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Advancing the Career Development for Future Primary School Teachers in Ukraine: New Neuropedagogical Challenges

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Abstract: *The article examines the neuropedagogical problem of developing emotional intelligence (EI) in future primary school teachers in Ukraine, particularly in the face of new social risks. It analyzes the recent neuropedagogical challenges and discusses how educational reforms and socio-political tensions affect teachers' emotional stability and ability to maintain balance and teach pupils effectively. The article aims to explore the neuropedagogical aspects of developing EI in future primary school teachers under current challenges, such as Russia's war against Ukraine. It also seeks to identify the constructive and destructive professional manifestations of EI and to address the methodological and epistemological gaps in resolving this problem. Research methods include descriptive and critical review, analysis of independent sociological data and the findings from the authors' semi-structured survey of future primary school teachers, followed by pedagogical modelling, and SWOT analysis presented as a key tool for outlining neuropedagogical challenges related to EI as a teacher's controversial characteristic. This article presents a concise overview of neurophysiological and neuropedagogical aspects of EI, combining reasoned assessment with constructive discussion. It introduces relevant neuropedagogical methods and techniques for future teachers to help them adapt to stress, improve the interaction among pupils, and enhance the practical use of EI during early teaching experience and career development. Key results include identifying factors which influence the zonal, neurohumoral and emotional-behavioural predictors of EI, as well as assessing strengths and weaknesses of EI in future primary school teachers. Finally, the article offers detailed recommendations for neuropedagogical correction under the current challenges in Ukraine's education. The international relevance of the article lies in debunking the "myth" of the universal applicability of EI in various socio-psychological conditions and outlining key approaches to address this particular problem in the future.*

Keywords: *emotional intelligence; empathy; victimity; excessive sensitivity; strengths and weaknesses of EI; positive and negative impact of EI; self-regulation; self-supervision; educational challenges and risks.*

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Introduction

Over the past few decades, the rational approaches to professionalization, development of teaching skills and ways of initial teaching practice for novice teachers have gradually shifted toward more irrational, traditionally "right-brained" personal traits and behavioural patterns. The era of "pure knowledge" is fading into the past. Meanwhile, education, society, and especially young people, are increasingly responsive to professionals who excel in proactive, emotionally engaging interactions to address professional challenges swiftly and effectively.

Research relevance

Due to the global disruptions of the past five years (the COVID-19 pandemic, the Palestinian-Israeli conflict and Russia's war against Ukraine), the educational specialists, psychologists and policymakers have overlooked the problem of a future primary school teacher as a new actor in the educational process and someone affected by events beyond their control. Researchers strive to address the shortage of educational and psychological resources available to pupils through strategies such as distance learning and "studying in bomb shelters" using neuropedagogical, socio-communicative and coping techniques (Galynska & Bilous, 2022; Topuzov et al., 2022). However, even during their early teaching practices, novice primary school teachers deal with additional professional and personal psychophysiological stressors and unmanageable working conditions.

Ukrainian teachers were among the first to recognize the global nature of this problem in 2014 when Russia's annexation of Crimea initiated widespread instability in the humanitarian sphere. Now, Ukraine faces two conflicting challenges: aligning teacher professionalization with international standards, while also struggling with the psycho-emotional and physical obstacles that hinder this very process and the development of career paths (Desiatov, 2014).

On the other hand, in Ukraine, there are certain difficulties in using emotional intelligence (EI). Excessive empathy and emotional burnout are becoming common among young teachers and trainee teachers, who should be able to demonstrate considerable mental energy and motivation for innovative teaching (Myroniuk, 2023).

Neuropedagogical research frequently centres on children's EI. However, recent studies have empirically demonstrated that learning can be optimized by incorporating pupils' neurobiological data. At the same time, a teacher's EI is a valuable tool for enhancing the educational-communicative

climate and managing pupils' emotive and cognitive behaviour (Babiak et al., 2023).

Before Russia's full-scale invasion, two distinct neuropedagogical traditions had been established in Ukraine: promoting self-development among teachers (from physical health to teaching excellence) (Kosholap et al., 2021) and supporting pupils' development and creative autonomy (Berbets et al., 2021). However, the role of emotional intelligence as a multifaceted resource for future primary school teachers to navigate educational and socio-political obstacles remains largely unexamined.

