

The impact of socio-legal factors on the digitisation of the educational process in higher education institutions with specific learning conditions

Ruslan Strotskyy

PhD in Law, Associate Professor
Lviv State University of Internal Affairs
79007, 26 Horodotska Str., Lviv, Ukraine
<https://orcid.org/0009-0003-2702-8804>

Nataliia Parasiuk

PhD in Law, Associate Professor
Lviv State University of Internal Affairs
79007, 26 Horodotska Str., Lviv, Ukraine
<https://orcid.org/0000-0002-7489-9181>

Vasyl Parasiuk*

PhD in Law, Associate Professor
Lviv State University of Internal Affairs
79007, 26 Horodotska Str., Lviv, Ukraine
<https://orcid.org/0000-0002-8195-7597>

Yuliia Lisitsyna

PhD in Law, Associate Professor
Lviv State University of Internal Affairs
79007, 26 Horodotska Str., Lviv, Ukraine
<https://orcid.org/0000-0001-5631-9297>

Oksana Onyshko

PhD in Law, Associate Professor
Lviv State University of Internal Affairs
79007, 26 Horodotska Str., Lviv, Ukraine
<https://orcid.org/0000-0002-5165-1810>

Abstract. The relevance of the topic is due to the fact that the digitisation of higher education in Ukraine, especially in institutions with specific learning conditions, has become critical in the context of martial law. The aim of the study was to assess the digitisation of the educational process and determine the impact of socio-legal factors and macroeconomic conditions. Higher education institutions in Ukraine with a special operating regime were studied. The multiple linear regression method was used, which allowed explaining 85% of the variation in the index in 2019-2023. To achieve this aim, a generalised educational digitalisation index was constructed, the initial indicators were normalised, and the relationship between the index and the level of digital literacy, regulatory and legal awareness, income and unemployment of the population was investigated. It was proven that full-scale war accelerated the need for sustainable digitalisation of higher education institutions with specific learning conditions, while exacerbating socio-legal challenges. The results confirmed the importance of developing professional-communicative, gaming and civic digital competences, while demonstrating the critical role of the legal component in security education. The results showed that the growth of digital and legal literacy and well-being correlates positively with the speed of digitalisation, while the economic shocks of the war period hold it back. The data obtained prove the resilience of the Ukrainian higher education system in crisis conditions and

Suggested Citation ————— **Article's History:** Received: 05.09.2025 Revised: 03.12.2025 Accepted: 29.12.2025 Published: 02.01.2026

Strotskyy, R., Parasiuk, N., Parasiuk, V., Lisitsyna, Yu., & Onyshko, O. (2025). The impact of socio-legal factors on the digitisation of the educational process in higher education institutions with specific learning conditions. *Social & Legal Studios*, 8(4), 18-28. doi: 10.32518/sals4.2025.18.

*Corresponding author



outline the priorities for post-war investment in secure IT infrastructure and staff training. The results of the study can be used in the activities of higher education institutions and other institutions that provide educational services

Keywords: digitalisation; higher education; higher education institutions; socio-legal factors; martial law; regression analysis; artificial intelligence

Introduction

The digitisation of higher education is rapidly and, most importantly, significantly transforming the pedagogical, technological and legal foundations of learning. At the same time, the intensive introduction of distance learning platforms, artificial intelligence and virtual environments has exacerbated the problem of e-learning quality, the need for unified interoperability models, the improvement of administrative and legal mechanisms, and the protection of the cyberspace of higher education institutions. A significant number of social and legal problems arise. It is against the backdrop of these changes that issues of socio-legal factors of digitalisation, pedagogical effectiveness of innovative tools and security become crucial (Bani-Meqdad *et al.*, 2024). At the same time, the issue of socio-legal factors is becoming crucial precisely because digital technologies are no longer auxiliary services, but have become an environment in which specialists are trained, knowledge is monitored, information is exchanged, and the educational process is managed, especially in higher education institutions with specific learning conditions, where the educational process is carried out in conditions of limited access, increased requirements for discipline, legal responsibility and data security, and often in conditions of martial law and relocation of staff and students.

An in-depth and critical analysis of the available literature on the research topic was conducted. Thus, the metaphysical understanding of education as a linguistic practice, carried out by M. Al-Maagbeh *et al.* (2024), demonstrates a transition from classical managerialism to regulation focused on the application of artificial intelligence in various areas of scientific and practical activity, including the educational process. Although the context is somewhat different, the authors clearly emphasise the need to update legal acts and ethical standards. This is relevant for Ukrainian higher education institutions when introducing AI-based systems, especially in the context of specific learning conditions. S. Rzhchytska (2022) explored the advantages and disadvantages of the online format for higher education institutions with specific learning conditions. The author concluded that, on the one hand, there is a clear expansion of international cooperation and access to global master classes, but on the other hand, there are real difficulties with the practical component and authentic feedback during studio classes. This may indicate that digital platforms need to adapt to specific learning conditions. V. Milićević *et al.* (2021) used the Delphi method with 68 experts and scenario planning to develop three scenarios for the development of e-learning by 2030. Within the scope of the work, political will, cybersecurity, and financial incentives were identified as key drivers of the process under study.

The study by H. Dei *et al.* (2024) reveals the legal risks and gaps in the regulatory framework for cybersecurity in Ukrainian higher education institutions. The authors propose a model of interagency coordination in which the key structures are the Ministry of Education and Science (MES), the State Special Communications Service, and the National Security Council. The aim of the model is to respond to attacks

and create backup data centres. Interagency coordination is extremely important in the digitisation of the educational process, especially when there are specific learning conditions.

