SECTION «PSYCHOLOGICAL SCIENCES»

DEVELOPMENT OF EMOTIONAL INTELLIGENCE IN SCHOOL STUDENTS: PSYCHOBIOLOGY PRINCIPLES AND PEDAGOGICAL TECHNOLOGIES

Svitlana Berezhna[1]
Vadym Tarasov[2]

DOI: https://doi.org/10.30525/978-9934-26-715-4-46

Abstract. Emotional intelligence, as a complex integrative characteristic of personality combining cognitive, emotional and social-behavioural components, plays a decisive role in schoolchildren's social adaptation, learning success and psychological well-being, which is especially urgent amid the increased psycho-emotional strain experienced by Ukrainian children under prolonged wartime stress. Building on the ability model of J. Mayer and P. Salovey, the non-cognitive competency model of R. Bar-On, D. Goleman's concept and H. Gardner's theory of multiple intelligences, the study substantiates the psychobiological and psycho-pedagogical conditions of emotional intelligence development and proposes the original comprehensive technology «EmoCompass», designed to purposefully form pupils' emotional competence and psychological resilience within general secondary education.

INTRODUCTION

Contemporary research regards emotions as an important regulator of cognitive activity, behaviour, social interaction, and personal development. The concept of "emotional intelligence" (EQ) has received a range of scholarly interpretations depending on researchers' theoretical approaches: in the ability model of J. Mayer and P. Salovey, in R. Bar-On's concept of non-cognitive abilities, in D. Goleman's mixed model of emotional

[1] National Psychological Association, Ukraine
[2] Doctor of Engineering, Professor,
Volodymyr Dahl East Ukrainian National University, Ukraine

© Svitlana Berezhna, Vadym Tarasov

intelligence, and within the framework of H. Gardner's theory of multiple intelligences. Despite differences in how the structure of the phenomenon is interpreted, most researchers agree in understanding emotional intelligence as a complex integrative personal formation that combines cognitive, emotional, and socio-behavioural components, is amenable to purposeful development, and therefore requires the elaboration of scientifically grounded psychological and pedagogical tools appropriate to it. Within the context of ongoing transformations of the education system, the problem of fostering an individual's emotional intelligence acquires particular significance. Education is gradually shifting its emphasis from the exclusively cognitive development of the learner toward creating conditions for their holistic development, which entails taking into account individual needs, personal resources, and opportunities for self-realisation. This problem is especially acute for the contemporary Ukrainian school: the prolonged effect of wartime stress factors, the forced change of the educational environment, and distance and blended forms of learning substantially increase the psycho-emotional burden on children while simultaneously complicating teachers' work in supporting their emotional well-being. This underscores the relevance of both the theoretical conceptualisation of the phenomenon of emotional intelligence and the development of practical technologies suitable for direct application in the conditions of a Ukrainian general secondary education institution.

The scientific novelty of the study lies in the fact that, for the first time, a comprehensive analysis of the problem of developing schoolchildren's emotional intelligence has been carried out at three interrelated levels – psychological, psychophysiological, and pedagogical – which made it possible to overcome the fragmentary treatment of this phenomenon characteristic of previous studies. The work deepens scientific understanding of the psychobiological principles underlying the formation of emotional intelligence in ontogenesis; systematises existing programmes for developing emotional intelligence within the educational space; and describes the author's original psychological and pedagogical technology for developing schoolchildren's emotional intelligence, "EmoCompass."

The aim of the study is to provide theoretical grounding for the psychobiological principles and psychological-pedagogical conditions of developing schoolchildren's emotional intelligence, and, on this basis,

to develop an original technology for its purposeful formation within the educational process of a general secondary education institution.

Achieving this aim required addressing the following tasks: to summarise the main theoretical approaches to understanding the structure of emotional intelligence; to characterise the psychophysiological mechanisms underlying the improvement of the emotional-regulatory sphere in ontogenesis; to identify the psychological-pedagogical foundations and conditions for unlocking emotional abilities within the educational space; and to develop an original psychological-pedagogical technology for developing schoolchildren's emotional intelligence.

The methodological basis of the study comprises general scientific theoretical methods: analysis and synthesis of the scholarly literature to systematise and generalise theoretical approaches to understanding the structure of emotional intelligence; comparative analysis of existing psychological-pedagogical programmes for EQ development; structural-functional analysis of the psychobiological principles underlying the formation of the phenomenon under study; and the modelling method, applied to devise the structure and content of the author's "EmoCompass" technology. The study is theoretical-analytical in nature and is grounded in a synthesis of the achievements of psychological, psychophysiological, and pedagogical science on the problem of improving an individual's emotional competence during school age.

The logic of the presentation is determined by the sequence in which the stated tasks are addressed. Thus, the relevance of the problem was substantiated, and the aim, tasks, methodology, and scientific novelty of the study were defined, after which the content of the phenomenon of emotional intelligence in contemporary psychology was consistently disclosed and the main theoretical models of its understanding were generalised. The psychophysiological mechanisms underlying the unfolding of emotional abilities in ontogenesis were described, which laid the groundwork for examining the psychological-pedagogical foundations of its development within the educational space and for analysing existing programmes for forming this quality in schoolchildren. On the basis of the theoretical generalisation carried out, the author's original psychological-pedagogical technology for developing schoolchildren's emotional intelligence, "EmoCompass," is presented, and prospects for further scholarly inquiry are outlined.

1. The Phenomenon of Emotional Intelligence in Contemporary Psychology

The popularisation of the concept of emotional intelligence is associated with the work of the American psychologist D. Goleman, who synthesised the findings of numerous psychological, neurobiological, and behavioural studies, thereby forming a holistic understanding of the role of emotions in the processes of thinking, decision-making, social interaction, and personal development [4]. Emotions are an integral component of human mental activity and substantially influence decision-making, interpersonal interaction, learning, and professional performance. One of the key tenets of D. Goleman's concept is the assertion that a high level of academic or general intelligence is not a sufficient condition for achieving success in life. Of considerable importance is a person's capacity to be aware of their own emotions, to manage them, to understand the inner experiences of other people, and to build social relationships effectively. The author argues that emotional intelligence is amenable to development and that its level of formation largely determines an individual's success across various spheres of life [4].