The pressing need for methodical changes and recognizing new neuropedagogical challenges in the context of this article stem from conceptual insights shared by Liliia Hrynevych (2024), a former Minister of Education and Science of Ukraine. She claims that more than one in ten schools in Ukraine is damaged, and the people are all emotionally and psychologically affected. Besides, neurosocial research among pupils reveals that only 25% of adolescents feel a sense of inner resilience (Hrynevych, 2024). This situation sets urgent tasks for wartime neuropedagogy and primary teacher training. These tasks focus on developing social-emotional and ethical skills in pupils, using neuro-potential and reducing the negative emotional-affective responses of teachers during their professional development.

Therefore, the article aims to study the available experience of neuropedagogy and related fields concerning the optimization of emotional intelligence (EI) among undergraduate students majoring in primary education during teaching placement. It also seeks to identify key challenges, transformations and both positive and negative expressions of EI empirically and theoretically. Furthermore, it suggests effective strategies for enhancing EI in future primary school teachers undergoing practical training during martial law in Ukraine. It also justifies the use of SWOT analysis to evaluate their EI, providing insights into the complex professional traits required of teachers in military settings.

Research methods include a descriptive analysis of neuroscientific sources, a critical comparative analysis to explore ambiguous and controversial epistemes, as well as a generalizing approach to existing neuropedagogical practices using EI.

Empirical methods involve conducting semi-structured periodic surveys of future primary school teachers during the first year of the full-scale invasion of Ukraine, focusing on their teaching placement in the 2022 and 2023 academic years.

Following Hall's adapted version (2022), these surveys were conducted with 387 future primary education teachers studying at H. S. Skovoroda Kharkiv National Pedagogical University, Poltava V. G. Korolenko National Pedagogical University, A. S. Makarenko Sumy State Pedagogical University and Pavlo Tychyna Uman State Pedagogical University. To analyze the obtained results, the authors used a quantitative content analysis and data processing with the NVivo software. Additionally, they employed pedagogical modelling based on their own experience and conducted a SWOT analysis of emotional intelligence as a tool for assessing the positive and negative aspects of EI on personal and group levels. This analysis highlighted that emotional intelligence is a multifaceted phenomenon in Ukraine's primary education system and future teachers' professional growth under wartime conditions.

The international relevance of the article lies in contributing to and broadening the problem of neuropedagogical contradictions in developing EI among future primary school teachers and their pupils under unfavourable conditions. The article also complements the recent studies on EI from the early 2000s, aimed at shifting the rational-cognitive educational-social paradigm. In this new paradigm, educational communication took priority over the learning process, the educational environment replaced the learning space, and non-verbal interaction became as significant as verbal debates. A notable example is a study by Zeidner et al. (2009) who introduced the first validated methods for studying EI and set new standards for sociologists, psychologists and educators. However, they also indicated that the "positive psychology" of emotional intelligence, which emphasizes both fulfilling life and work, could carry hidden negative consequences, similar to a trendy "cure-all" (Zeidner et al., 2009).

The practical value of the article is rooted in suggesting specific methods and recommendations for primary teacher training, particularly in the area of developing and applying EI in stressful circumstances, exemplified by the unique educational environment under wartime conditions.

Emotional intelligence and neuropedagogy in teacher professionalization: a brief review and preliminary discussions

The cognitive frameworks of pedagogy, leadership, emotional competence and professional development, particularly for future and inexperienced teachers, are closely related to neurophysiological factors. These factors are shaped internally (through the activity of specific brain regions) and externally by the neurohumoral environment, influenced by

psychogenic and sociogenic factors. Additionally, internal factors such as self-regulation, coping strategies, motivational-emotional mobilization and maturity play a key role in one's ability to control the neuropsychological state and status.

It is essential to summarize these interrelated factors that affect teachers as individuals. The concept of emotional intelligence emerged alongside the rise of neuroscientific research and its integration into the humanities and management. Mayer et al. (2011) first introduced the term "emotional intelligence" in 1990, identifying its main components (self-awareness, self-regulation, motivation, empathy and social skills). However, further neurophysiological research has revealed that the dependence of EI on individual factors is somewhat relative. Therefore, this article seeks to briefly examine the neurophysiological basis of EI.