Z. Zahynei-Zabolotenko *et al.* (2023), Y. Bahno and O. Serhiichuk (2024) and H. Aliksieieva (2024) considered teacher education as an element of the state's social function in a digital society and focused on the relationship between digital tools for training teachers and legal guarantees of access to quality education. Yu. Tryus *et al.* (2020), A. Hal-eem *et al.* (2022) and V. Fazan *et al.* (2023) explored the role of digital technologies in the transformation of education and showed that the intensive digitisation of the learning process enhances the personalisation of learning, develops interactive formats, supports flexible models of access to knowledge, and changes the very pedagogical interaction between lecturer and learner. In their conclusions, the authors emphasised that digital solutions are becoming a key factor in maintaining the continuity of learning in times of crisis, but at the same time require new competencies from teaching staff, as well as reliable cybersecurity and data protection mechanisms. V. Bobrytska (2022) showed that there is a steady demand in educational circles for the digitisation of general secondary education. S. Bondarenko *et al.* (2022) studied the legal mechanisms of information security in the context of the digitalisation of social processes and argued that the digital educational environment cannot be viewed solely as a technical system; it must have formalised regimes for legal protection of information, access management, responsibility for violations of data circulation rules, and response to cyber incidents. At the same time, summarising the literature review, it should be noted that researchers have overlooked the specifics of higher education institutions with specific learning conditions. It is the lack of quantitative assessment of the impact of socio-legal factors and external economic shocks that forms the scientific niche that this study fills.

The aim of the study was to assess the impact of socio-legal factors on the digitisation of the educational process in higher education institutions with specific learning conditions. Thus, the main objectives for achieving the set aim were to construct an integrated educational index, analyse the dynamics of digitalisation in 2019-2023, and apply a regression approach to quantitatively test the relationships between digital practices, legal awareness, economic factors, and the sustainability of educational infrastructure.

Materials and methods

At the initial stage, the expert analysis method was used. The expert analysis method was used for the substantive selection of indicators and verification of their relevance to specific learning conditions. Experts helped to filter out redundant indicators, agree on definitions, and confirm the use of equilibrium weights in the integral index. As a result, four educational indicators were selected from the array of official statistics and internal reporting of higher education institutions: (1) the share of higher education institutions with

specific learning conditions that use information and communication technologies; (2) the share of higher education institutions with specific learning conditions that use artificial intelligence-based systems; (3) the average level of digital competence in higher education institutions with specific learning conditions; (4) the average salary in higher education institutions with specific learning conditions) and four macro indicators (the level of digital literacy of the population; the level of regulatory and legal literacy of the population; the level of unemployment; the income of the population). Thus, a number of experts were involved, including 40 specialists, as well as 18 representatives of digital development departments of higher education institutions, 12 researchers in the field of higher education development, 6 cybersecurity specialists, and 4 lawyers. The surveys were conducted online in two rounds using Google forms. The survey was conducted from February to April 2025. It should be noted that after providing consolidated feedback, the participants adjusted their own assessments until a consensus was reached.

Taken together, the indicators most fully reveal the problem of the digitalisation of the educational process and external socio-legal conditions. To compare the scale and units of measurement of different indicators, a linear min-max transformation was used (1):

$$N_{ij} = \frac{H_{ij} - \min\{H_i\}}{\max\{H_i\} - \min\{H_i\}}, \quad (1)$$

where N_{ij} is the normalised value of indicator (j) in year i , H_{ij} is the actual value of indicator j in year i ; $\min\{H_j\}$ is the minimum value of indicator j for the selected period; $\max\{H_j\}$ is the maximum value of indicator j for the period. This allowed all values to be converted to a single normalised measurement. The normalised values are reduced to a single aggregate indicator using a simple equilibrium additive model (2):

$$I(t) = \frac{1}{m} \sum_{i=1}^m N_i(t), \quad (2)$$

where $N_j(t)$ is the normalised value of the j -th indicator in year t . In this case, m is 4, since four educational indicators were selected. For the initial study of interrelationships, “factor-index” correlation diagrams and the simplest method of least squares were used to construct a trend line. Next, the direct assessment of the impact of external factors was carried out using the model (3):

$$I_{Dt} = \beta_0 + \beta_1 w_1 + \beta_2 w_2 + \dots + \beta_{k_{wk}} + \varepsilon, \quad (3)$$

where I_{Dt} is the integral educational index in year t ; w_k are macro indicators; β_0 is the intercept; $\beta_1, \beta_2, \beta_3$ are the sensitivity coefficients of the index to the corresponding factors; ε_t is a random error. The combination of min-max normalisation, equilibrium integral index and multiple linear regression ensures the reproducibility of calculations and internal consistency of assessment. A two-stage expert selection of indicators followed by coordination of assessments increased the content validity of the results for higher education institutions with specific learning conditions.

Results

Higher education in Ukraine is a very complex system that is significantly dependent on socio-legal factors and changes in the external environment as a whole. At the same

time, in recent years, it has also been undergoing an active digital transformation, which is enshrined at the state level by regulatory and legal acts. The basic Law of Ukraine No. 2145-VIII “On Education” (2017) and Law of Ukraine No. 1556-VII “On Higher Education” (2014) contain provisions on the use of information and communication technologies in the educational process. In addition, the Government has identified priority areas for the digitalisation of education, in particular in Order of the Cabinet of Ministers of Ukraine No. 365-p “Some Issues of Digital Transformation” (2021), which includes a list of key tasks for the digital development of education and science. Particular attention is paid to distance learning. First the COVID-19 pandemic and then the full-scale armed invasion together required radical action at the state level. Thus, even before the war, in 2019-2021, the Regulations on Distance Learning were updated and electronic platforms for education were introduced. In the context of the COVID-19 pandemic in 2020, the Ministry of Education and Science proposed, within the framework of the Concept of Digital Transformation of Education and Science (2021-2026) (2021), a mass transition to online learning, emphasising the creation of a unified digital educational environment.

After the start of full-scale war, the regulatory framework was quickly adapted to the conditions of martial law. In March 2022, a number of decisions were adopted. Thus, Order of the Ministry of Education and Science No. 235 “On Some Issues of Organising the Work of Institutions of Professional Pre-Higher and Higher Education During Martial Law” (2022) obliged higher education institutions (including those with special learning conditions) to ensure the evacuation and safety of participants in the educational process, as well as the use of available electronic resources to resume learning in distance or blended forms. In other words, full-scale war has effectively forced educational institutions to make maximum use of digital technologies to continue learning even in the absence of traditional infrastructure. By the beginning of 2023, a basic regulatory framework for the digitalisation of higher education had already been established, even under emergency conditions. The authorities and educational institutions were given the tools to ensure the continuity of education through digital solutions. Of course, higher education institutions with specific learning conditions require special attention. For this reason, this article assesses the digitisation of the educational process in such institutions over the last five years.

