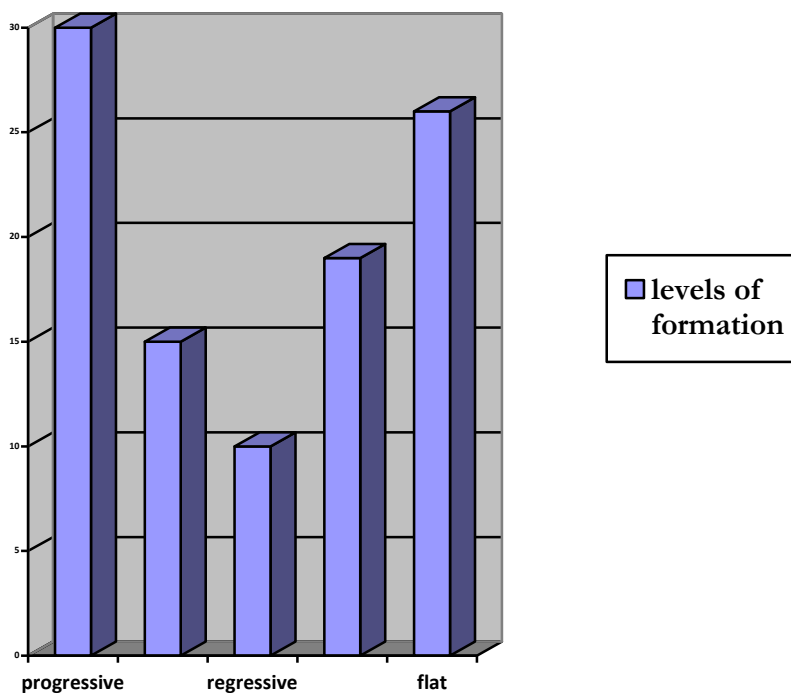


Fig. 1. Levels of formation of motivational component in the context of formal education (developed by the authors)

Relying on the received data we can conclude that motivation for education is mostly progressive, whereas regressive indicators are significantly lower.

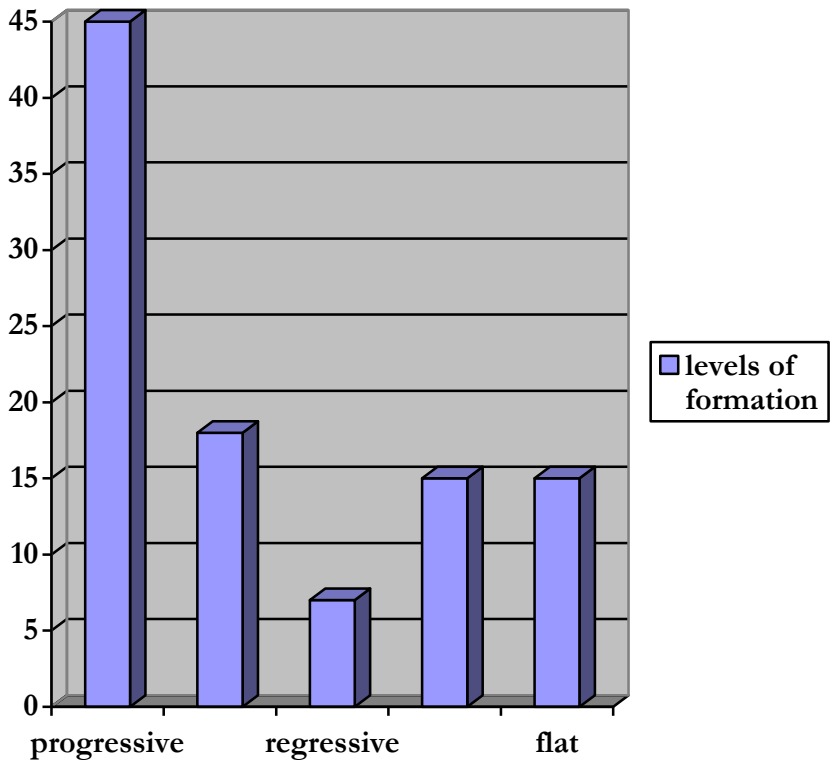


Fig. 2. Levels of formation of motivational component in the context of non-formal education (developed by the authors)

Based on the study, we determined that neuropedagogical approaches to the formation of educational activities reflected in the implementation of innovative learning technologies are the most effective because they reflect the features of brain activity.

Conclusion

The conducted research identified the main neuropedagogical features of learning in the context of formal and non-formal education.