In his work, D. Goleman draws substantially on the research of P. Salovey and J. Mayer, adopting the interpretation of the concept of "emotional intelligence" that they proposed [18]. At the same time, most scholars regard J. Mayer and P. Salovey as the authors of the first coherent scientific concept of emotional intelligence, since they were the first to establish this phenomenon as a distinct subject of psychological inquiry. The theoretical foundation of their concept was H. Gardner's theory of multiple intelligences, according to which human intelligence has a multidimensional structure encompassing various types of abilities. Within this approach, emotional intelligence is regarded as a set of cognitive abilities that enable the perception, analysis, interpretation, and use of emotion-related information [17]. Such abilities allow a person to recognise emotional processes and to use emotional information in thinking, decision-making, and the regulation of their own behaviour.

Building on these premises, J. Mayer and P. Salovey developed a model of emotional intelligence comprising four interrelated components. The first component characterises the ability to accurately perceive, identify, and adequately express emotions. The second relates to the use of emotions to

support cognitive activity, problem-solving, and effective decision-making. The third component encompasses the ability to understand the causes of inner experiences and the patterns of their change and interrelation. The fourth involves the ability to consciously regulate one's own emotional sphere and to constructively influence the emotions of others [18].

The further development of the theory of emotional intelligence gave rise to so-called mixed models. Unlike the Mayer–Salovey ability model, these define emotional intelligence as a more complex formation that, in addition to cognitive abilities, includes motivational characteristics, personal qualities, social skills, behavioural features, and other individual psychological resources of the person [18].

O. Nosenko regards emotional intelligence as a form of reflexive consciousness that functions as a superstructure over primary emotional impulses; in contrast to approaches that treat EQ predominantly as a set of emotional abilities or personal dispositions, she emphasises its role in the conscious comprehension, regulation, and control of an individual's emotional sphere [10]. According to the hierarchical model she proposes, the degree to which emotional intelligence is formed manifests through the interrelation of internal components (psychological well-being, self-esteem, strategies for coping with difficult life situations) and external components (motivation, locus of control, patterns of behaviour) of the personality. The model distinguishes three levels of EQ development: the lowest, characterised by the predominance of situational, reactive emotional responses and insufficient self-control; the middle, associated with the conscious regulation of emotions, high self-esteem, and the use of constructive coping strategies; and the highest, which reflects the harmonious integration of the emotional sphere, the value system, and behaviour, ensuring intrinsically motivated activity, stable self-control, and adequate responses to emotiogenic situations.

In O. Ampleieva's theoretical model of EQ, emotional intelligence is presented as a complex psychological formation that determines the specific features of perceiving, comprehending, and using emotional information in activity and interpersonal interaction [1]. The author emphasises the functional aspect of emotional intelligence, treating it as a system of an individual's internal resources that ensures understanding of one's own emotional states, comprehension of other people's experiences,

and conscious management of behaviour appropriate to the situation. The structure of the model encompasses three interrelated spheres of the functioning of emotional intelligence: the evaluation and expression of emotions, the control of subjective emotional manifestations, and the use of emotions in activity. The researcher devotes considerable attention to the interrelation between intrapersonal processes (self-awareness, self-control, motivation, and the capacity to control and transform emotional reactions) and interpersonal manifestations (empathy, understanding of others' emotions, effective communication). Thus, O. Ampleieva's model reveals emotional intelligence as a dynamic system that combines emotional self-knowledge, regulatory mechanisms, and the social orientation of the personality, underscoring its significance for effective activity and interpersonal interaction.

O. Vovchenko interprets emotional intelligence as a complex integrative personal phenomenon that performs the function of an adaptive resource in a person's interaction with the social environment, and emphasises its non-cognitive nature: EQ is not reducible to intellectual abilities but is formed as a system of emotional knowledge, skills, and modes of behavioural management, acting as an important factor of social adaptation, self-knowledge, self-regulation, and the formation of personal identity – a factor that acquires particular significance in adolescence [2]. The model the researcher proposes is grounded in systemic-structural, comprehensive, and multidisciplinary approaches and includes two groups of interrelated components. The alpha components determine the internal structure of emotional intelligence (the emotional, cognitive, behavioural, and motivational spheres of the personality) and encompass the abilities to recognise, differentiate, and verbalise emotions, to exercise emotional-volitional regulation, to display empathy, to control behavioural reactions, and to form an adequate self-assessment and self-concept. The beta components perform a directing function, shaping the specific features of the formation of the system of emotional knowledge and regulatory mechanisms under the influence of the social environment and interpersonal interaction.

A distinctive feature of O. Vovchenko's concept is its consideration of emotional intelligence in the context of the personal development of individuals with intellectual disabilities, in whom the emotional sphere

serves as a significant resource for compensation and social adaptation – an approach that broadens the traditional understanding of the relationship between intellectual and emotional development and underscores the role of emotional competencies in shaping an individual's life success and autonomy [2].

The models presented demonstrate the gradual evolution of scientific conceptions of emotional intelligence: from understanding it as a system of discrete abilities to comprehensive concepts that take into account the mechanisms of reflection, motivation, social context, personal development, and the psychobiological factors underlying its formation. A distinctive feature of the current stage of research is the active expansion of the subject field in the study of emotional intelligence. Scholarly interest is focused not only on refining its structure and component composition but also on investigating the neurobiological mechanisms involved, the age-related dynamics of its development, and its relationship with psychological well-being, academic achievement, mental health, and social adaptation. In parallel, work continues on developing new theoretical models, valid diagnostic methods, and effective programmes for developing emotional intelligence across different age and social groups.