To determine the level of digitisation of the educational process, four key indicators were selected together with experts for the last five years, which characterise the implementation of digital technologies in higher education institutions in Ukraine with specific learning conditions. It should be noted that the experts chose four indicators precisely because they reflect four different aspects of the digitalisation of the educational process, which together characterise not only the availability of technology or programmes, but the real ability of the institution to maintain the quality of education in conditions of security restrictions, martial law and staff losses, which is directly indicated as the key context for the functioning of higher education institutions with specific learning conditions. For example, the indicator of average salary in higher education institutions with specific learning conditions was included not to describe general well-being, but as an indicator of institutional capacity to support

and retain qualified staff, invest time in developing digital content, and maintain the stability of teaching teams in a long-term crisis. At the same time, experts allow the main aspects of digitalisation itself to be reflected. These include educational content, access for applicants, staff competence and resource provision. Table 1 shows that all indicators had

a steady upward trend until 2021 (with particularly sharp progress in 2020-2021 due to the widespread introduction of distance learning during the pandemic). Since the selected indicators have different units of measurement and scales, they were brought to a comparable scale by normalising the data before the integrated assessment (Table 2).

Table 1. Initial data for modelling

| Macro level (M1-M4) | | | | | |
|---|---------|---------|---------|---------|---------|
| Selected indicators for modelling | 2019 | 2020 | 2021 | 2022 | 2023 |
| Level of digital literacy of the population, % | 24.9 | 31.2 | 39.7 | 44.2 | 56.7 |
| Level of legal and regulatory literacy of the population, % | 28.5 | 33.6 | 45.1 | 51.2 | 62.9 |
| Unemployment rate, % | 9.2 | 9.5 | 10.2 | 21.1 | 17.4 |
| Household income, UAH billion | 3,248.7 | 3,744.4 | 4,045.1 | 4,863.5 | 5,257.1 |
| Educational level (H1-H4) | | | | | |
| Selected indicators for modelling | 2019 | 2020 | 2021 | 2022 | 2023 |
| Share of higher education institutions with specific learning conditions that apply information and communication technologies, % | 76.7 | 82.6 | 88.2 | 95.3 | 99.1 |
| Share of higher education institutions with specific learning conditions that use artificial intelligence-based systems, % | 2.3 | 11.4 | 14.2 | 31.9 | 43.3 |
| Average level of digital competence in higher education institutions with specific learning conditions, [0-1] | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| Average salary in higher education institutions with specific learning conditions, thousand UAH | 10.5 | 14.1 | 14.3 | 14.9 | 17.5 |

Source: compiled by the authors based on data from the State Statistics Service of Ukraine (2023) and the results of expert analysis

Table 2. Normalised values of indicators of the level of digitalisation of the educational process in higher education institutions with specific learning conditions

| Educational level (H1-H4) | | | | | |
|---|------|-------|-------|-------|------|
| Selected indicators for modelling | 2019 | 2020 | 2021 | 2022 | 2023 |
| Share of higher education institutions with specific learning conditions that apply information and communication technologies, % | 0 | 0.263 | 0.513 | 0.83 | 1 |
| Share of higher education institutions with specific learning conditions that use artificial intelligence-based systems, % | 0 | 0.222 | 0.29 | 0.722 | 1 |
| Average level of digital competence in higher education institutions with specific learning conditions, [0-1] | 0 | 0.025 | 0.5 | 0.75 | 1 |
| Average salary in higher education institutions with specific learning conditions, thousand UAH | 0 | 0.514 | 0.543 | 0.629 | 1 |

Source: compiled by the authors

Next, based on the normalised data, the integral educational index of the digitisation of the educational process in higher education institutions with specific learning conditions was calculated for each year. The values obtained show a steady and virtually continuous increase in the level of digitisation throughout the period 2019-2023. Thus, in 2019, the index was at its lowest level. However, in 2020 and 2021, accelerated growth was observed, reflecting the widespread introduction of distance learning formats under the influence of the COVID-19 pandemic, as well as active investments by universities in digital infrastructure and the development of basic digital competencies among lecturers. In 2022, the index rose despite the destruction of material resources, the evacuation of staff and students, and security

threats. This shows that martial law did not stop digitalisation but, on the contrary, made it a critically necessary mechanism for maintaining the continuity of the educational process in institutions with specific learning conditions. In 2023, the index reached its maximum value, which means the highest concentration of digital practices using artificial intelligence-based systems in five years, growth in the digital competence of staff, and the ability of institutions to retain qualified personnel and maintain the functioning of a secure educational infrastructure. Thus, 2022 is not a failed period of digitalisation, but rather a year of rapid acceleration in the transition to sustainable digital solutions, while 2023 marks the peak of adaptation and stabilisation of the education system under martial law, as reflected in Figure 1.