As previously discussed, it is crucial to differentiate the relatively fixed mechanisms of the brain, particularly the regions responsible for higher and lower mental functions. One key area is the amygdala, an essential component of the limbic system, which plays a central role in processing emotional information. It is involved in threat detection and activates the fight or flight response (LeDoux, 2000), a concept commonly referred to in psychology as emotional reactivity. Furthermore, the amygdala, bypassing rational analysis, helps one recognize emotional expressions in others' faces (Adolphs et al., 1994). In contrast, the prefrontal cortex is responsible for the cognitive regulation of emotions and decision-making. In psychological and neuropedagogical practices, it is associated with proactivity, the opposite of reactivity. Relevant studies have shown that the prefrontal cortex integrates with the amygdala to modulate emotional responses on an individual basis (Ochsner et al., 2002). This interaction is key to self-regulation, a vital component of EI. The insula, another significant brain region, is involved in perceiving internal bodily states and subjective emotional experiences. In the context of neuropedagogy, this is particularly important for developing a holistic sense of self, linking physical and sensory states with their interpretation. The insula, therefore, plays a vital role in emotional awareness, which is essential for self-awareness (Craig, 2009). Importantly, emotional reactivity in students is often pronounced due to the developmental instability of the neurohumoral system and their limited experience with socialization and professional development.

Besides, special emphasis should be placed on the importance of neurotransmitters in pedagogy and how future primary school teachers can use emotional competence effectively. Key hormones influencing the interaction between brain regions and neural impulse transmission,

important for EI, include serotonin, dopamine and oxytocin. Their roles in neuropedagogical and neuro-social interactions, as well as student behaviour, vary over time and can be affected by external psychological stress. The focus of this article is on understanding the specifics of teacher professionalization during wartime and the changes in EI that occur under these conditions. Therefore, this article does not aim to address the impact of acute stressors such as psychotrauma or PTSD. Instead, it deals with moderate, long-term influences such as burnout, anxiety, continuous anticipation of danger and frequent interruptions (e.g., air-raid alerts and sheltering). In this context, mood, motivation, social interaction and empathy are influenced by hormonal factors. For instance, prolonged lack of positive emotions can lead to serotonin deficiency, which may cause stable mood decline and potentially long-term depression (Young, 2007). No signs of depression were found among the surveyed students, likely because those experiencing depression did not participate in the surveys and were not able to demonstrate EI or successful professionalization.

The dopaminergic system has proven to be particularly sensitive and professionally significant. Dopamine plays a key role in the reward and motivation system across all biosocial levels of activity. Elevated dopamine levels are linked to positive emotions and motivation, which are essential for goal achievement, professional growth and leadership (Berridge & Robinson, 1998). This aspect is explored in greater detail in the following quasi-experimental section. Notably, the active extracurricular activities of future primary school teachers, such as providing support, care, empathy, volunteering and engaging in movement and location changes, have helped maintain sufficient dopamine levels. However, the directions of motivational and emotional behaviour appeared to be more sensitive and not always constructive.

There is a need for more targeted and in-depth studies on oxytocin. Nonetheless, personal attachment, empathy and close personal interactions between future primary school teachers and individual pupils, even during brief periods, are characterized by an oxytocinergic nature. These characteristics tend to increase under the influence of military stressors. This conclusion is supported by neuro-social research on oxytocin as a relaxant and anxiety reducer in microsocial interactions (Meyer-Lindenberg et al., 2011).

After exploring the distinctive "three levels" of the neurophysiological mechanisms underlying EI, it is imperative to consider the neuropedagogical aspects. As noted earlier, a future teacher, characterized by high neuroplasticity and flexible neural connections, has a

moderate self-regulatory impact on the neuro-humoral balance and a significant influence on EI-related skills. In neuropedagogy and educational standards, these skills are referred to as emotional competence when proactive behaviour is predominant (Robertson, 2020).

The concept of emotional competence was introduced by Saarni (1999). It comprises three main components, namely, "self" identity, character (neuropsychological profile) and accumulated experience, which form the basis for the "self" figure. In the field of neuropedagogy, emotional intelligence plays a vital role, facilitating individuals to grasp their emotional states, perceive the feelings of others, engage constructively with those emotions and control their own and others' emotional responses in line with social norms. It also encompasses empathy, self-regulation of negative experiences and understanding how one's emotions affect others. This concept aligns with the neuro-social structure of a future teacher's personality, who, within the educational environment, acts as a micro-correlate of the social environment, shaping their image and self-concept as fundamental elements of neuropedagogical influence (Hernández Fernández, 2022).

Recent studies have highlighted the importance of EI in teachers, not only as a professional tool or neuropsychological characteristic, but also as a psychophysiological state influenced by biorhythmic fluctuations and dependent on personal lifestyle, psychotype and, particularly, the nature of the workload and early professionalization. Przybylska (2016) examined EI concerning teachers' emotional competencies and experiences, finding that EI can range from job satisfaction to emotional burnout under overload conditions. A key conclusion is that EI can act as a significant negative predictor in evaluating teacher effectiveness (Przybylska, 2016).

