UDC 37.015.3:004.8:364-78
DOI https://doi.org/10.31392/UDU-nc.series5.2026.112.12

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ARTIFICIAL INTELLIGENCE TECHNOLOGIES TO SUPPORT STUDENT YOUTH UNDER STRESSFUL CONDITIONS

This article presents the findings of a study exploring the applications of artificial intelligence (AI) technologies in supporting student youth under stressful conditions within the framework of social work.

Under the conditions of full-scale war, which exerts severe psychological stress on children and young people, providing support to student youth is a priority task for professionals in the educational and social sectors. This paper highlights the potential of AI technologies as a tool for overcoming the effects of traumatic experiences, mitigating psycho-emotional stress, and preventing crisis states among students. This paper analyzes key international and national regulatory frameworks shaping the ethical boundaries of AI deployment.

The study outlines key directions for integrating generative AI (including Large Language Models, LLMs), natural language processing (NLP), predictive analytics, recommendation algorithms, and Big Data analytics. These technologies aim to facilitate timely risk detection, combat cyberbullying, optimize interagency collaboration, and personalize the educational process.

The paper emphasizes that a critical prerequisite for the effective and safe implementation of digital technologies in social and educational domains is adherence to the human-in-the-loop (HITL) principle.

Under this framework, AI serves strictly as a decision-support system, while final data validation and the intervention strategy remain the sole responsibility of human specialists.

In conclusion, AI technologies are increasingly applied to address vital challenges in the social sphere and hold substantial promise. Nevertheless, the ultimate effectiveness of psychosocial and psycho-pedagogical support for youth fundamentally depends on qualified specialists, the creation of a safe supportive environment, and the mitigation of adverse factors.

Key words: *social work, artificial intelligence, generative AI, student youth, stressful conditions, support, resilience, predictive analytics, coping strategies, human-in-the-loop principle.*

(статтю подано мовою оригіналу)

Amid full-scale war, which severely impacts children and young people, supporting student youth has become a critical priority for educational and social work professionals. Adolescence (primarily ages 14 to 18) is a complex developmental stage marked by physical growth, identity exploration, and worldview formation, which can heighten vulnerability to adaptation difficulties and adversely affect psycho-emotional well-being. Wartime stressors – including forced displacement, power blackouts, persistent danger, and time spent in shelters – further exacerbate these developmental crises. Consequently, anxiety disorders and depressive symptoms have surged among student youth, underscoring the urgent need for comprehensive psychosocial support.

Contemporary scholarly and methodological publications in social work reflect growing attention to the potential of artificial intelligence (AI) technologies, which are increasingly viewed by the academic community as an analytical and supportive resource for psychology and social work professionals [2; 7; 9].

Aim and Objectives. The purpose of this article is to present the findings of an analysis regarding the possibilities of applying artificial intelligence technologies to support student youth under stressful conditions within the context of social work.

Theoretical and Regulatory Groundwork. The foundation of this study is formed by international and Ukrainian regulatory and conceptual documents, including the European Union Artificial Intelligence Act (EU AI Act) [8], UNESCO's Guidance for generative AI in education and research [6], the White Paper on AI Regulation in Ukraine [1], as well as relevant methodological guidelines issued by the Ministry of Education and Science of Ukraine for general secondary and higher education institutions [3].

The study relies on the works of Ukrainian and foreign social work scholars addressing AI deployment in the social sphere, various aspects of social support, and problem prevention (T. Semygina & O. Karagodina [2], J. Schoeman & A. Van Breda [9], M. Dalziel, K. Schaffer & N. Martin [4], and others).

The primary research methods employed include analysis and synthesis of Ukrainian and international literature in social work, particularly regarding artificial intelligence applications; conceptual and regulatory document analysis; as well as the generalization and systematization of existing practice in deploying AI to support student youth.

The rapid implementation of AI systems in social and educational spaces requires clear legal and ethical regulation to minimize risks of algorithmic bias and privacy violations. Currently, a comprehensive international and national regulatory framework is actively being established. The foundational document is the EU Artificial

Intelligence Act (EU AI Act), which classifies AI systems used in educational and social contexts as high-risk, establishing strict criteria for their deployment [8]. Key benchmarks include UNESCO's Guidance for generative AI in education and research [6] and European directives such as Ethical guidelines on the use of artificial intelligence and data in teaching and learning for educators [5]. As the first global guidance dedicated to GenAI in education, UNESCO's framework [6] assists countries in taking immediate action, formulating long-term policies, and building human capacity to uphold a human-centered vision for emerging technologies. Specifically, this Guidance:

– looks into what GenAI is and how it works, presenting the diverse technologies and models available
– identifIes a range of controversial ethical and policy issues around both AI in general, and GenAI specifically
– discusses the steps and key elements to be examined when seeking to regulate GenAI based on a human-centred approach – one that ensures ethical, safe, equitable and meaningful use
– proposes measures that can be taken to develop coherent, comprehensive policy frameworks to regulate the use of GenAI in education and research
– looks into the possibilities for creatively using GenAI in curriculum design, teaching, learning and research activities
– explores long-term implications of GenAI for education and research [6].