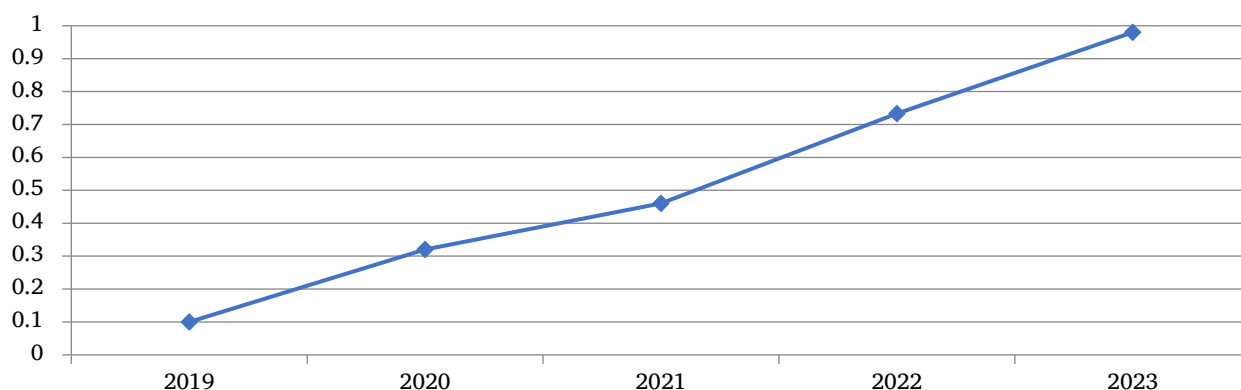


Figure 1. Dynamics of changes in the integral educational index of digitisation of the educational process in higher education institutions with specific learning conditions for 2019-2023

Source: compiled by the authors

Naturally, given all the conditions, the index gradually increases, which indicates a gradual recovery of the digital potential of education even under the conditions of an ongoing state of martial law. This has been facilitated by the adaptation of institutions and support from the state itself and other stakeholders. Next, evaluate how changes in the external environment, i.e., social and legal conditions, may be related to the level of digitalisation of the educational process in higher education institutions with specific learning conditions. The further regression model based on only three factors, namely digital literacy, regulatory literacy, and income. The unemployment rate was excluded. The reason is that in 2022-2023, sharp changes in unemployment practically repeat the impact of the general economic shock, which is already reflected in household income. In addition, only 5 annual observations from 2019 to 2023 were used. This time horizon is not arbitrary. Firstly, it was during these years that two systemic crises occurred in succession. These were the COVID-19 pandemic, which forced higher education institutions to switch to remote formats in 2020-2021, and the full-scale war, which shifted

part of the educational process to emergency digital provision. Secondly, it is only since 2019 that comparable official data has been available on the use of information and communication technologies, artificial intelligence-based systems, digital competence of staff and salaries in higher education institutions with specific learning conditions. For earlier years, these indicators were either not measured in a consistent format or did not cover such institutions separately. Thus, it is the five-year sample that allows to track the period when digitalisation ceased to be an auxiliary tool and became a condition for the survival of the educational process in institutions with specific learning conditions. At the same time, such a sample is statistically very small for classical econometric analysis. Thus, the level of digital literacy of the population, the level of legal literacy of the population, and the household income all show a clear upward trend over time, as they simultaneously reflect the growth of society's ability to work in a digital environment, the accumulation of legal awareness in the field of access to information and data protection, and the resource capacity of families and employees (Table 3).

Table 3. Results of the regression model of the dependence of the educational index of digitisation of the educational process on macrofactors of socio-legal significance (M1-M3)

| Independent variable | Intercept | Coefficient of the variable | Standard error of the coefficient | t-statistic of the coefficient | p-value of the coefficient | R ² |
|--|-----------|-----------------------------|-----------------------------------|--------------------------------|----------------------------|----------------|
| Level of digital literacy among the population | -0.715 | 0.03092 | 0.00312 | 9.91 | 0.102 | 0.87 |
| Level of legal literacy among the population | -0.712 | 0.02741 | 0.00304 | 8.99 | 0.202 | 0.86 |
| Household income | -1.465 | 0.00046 | 0.00003 | 13.24 | 0.209 | 0.88 |

Source: compiled by the authors

Thus, the values of the coefficients reflect the strength and direction of influence (minus indicates a negative influence, plus indicates a positive influence) of the respective factors on the integral educational index of digitisation of the educational process in higher education institutions with specific learning conditions. Statistical significance was assessed using Student's t-test in accordance with the selected methodology. A high coefficient of determination confirms the explanatory power of the model.

Table 3 shows that the coefficient is positive for each individual factor. This means that the growth of the factor

goes in the same direction as the growth of the integral educational index of digitisation. In other words, in the years when the digital literacy of the population was higher, the integral index of digitisation of institutions with specific learning conditions was also higher. The same is observed for the regulatory and legal literacy of the population and for the household income. It should be noted that in this case, only 5 annual expert observations for the period 2019-2023 and three independent variables were studied. The coefficients are sensitive to any change in the initial data, the standard errors are large, and the t-statistics and p-levels do

not give grounds to assert the proven existence of a causal effect. All p levels do not exceed 0.30, i.e. the probability

that the observed effect is random noise is less than 30% for each factor (Fig. 2).