The neuropedagogical approach to integrating emotional-reflective, empathetic and self-regulatory skills in novice teachers, alongside traditional pedagogy, has led educational specialists and administrators to incorporate emotional competencies and emotional intelligence (EQ) into professionalization standards, recognizing their importance as equivalent to IQ. Although Payne's introduction (1985) of EI in the mid-1980s represented a significant shift, IQ remained the dominant focus in pedagogy until the 1990s. Current research, however, has shown that in professional employment and career advancement, IQ accounts for only 10% of success, with the remaining 90% attributed to EQ (Goleman, 2020).

The neuropedagogical challenges faced by trainee teachers and novice teachers, caught between established educational standards and unfavourable conditions, are complicated by conflicting factors. On the one

hand, the effectiveness of professional performance is closely linked to the presence and development of EI that enhance pedagogical leadership, such as the roles of facilitator, helper, mentor and tutor. On the other hand, prolonged exposure to stressful environments or indirect professional stressors (such as social tensions and harmful political conditions) can lead to declines in self-confidence, subjectivity and self-control. Recent research highlights that EI, as a foundation for subjectivity and pedagogical leadership, also shapes professional standards within specific contexts. Consequently, both micro and macro educational contexts influence the effectiveness of pedagogical leadership and learning outcomes (Blaik Hourani et al., 2023).

This indicates that current educational policies on EI as a professional trait, especially for novice primary school teachers, fail to consider neurobiological, socio-political, military-political, epidemiological, or other destructive macro-predictors, as well as micro-predictors specific to particular regions or educational environments.

Methods for identifying destructive neuromarkers in professionalization and the results of its use

It is important to start the methodology section by outlining its underlying assumptions, which served as the foundation for choosing the authors' approach. The previous section identified that the determinants of neuropedagogical professionalization for young teachers in stressful conditions can range from zonal and neurohumoral factors (which are not readily influenced by educational tools) to psychophysiological regular and causal factors. The latter can be addressed through relevant methods by young teachers and their mentors.

At the same time, a notable gap in neuropedagogical research similar to this is the absence of specific diagnostic techniques and subsequent modulation of EI characteristics among future and novice primary school teachers, who are expected to develop and start their professional careers under wartime conditions.

First and foremost, the authors of this article proceeded from the understanding that emotional intelligence plays an important yet ambiguous role in the life and professional activities of a novice primary school teacher in times of war. Military conditions introduce additional challenges even for well-developed EI, leading to phenomena of either excessively effective (overly intense) or distinctly unsuccessful use of EI when working with younger pupils, particularly for teachers with minimal or no experience.

Existing concerns about the initial professionalization of primary school teachers in unconventional background conditions (such as socio-political tension in the country, ongoing military conflicts, the COVID-19 pandemic, or other threats) are intensified by the fact that, for almost a decade, some European countries have experienced difficulties in the initial professionalization of novice primary school teachers, with rates exceeding 30% (Pălăşan, 2015). The authors' observations in Ukraine indicate this rate is above 48% (Lavrysh et al., 2022).

For preliminary analysis, the authors used independent data from a survey conducted by the NGO "Smart Education" in collaboration with the "Democratic Initiatives" Foundation in March 2024, which included 600 novice teachers (Guz, 2024). The findings indicated that since the onset of the full-scale Russian invasion, 78% of teachers have reported experiencing sadness, fear and aggression, with 40% also noting irritability. Additionally, 32% have observed a decline in professional motivation, while 23% have experienced difficulty concentrating and excessive sensitivity to criticism (Shurmakevych, 2024). The participants also indicated that they are facing similar psycho-emotional issues as their pupils and are seeking comprehensive support, including changes in the emotional climate and work routines.

A central aspect of further analysis is the results from a 2009 correlational-regression study on the relationship between EI and stress management, conducted by South African specialists. This study, which used the "Occupational Personality Questionnaire" (OPQ32i) and the "Emotional Quotient Inventory" (Bar-On EQ-i), found that while stress management is a key component of EI, the latter tends to diminish in unstable social environments, and intense stress can impair professional EI, leading to more basic, reticular emotional responses (Ramesar et al., 2009).

