

**Sharov S.V.**

*Candidate of Pedagogical Sciences, Associate Professor,  
Head of the Department of Computer Science*

**Zemlianska A.V.**

*Candidate of Philological Sciences, Associate Professor,  
Associate Professor of the Department of Social Sciences and Humanities  
Dmytro Motorny Tavriya State Agrotechnological University*

## **CREATING A SECURE AND SAFE ADAPTIVE DIGITAL LEARNING ENVIRONMENT UNDER DISPLACEMENT CONDITIONS**

**Abstract.** *The article examines the conceptual foundations and practical tools for developing a digital educational environment that adapts to the needs of learners under forced displacement conditions. The concept of a secure and safe digital space is explored, encompassing both cybersecurity and psychological comfort. Key characteristics of learning adaptivity are identified, particularly the technical flexibility of platforms and asynchronous interaction models. Emphasis is placed on the importance of maintaining social ties and fostering a sense of stability through digital educational tools. The role of the teacher as an architect of a safe virtual environment is substantiated.*

**Key words:** *adaptive learning, digital space, educational safety, flexible education, digital transformation.*

**Шаров С.В., Землянська А.В. Створення безпечного та адаптивного цифрового простору для навчання в умовах переміщення.** У статті досліджено концептуальні засади та практичні інструменти розбудови цифрового освітнього середовища, що здатне адаптуватися до потреб здобувачів, які перебувають у стані вимушеного переміщення. Розкрито зміст поняття безпечного цифрового простору, що охоплює як кібербезпеку, так і психологічний комфорт. Визначено ключові характеристики адаптивного навчання, зокрема технічна гнучкість платформ, асинхронні моделі взаємодії та ін. Акцентовано увагу на важливості збереження соціальних зв'язків та формування відчуття стабільності через цифрові освітні інструменти. Обґрунтовано роль викладача як архітектора безпечного віртуального середовища.

**Ключові слова:** *адаптивне навчання, цифровий простір, освітня безпека, гнучка освіта, цифрова трансформація.*

**The relevance of the study.** In the current climate of major challenges, the movement of teachers and students, both within the country and abroad, necessitates

a shift away from rigid educational structures towards flexible, adaptive models. Digitalisation is becoming not merely a technical aid, but the sole stable space where learners can continue their studies regardless of their physical location. However, creating such a space requires new approaches to security, safety and adaptability that take into account limited technical resources, unstable connectivity and the traumatic experiences of learners.

**Analysis of recent research and publications.** The issue of organising the educational process in the context of crisis and digitalisation is the focus of many researchers. The theoretical and methodological foundations for implementing information and communication technologies and interactive teaching methods have been thoroughly explored in the works of T. Sharova, A. Zemlianska, and L. Kopeitsova [7]. The authors have demonstrated the effectiveness of e-learning as a format for modern education [8] and substantiated the role of information systems in shaping learners' individual educational trajectories [9], which is a fundamental prerequisite for ensuring learning flexibility.

In light of recent crises, academic research has increasingly focused on providing psychological and pedagogical support to participants in the educational process. O. Tashkinova, L. Ponomarova, and O. Rohovska analyse the challenges and prospects of implementing trauma-informed teaching in Ukrainian higher education institutions [5]. At the same time, it is essential to examine international experience in teacher training for working with learners affected by trauma, as emphasised by T. Holovatenko [1].

A separate group of studies focuses on psychological support and personal resilience. The works of N. Didyk [3] reveal the specific features of psychological support for learners under martial law, whilst the handbook by the same author proposes specific methodologies for working with learners who have suffered psychological trauma [2]. Of particular relevance is the study by N. Didyk and S. Zeninets [4], which regards stress resilience as an essential component of the professional competence of future teachers in an era of global transformation.

Despite a significant body of academic research, the issue of creating a safe digital environment that combines technical adaptability with psychological support in the context of learners' constant displacement requires further investigation.