2. Psychophysiological Mechanisms of the Formation of Emotional Intelligence in Ontogenesis

From the standpoint of neuropsychology, emotions appear as complex systemic formations that can only be analysed within the context of the holistic functioning of the psyche and the organism. The theoretical basis of this approach is the concept of the systemic-dynamic localisation of higher mental functions, according to which each mental function is ensured by the coordinated interaction of various brain structures, each of which performs a specific role and makes its own contribution to the formation of complex functional systems whose components are responsible for different aspects of mental activity.

The problem of determining the brain mechanisms of emotions remains the subject of active scholarly debate. Neuropsychological research into emotional processes is represented by several mutually complementary approaches. Proponents of the theory of functional brain asymmetry (R. Sperry, M. Gazzaniga, and others) focus on the leading role of the

right hemisphere in processing emotional information. At the same time, contemporary neuroscientific concepts (J. LeDoux, A. Damasio, R. Davidson) regard emotions as the result of the integrated interaction of the hemispheres and various brain systems, in which sensory, cognitive, and regulatory mechanisms function as a single system. An important place in these processes is occupied by evolutionarily formed subcortical structures, in particular the components of the limbic system, which ensure basic emotional reactions.

Insufficient functional maturity of the right and left cerebral hemispheres, as well as disruptions in interhemispheric interaction, can adversely affect not only the development of higher mental functions but also the emotional development of schoolchildren. In particular, an insufficient degree of formation of right-hemisphere structures complicates the recognition of facial emotional expressions, the perception of non-verbal information, and the adequate understanding of other people's emotional states. At the same time, the functional immaturity of the left hemisphere may manifest itself in impairments of speech self-control, difficulties in using facial expressions and gestures, and limited possibilities for the verbal expression of one's own emotions.

Neuropsychological and psychophysiological research points to a number of biological prerequisites for the formation of emotional intelligence, associated with the maturation and functional interaction of various brain structures. One of the leading neurophysiological mechanisms is the functioning of the prefrontal cortex, which ensures higher forms of voluntary behavioural regulation, control of impulsive reactions, evaluation of the consequences of one's own actions, and purposeful behavioural management. Its activity creates the neurobiological groundwork for the formation of a person's ability to be aware of their own emotional states and to regulate their modes of response in accordance with the situation.

The functional interaction of the limbic system and cortical structures is of considerable importance in the neuropsychological underpinning of emotional processes. The initial emergence of emotional reactions is associated with the activity of subcortical centres, in particular the amygdala, while the cerebral cortex participates in their conscious awareness, evaluation, and incorporation into a system of purposeful behaviour. The coordinated activity of these structures ensures the

integration of emotional information with cognitive processes. A distinct role in the ontogenetic formation of emotional abilities is played by the functioning of mirror neuron systems, which are regarded as one of the neurobiological mechanisms of empathy. Through their activity, a person is able to recognise other people's emotional manifestations through facial expressions, gestures, and intonational cues, thereby embodying an internal reflection of others' experiences.

The formation of individual components of emotional intelligence is uneven in character, reflecting the principle of heterochrony in psychophysiological development: primary school age is characterised by heightened sensitivity to the recognition and differentiation of emotions, whereas adolescence creates conditions for a deeper comprehension of emotional states, the development of reflection, and more complex forms of emotional self-regulation. In early childhood, the central nervous system undergoes active formation, accompanied by the formation of new neural networks, the improvement of myelination processes, and the strengthening of functional interaction between brain regions. Of particular significance in ontogenesis is the gradual maturation of the prefrontal cortical zones, which ensures the transition from the predominance of immediate emotional reactions to voluntary and socially mediated forms of behaviour, creating conditions for the formation of a child's capacity to evaluate their own experiences, take into account the consequences of emotional reactions, and apply more complex strategies of behavioural control. The limbic system, which includes the amygdala, the hippocampus, and other structures, is involved in the formation of emotional memory, the evaluation of the significance of events, and the consolidation of emotional experience.

An important factor in the neurobiological underpinning of the improvement of the emotional-regulatory sphere is the functioning of the brain's neurotransmitter systems, which are involved in mood regulation and the formation of motivation and emotional stability. Thus, the serotonergic system ensures the stability of emotional background, the control of impulsivity, and adaptation to stressful situations; the noradrenergic system is involved in mobilising the body's resources, forming anxiety responses, and increasing readiness for action; and dopaminergic mechanisms are associated with the processes of motivation, the experience of pleasure, and

the formation of the reward system. The harmonious functioning of these neurochemical mechanisms provides the foundation for emotional balance and the acquisition of effective models of self-regulation.

The cognitive component of the improvement of the emotional-regulatory sphere is associated with the formation of such mental processes as attention, memory, speech, thinking, and the capacity for social cognition. In the course of growing up, a child gradually acquires the ability to more accurately recognise the emotional nuances of situations, to establish connections between emotions and their causes, to analyse their own experience, and to form generalised emotional-behavioural models. The development of memory makes it possible to draw on prior experience in choosing more constructive modes of response, while the improvement of attention facilitates the identification of emotionally significant cues in the process of social interaction. Thus, the formation of emotional intelligence in childhood is the result of a complex interaction between the biological maturation of the brain, the development of cognitive functions, and the accumulation of social experience.

The ontogenetic dynamics of emotional intelligence are particularly pronounced in adolescence, when, alongside the continuing maturation of the brain's regulatory systems, qualitative changes occur in the sphere of self-awareness, reflection, and interpersonal perception. Unlike younger children, adolescents display their experiences with greater restraint, often concealing some of their emotions even in trusting relationships with adults or peers, which makes it more difficult for others to understand them. The emotional sphere during this period is characterised by high dynamism and instability: the active restructuring of emotional processes makes it more difficult for adolescents to become aware of the causes of their own experiences, to interpret them adequately, and to regulate them effectively. A characteristic feature of adolescence is also ambivalence – the simultaneous coexistence of contradictory yet equally genuine feelings toward one and the same person or situation (for example, attachment and irritation, or sympathy and rejection), which is a natural feature of emotional development at this stage.