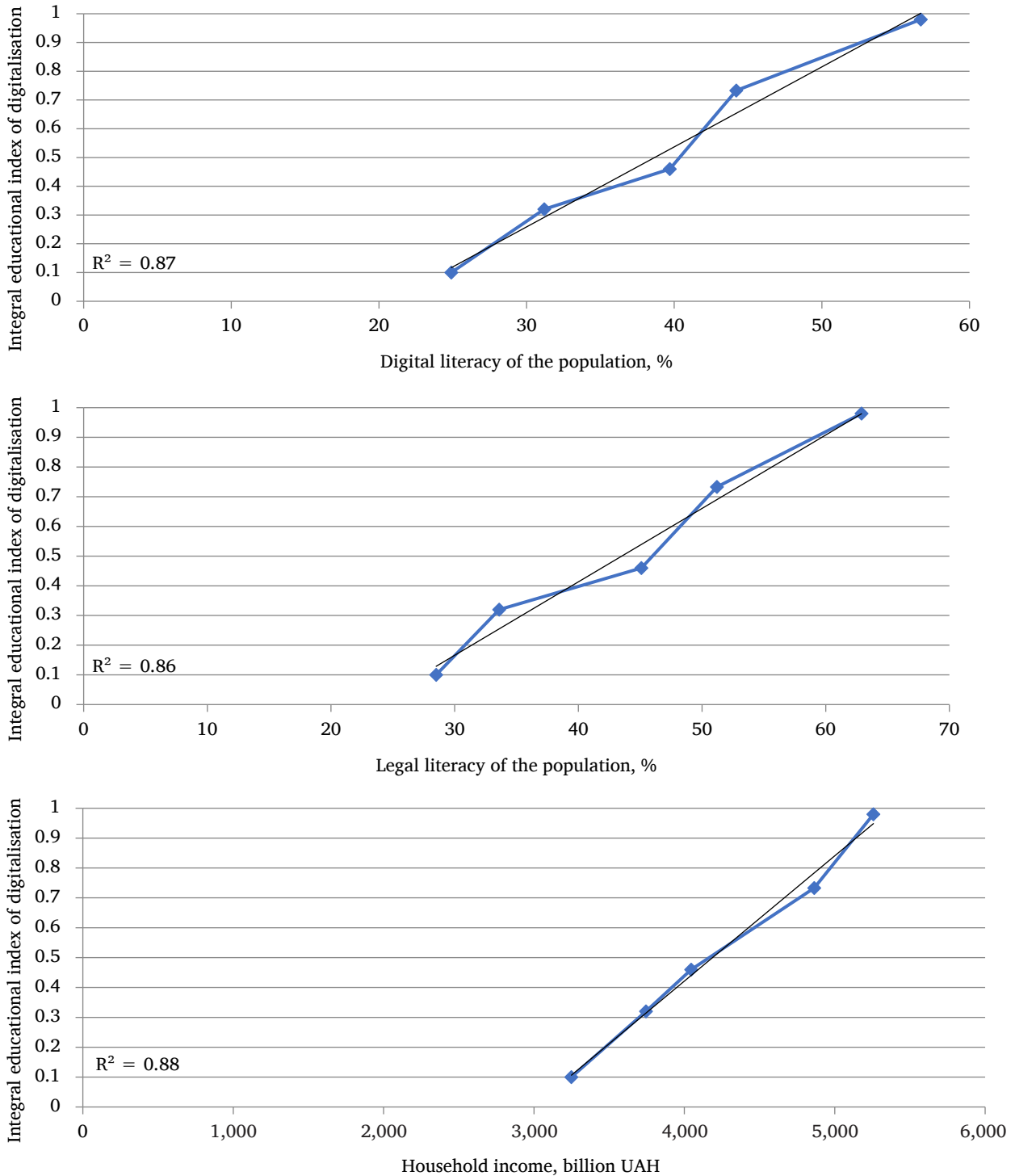


Figure 2. Relationship between the integral educational index of digitisation of the educational process in higher education institutions and macrofactors of a socio-legal nature

Source: compiled by the authors

Based on the analysis conducted, it is appropriate to formulate specific regulatory proposals and practical guidelines for higher education institutions with specific learning conditions. Firstly, at the legislative level, mandatory digital

and legal training for all academic and teaching staff should be established as an element of professional development. For institutions with specific learning conditions, this is critical, as their staff work with restricted information, military

data, and official service data; a legal error by a lecturer or an e-learning platform administrator could result in a leak of official information or a violation of students' rights.

Another area concerns the security of the digital educational environment. Article 16 of Law of Ukraine No. 1556-VII "On Higher Education" (2014), through its requirements for the higher education quality assurance system, imposes an obligation on higher education institutions to ensure the availability of information systems for the effective management of the educational process, as well as the professional development of employees and the provision of resources for the educational process. For institutions with specific learning conditions, this is not enough, as such institutions process confidential personal and official data, including data on cadets and law enforcement personnel, defence research materials and training results. Thus, it is proposed to supplement Article 16 with a direct requirement for higher education institutions with specific learning conditions to implement and regularly audit information security and cyber protection policies based on the ISO/IEC 27001:2022 (2022) information security management standard, with a clear distinction between the access of lecturers, cadets and technical staff to internal educational platforms. This clarification should provide a legislative basis for internal regulations on the storage of official information, logging of access to educational databases, response to cyber incidents and disciplinary responsibility for violations of digital security in the learning process.

The continuity of the educational process in crisis conditions should be ensured at the level of law. Order of the Ministry of Education and Science No. 235 (2022) obliged heads of higher education institutions to ensure the protection of participants in the educational process, organise evacuation if necessary, create opportunities for receiving evacuated students and teachers, and confirm the availability of electronic educational platforms, learning management systems, server capacities and the possibility of continuing education in a blended or distance format. This document set a precedent for crisis management in education, but it works as a temporary order. For institutions with specific learning conditions, which often have mobilisation tasks and cannot stop training personnel even during martial law, it is advisable to include a separate provision on digital resilience and a plan for the continuity of the educational process in the Law of Ukraine "On Higher Education". Such a provision should oblige institutions to maintain backup secure servers, duplicate educational content, secure remote access channels, online identification procedures for students and lecturers, and mechanisms for quickly transferring training to a remote or blended format without loss of quality. This would elevate the temporary requirements of Order of the Ministry of Education and Science No. 235 (2022) to the status of a permanent obligation and would establish that digital infrastructure is not auxiliary, but rather an element of national security in the field of security and defence personnel training.

It is necessary to strengthen socio-economic guarantees and incentives for personnel who ensure the digitisation of the educational process in institutions with specific learning conditions. Article 59 of Law of Ukraine No. 1556-VII (2014) guarantees scientific and pedagogical workers appropriate working conditions, professional development, social and pension benefits, and provides for additional

payments for academic degrees and titles, with the institution having the right to set higher additional payments from its own revenues. At the same time, the current version does not take into account that the administration of secure electronic learning platforms, cybersecurity support, the lawful handling of personal data of cadets and teachers, and the support of remote formats in high-risk modes are in fact elements of the institution's critical infrastructure. It is proposed to supplement Article 59 with a provision on special additional payments and allowances for employees who perform the functions of managing digital infrastructure and ensuring the information security of the educational process, in particular in institutions with specific learning conditions. This has two objectives. First, it reduces the outflow of such specialists to the private sector and increases the stability of the workforce. Second, it recognises at the legislative level that the quality of digitalisation depends not only on technology, but also on personnel, who must be motivated to remain in the education system.