The data presented above reflect prior studies in this field, establishing *a relevant foundation* for this research. The data presented below, however, were collected and analyzed by the authors of this article during their own study conducted under more challenging conditions (Russia's war against Ukraine). Therefore, it is crucial to focus on *the research methodology*. It was carried out in two main stages, namely, data collection and data analysis methods, with a detailed overview of this process.

The authors of the article used data from prior research, ensuring that they cited them correctly. Only those future primary school teachers who provided personal voluntary consent participated in the semi-structured survey. Additionally, the ethics committees of the respective universities were informed about their participation.

Data collection and research duration

The objective of this stage was to gather data (neuromarkers) on the dynamics of emotional intelligence (EI) in future primary school teachers over a relatively short longitudinal period (six weeks of practical training under wartime conditions). Due to limitations imposed by such conditions, it is necessary to clarify the following: a) the participant selection criterion was regional, focusing on students from pedagogical universities in northeastern Ukraine, an area outside the immediate war zone but subject to frequent shelling; b) given the limited sample size, the empirical section of this article demonstrates a quasi-experiment, while the article itself remains theoretical in nature.

At the same time, *participant selection* was non-randomized; data were collected within specific educational settings in designated higher education institutions with which the authors had previously established academic connections, which also determined the *number* of participants involved. In this regard, it was decided to conduct longitudinal studies (periodic surveys) in the first half of 2023 (semester 4), using Hall's adapted survey (2022). The main focus was on 387 future primary school teachers from such cities as Kharkiv, Poltava, Uman and Sumy. These cities frequently face risks and disruptions in the functioning of educational institutions. Consequently, Pavlo Tychyna Uman State Pedagogical University and Poltava V. G. Korolenko National Pedagogical University have adopted a blended learning model, while H. S. Skovoroda Kharkiv National Pedagogical University and A. S. Makarenko Sumy State Pedagogical University have transitioned to online learning.

Since this article is theoretical in nature, the empirical component includes a demonstrative quasi-experiment with a limited sample size. The selection criterion for participants in the study was based on regional factors, specifically targeting students from pedagogical universities in the northeastern region of Ukraine. This area is not on the front lines but does experience regular shelling.

Data collection and analysis methods

The authors used the semi-structured survey of Ukrainian teachers based on Hall's adapted survey (2022), which is widely employed by Ukrainian researchers (Doroshkevych & Ilyash, 2020), has uncovered various data reflecting both positive and negative manifestations and characteristics of EI among future primary school teachers at the beginning of their professionalization. These results highlight the need for further discussion and methodical guidance.

At the same time, the authors of the article modified Hall's survey (2022) to explore EI issues during the early stages of future primary school teachers' professionalization and included the following adapted questions in the semi-structured survey framework (see Table 1).

Table 1. Hall's (2022) adapted survey on the problem of EI among novice primary school teachers

A diagnostic component of EI	Question
Self-awareness	Can you recognize your emotions in stressful situations? How would you describe your emotions throughout the school day?
Self-regulation	How do you typically handle stressful situations or conflicts with pupils during lessons? Can you remain calm and composed?
Motivation	Do you feel an inner motivation to continue teaching even under challenging conditions? What inspires and supports you during difficult times?
Empathy	How do you understand and respond to your pupils' emotions, especially if they show signs of anxiety or fear? Can you provide support to pupils who are experiencing stress?
Social skills	How do you communicate with colleagues and school administration under stress? Do you find it easy to find common ground and maintain working relationships?
Stress management	What methods do you use to reduce your stress during the workday? Do you have effective strategies for maintaining emotional stability?
Adaptation to change	How do you handle changes in the educational process under wartime conditions? Can you adapt to new conditions quickly?
Emotional support	Can you access emotional support from colleagues or school administration? How do you use this support in your work?
Understanding pupils' emotions	How do you assess what your pupils are feeling during lessons? Does your understanding of their emotions help you adjust the educational process?
Work-life balance	Can you maintain a balance between work responsibilities and personal life under challenging conditions? What measures do you take to sustain this balance?

Source: the authors' own conception

Methods of data processing and analysis

To identify the results of the quasi-experimental surveys, the authors employed a quantitative content analysis, which involved the following steps:

1. Counting the frequency of references to various emotional states or reactions in the responses to generalize the neuro-markers of emotional intelligence (positive, negative and undifferentiated) statistically.