The formation of emotional competence does not occur spontaneously but requires purposeful and systematic work. The effective development of the capacity to recognise, become aware of, and control one's own

emotions, and to interact constructively with other people, is possible only with the active support of the family, teachers, psychologists, and the child themselves. Thus, the formation of emotional intelligence is the result of the coordinated action of neurophysiological processes, cognitive development, and social experience, which together ensure the formation of the capacity for awareness, control, and transformation of one's own emotions and for effective interaction with others.

3. Foundations for the Development of Emotional Intelligence in the Educational Space

One of the strategic tasks of contemporary education is the formation of an individual's social competence in line with European educational benchmarks; according to N. Stepanova, this formation should begin at the early stages of ontogenesis within a person-centred educational environment that takes into account the child's individual needs, interests, and abilities [12]. In this context, the formation of emotional intelligence acquires particular relevance as a factor in becoming aware of one's own emotional states, understanding the experiences of others, building productive social relationships, and communicating effectively.

I. Sukhopara emphasises that the effectiveness of the educational process is determined not only by the level of knowledge acquisition but also by the extent to which the individual has developed the capacity to be aware of and adequately express behavioural manifestations of their experiences, to exercise voluntary regulation of emotional reactions, and to take into account the affective states of other participants in interaction [13]. The author underscores the importance of a complex of psychological and pedagogical factors that determine the success of a child's adaptation, the effectiveness of communication, and the harmonious development of the personality within the New Ukrainian School (NUS).

Current trends in the development of Ukrainian education indicate the consolidation of a systemic approach to the formation of learners' emotional intelligence: in accordance with the conceptual foundations of the NUS [7], educational activity is oriented toward the development of a holistic personality through the formation of key competencies, among which social and emotional skills occupy an important place; this has led to the active integration into educational practice of programmes and technologies aimed

at developing self-knowledge, emotional self-regulation, empathy, and the psychological well-being of students.

One of the current avenues for implementing these tasks is the "Lessons of Happiness" course, launched within the framework of the All-Ukrainian mental health programme "Ty Yak?" ("How Are You?") [14]. Adapted on the basis of international well-being education approaches, the course is designed for primary and lower secondary school students and is aimed at developing the ability to become aware of one's own emotional experience, to build healthy relationships, to show compassion, and to apply constructive strategies for coping with emotional tension, grounded in an understanding of psychological well-being as a precondition for a child's successful learning and personal development.

Considerable potential for developing students' emotional intelligence is also offered by the Social, Emotional, and Ethical Learning (SEE Learning) programme, developed on the basis of contemporary research into the social, emotional, and moral-ethical development of the individual and implemented within the Ukrainian educational space as part of international and domestic initiatives [11]. A conceptual feature of the programme is its combination of developing emotional awareness, the capacity for attentional focus, compassion, and ethical analysis of life situations with the formation of constructive models of interaction with others, including with regard to the impact of the stress-inducing and psychotraumatic factors of contemporary social challenges.

A separate avenue is constituted by correctional-developmental and psychological programmes implemented by practical psychologists and social pedagogues directly within educational institutions and aimed at forming the basic structures of emotional intelligence: the ability to recognise and differentiate emotional states, to become aware of one's own experiences, to respond constructively in difficult situations, and to sustain favourable psychological conditions for interaction within the school environment. This avenue includes both nationwide psychosocial support programmes and original developments tailored to different age categories of schoolchildren.

An analysis of current educational programmes makes it possible to distinguish three main lines of work in developing students' EQ: the development of emotional awareness; the formation of mechanisms

for controlling responses to emotiogenic stimuli; and the improvement of social competence through the development of empathy, the capacity for effective communication and cooperation, and the constructive resolution of interpersonal conflicts. These approaches are implemented in school practice through a variety of organisational forms: integrating elements of social-emotional learning into the content of school subjects, conducting brief psychological exercises, training sessions, thematic courses, and extracurricular activities. At the same time, a decisive condition for the effectiveness of such initiatives is the professional preparedness of teaching staff, since it is the teacher who ensures a psychologically comfortable educational space and fosters the formation of emotionally competent behaviour in schoolchildren. Let us consider several programmes for developing emotional intelligence that have been designed and tested by Ukrainian psychologists and educators.

The programme for developing the emotional intelligence of primary school students proposed by Ye. Fedorenko is oriented toward integrating contemporary psychological and pedagogical approaches into the system of primary education and is grounded in the interrelation of two basic aspects of EQ: the ability to become aware of and interpret one's own and others' emotional states, and the ability to constructively regulate emotional responses [15]. The content of the programme, implemented through a variety of methods and forms of work adapted to the age-related characteristics of primary school students, is oriented toward helping children come to know their own emotional experience, developing the ability to analyse social situations, and forming constructive ways of interacting with the environment, which contributes to raising students' emotional competence and to their successful social adaptation.

In the research of T. Mukhina and M. Kononenko, the concept of "Lessons of Happiness" is presented as a tool for developing the emotional intelligence of primary school students, grounded in the tenets of humanistic pedagogy, positive education, social-emotional learning, and the value orientations of the NUS aimed at developing the child's holistic personality [9]. The content of the lessons encompasses thematic blocks devoted to becoming aware of emotional states, developing compassion, forming a constructive attitude toward oneself and others, and developing interaction skills; these are implemented through interactive exercises, elements of

art therapy and fairy-tale therapy, mindfulness techniques, and role-play modelling, which contribute to broadening children's emotional experience and to their adaptation to the social environment.