Within the Ukrainian legal framework, the trajectory of technology development is guided by the White Paper on AI Regulation in Ukraine [1] and relevant instructional-methodological guidelines issued by the Ministry of Education and Science of Ukraine for general secondary and higher education institutions [3]. Specifically, Ukrainian methodological guidelines emphasize ensuring human rights compliance and professional ethical standards, raising educators' awareness regarding potential risks and challenges, and fostering the capacity to interact critically, safely, and effectively with AI systems in educational practices [3].

A central concept uniting these policy documents is the human-in-the-loop (HITL) principle – ensuring continuous human oversight and reserving final decision-making authority exclusively for human specialists.

The practical application of AI technologies in youth support encompasses several interconnected domains, utilizing both generative and analytical models for psychological assistance, coping strategy development, and early warning systems.

Below are the primary domains of AI application in supporting student youth, which are either already partially implemented or represent promising directions for international and Ukrainian practice.

A practically proven and vital component of primary psychological assistance is the deployment of specialized chatbots powered by Large Language Models (LLMs). Adapted virtual assistants can operate 24/7, offering young people basic emotional support, self-regulation techniques, and routing users to human specialists during acute stress reactions when in-person psychological support is unavailable. An additional tool includes psychoeducation AI applications that utilize personalization principles to foster emotional intelligence and resilience skills in adolescents. Such platforms enable youth to practice coping strategies and enhance psychological literacy within a safe digital space.

Alongside communication systems, significant preventive potential is demonstrated by predictive analytics and Early Warning Systems (EWS). Utilizing Machine Learning (ML) algorithms, social work professionals can analyze students' "digital footprints" within Learning Management Systems (LMS, e.g., Moodle). Neural networks are capable of identifying subtle patterns, such as a sharp decline in academic performance, systematic absenteeism, or changes in activity to late-night hours. Flagging these markers allows the system to automatically categorize a student's profile into a risk group, enabling social educators or counselors to initiate proactive intervention before severe maladaptation or social isolation occurs.

Another critical aspect of creating a safe supportive environment for children and youth is digital monitoring to combat cyberbullying, which often assumes hidden and aggressive forms during wartime. Integrating Natural Language Processing (NLP) technologies into school forums or closed platforms enables automated Sentiment Analysis of text. Trained algorithms detect signs of cyberbullying, online grooming, or suicidal ideation markers with high validity, instantly generating alerts for moderators or psychological services. This facilitates the timely protection of victims without directly intruding into personal correspondence, thereby upholding privacy principles.

No less critical is the issue of cognitive overload among student youth. High academic demands coupled with chronic stress serve as direct drivers of burnout. Employing smart personalization driven by AI recommendation systems allows educational content to be dynamically adapted to a student's psychophysiological state. By analyzing micro-data from interactions with learning materials, the system can adjust task difficulty, offer alternative information delivery formats, and construct individualized learning pathways. This mitigates the fear of failure and restores adolescents' sense of self-efficacy and control over their lives.

Beyond direct interaction with students, a promising direction for AI application is optimizing information exchange and Big Data management at the institutional level of social and educational bodies. This enables specialists to comprehensively assess a student's social context, forecast risks of marginalization or worsening family hardship in a timely manner, and initiate effective interagency interventions.

An additional innovative area involves Affective Computing – technologies designed to recognize emotional states by analyzing biometric and behavioral indicators. Provided strict informed consent is obtained, AI can analyze acoustic voice features or keystroke dynamics (typing rhythms), where sudden shifts correlate with elevated levels of latent anxiety or stress.

Furthermore, the successful integration of these analytical and generative AI tools is contingent upon raising the digital competence and AI literacy of social work practitioners, school psychologists, and educators. AI literacy in social work extends beyond basic technical skills; it encompasses an understanding of algorithmic limitations, prompt engineering for supportive communication, and the capacity to critically evaluate AI-generated outputs. Practitioners must be trained to recognize "automation bias" – the tendency to blindly trust automated risk scores generated by predictive analytics – and maintain critical clinical judgment. Continuous professional development programs must incorporate modules on ethical AI interaction, data privacy management, and crisis escalation protocols when AI systems detect acute distress markers.

Based on the functional capacities of AI, a structured three-tiered framework for its integration into youth support systems can be conceptualized. The primary tier focuses on direct-to-youth informational and psychoeducational tools, including 24/7 conversational agents and adaptive self-help applications designed for emotional self-regulation and resilience building. The secondary tier encompasses diagnostic and early prevention tools operating within educational environments (LMS predictive analytics, NLP sentiment monitoring) to identify early signs of academic burnout, cyberbullying, or social withdrawal. The tertiary tier involves institutional and interagency coordination, leveraging Big Data management tools for multidisciplinary teams (social workers, psychologists, medical personnel, educational administrators) to consolidate risk profiles, optimize case management, and coordinate targeted interventions.