2. Using text analysis software (NVivo) to qualitatively and quantitatively analyze unstructured data based on textual references to relevant phenomena (such as empathy, fear and inspiration). This analysis made it possible to determine their dynamics over a longitudinal period and, consequently, identify the most prevalent emotional reactions.

Results

Following the survey, the initial conclusions highlight key issues, namely, the hidden or apparent rise in neuro-markers of victimity, where the state of being a victim gradually becomes seen as normal or even a primitive "comfort zone". This intensifies the mutual empathy between trainee teachers and pupils, manifesting as compassion and pity. Clearly, the problem becomes even more pronounced and complex when considering the current stressful challenges in relation to professional standards of neuropedagogy. The concepts of victim and charismatic personality (teacher-leader) are inherently incompatible and, from the standpoint of proactive emotional intelligence, mutually exclusive. Excessive empathy and compassion have been identified as destructive aspects of EI (Barab, 2013).

Moderate fear, when followed by adequate self-control and mobilization of mental resources, can serve as a constructive stimulus. However, frequent loss of such control can be harmful. It has been observed that a trainee teacher who fears for their well-being and that of their pupils may either block EI or demonstrate an exaggerated form of empathy and care. This points out to the need for further research into fear as an enemy of EI, and EI as an enemy of fear in the context of future primary school teachers' professionalization during wartime.

Additionally, when examining the well-established components of EI among primary school teachers, it is useful to compare and synthesize certain metamorphoses, or controversial effects (see Table 2).

Table 2. Metamorphoses of EI characteristics in future primary school teachers at the beginning of their careers in Ukraine (based on short-term longitudinal studies)

EI characteristic	Improvement parameter	Decline parameter
Self-awareness	They are aware of their strengths and weaknesses, which helps them respond to stressful situations effectively.	They may fail to notice when their behaviour becomes destructive.
Self-regulation	They can remain calm during stressful situations while maintaining professional behaviour.	They could be overwhelmed by stress and discomfort, causing them to react aggressively or impulsively.
Motivation	They are focused on their pupils' success under wartime conditions and are willing to invest additional effort to achieve it.	They may experience hypermotivation, which leads to exhaustion and emotional burnout, resulting in a subsequent loss of motivation.
Empathy	They can empathize with and support pupils during difficult times.	They may be insensitive or hypersensitive, which lowers the quality of communication.
Social skills	They can resolve conflicts and stressful situations, as well as create a positive atmosphere.	Due to confusion or excessive responsibility, they may behave chaotically in stressful situations, leading to tense scenarios.

Source: based on the results of the authors' semi-structured survey in combination with Hall's survey (2022)

Therefore, the potential of emotional intelligence in future primary school teachers, who undergo training in wartime conditions and will work (or currently work) with pupils who have the lowest sensitivity thresholds, cannot be achieved positively. EI acts as both a "friend" and an "enemy" to young teachers, highlighting the need for practical solutions to this challenge through neuropedagogical tools.

Using EI in professional development of future primary school teachers within neuropedagogy: gaps and recommendations under wartime conditions

There are studies on neuropedagogical issues related to teacher training and learning under non-standard conditions, focusing primarily on the de-formalization of education due to global technological changes

(Gvozdii et al., 2022). Additionally, quarantine and military restrictions have shifted the emphasis in educational communication toward the interaction between "the brain and the digital flow" (Honcharuk et al., 2023). However, there remain epistemological and methodological gaps in neuropedagogical aspects of preparing teachers to work with younger pupils during wartime remain.

The results from the previous section present a diagnostic summary but call for a response. The aim of this article would be incomplete if it did not address neuropedagogical and psychological recommendations designed for correcting the "defects" in EI among future primary school teachers and supporting their professional growth in the challenging and hyper-emotional conditions during wartime.

Given the limited data collection and the absence of experience in creating neuropedagogical methods for wartime conditions, this article uses the following approaches to address the identified gaps: 1) summarizing practical experience (including the authors' and those from relevant projects), 2) educational modelling, 3) extrapolating non-pedagogical methods into the neuropedagogical field. One notable and largely original approach is the application of SWOT analysis as a tool for both individual and collective evaluation of the constructive and destructive aspects of teachers' EI in wartime conditions.

Today, there is extensive research on preserving and mobilizing the psycho-emotional potential of children. At the same time, teachers often remain overlooked, and educational policies fail to acknowledge their vulnerability. Current efforts to resolve this issue include independently organized neuropedagogical seminars for trainee teachers and psychologists, driven by their difficulties and challenges under wartime conditions. In these situations, a teacher must first act as a psychologist for themselves and their pupils before fulfilling their teaching role.