**The purpose of this article** is to substantiate strategies for designing a safe and adaptive digital environment that responds to the educational needs of learners in situations of displacement and supports their successful adaptation to new living conditions.

**Presentation of the main material.** A safe digital space for learning in crisis conditions is based on the principle of 'technological minimalism and methodological maximisation'. This approach means that educational platforms

must be adapted to work on mobile devices with low internet bandwidth, whilst ensuring a high level of learner engagement through interactive content.

The first component of an educational environment adaptability is its technical flexibility, which determines the system ability to function under conditions of critical resource instability. Learners who are on the move often lose access to desktop computers or laptops. This situation makes mobile learning not merely an option but an unavoidable strategy. With this in mind, this approach requires teachers and content developers to adapt educational materials for small smartphone screens, use mobile learning management system applications (such as Moodle Mobile or Google Classroom), and optimise files for fast loading over poor internet connections.

In a technical context, adaptability is also inextricably linked to the prioritisation of asynchronous interaction methods. In today's environment, where access to the internet and electricity supply is sporadic, a rigid reliance on synchronous video conferences via Zoom or Teams can sometimes become a barrier. Instead, flexible timetables allow students to work through the material at their own pace, when safety conditions permit.

Contemporary researchers O. Tashkinova, L. Ponomarova and O. Rohovska emphasise that today, particular attention is being paid to the problem of introducing trauma-sensitive teaching in the context of temporarily displaced higher education institutions. The researchers present an analysis of the traumatic experiences of students and the development of stress resilience whilst studying in conditions of constant change and stressful situations [5, p. 61]. The technical implementation of this flexibility involves using 'cloud' services to save learning progress, enabling students to start a task on one device and complete it on another without losing data. Furthermore, content autonomy becomes a key element – the ability to download materials for offline viewing, which reduces the dependence of the educational process on external infrastructure factors and ensures the continuity of learning even in crisis situations.

The second most important aspect, though not the highest priority, is comprehensive digital security, which, in the context of displacement, is shifting from a purely technical concept to a humanitarian one. Beyond the basic level – reliable protection of personal data and the use of certified cloud services (Google Classroom, Moodle, Microsoft Teams) – security today encompasses the creation of an 'emotional digital sanctuary'. According to D. Tinkova, A. Tkachenko and S. Danyliuk, 'the implementation of trauma-sensitive learning principles helps to create a more adaptive and sensitive learning environment, which reduces stress for learners by enabling them to adapt better to new conditions' [6, p. 132]. For a learner whose physical world has become unpredictable due to the loss of their home, the digital platform should become a 'point of stability'. This approach is achieved

through the development and strict adherence to protocols for virtual interaction: from a clear timetable that does not change suddenly, to ethical rules for communication in chat rooms. The predictability of the teacher's actions and the structured nature of the educational content reduce students' anxiety levels, creating a sense of control over the situation [9, p. 152].

Cyber hygiene and media literacy are key components of security within adaptive learning. As learners in displacement situations spend more time online, the digital space must be protected from disinformation, cyberbullying and inappropriate content [7, p. 232]. In such a system, the teacher acts not only as a transmitter of knowledge but also as a facilitator of safe communication, integrating short 'resilience breaks' and psychological stress-relief techniques into lessons.

In addition to individual support, particular attention is paid to creating virtual spaces for informal communication. This can be achieved through digital platforms (such as dedicated channels in Microsoft Teams, 'breakout rooms' in Zoom, or Padlet boards), where learners can interact without academic pressure. Such a space allows for the restoration of horizontal connections, the sharing of personal experiences of displacement, and the formation of new shared interests, which is critically important for overcoming feelings of isolation and social apathy. At the same time, the implementation of joint digital projects serves as a powerful tool for socialisation. Collaborative work on virtual exhibitions, the joint creation of media content, or participation in gamified educational quests shifts the learner's focus from traumatic experiences to constructive activities [8, p. 121]. Through this collaboration, students from different regions of Ukraine discover common ground, fostering national unity and helping build a sense of belonging to a cohesive community.