Implementing AI-driven support systems in Ukraine faces distinct contextual challenges. Infrastructure instability caused by wartime destruction, power blackouts, and intermittent internet connectivity presents significant technical hurdles to deploying cloud-based AI tools. Furthermore, institutional readiness varies significantly across regions, with many educational institutions lacking the technical resources or trained personnel required to manage complex digital analytical systems. Addressing these barriers requires developing lightweight, offline-capable digital tools, establishing clear institutional data governance policies, and conducting pilot implementation projects prior to large-scale national adoption.

At the same time, the deployment of deep AI analytics gives rise to a range of ethical challenges. Collecting behavioral data requires flawless compliance with data protection legislation (specifically GDPR principles). Furthermore, algorithmic bias poses a significant concern, where a neural network might erroneously stigmatize a student due to unrepresentative training datasets. Consequently, AI must be viewed strictly as a Decision Support System (DSS), where data validation and the formulation of the final intervention strategy remain the sole prerogative of a qualified professional.

Conclusions. Based on the results presented in this paper, key directions for applying AI technologies to support student youth can be outlined as follows:

Counseling and psychoeducation: specifically, utilizing specialized AI assistants (LLM-based chatbots) to provide primary emotional assistance, master self-regulation techniques, foster resilience, and acquire effective coping strategies within a safe digital environment;

Early risk prevention: analyzing students' 'digital footprints' in Learning Management Systems (LMS) using machine learning algorithms for the timely detection of maladaptation markers (declining academic performance, etc.) and proactive specialist engagement; applying Natural Language Processing (NLP) and Sentiment Analysis methods for the automated detection of cyberbullying, online grooming, and suicidal ideation threats while ensuring correspondence privacy; leveraging Affective Computing technologies (subject to informed consent) to identify latent anxiety and stress via indirect parameters (voice acoustics, keystroke dynamics);

Personalization of learning and inclusiveness: applying recommendation systems for dynamic correction of content difficulty, reducing cognitive overload, preventing academic burnout, and restoring students' sense of self-efficacy;

Information support: specifically, consolidating interagency data (educational institutions, psychological and medical services, social bodies) into unified protected profiles for the systematic assessment of a child's social context and the timely mitigation of complex life circumstances.

Limitations of the Study. It is necessary to indicate the limitations of this research. The author does not claim an exhaustive coverage of the issue. In particular, further dedicated research is required regarding the minimization of risks associated with digital technology deployment in the social sphere, compliance with ethical principles, and related matters.

In conclusion, under conditions of heightened stress and psycho-emotional challenges associated with war, the issue of supporting student youth requires special attention. Artificial intelligence technologies are increasingly applied today to address vital tasks in the social sphere and hold substantial promise given the urgency of the problem and the rapid evolution of AI capabilities. At the same time, the ultimate effectiveness of psychosocial and psycho-pedagogical support for student youth fundamentally depends on human specialists conducting such support, the creation of a safe supportive environment, and the mitigation of adverse factors.

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Литовченко О. В. Технології штучного інтелекту для підтримки учнівської молоді в умовах стресогенних впливів

Матеріали статті представляють результати дослідження можливостей застосування технологій штучного інтелекту для підтримки учнівської молоді в умовах стресогенних впливів у контексті соціальної роботи.

В умовах повномасштабної війни, що зумовлює значний стресогенний вплив на дітей та молодь, підтримка учнівської молоді є пріоритетним завданням для фахівців освітньої та соціальної сфер. У публікації розкрито потенціал технологій штучного інтелекту (ШІ) як інструменту подолання наслідків травматичного досвіду, зниження рівня психоемоційного навантаження та превенції кризових станів серед учнівської молоді. Проаналізовано ключові міжнародні та національні нормативно-правові документи, що формують етичні рамки застосування ШІ.

Окреслено вектори інтеграції систем генеративного ШІ (зокрема великих мовних моделей, LLM), обробки природної мови, предиктивної аналітики, рекомендаційних алгоритмів та алгоритмів аналізу великих даних (Big Data) для надання первинної емоційної допомоги та психоедукації, своєчасного виявлення ризиків, протидії кібербулінгу, оптимізації міжвідомчої взаємодії та персоналізації освітнього процесу.

Акцентовано, що ключовою умовою ефективної та безпечної імплементації цифрових технологій в освітній та соціальній сфері є дотримання принципу антропоцентричності (human-in-the-loop), за якого технології ШІ виступають виключно інструментом підтримки прийняття рішень, а остаточна валідація даних та визначення стратегії підтримки залишаються функцією фахівця.

Узагальнено, що технології штучного інтелекту сьогодні застосовуються для вирішення важливих завдань у соціальній сфері і мають значні перспективи. Водночас, ефективність психосоціальної підтримки та психолого-педагогічного супроводу учнівської молоді головним чином залежить від фахівців, які здійснюють такий супровід, створення безпечного підтримуючого середовища, обмеження негативних впливів тощо.

Ключові слова: *соціальна робота, штучний інтелект, генеративний ШІ, учнівська молодь, стресогенні впливи, підтримка, резильєнтність, предиктивна аналітика, копінг-стратегії, принцип антропоцентричності (human-in-the-loop).*

Дата першого надходження статті до видання: 01.09.2026
Дата прийняття статті до друку після рецензування: 30.09.2026
Дата публікації (оприлюднення) статті: 27.10.2026

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