Prominent initiatives include Social, Emotional and Ethical Learning (SEEL) programmes in Ukraine and various online conferences, such as the All-Ukrainian Online Conference on Neuropedagogy in Crisis Conditions. These conferences have proposed techniques for managing rapid and slow thinking processes (reptilian, limbic and neocortical systems). Practical neuropedagogical advice can be found on YouTube (Diadiushkina, 2022). Additionally, knowledge-oriented Ukrainian pedagogy has begun to incorporate EI regulation practices to enhance teachers' cognitive, reflective and emotional competencies under wartime conditions (Bondar, 2024).

Adjusting EI skills is typically seen as strategic stress management, while cognitive-behavioural correction and coping strategies tend to offer

only short-term benefits (Justice & Espinoza, 2007). On the other hand, to combat emotional reflexes in a collective environment, it is crucial to counter primitive and rudimentary emotional contagion, which occurs automatically and facilitates emotional closeness at the lowest reticular level (Hatfield et al., 1993).

Building on these insights and drawing from personal teaching experience during Russia's war against Ukraine between 2022 and 2024, the authors of this article offer their strategies to enhance EI among future primary school teachers as part of their initial professional development during wartime (see Table 3).

Table 3. The authors' strategies for regulating EI in future primary school teachers in wartime conditions

Specific area	Method/technique	Explanation
Body-to-body communication	Non-verbal exercises	Introducing exercises that emphasize non-verbal communication, including joint activities such as yoga or dancing, emotional touch, physical contact and interaction.
	Eye contact	Teaching techniques for establishing and maintaining eye contact to convey support and mutual understanding without words.
Countering emotional contagion and excessive empathy	Developing emotional boundaries	Teaching future teachers to establish healthy boundaries between themselves and others' emotions to prevent emotional burnout.
	Grounding techniques	Using grounding techniques, such as breathing exercises, mindfulness and physical activities, to remain calm and stable.
Viewing uncertainty and fear as areas for growth	Mindfulness	Implementing mindfulness practices to help future teachers focus on the present and reduce anxiety levels.
	Teaching stress management	Organizing stress management workshops where trainee teachers can learn to use uncertainty as an

		opportunity for personal and professional growth.
	Supporting self-reflection	Encouraging future primary school teachers to regularly analyze their fears and uncertainties, viewing them as points for growth and improvement.
Emotional self-regulation	Daily rituals	Establishing daily rituals, such as hugs, meditation, or short breaks for breathing exercises, to help stabilize emotional states.
	Emotional diaries	Keeping a journal where future teachers can record their emotions, analyze them and learn to find constructive ways to express them.
Professional self-support	Supervision	A format for structured meetings that allows future primary school teachers to discuss their work, share their experiences and receive feedback and support from one another.
	Soothing talks on casual topics	These meetings are scheduled at a time that suits all participants and held in a calm and comfortable setting to ensure there are no distractions.

Source: the authors' own conception based on pedagogical modelling and generalization of personal experience

Considering the results of the quasi-experimental, non-randomized, semi-structured survey, along with the neuropedagogical methodical recommendations and optimization strategies, a speculative SWOT analysis of EI characteristics among future primary school teachers under wartime conditions can be conducted in the course of their initial professionalization (see Table 4). Naturally, this requires detailed recommendations and experimental validation of its effectiveness (see Research Limitations).

Several years ago, researchers introduced SWOT analysis to enhance character development in primary school pupils (Satria & Shahbana, 2020). While this study had a limited focus on neuropedagogy, this article aimed to expand on this concept, recognizing that the emotional intelligence of primary school teachers undergoing professional development in wartime is

a complex issue. Thus, through a neuropedagogical lens, one might suggest that future teachers and their academic mentors employ SWOT analysis in individual and group settings. This approach should help them objectively assess the strengths and weaknesses of their emotional intelligence, facilitating targeted optimization efforts.