Researchers at Vasyl Stefanyk Precarpathian National University – O. Khrushch, O. V. Fedyk, and O. I. Fedyk – have developed a training programme for developing the emotional intelligence of young people, based on K. Drigas's hierarchical model. Built on the principle of the gradual increase in task complexity, the programme provides for the sequential formation of intrapersonal and interpersonal aspects of emotional competence and is structurally organised into nine thematic modules aimed at deepening knowledge about the nature of emotions, becoming aware of inner experiences, and mastering the ability to interact constructively with others [16]. A distinctive feature of the programme is its combination of theoretical comprehension of emotional processes with practical activity, which ensures the transfer of the knowledge acquired to real situations of interpersonal interaction, the development of sensitivity to other people's emotional manifestations, and the improvement of communicative behaviour.

The original correctional-developmental programme "The Amazing World of Emotions," by A. Kubai and L. Hornich, is aimed at developing the emotional intelligence of primary-school-age children on the basis of competency-based and person-centred approaches, according to which the child is regarded as an active subject of their own development [8]. The programme is oriented toward developing students' ability to understand their own emotional experience, to become aware of other people's feelings, to establish positive social contacts, and to adapt to the conditions of school life. An important feature of the programme is its comprehensive character, which provides for the coordinated interaction of all participants in the educational process – children, practical psychologists, teachers, and parents – and is implemented through play-based methods, creative tasks, and elements of art therapy and situational modelling, which contribute to broadening the child's emotional vocabulary, developing self-understanding, and improving their adaptation to the educational environment.

The analysis of the programmes presented shows that current practice in developing emotional intelligence within Ukraine's educational environment

is characterised by a diversity of methodological approaches and forms of implementation. The formation of emotional intelligence is gradually acquiring the status of one of the priority directions of contemporary education, since the extent to which it is developed is linked to social competence, psychological well-being, and an individual's successful adaptation to today's complex conditions.

4. Psychological and Pedagogical Technologies for the Development of Emotional Intelligence

A generalisation of the results of the theoretical analysis provides grounds for asserting that the effective development of schoolchildren's emotional intelligence is possible only under the condition of creating a holistic psychological-pedagogical technology that combines scientific grounding, a clear age-based structure, and practical tools suitable for systematic application within a general secondary education institution. The analysis of programmes for improving the emotional sphere of school-age children conducted above has revealed both their undeniable advantages and a number of limitations, associated primarily with the fragmentary nature of their implementation, the absence of age-related continuity between levels of education, and insufficient consideration of the psychobiological principles of emotional regulation. This underscores the need to develop an original technology that integrates the achievements of psychology, neuropsychology, and pedagogy into a single practice-oriented system suitable for application in the conditions of the contemporary Ukrainian school.

An important factor in constructing such a technology is taking into account the role of the speech sphere and cognitive processes in the formation of emotional intelligence: mastery of inner speech enables a child to progress gradually from the immediate experience of emotions to their conscious awareness, differentiation, and verbalisation, while the development of thinking expands the possibilities for understanding the social context, the causes and consequences of events, and the emotional reactions of others – which is the groundwork for empathy. This is precisely why the content of the "EmoCompass" psychological-pedagogical technology is consistently built around the development of the child's emotional vocabulary and analytical skills.

The conceptual grounding for developing such a technology is provided by the generalised psychological-pedagogical conditions substantiated in the scholarly work of Ukrainian researchers. In particular, N. Volik identifies the leading conditions for the formation of a child's emotional intelligence as teachers' awareness of the specific features of the child's emotional sphere, a high level of emotional intelligence among educational-institution staff themselves, the creation of an emotionally favourable developmental environment, and the enhancement of parents' psychological-pedagogical culture [3]. N. Zobenko emphasises the importance of a specially organised psychological-pedagogical environment that entails an atmosphere of emotional well-being, the emotional richness of the educational process, partnership-based interaction among its participants, and a well-developed culture of emotional communication [5]. O. Ihnatovych and Yu. Litvin regard the development of emotional intelligence as a process that requires the formation of an emotionally favourable atmosphere of trust, support, and safety, the purposeful development of emotional literacy, self-regulation skills, empathy, and communicative competence, and the mandatory integration of the relevant work into the educational process through special programmes, practical exercises, project-based activities, and training formats [6]. It is precisely these scholarly positions that determined the architecture of the technology presented here.

On the basis of a generalisation of the theoretical approaches examined, the author's original psychological-pedagogical technology for developing schoolchildren's emotional intelligence, "EmoCompass," has been developed. The name of the technology symbolises its functional purpose: like a compass that helps a person orient themselves in space, the developed complex is intended to help a child find their bearings in their own inner world and in the world of other people's feelings, gradually forming stable skills of consciously lived emotional life. The aim of the technology is the purposeful and consistent development of the four basic components of schoolchildren's emotional intelligence in accordance with the ability model of J. Mayer and P. Salovey: the ability to accurately perceive and identify emotions; the capacity to use emotional information to support thinking and problem-solving; the ability to understand the causes of emotions and the patterns of their unfolding; and the skills to consciously regulate one's own emotions and to respond constructively to the emotions of others.

Achieving this aim entails addressing the following tasks: forming in learners an emotional vocabulary sufficient for accurately naming their own experiences and those of others; developing the ability to establish cause-and-effect relationships among events, thoughts, and emotional reactions; mastering techniques for the voluntary regulation of emotional states, including at the psychophysiological level; forming skills of empathic listening and constructive behaviour in situations of interpersonal tension and conflict; and enhancing children's psychological resilience to the stress-inducing factors of the present day. The "EmoCompass" technology is grounded in the principles of scientific validity, systematicity, age-appropriateness of content and forms of work, the gradual increase in complexity of material following a spiral principle, the unity of the cognitive and emotional components of learning, and the principle of the psychological safety of the educational environment, which entails the voluntary participation of children in exercises that touch on personal emotional experience and the prevention of forced public disclosure of traumatic experiences. The technology is aligned with the key competencies of the NUS and can be integrated into the content of the subjects "I Explore the World" and "Health Basics," into social-emotional and ethical learning courses, and into extracurricular activities and the work of an educational institution's psychological service.