The problem of legal certainty of data regimes and transparency of internal regulations remains. The concept of digital transformation of education and science defines the accessibility and reliability of data in the field of education and science as a separate strategic goal, as well as the need for transparent and effective services and processes. Thus, Order of the Ministry of Education and Science No. 235 (2022) requires higher education institutions under martial law to ensure the protection of participants in the educational process, including the organisation of safe distance learning and joint administration of the educational process between different institutions, which in fact means the exchange of personal files, journals and educational records between institutions. For institutions with specific learning conditions, such exchange includes data on cadets' military ranks, information on service records and professional training results, which are highly sensitive. Thus, a separate provision should be added to Law of Ukraine No. 1556-VII (2014) should be amended to include a separate provision for institutions with specific learning conditions stating that any transfer of educational data between institutions is only possible subject to documented agreement on the access and protection regime, specifying the responsible official, the retention period for copies and the procedure for deletion after the joint administration of the educational process has been completed. Such a provision should be reflected in the internal regulations of each institution and be subject to external audit, for example during the accreditation of educational programmes, since accreditation is defined by law as a mechanism for assessing the quality of educational activities and a tool for improving the quality of higher education.

Thus, the above-proposed system of measures covers key areas. In particular, from the development of digital and legal competencies and cyber security to interoperability, financing, ethical communication and inclusiveness. The introduction of such socio-legal mechanisms, with clear indicators and defined responsibilities, will create a comprehensive legal framework. It is this framework that will ensure a sustainable, secure and high-quality digital transformation of the educational process in Ukrainian higher education institutions under the specific learning conditions dictated by wartime.

In conclusion, it should be emphasised once again that the war, like the COVID-19 pandemic, will end one day, but digitalisation will not. It is a rapid and constant external

phenomenon that will always influence the educational process and remain relevant even in the most critical circumstances. The Ukrainian higher education system has demonstrated its ability to adapt digitally in a state of martial law, and this experience may serve as a basis for the rapid development of educational technologies in the post-war period. It should be remembered that the most important factors for success will be investment in infrastructure, staff training (digital and legal literacy), and stable regulatory and legal support that takes into account the specifics of a particular higher education institution.

Discussion

The study showed that the digitisation of the educational process in higher education institutions with specific learning conditions is not a local technological modernisation, but rather a systemic condition for maintaining educational activities in a state of constant stress, which combines the effects of the COVID-19 pandemic and martial law. Thus, this result partially aligns with some previous works, but also demonstrates certain discrepancies that need to be explained. For example, G. Griban *et al.* (2022) note that the key condition for effective teaching is not so much formal training in the specialty as the ability of the lecturer to maintain stable communication with students in the digital space, adapt content, provide instant feedback, and maintain educational interaction in conditions of instability. The authors emphasise the importance of combining professional, communicative and digital components in the training system for teaching staff. In this respect, the above results support them, as the integrated educational digitisation index reflects not only the technical availability of platforms, but also the readiness of staff to work consistently in a digital environment. However, this work focuses not only on the lecturer, but on the entire organisation of the institution with its regulatory, security and resource base. This is not always taken into account in studies of pedagogical skills, but it is crucial for institutions with specific learning conditions, where a secure digital channel is also an element of the legal regime of access to information, and not just a pedagogical style of communication. O. Sadovets *et al.* (2025) argue that gamification increases student engagement, makes it easier to maintain attention in a distance learning format, increases motivation and promotes independent student work. The analysis focuses on the student's experience in the digital environment, the ability to maintain learning dynamics through game elements and mechanisms of immediate reinforcement of results. At the same time, within the framework of this study, it is worth supporting the thesis that student motivation mechanisms and pedagogical tools for maintaining attention are important. However, this study measured a different level of the problem. For institutions with specific learning conditions, digitalisation is a prerequisite for maintaining the continuity of the educational process in principle, including disciplinary control, information protection and the legal regime of access. Thus, this analysis expands on the well-known logic of gamification, adding a legal and security dimension, without which recommendations such as making learning more interesting may not be sufficient for this type of institution.

Also, for example, K. Dzhezhera (2023) focuses on motivational factors for ensuring the quality of education in the context of distance learning in higher education institutions.

At the same time, it is necessary to support these conclusions from the perspective of the internal logic of the educational process. This is fully consistent with what was observed in the data obtained on the steady growth of digital competence among staff and the spread of practices using digital platforms and systems based on artificial intelligence. However, the above analysis shows a different picture regarding the source of this stability. Thus, the quality of distance learning in institutions with specific learning conditions is supported not only by the psychological and organisational support of the lecturer. It depends on the existence of legal norms that allow the educational process to continue under martial law, on cyber protection that prevents the leakage of official data, and on the institutional retention of qualified personnel through salaries. A. Al-Abdullatif *et al.* (2020) concluded that without the systematic formation of a legal culture of digital behaviour among students, no technological modernisation of education will be safe. The current study supports this thesis and does not simply repeat it, but confirms with data that the legal component is an integral structural element of digital resilience, not an optional addition. This study showed that the regulatory and legal literacy of the population demonstrates a positive correlation with the integral educational index of digitalisation. For example, a study by D.M. Quinn (2003) analysed the legal risks of introducing educational technologies into the activities of educational institutions and management teams, in particular the issues of access to students' personal data, copyright on educational materials, and the administration's responsibility for the functioning of the virtual educational environment.

A comparison of the results obtained with current scientific approaches revealed both points of intersection, particularly regarding the role of lecturers' digital competence, gamification, and student motivation mechanisms, and significant differences due to the special legal and security status of such institutions. Unlike studies that focus primarily on pedagogical or psychological aspects, the present study demonstrates that digital resilience is formed through the integration of regulatory, organisational, cybersecurity, and human resource components, without which no innovative methods can be effective or secure. Thus, digitalisation is a complex condition for the functioning of the education system in a high-risk environment, and the legal culture of digital behaviour is an integral factor in its stability and security.

