



NEUROPEDAGOGICAL FOUNDATIONS FOR DEVELOPING STUDENTS' INFORMATION LITERACY AND READING CULTURE

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Abstract

This article examines the neuropedagogical foundations for developing students' information literacy and reading culture in contemporary education. The relevance of the study is determined by the growing complexity of the information environment, the expansion of digital texts, and the need to prepare learners for conscious, critical, and responsible interaction with different sources of knowledge. Information literacy is interpreted not only as the ability to search for and use information, but also as a cognitive and metacognitive process that includes attention control, source evaluation, verification, comparison, interpretation, and ethical use of information. Reading culture is considered as a stable personal and educational quality that involves motivation for reading, deep comprehension, reflective interpretation, aesthetic perception, and the ability to connect textual meaning with personal and social experience. The article emphasizes that both phenomena are based on the interaction of attention, memory, thinking, emotion, motivation, and metacognitive regulation. From a neuropedagogical perspective, effective development of information literacy and reading culture requires organizing learning in accordance with the natural mechanisms of brain activity, cognitive load, emotional engagement, and active learning. The study highlights the importance of learner-centered tasks, meaningful reading strategies, critical analysis of sources, reflective discussion, and digital reading practices. The results of the analysis show that the integration of information literacy and reading culture creates conditions for the formation of independent, critical, and culturally developed learners who are able to



understand, evaluate, and use information responsibly in academic and social contexts.

Keywords: Information literacy, reading culture, neuropedagogy, cognitive development, metacognition, critical thinking, digital reading, source evaluation

O‘QUVCHILARDA AXBOROT SAVODXONLIGI VA KITOBXONLIK MADANIYATINI RIVOJLANTIRISHNING NEYROPEDAGOGIK ASOSLARI

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Annotatsiya

Ushbu maqolada o‘quvchilarda axborot savodxonligi va kitobxonlik madaniyatini rivojlantirishning neyropedagogik asoslari tahlil qilinadi. Tadqiqotning dolzarbligi axborot muhitining murakkablashuvi, raqamli matnlar hajmining ortishi hamda o‘quvchilarni turli bilim manbalari bilan ongli, tanqidiy va mas’uliyatli ishlashga tayyorlash zarurati bilan belgilanadi. Axborot savodxonligi faqat axborotni izlash va undan foydalanish ko‘nikmasi sifatida emas, balki diqqatni boshqarish, manbani baholash, tekshirish, qiyoslash, talqin qilish va axborotdan etik foydalanishni o‘z ichiga oluvchi kognitiv hamda metakognitiv jarayon sifatida talqin etiladi. Kitobxonlik madaniyati esa mutolaaga motivatsiya, matnni chuqur anglash, refleksiv talqin qilish, estetik qabul va matn mazmunini shaxsiy hamda ijtimoiy tajriba bilan bog‘lash qobiliyatini ifodalovchi barqaror ta’limiy sifat sifatida qaraladi. Maqolada ushbu ikki hodisa diqqat, xotira, tafakkur, emotsiya, motivatsiya va metakognitiv nazoratning o‘zaro ta’siriga tayanishi asoslanadi. Neyropedagogik nuqtai nazardan axborot savodxonligi va kitobxonlik madaniyatini samarali rivojlantirish ta’lim jarayonini miya faoliyati, kognitiv yuklama, emotsional jalb etilganlik va faol o‘rganish mexanizmlariga mos tashkil etishni talab qiladi. Tahlil natijalari axborot savodxonligi va kitobxonlik madaniyati integratsiyasi mustaqil,



tanqidiy fikrlaydigan va madaniy jihatdan rivojlangan o'quvchi shaxsini shakllantirishga xizmat qilishini ko'rsatadi.

Kalit so'zlar: axborot savodxonligi, kitobxonlik madaniyati, neyropedagogika, kognitiv rivojlanish, metakognitsiya, tanqidiy fikrlash, raqamli o'qish, manbani baholash.

Introduction

The development of students' information literacy and reading culture has become one of the central issues of modern pedagogy, because the contemporary learner acts in an educational environment saturated with digital texts, multimedia resources, online platforms, social networks, and constantly changing information flows. In such conditions, the ability to read is no longer limited to decoding printed text, and the ability to use information is no longer limited to finding ready-made data. A student must be able to search for information purposefully, distinguish reliable sources from unreliable ones, compare different viewpoints, understand explicit and implicit meanings, evaluate arguments, and transform information into meaningful knowledge. Therefore, information literacy and reading culture should be considered as interconnected educational qualities that determine the intellectual, communicative, and personal development of learners.