Age-based modules of the "EmoCompass" technology. The technology has a three-tier age-based structure that ensures continuity and the gradual increase in complexity of the content of work in accordance with the age-related characteristics of a child's mental development. Module I, "First Steps," is designed for primary school students (grades 1–4) and focuses on forming a basic emotional vocabulary, the ability to recognise the main emotions from facial expressions, intonation, and bodily manifestations, and elementary techniques for self-soothing through play activity and sensory exercises. The primary form of work at this stage is play, storytelling, and drawing, since these correspond to the leading activity of the younger schoolchild and make it possible to master complex emotional material in an accessible, safe form.

Module II, "Emotional Literacy," is oriented toward lower secondary school students (grades 5–9) and provides for a deeper focus on the causes of emotions, the development of empathy and perspective-taking, and

the mastery of techniques for constructive conflict resolution and skills of assertive behaviour. This choice of content emphasis is determined by the fact that adolescence is characterised by heightened emotional lability, an intensified need for peer recognition, and the active formation of self-awareness, and therefore requires an expanded repertoire of techniques for conscious self-regulation. Module III, "Conscious Choice," is designed for upper secondary school students (grades 10–11) and is aimed at developing the ability to use emotional intelligence in decision-making situations, in particular those related to professional self-determination, interpersonal relationships, and leadership behaviour, as well as at mastering techniques for providing emotional support to peers by preparing senior students for the role of school mediators and emotional-literacy tutors for younger schoolchildren.

The set of exercises of the "EmoCompass" technology. Within each age-based module, the content of the technology is organised into four functional blocks of exercises corresponding to the four branches of J. Mayer and P. Salovey's model of emotional intelligence, which ensures the theoretical soundness and internal coherence of the complex developed.

Block 1, "I Recognise," is aimed at developing the ability to accurately identify emotional states. The "Emotional Alphabet" exercise involves systematically introducing children to an expanded vocabulary of emotions: at each session, students master a new word denoting a feeling, select a corresponding facial expression for it, recall a situation from their own experience, and choose a colour associated with that feeling, which gradually forms a differentiated emotional vocabulary in place of the limited set of words "good" and "bad." The "Mirror of Feelings" exercise is performed in pairs: one student demonstrates a given emotion through facial expression and posture, while the other names it and describes the bodily cues that led to their guess, after which the participants switch roles. The exercise develops both the expressiveness of emotional self-expression and the accuracy of recognising emotions from non-verbal cues. The "Emotional Barometer" exercise is used at the beginning and end of a session: students mark their current emotional state on a scale from one to ten or on a colour scale, which builds the habit of regular self-observation and gives the teacher prompt diagnostic information about the group's emotional well-being.

Block 2, "I Understand," forms the ability to establish cause-and-effect relationships between events and emotional reactions. The "Emotional Detective" exercise invites students to analyse a short story or a life situation and to determine what emotion the character is experiencing, what specifically caused it, and what thoughts might have accompanied that experience. The exercise is performed in groups with subsequent discussion, which makes it possible to see the multiplicity of possible interpretations of one and the same situation. The "Story with Two Endings" exercise involves examining a conflict situation from the perspective of each of its two participants in turn, which develops the capacity for decentration and an understanding that a single event can evoke different, sometimes opposite, emotional reactions in different people. The "Map of Causes and Consequences" exercise uses a graphic diagram in which the student sequentially records an event, their first thought about it, the emotion, the bodily reaction, and the subsequent behaviour, which visualises the connection between the cognitive appraisal of a situation and the emotional response and gradually forms the skill of consciously analysing one's own reactions instead of reacting impulsively.

Block 3, "I Use," develops the ability to apply emotional information to support thinking, creativity, and problem-solving. The "Emotional Brainstorm" exercise invites students to generate options for solving an academic or life problem by successively "trying on" different emotional states – for example, asking themselves what solution curiosity would suggest and what solution caution would suggest – which demonstrates to children the practical value of emotions as a source of additional information rather than an obstacle to rational thinking. The "Mood Colour for the Task" exercise invites students, before undertaking a demanding task, to identify their current emotional state and consciously choose a working strategy that suits it – for example, a brief pause to calm down in the case of a high level of anxiety, or, conversely, drawing on an energetic, upbeat state for brainstorming – which forms the skill of flexibly managing one's own resources.

Block 4, "I Regulate," constitutes the psychophysiological foundation of the technology and draws on the neuropsychological mechanisms underlying the formation of emotional intelligence. This block includes a set of breathing exercises that normalise the body's physiological rhythms, improve the energy supply to brain activity, and help reduce psycho-

emotional tension. Thus, the "Volcano and Ocean" exercise combines a deep inhalation through the nose and a slow, extended exhalation through the mouth with an imaginative representation of the transition from the turbulent state of a "volcano" to the calm state of an "ocean." The block also includes exercises for developing oculomotor function, which strengthen the eye muscles, improve cerebral blood circulation, and reduce the level of mental overload; articulation exercises, which activate the brain's speech structures and are often combined with movements of the hands and fingers for additional stimulation of interfunctional connections; and exercises for developing interhemispheric interaction, which involve performing cross-lateral movements, in particular the simultaneous change of hand positions or the simultaneous drawing of different shapes with each hand, which activates the coordinated activity of both cerebral hemispheres and improves coordination, attention, and voluntary behavioural regulation. In addition, the block contains techniques for situational self-regulation, intended for use directly at the moment of emotional tension: the "Anger Thermometer" exercise, which helps a student determine the intensity of an emotion on a scale and choose an appropriate mode of response before the tension reaches a critical point; the "Freeze Frame" exercise, which trains the child to take a brief pause between impulse and action; and the "Calm Kit" exercise – an individual set of soothing objects and techniques (a favourite object, a breathing technique, a short anchoring phrase) that the student prepares in advance together with a teacher or psychologist for use in situations of acute stress.