Table 4. A SWOT analysis of EI characteristics among future primary school teachers under wartime conditions

Strengths	Weaknesses
1. A high level of empathy 2. Psychological resilience 3. Good communication skills 4. Self-regulation ability	1. A high level of emotional burnout 2. Limited resources for emotional support 3. Insufficient training in EI 4. Work overload
Opportunities	**Threats**
1. Advanced training (mostly, training sessions) 2. Participation in support programmes 3. Expanding collaboration with non-educational organizations 4. Using the latest coping and relaxation techniques	1. Duration of the military conflict 2. The risk of losing motivation and decreasing productivity over an extended period 3. Gradual decline in education quality 4. Accumulating psychological issues among pupils

Source: the authors' own conception

Therefore, performing a SWOT analysis of emotional intelligence among future primary school teachers in Ukraine enables an evaluation of their readiness to work under wartime conditions. Neuropedagogical diagnostic tools demonstrate that teachers with high emotional intelligence excel in stress management and in fostering a supportive atmosphere for their pupils, thus enhancing their effectiveness. On the other hand, a lack of emotional intelligence can result in burnout and communication challenges with children. Training aimed at developing these skills can improve teachers' resilience in difficult situations. However, prolonged conflict raises the risk of increased emotional stress, potentially affecting their performance without proper support.

Conclusions

This article concludes that the role of emotional intelligence in the neuropedagogical and neuro-social interactions and behaviour of future primary school teachers varies significantly over short and long terms, depending on the stability or destructiveness of the social context.

Moreover, pedagogy, leadership, emotional competence and professional development, particularly among novice teachers, are intricately linked to neurophysiological factors. These factors are influenced by brain activity, neurohumoral balance and a range of psycho- and socio-genetic external factors. Internal factors such as self-regulation, coping strategies, motivational-emotional mobilization and personal maturity also play a crucial role in shaping neuropsychological states and personal status. The findings suggest that while improving EI during practical training has minimal impact on the innate profiles of relevant brain regions, it can influence the neurohumoral balance and manage higher-level EI manifestations even under extreme conditions.

A detailed review of various sources reveals that EI is a traditionally powerful tool for helping future primary school teachers enhance their professionalism, teach effectively and support their pupils, especially in wartime conditions. However, it is crucial to recognize and address the potential negative effects of EI under prolonged stress, both during the educational process and during practical training. Measures should be taken to prevent emotional burnout, excessive empathy, loss of personal boundaries and the decline in the teacher's sense of self while maintaining overall personal well-being.

The article has confirmed that primary school pupils are much more intuitively and emotionally attuned to young teachers compared to their older colleagues. However, this heightened sensitivity can play a cruel joke on future primary school teachers as children's hypersensitivity to emotional states at the beginning of teachers' careers in challenging conditions leads to uneven and often unconscious use of emotional competencies and reactions. This can be framed as a conflict within wartime education, namely, neuropedagogy versus neurophysiology.

The authors' non-randomized semi-structured surveys and independent studies by other researchers indicate that the core components of EI among future primary school teachers (self-awareness, self-regulation, motivation, empathy and social skills) may manifest inadequately or excessively, in either constructive or destructive ways, in the context of

wartime conditions. Nevertheless, applying the proposed techniques is expected to balance these EI strengths and weaknesses.

The article also shows that SWOT analysis can serve as a neuropedagogical tool for identifying, summarizing and presenting the challenges and benefits, as well as the strengths and weaknesses, of future teachers who are in the process of professionalization and starting to work in a wartime setting. The findings from this analysis should help in selecting more effective methods for training and supporting these teachers.

Thus, it is essential to use opportunities for professional development and neuropedagogical and psychosocial support to safeguard teachers' emotional health, mitigate threats and enhance the educational environment. Key (didactic and managerial) methods of optimization include 1) body-oriented communication with colleagues and pupils, and non-verbal interactions; 2) preventing emotional contagion and excessive empathy; 3) treating uncertainty and fear as growth opportunities when leaving the comfort zone; 4) supervision and mutual relaxation for novice teachers.

A major, yet concerning, conclusion from this research is that EI can be significantly influenced by prolonged stress, not only in children who have faced traumatic events and struggle with recognizing and expressing emotions but also in future primary school teachers who may engage in excessive emotional contact with their pupils as a form of primitive psychological defence.

Research Limitations

The SWOT analysis of emotional intelligence characteristics among teachers in Ukraine, along with the following recommendations, is primarily illustrative and somewhat speculative. Therefore, it requires additional methodical refinement and practical validation.

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Author 1 performed a critical review of neuropedagogical and neurophysiological aspects of EI in future primary school teachers. Author 2 gathered independent data and conducted semi-structured surveys. Author 3 analyzed the results using validated methods. Author 4 carried out the necessary neuropedagogical modelling and offered relevant recommendations. Author 5 completed the SWOT analysis and integrated the findings. Author 6 assembled the results of the various tasks into a unified document.

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