Information literacy refers to the student's ability to identify an information need, find relevant sources, select necessary materials, evaluate their credibility, interpret their content, and use information ethically and effectively. Reading culture, in turn, includes a stable motivation for reading, the ability to understand texts deeply, interpret them independently, reflect on their meaning, and connect textual content with personal experience, social values, and cultural knowledge. Although these concepts have different emphases, they are closely connected in the real learning process. Information is often acquired through text, while meaningful reading requires the ability to work critically with information. For this reason, their integration provides a broader pedagogical basis for developing independent, thoughtful, and responsible learners.



The neuropedagogical approach makes it possible to explain this integration more deeply. Neuropedagogy studies the relationship between brain activity and the organization of learning. It emphasizes that educational processes should be built in accordance with the natural mechanisms of attention, memory, perception, emotion, motivation, thinking, and metacognitive control. When students work with information and texts, they activate complex cognitive processes: they focus attention, retain information in working memory, connect new knowledge with previous experience, identify logical links, evaluate the reliability of content, and regulate their own understanding. Thus, the development of information literacy and reading culture is not only a methodological task, but also a cognitive and neuropsychological process.

In the context of pedagogical education, this issue is especially important, because future teachers must understand not only what to teach, but also how students perceive, process, remember, and interpret information. The neuropedagogical perspective helps to design learning activities that reduce excessive cognitive load, support active participation, strengthen motivation, encourage reflective reading, and develop critical thinking. Such activities may include guided reading, source comparison, discussion of texts, verification of facts, analysis of digital content, formulation of questions, and self-assessment of comprehension.

The relevance of this study is also connected with the need to prepare students for responsible participation in the information society. The abundance of information does not automatically lead to knowledge; on the contrary, without critical and reflective skills, it may cause superficial reading, cognitive overload, dependence on ready-made answers, and vulnerability to misinformation. Therefore, developing students' information literacy and reading culture on neuropedagogical foundations is a necessary condition for improving the quality of education, strengthening independent learning, and forming a learner capable of conscious intellectual activity.

Methods

The methodological basis of the study is formed by an integrative analysis of pedagogical, cognitive, psychological, and neuropedagogical approaches to the



development of students' information literacy and reading culture. The research is based on the idea that these two educational phenomena cannot be studied separately from the learner's cognitive activity, because both information processing and reading comprehension depend on attention, memory, perception, thinking, motivation, emotion, and metacognitive regulation. Therefore, the study uses a theoretical-analytical method aimed at identifying the internal connections between information literacy, reading culture, and the neurocognitive mechanisms of learning.

The first methodological direction of the study is the analysis of scientific and pedagogical literature related to information literacy, reading culture, digital reading, critical thinking, metacognition, and neuropedagogy. Through this analysis, the main concepts of the research are clarified and their pedagogical content is determined. Information literacy is considered as a complex competence that includes the ability to search for information, select relevant sources, evaluate reliability, distinguish facts from opinions, verify data, and use information ethically. Reading culture is analyzed as a personal and educational quality that includes motivation for reading, deep comprehension, interpretation, reflection, aesthetic perception, and the ability to connect the meaning of a text with broader social and cultural experience. This conceptual analysis makes it possible to reveal their common cognitive and educational foundations.

The second methodological direction is the comparative analysis of the structural components of information literacy and reading culture. In this process, attention is given to their motivational, cognitive, operational, critical-reflective, communicative, ethical, and axiological aspects. The comparison shows that both phenomena require conscious intellectual activity, independent judgment, and reflective evaluation. At the same time, information literacy is more strongly connected with searching, selecting, verifying, and using information, while reading culture is more closely related to understanding, interpreting, and valuing textual meaning. This comparison allows the study to determine the points of integration between the two concepts and to justify their development as a unified pedagogical process.