Diagnostics, stages of implementation, and organisational-methodological conditions. The effectiveness of the "EmoCompass" technology is assessed according to three criteria corresponding to the structural components of emotional intelligence: a cognitive criterion, reflecting the completeness of the emotional vocabulary and the accuracy of emotion recognition; an emotional-value criterion, characterising the level of empathy and the child's attitude toward their own and others' experiences; and a behavioural criterion, attesting to the student's ability to apply the self-regulation techniques acquired in real situations of interpersonal interaction. For younger schoolchildren, it is advisable to use predominantly projective drawing techniques and structured pedagogical observation, whereas for lower and upper secondary school students, adapted emotional intelligence

questionnaires may be used in combination with expert assessment by teachers and practical psychologists.

The implementation of the technology within an educational institution involves three successive stages. The diagnostic stage consists in determining the baseline level of formation of students' emotional intelligence, familiarising the teaching staff with the content of the technology, and conducting short-term training for teachers in the techniques of its implementation. The formative stage encompasses the systematic implementation of sessions over the course of the academic year, in particular within homeroom periods, social-emotionally oriented courses, or individual lessons agreed upon with the institution's psychological service, with a gradual transition from module to module in accordance with the age-based structure of the technology. The control-and-generalisation stage involves repeat diagnostics, a comparative analysis of the results obtained, and the adjustment of the content of further work on the basis of the data collected.

The successful implementation of the "EmoCompass" technology on the scale of a general secondary education institution is possible only under the condition of creating a comprehensive system of scientific-methodological and organisational support for it. Above all, it is necessary to ensure adequate staffing capacity, which entails forming in teachers, practical psychologists, and school administrators the professional competencies needed to organise purposeful work on developing schoolchildren's emotional sphere. Equally important is scientific-methodological support, which includes the development of a methodological guide, the use of valid psychodiagnostic tools, and systems for monitoring the effectiveness of educational programmes. Particular attention needs to be paid to developing the corresponding infrastructure of the educational environment – a psychologically safe and emotionally favourable space – as well as to improving the organisational-managerial mechanisms of interaction among teachers, practical psychologists, and students' parents. Only a comprehensive approach that combines human-resource, methodological, organisational, and psychological resources can ensure the sustainable and systematic implementation of the "EmoCompass" technology and the achievement of its ultimate goal – the harmonious development of an emotionally competent, psychologically resilient personality in the schoolchild

CONCLUSIONS

The study conducted made it possible to carry out a holistic psychological-pedagogical analysis of the problem of developing schoolchildren's emotional intelligence and, on this basis, to develop a practice-oriented technology for its formation within the conditions of a general secondary education institution. The theoretical analysis demonstrated that emotional intelligence is a complex integrative personal formation that combines cognitive, emotional, and socio-behavioural components and rests on certain psychophysiological prerequisites, in particular the coordinated functioning of the brain structures responsible for perceiving, evaluating, and regulating emotional states. The generalisation of the scientific approaches of J. Mayer and P. Salovey, D. Goleman, R. Bar-On, H. Gardner, and Ukrainian researchers made it possible to substantiate an understanding of emotional intelligence as a capacity amenable to purposeful development throughout the entire period of schooling.

The examination of the psychobiological principles underlying the formation of emotional intelligence in ontogenesis confirmed the close connection between a child's emotional sphere and the development of speech, voluntary behavioural regulation, and interhemispheric interaction, which substantiates the advisability of incorporating neuropsychological corrective exercises into educational technologies aimed at developing students' emotional competence. The analysis of the pedagogical conditions and existing programmes for developing emotional intelligence within the educational space showed that the effectiveness of such work is ensured by the creation of an emotionally favourable environment, partnership-based interaction among participants in the educational process, a high level of emotional competence among teachers themselves, and the systematic – rather than episodic – organisation of the relevant activity.

The practical outcome of the study is the author's original psychological-pedagogical technology for developing schoolchildren's emotional intelligence, "EmoCompass," which integrates the theoretical achievements of the psychology of emotional intelligence, neuropsychological data, and contemporary pedagogical approaches into a single system comprising three age-based modules, four functional blocks of exercises, and an algorithm for stage-by-stage implementation in the educational process. Unlike the fragmentary practices found in the current educational space, the proposed

technology ensures age-related continuity of work from primary through senior secondary school, combines the cognitive, emotional-value, and behavioural components of development, and takes into account the need for enhanced psychological support for children under the conditions of the prolonged stress-inducing impact of wartime. The sample practical lesson and diagnostic tools developed give the technology a finished form suitable for direct use by teachers and practical psychologists.

The study carried out confirms the initial premise that the purposeful and systematic development of emotional intelligence has a positive bearing on academic performance, social adaptation, psychological resilience, and constructive behaviour among schoolchildren in situations of interpersonal interaction. At the same time, the phenomenon of emotional intelligence remains an open direction for scholarly inquiry. Prospects for further research are associated with the experimental verification of the effectiveness of the "EmoCompass" technology on a representative sample of students from different age groups; the study of the long-term effects of its application; the development of analogous technologies for the systems of preschool and vocational (technical-vocational) education; and a deeper investigation of the relationship between emotional intelligence and academic achievement, psychological well-being, and an individual's social competence under the conditions of the challenges currently facing Ukrainian society.

References:

1. Ampliieva, O. M. (2018). Teoretychna model emotsiinoho intelektu yak vazhlyvoho komponentu profesiinoi diialnosti psykholoha [Theoretical model of emotional intelligence as an important component of psychologist's professional activity]. *Visnyk Lvivskoho universytetu. Seriia: Psykholohichni nauky*, (3), 3–9. (in Ukrainian).