**Conclusions.** The creation of a safe and adaptive digital environment is essential for the resilience of the Ukrainian education system. Flexibility in tool choice and a focus on mobility and psychological safety enable learners to remain within the Ukrainian educational system even under the most challenging circumstances of displacement. Implementing such approaches within international initiatives ensures not only the overcoming of educational losses but also the development of digital resilience in the next generation.

The materials presented in this article are the result of research conducted by a team from Dmytro Motornyi Tavria State Agrotechnological University as part of the international SAFE LEARN project (ID: 101236049). This initiative, implemented under the ERASMUS-EDU-2025-CBHE programme, aims to transform the educational landscape. The TSATU team continued work within the SAFE LEARN project will not only enable the scaling up of the results achieved but also the development of flexible response mechanisms to new security challenges facing Ukrainian higher education.

*References*

1. Головатенко Т. Тенденції підготовки вчителів до впровадження травма-інформованого навчання: досвід розвинених країн. *Освітологія*. 2023. Вип. 12(12). С. 42–54.
2. Дідик Н.М. *Психологічна робота з дітьми, які зазнали психічної травми, у воєнний час*: навчальний посібник. Кам'янець-Подільський : Кам'янець-Подільський національний університет імені Івана Огієнка, 2025. 114 с.
3. Дідик Н.М. Психологічний супровід здобувачів освіти в умовах воєнного стану. *Психологічне забезпечення інноваційних процесів в освітньо-професійному просторі закладу вищої освіти: сучасні реалії та перспективи: збірник наукових праць за матеріалами II Всеукраїнської науково-практичної конференції (21 вересня 2022 року, м. Кам'янець-Подільський)*. Київ: КНТ, 2022. С. 9–34.
4. Дідик Н.М., Зенинець С.М. Стресостійкість в умовах воєнного стану як компонент фахової компетентності майбутніх педагогів. *Березневий науковий дискурс 2025 на тему: «Синергія освіти, науки та бізнесу в епоху глобальних трансформацій»*: збірник матеріалів III Міжнародної науково-практичної конференції (27 лютого 2025 р., м. Чернігів). 2025. С. 47–50.
5. Ташкінова О., Пономарьова Л., Роговська О. Проблеми та перспективи запровадження травма-чутливого викладання в закладах вищої освіти України. *Людинознавчі студії. Педагогіка*. 2024. Вип. 49. С. 61–68.
6. Тінькова Д., Ткаченко А., Данилюк С. Підготовка майбутніх учителів інформатики до реалізації концепції травма-інформованого навчання у сучасній школі. *Наукові записки. Серія: Проблеми природничо-математичної, технологічної та професійної освіти*. 2025. Вип. 1(5). С. 132–139.
7. Шарова Т. М., Землянська А. В., Копейцева Л. П., Шаров С. В. Використання інтерактивних методик та інформаційно-комунікаційних технологій на уроках літератури. *Педагогічна інноватика: досвід та перспективи Нової української школи*: кол. монографія / за заг. ред. А. М. Солоненка, І. А. Мальцевої, Л. Ю. Москальової, О. С. Арабаджи. Мелітополь: ТОВ «Колор Принт», 2019. Розд. 9. С. 232–256.
8. Шарова Т. М., Шаров С. В. Електронне навчання: дієвий формат освіти. *Академічна культура дослідника в освітньому просторі: європейський та національний досвід: зб. матер. II Міжнар. наук.-практ. конференції (16–17 травня 2019 р., м. Суми)*. 2019. С. 119–123.
9. Шарова Т. М., Шаров С. В. Формування індивідуальної освітньої траєкторії студента засобами інформаційної системи. *Науковий вісник Мелітопольського державного педагогічного університету. Серія: Педагогіка*. 2017. № 2(19). С. 149–154.