The third methodological direction is based on the neuropedagogical interpretation of learning. From this perspective, the development of information



literacy and reading culture is studied in connection with the mechanisms of attention control, working memory, cognitive load, emotional engagement, motivation, and metacognitive monitoring. The study assumes that students learn more effectively when educational tasks correspond to the natural principles of brain activity. For this reason, the organization of reading and information-related tasks should include gradual complexity, active participation, meaningful repetition, visual and verbal support, emotional relevance, and opportunities for self-assessment.

The fourth methodological direction is modeling. On the basis of the analyzed theoretical materials, the study identifies pedagogical conditions that may support the development of students' information literacy and reading culture. These conditions include the use of problem-based reading tasks, comparison of several sources, guided work with digital texts, reflective discussion, source evaluation exercises, and metacognitive questions before, during, and after reading. Such methodological organization helps students move from passive perception of information to conscious selection, critical analysis, meaningful comprehension, and responsible use of knowledge.

Results

The results of the theoretical analysis show that information literacy and reading culture are closely connected educational phenomena that develop through common cognitive, motivational, and reflective mechanisms. Information literacy provides students with the ability to search for information, select relevant sources, verify data, evaluate reliability, and use knowledge responsibly. Reading culture, in turn, develops the ability to understand texts deeply, interpret meanings, reflect on ideas, and form a personal attitude toward what has been read. When these two qualities are developed separately, the educational effect remains limited. However, when they are integrated on neuropedagogical foundations, they create a unified system of intellectual, communicative, and personal development.

One of the main results is the identification of attention as a key mechanism in the development of both information literacy and reading culture. In the modern information environment, students encounter a large number of digital signals,



hyperlinks, images, videos, notifications, and fragmented texts. This situation often leads to distraction and superficial perception. Therefore, the development of information literacy requires the ability to concentrate on relevant information, filter unnecessary content, and maintain attention during source analysis. Reading culture also depends on stable attention, because deep reading is impossible without concentration on the structure, logic, language, and meaning of the text. From a neuropedagogical point of view, tasks aimed at developing attention should be gradual, meaningful, and connected with students' real learning needs. Another important result is related to the role of working memory and cognitive load. When students compare several sources, distinguish facts from opinions, analyze arguments, or interpret a complex text, they actively use working memory. If the amount of information is excessive or poorly structured, students may experience cognitive overload, which reduces comprehension and critical evaluation. This means that the development of information literacy and reading culture requires the careful organization of educational material. Texts, tasks, and digital resources should be selected according to students' age, cognitive abilities, and level of preparation. Step-by-step instructions, visual organization, guiding questions, and short reflective tasks help reduce unnecessary cognitive load and support meaningful understanding.

The analysis also shows that metacognition is a central condition for the development of information literacy and reading culture. A student who possesses metacognitive skills can ask important questions: What information do I need? Is this source reliable? Do I understand the text correctly? Which argument is strong and which one is weak? What conclusion can I draw from this material? Such questions help students control their own thinking and reading process. In information literacy, metacognition supports source evaluation and verification. In reading culture, it supports comprehension monitoring, interpretation, and reflection.

The study also reveals the importance of motivation and emotional engagement. Students are more likely to read deeply and work critically with information when the material is meaningful, interesting, and connected with their personal experience. Neuropedagogical foundations show that learning becomes more effective when cognitive activity is supported by positive emotional involvement.



Therefore, reading tasks and information-related assignments should not be mechanical. They should encourage curiosity, discussion, independent judgment, and personal response.

Thus, the results indicate that the development of students' information literacy and reading culture should be organized as an integrated pedagogical process based on attention control, working memory, metacognition, motivation, emotional engagement, and active learning. This approach helps students become independent readers, critical thinkers, and responsible users of information.

Discussion

The analysis of the neuropedagogical foundations for developing students' information literacy and reading culture shows that these processes should be understood not as separate educational tasks, but as interconnected dimensions of the learner's intellectual development. In traditional teaching practice, information literacy is often associated mainly with the ability to search for information, while reading culture is usually connected with the habit of reading books. However, such a narrow interpretation does not fully reflect the demands of the modern educational environment. Today, students need not only to access information, but also to understand its meaning, evaluate its credibility, compare different sources, interpret texts critically, and use knowledge responsibly. Therefore, the integration of information literacy and reading culture has both theoretical and practical significance.