2. Vovchenko, O. A. (2021). Fenomenolohiia emotsiinoho intelektu pidlitkiv z porushenniamy intelektualnoho rozvytku [Phenomenology of emotional intelligence of adolescents with intellectual development disorders] (Doctoral dissertation, Special Psychology, 19.00.08). Kyiv, 487 p. (in Ukrainian).

3. Volik, N. M. (2022). Pedahohichni umovy rozvytku emotsiinoho intelektu dytyny doshkilnoho viku v zakladi doshkilnoi osvity [Pedagogical conditions for the development of emotional intelligence of preschool children in preschool educational institutions]. *Naukovyi visnyk Melitopolskoho derzhavnoho pedahohichnoho universytetu. Seriia: Pedahohika*, 2(29), 162–169. (in Ukrainian).

4. Goleman, D. (2020). Emotsiinyi intelekt [Emotional Intelligence] (S. L. Humetska, Trans.). Kharkiv: Vivat. 512 p. (Original work published in English). (in Ukrainian).

5. Zobenko, N. A. (2023). Psykholoho-pedahohichni umovy rozvytku emotsiinoho intelektu uchniv v osvitnomu protsesi suchasnoi pochatkovoi shkoly [Psychological and pedagogical conditions for the development of students' emotional intelligence in the educational process of modern primary school]. *Imidzh suchasnoho pedahoha*, 2(209), 99–107. (in Ukrainian).

6. Ihnatovych, O. M., & Litvin, Yu. O. (2024). Psykholoho-pedahohichni umovy rozvytku emotsiinoho intelektu suchasnoi molodi [Psychological and pedagogical conditions for the development of emotional intelligence of modern youth]. *Habitus. Seriia: Vikova ta pedahohichna psykholohiia*, (66), 64–70. (in Ukrainian).

7. Ministry of Education and Science of Ukraine. (2016). Kontseptsiia "Nova ukrainska shkola" [Concept of the "New Ukrainian School"]. Available at: http://mon.gov.ua/activity/education/zagalna-serednya/ua-sch-2016/konczepcziya.html (accessed July 26, 2026). (in Ukrainian).

8. Kubai, A. O., & Hornich, L. I. (2020). Emotsii dyvovyzhnyi svit: Korektsiino-rozvytkova prohrama [Amazing world of emotions: Correctional and developmental program]. Lutsk: Lutsk Secondary School No. 23. 69 p. Available at: https://goo.su/jYc8Rg (accessed July 15, 2026). (in Ukrainian).

9. Mukhina, T. Ye., & Kononenko, M. O. (2026). Uroky shchastia yak efektyvnyi instrument rozvytku emotsiinoho intelektu zdobuvachiv pochatkovoi osvity [Lessons of happiness as an effective tool for developing emotional intelligence of primary education students]. *Suspilstvo ta natsionalni interesy*, 2(22), 606–618. (in Ukrainian).

10. Nosenko, E. L. (2012). Emotsiinyi intelekt yak forma proiavu vazhlyvoi skladovoi osobystisnoho potentsialu – refleksyvnoi svidomosti [Emotional intelligence as a form of manifestation of an important component of personal potential – reflective consciousness]. *Visnyk Dnipropetrovskoho natsionalnoho universytetu. Seriia: Pedahohika i psykholohiia*, 18(20), 9/1, 116–123. (in Ukrainian).

11. Elkin, O. (Ed.). (2021). Sotsialno-emotsiine ta etychne navchannia: Navchalna prohrama dlia serednoi shkoly [Social, emotional and ethical learning: Curriculum for secondary school]. Kharkiv: Dim reklamy. 416 p. (in Ukrainian).

12. Stepanova, N. M. (2025). Rozvytok emotsiinoho intelektu zdobuvachiv osvity molodshoho shkilnoho viku yak skladovoi sotsialnoi kompetentnosti [Development of emotional intelligence of primary school students as a component of social competence]. *Aktualni pytannia u suchasnii nautsi*, 7(37), 1142–1153. (in Ukrainian).

13. Sukhopara, I. H. (2019). Chynnyky rozvytku emotsiinoho intelektu molodshykh shkoliariv u konteksti Novoi ukrainskoi shkoly [Factors of emotional intelligence development of primary school students in the context of the New Ukrainian School]. *Naukovyi visnyk Mykolaivskoho natsionalnoho universytetu*

imeni V. O. Sukhomlynskoho. Seriia: Pedahohichni nauky, 65(2), 296–301. (in Ukrainian).

14. Ty yak? : Vseukrainska prohrama mentalnoho zdorovia [How are you? All-Ukrainian Mental Health Program]. (2026). Official website. Available at: https://howareu.com (accessed June 8, 2026). (in Ukrainian).

15. Fedorenko, Ye. (2023). Prohrama rozvytku emotsiinoho intelektu molodshykh shkoliariv v osvitnomu protsesi pochatkovoi shkoly [Program for the development of emotional intelligence of primary school students in the educational process of primary school]. In O. A. Mkrtichian (Ed.), Innovatsii v pochatkovii osviti: dosvid, vyklyky sohodennia, perspektyvy [Innovations in primary education: Experience, current challenges, prospects] (pp. 62–66). Kharkiv: H. S. Skovoroda KhNPU. (in Ukrainian).

16. Khrushch, O. V., Fedyk, O. V., & Fedyk, O. I. (2026). Zmist treninhovoi prohramy rozvytku emotsiinoho intelektu v osib yunatskoho viku [Content of the training program for the development of emotional intelligence in youth]. *Vcheni zapysky Tavriiskoho natsionalnoho universytetu imeni V. I. Vernadskoho. Seriia : Psykholohiia*, 37(76), 3, 152–158. (in Ukrainian).

17. Gardner, H. (1983). Frames of Mind: The Theory of Multiple Intelligences. New York: Basic Books. 449 p.

18. Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, 9, 185–211.