Conclusions

In conclusion, it should be emphasised that within the scope of this study, it was possible to construct an integrated educational index of the digitisation of the educational process in higher education institutions with specific learning conditions and to track its dynamics in the period from 2019 to 2023. The index grew throughout the period, starting from very low values in 2019 to almost maximum values in 2023. The growth accelerated initially due to the COVID-19 pandemic, when learning was forced to move online and universities invested in digital infrastructure and digital competencies of staff. Then, in 2022, the index continued to rise despite the destruction of physical infrastructure, the evacuation of staff and students, communication disruptions and other consequences of martial law. This means that even extreme conditions did not stop digitalisation, but made it the only way to maintain the continuity of the educational process in institutions with specific learning conditions. At

the same time, educational institutions with specific learning conditions face additional challenges in the context of digitalisation. These include restrictions on network access for security reasons, the need to protect confidential information, strict discipline and regulations. In wartime, many of them have been relocated or suffered staff losses. Legal aspects are particularly important here, such as compliance with secrecy regimes, cybersecurity, and standards for education during special periods. The Ukrainian higher education system has demonstrated its ability to adapt to digitalisation under martial law, and this experience may serve as a basis for the rapid development of educational technologies in the post-war period. A promising area for further research could be an in-depth analysis of the state of information protection in higher education institutions with specific learning conditions, correlating with their level of digitalisation and legal literacy.

The results obtained allow to conclude that the digital competence and legal literacy of staff should be enshrined in legislation as a mandatory element of professional development for scientific and pedagogical workers in institutions with specific learning conditions. Article 16 of the Law of Ukraine “On Higher Education” should be supplemented with a requirement for such institutions to have and regularly review internal cybersecurity and data management policies with clear access restrictions to educational platforms

and documented responsibility for violations of information handling procedures. The provisions of Order No. 235 of the Ministry of Education and Science on the continuity of the educational process during martial law should be translated into a permanent legislative norm on digital resilience. This means having backup secure servers, duplicating educational content, procedures for identifying participants in the online educational process, and being ready to instantly switch to remote or blended formats without losing quality.

A promising area for further research is a comprehensive study of the relationship between the level of digitalisation, legal literacy, and the state of information security in higher education institutions with specific learning conditions, particularly in the legal dimension, with regard to compliance of internal policies with the requirements of martial law, access regimes, cybersecurity, and the regulatory framework for digital resilience.

Acknowledgements

None.

Funding

The study received no funding.

Conflict of interest

None.

References

- [1] Al-Abdullatif, A.M., & Gameil, A.A. (2020). Exploring students' knowledge and practice of digital citizenship in higher education. *International Journal of Emerging Technologies in Learning (IJET)*, 15(19), 122-142. doi: 10.3991/ijet.v15i19.15611.
- [2] Aliexsieieva, H. (2024). Integration of digital technologies and artificial intelligence into the dual methodology of teaching bachelors of vocational education. *Scientia et Societas*, 3(1), 39-47. doi: 10.69587/ss/1.2024.39.
- [3] Al-Maagbeh, M.M., Rabbo Aldrou, K.K.A., Al-Naimat, O., & Sylkin, O. (2024). Historical approaches to the development of administrative law in Jordan in the period 1970-2024: From the modernization of public administration to the use of artificial intelligence. *Clio. Journal of History, Human Sciences and Critical Thought*, 8, 52-72. doi: 10.5281/zenodo.12597931.
- [4] Bahno, Y., & Serhiichuk, O. (2024). Didactic principles of implementation of mixed forms of education in the educational environment of educational institutions. *Scientia et Societas*, 3(2), 70-81. doi: 10.69587/ss/2.2024.70.
- [5] Bani-Meqdad, M.A.M., Senyk, P., Udod, M., Pylypenko, T., & Sylkin, O. (2024). Cyber-environment in the human rights system: Modern challenges to protect intellectual property law and ensure sustainable development of the region. *International Journal of Sustainable Development and Planning*, 19(4), 1389-1396. doi: 10.18280/ijssdp.190416.
- [6] Bobrytska, V. (2022). [Current educational reforms in Ukraine within the frame of pedagogical reflection](#). *Ukrainian Professional Education*, 6(2), 18-23.
- [7] Bondarenko, S., Makeieva, O., Usachenko, O., Veklych, V., Arifkhodzhaieva, T., & Lerynyk, S. (2022). The legal mechanisms for information security in the context of digitalization. *Journal of Information Technology Management*, 14(Special Issue), 25-58. doi: 10.22059/jitm.2022.88868.
- [8] Concept of digital transformation of education and science (2021-2026). (2021). Retrieved from <https://surli.cc/mcopnk>.
- [9] Dei, H., Shvets, D., Lytvyn, N., Sytnichenko, O., & Kobus, O. (2024). Legal challenges and perspectives of cybersecurity in the system of state governance of educational institutions in Ukraine. *Journal of Cyber Security and Mobility*, 13(5), 963-982. doi: 10.13052/jcsm2245-1439.1357.
- [10] Dzhedzhera, K. (2023). Motivative factors of ensuring the quality of education in higher education institutions in the conditions of distance learning. *New Pedagogical Thought*, 3(115), 31-35. doi: 10.37026/2520-6427-2023-115-3-31-35.
- [11] Fazan, V., Semenovska, L., & Vazhenina, I. (2023). Features of the development of education in Switzerland. *Pedagogical Sciences*, 6(1), 122-127. doi: 10.33989/2524-2474.2023.81.289403.
- [12] Griban, G., et al. (2022). Professional and communicative competence of physical education instructors in postmodern education. *Postmodern Openings*, 13(4), 158-186. doi: 10.18662/po/13.4/512.
- [13] Haleem, A., Javaid, M., Qadri, M.A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275-285. doi: 10.1016/j.susoc.2022.05.004.
- [14] SO/IEC 27001:2022. (2022). *Information security, cybersecurity and privacy protection – information security management systems – requirement*. Retrieved from <https://www.iso.org/ru/standard/27001>.
- [15] Law of Ukraine No. 1556-VII “On Higher Education”. (2014, July). Retrieved from <https://zakon.rada.gov.ua/laws/show/1556-18#Text>.
- [16] Law of Ukraine No. 2145-VIII “On Education”. (2017, September). Retrieved from <https://zakon.rada.gov.ua/laws/show/2145-19#Text>.