From the neuropedagogical point of view, this integration is justified by the fact that both processes rely on the same cognitive mechanisms. Attention allows students to select relevant information and focus on the text. Working memory helps them retain and compare ideas. Long-term memory connects new information with previous knowledge and experience. Thinking enables analysis, synthesis, interpretation, and evaluation. Metacognition allows learners to control their own understanding, notice difficulties, and correct mistakes. Motivation and emotion support involvement in reading and learning activities. Thus, the development of information literacy and reading culture is directly related to the organization of learning in accordance with the natural laws of cognitive activity.



A particularly important issue is the influence of the digital environment on students' reading and information behavior. Digital resources expand access to knowledge, but at the same time they increase the risk of fragmented attention, superficial reading, excessive dependence on ready-made answers, and uncritical acceptance of information. Students may quickly find information, but this does not mean that they understand it deeply or can evaluate it correctly. For this reason, teachers should not limit digital learning to the use of electronic resources. They should teach students how to read digital texts attentively, compare sources, identify manipulative content, distinguish facts from opinions, and verify information before using it in academic tasks.

The discussion also shows that the teacher's role changes significantly in this process. The teacher is not only a transmitter of knowledge, but also an organizer of cognitive activity. A neuropedagogically grounded teacher creates learning situations in which students search, read, compare, question, explain, discuss, and reflect. Such tasks activate students' thinking and help them move from passive reception to conscious intellectual activity. For example, when students are asked to compare two texts on the same topic, identify differences in arguments, evaluate the reliability of sources, and express their own position, they simultaneously develop information literacy and reading culture.

Another important aspect is the need for a learner-centered approach. Students differ in reading experience, motivation, attention stability, vocabulary, background knowledge, and digital skills. Therefore, the same task may be simple for one learner and cognitively difficult for another. Neuropedagogical organization requires gradual complication of tasks, differentiated support, meaningful repetition, and opportunities for self-assessment. In this way, information literacy and reading culture become not formal educational requirements, but real mechanisms of personal, intellectual, and cultural development.

Conclusion

The development of students' information literacy and reading culture on neuropedagogical foundations is an important condition for improving the quality of modern education. The study shows that these two phenomena are not isolated



pedagogical categories, but mutually connected components of students' intellectual, communicative, and personal growth. Information literacy enables learners to search for necessary information, select reliable sources, distinguish facts from opinions, verify data, evaluate arguments, and use information ethically. Reading culture develops motivation for reading, deep comprehension, interpretation, reflection, aesthetic perception, and the ability to connect textual meaning with personal experience and social values. When these qualities are integrated, they form a broader educational result: a learner who can consciously perceive, critically analyze, and responsibly use information in different academic and social situations.

The neuropedagogical approach makes it possible to understand the internal mechanisms of this process. Information processing and reading comprehension depend on attention, working memory, long-term memory, perception, thinking, emotion, motivation, and metacognitive control. If these mechanisms are ignored, the development of information literacy and reading culture may remain formal and superficial. Students may learn how to find information, but may not be able to evaluate it critically; they may read texts, but may not understand their deeper meaning. Therefore, education should be organized in accordance with the natural principles of cognitive activity, including gradual complexity, meaningful repetition, emotional engagement, active participation, and reflective self-control.

The results of the analysis confirm that attention control is one of the main conditions for effective work with information and texts. In the digital environment, students often face fragmented content and many distracting factors. This requires special pedagogical tasks aimed at developing concentration, source selection, and purposeful reading. Working memory and cognitive load are also important, because excessive or poorly structured information can weaken comprehension and reduce the quality of analysis. For this reason, teachers should carefully select texts and information resources, organize tasks step by step, and support students with guiding questions, schemes, discussions, and reflection.

Metacognition has a central role in the development of both information literacy and reading culture. A student who can monitor his or her own understanding, ask



critical questions, evaluate sources, and reconsider conclusions becomes more independent in learning. Such a learner does not simply accept ready-made information, but transforms it into meaningful knowledge. This is especially significant in the current information environment, where misinformation, superficial reading, and dependence on digital answers are becoming serious educational challenges.

Thus, the neuropedagogical foundations of developing students' information literacy and reading culture include the purposeful activation of cognitive, emotional, motivational, and reflective mechanisms. The pedagogical process should combine reading tasks, source analysis, critical discussion, digital text interpretation, fact verification, and self-assessment. Such an approach helps to form students who are intellectually independent, critically thinking, culturally developed, and capable of responsible participation in the information society.

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