Based on the theoretical analysis of key principles of educational activities formation, we identified special approaches to formal education. Formal education is made possible due to the quality standards of teaching.

Non-formal education provides the human right to lifelong learning. This right is exercised in the scope of workshops or projects designed for people who pursue new directions and careers.

The study identified neuropedagogical features of educational activities that determine the capabilities of the brain in the context of solving intellectual and emotional problems. The mental activity becomes a foundation for the design of the educational activity within the neuropedagogical approach.

The received data resulted from a survey of respondents on the method of determining the personal component of the motivational structure. The study indicators confirmed the effectiveness of neuropedagogy in the organization of formal and non-formal education.

References

- Ananyev, B. G. (1980). *Izbrannyye psikhologicheskiye trudy* [Selected works in psychology] (1st vol.). Moscow: Pedagogika.
- Batishev, S. Y. (1981). *Otcherki professionalno-tekhnicheskogo obrazovaniya* [Essays on vocational education]. Moscow: Pedagogika.
- Berne E. (1992). *Igry, v kotoryye igrayut lyudi: psikhologiya chelovecheskikh otnosheniy* [Games people play: The psychology of human relationships]. Saint Petersburg: Lenizdat.
- Federighi P. (1999). Glossary of adult learning. Hamburg: UNESCO Institute for Education. <https://unesdoc.unesco.org/ark:/48223/pf0000128815>
- Fordham P. E. (2020). *Informal, non-formal and formal education programmes*. <http://infed.org/mobi/informal-non-formal-and-formal-education-programmes/>
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Giddens, A. (1991). *Modernity and self-identity. Self and society in the late modern age*. Cambridge: Polity Press.
- Gray, P. (2008). *A brief history of education. To understand schools, we must view them in historical perspective*. <https://www.psychologytoday.com/us/blog/freedom-learn/200808/brief-history-education>
- Gurevytch, R. S., Kademiya, M. Y., & Shevchenko, L. S. (2011). *Navtchalno-vykhovnui protses* [Educational process in vocational schools]. Vinnytsia: TOB Planer.
- Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2019). The KOF globalisation index-revisited. *The Review of International Organizations*, 14, 543–574. <https://doi.org/10.1007/s11558-019-09344-2>

- Imel, S. (1998). Transformative learning in adulthood. Washington, D.C.: Office of Educational Research and Improvement.
- Milman, V. E. (2018). Metodika. "Diagnostics of the personality motivation structure", ["Methodology. "Diagnostics of the personality motivation structure"]. <https://studfile.net/preview/7284241/page:9/>
- Mykytenko, O. S. (2016). Stanovlennia I rozvytok pidhotovky dlia lehkoyi promyslovosti [Formation and development of training for skilled workers for light industry in technical schools]. Kyiv: Institute for Pedagogical and Adult Education of the National Academy of Pedagogical Science.
- Rizzolatti G., Arbib M. A. (1998). Language within our grasp. *Trends in Neurosciences*, 21(5), 188-194. [https://doi.org/10.1016/s0166-2236\(98\)01260-0](https://doi.org/10.1016/s0166-2236(98)01260-0)
- Rudenko, L. A. (2015). Formuvannia komunikatyvnoyi kultury fakhivtsiv sfery obsluhovuvannia [Formation of communicative culture of future service specialists in vocational schools: monograph]. Lviv: Piramida.
- Smith, M. B., & Schwartz, S. H. (1997). Values. In J. W. Berry, M. H. Segall, & C. Kagitcibasi (Eds.). *Handbook of crosscultural psychology* (3rd vol.) (pp. 77–118). Boston: Allyn & Bacon.
- Vatamaniuk, G. P. (2014). Formuvannia komunikatyvnykh umin u satrshykh doshkilnykh [Formation of communicative skills in preschoolers in the process of music and game activities: Practical approach]. Kamyianets-Podilskiy: Druk-Servis.
- Vdovytych, S. M. (2013). Sutchasni osvitni tekhnolohiyi movnoyi pidhotovky maibutnih fakhovtsiv sfery obsluhovuvannia [Today's educational technologies of language training of future service specialists]. Kiev: Pedahohitchna Dumka.
- Vozniuk, A. V. (2019). Na puti sozdaniyz pedagogiki zhyznennykh faktov [Towards a pedagogy of life facts: A study guide]. Zhytomir: Koob Publications.
- Vuckovic, T. (2019). The overall goal of education and general purpose. *International Journal for Empirical Education and Research*, 3(20), 53-66. <https://doi.org/10.35935/edr/33.6653>