-
- [17] Milićević, V., Denić, N., Milićević, Z., Arsić, L., Spasić-Stojković, M., Petković, D., Stojanović, J., Krkić, M., Milovančević, N.S., & Jovanović, A. (2021). E-learning perspectives in higher education institutions. *Technological Forecasting and Social Change*, 166, article number 120618. doi: [10.1016/j.techfore.2021.120618](https://doi.org/10.1016/j.techfore.2021.120618).
- [18] Order of the Cabinet of Ministers of Ukraine No. 365-p “Some Issues of Digital Transformation”. (2021, February). Retrieved from <https://zakon.rada.gov.ua/laws/show/365-2021-%D1%80#Text>.
- [19] Order of the Ministry of Education and Science No. 235 “On Some Issues of Organising the Work of Institutions of Professional Pre-Higher and Higher Education During Martial Law”. (2022, March). Retrieved from <https://zakon.rada.gov.ua/go/v0235729-22>.
- [20] Quinn, D.M. (2003). Legal issues in educational technology: Implications for school leaders. *Educational Administration Quarterly*, 39(2), 187-207. doi: [10.1177/0013161X03251152](https://doi.org/10.1177/0013161X03251152).
- [21] Rzhychytska, S. (2022). Challenges and advantages of distance learning in art institutions of tertiary education. *Library Science. Record Studies. Informology*, 18(3), 100-105. doi: [10.32461/2409-9805.3.2022.267003](https://doi.org/10.32461/2409-9805.3.2022.267003).
- [22] Sadovets, O., Martynyuk, O., Orlovska, O., Lysak, H., Korol, S., & Zembytska, M. (2022). Gamification in the informal learning space of higher education (in the context of the digital transformation of education). *Postmodern Openings*, 13(1), 330-350. doi: [10.18662/po/13.1/399](https://doi.org/10.18662/po/13.1/399).
- [23] State Statistics Service of Ukraine. (2023). *Activities of small and medium-sized enterprises*. Retrieved from <https://www.ukrstat.gov.ua/>.
- [24] Tryus, Yu., Zaspá, H., Kozhemyakin, O., & Ashyrova, A. (2020). Information and analytical system for educational activities support of structural divisions of higher education institutions. *Bulletin of Cherkasy State Technological University*, 25(4), 27-38. doi: [10.24025/2306-4412.4.2020.219482](https://doi.org/10.24025/2306-4412.4.2020.219482).
- [25] Zahynei-Zabolotenko, Z., Tkachenko, I., Suprun, V., Kvasha, O., Prysiashniuk, I., & Moisieienko, L. (2023). Legal aspects of pedagogical education in a digital society under the implementation of the social function of the state. *Journal of Law and Sustainable Development*, 11(6), article number e1253. doi: [10.55908/sdgs.v11i6.1253](https://doi.org/10.55908/sdgs.v11i6.1253).

Вплив соціально-правових факторів на діджиталізацію освітнього процесу у закладах вищої освіти із специфічними умовами навчання

Руслан Строцький

Кандидат юридичних наук, доцент
Львівський державний університет внутрішніх справ
79007, вул. Городоцька, 26, м. Львів, Україна
<https://orcid.org/0009-0003-2702-8804>

Наталія Парасюк

Кандидат юридичних наук, доцент
Львівський державний університет внутрішніх справ
79007, вул. Городоцька, 26, м. Львів, Україна
<https://orcid.org/0000-0002-7489-9181>

Василь Парасюк

Кандидат юридичних наук, доцент
Львівський державний університет внутрішніх справ
79007, вул. Городоцька, 26, м. Львів, Україна
<https://orcid.org/0000-0002-8195-7597>

Юлія Лісіцина

Кандидат юридичних наук, доцент
Львівський державний університет внутрішніх справ
79007, вул. Городоцька, 26, м. Львів, Україна
<https://orcid.org/0000-0001-5631-9297>

Оксана Онишко

Кандидат юридичних наук, доцент
Львівський державний університет внутрішніх справ
79007, вул. Городоцька, 26, м. Львів, Україна
<https://orcid.org/0000-0002-5165-1810>

Анотація. Актуальність теми зумовлена тим фактом, що цифровізація вищої освіти України, особливо в закладах із специфічними умовами навчання, набула критичної ваги в умовах воєнного стану. Метою дослідження було оцінювання діджиталізації освітнього процесу, визначення впливу соціально-правових факторів і макроекономічних умов. Було досліджено заклади вищої освіти України із особливим режимом роботи. Використано метод множинної лінійної регресії, що дозволило пояснити 85 % варіації індексу у 2019-2023 рр. Для досягнення поставленої мети, було побудовано узагальнений освітній індекс діджиталізації, нормалізувано вихідні показники, досліджено взаємозв'язок індексу з рівнем цифрової грамотності, нормативно-правової обізнаності, доходами та безробіттям населення. Доведено, що повномасштабна війна прискорила потребу у сталій цифровізації закладів вищої освіти із специфічними умовами навчання, водночас загостривши соціально-правові виклики. Отримані результати підтвердили важливість розвитку професійно-комунікативних ігрових та громадянських цифрових компетентностей, одночасно демонструючи критичну роль правового компонента в безпековому навчанні. Результати показали, що зростання цифрової та правової грамотності й добробуту позитивно корелює зі швидкістю цифровізації, тоді як економічні шоки воєнного періоду її стримують. Отримані дані доводять резильєнтність української системи вищої освіти в кризових умовах і окреслюють пріоритети післявоєнного інвестування у захищену IT-інфраструктуру та підготовку персоналу. Результати дослідження можуть бути використані в діяльності закладів вищої освіти та інших установ, які впроваджують освітні послуги

Ключові слова: цифровізація; вища освіта; заклади вищої освіти; соціально-правові фактори; воєнний стан; регресійний аналіз; штучний інтелект