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A Systematic Analysis of the Impact of the Military Conflict on the Distance Education System in Ukraine

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Abstract: Distance learning has become one of the hottest educational trends of the 21st century. The COVID-19 pandemic and the war in Ukraine have only accelerated the process of its integration into the education sector. The purpose of this paper is to study the impact of distance education on adaptation to this teaching method and academic performance of students using it in both forms, as well as to find improvements that can be made to it. Methods included a systematic literature review using specific databases and inclusion/exclusion criteria. The databases used were Web of Science, Scopus, and Google Scholar. The results of the study showed that distance learning technologies, such as online laboratories, video lectures, interactive whiteboards, online educational platforms, chats, websites and other instant messaging tools, have become the only adequate response to the organisational challenges that have arisen in the new environment. The abrupt shift from traditional face-to-face learning to innovative forms of learning required a radical restructuring of educational institutions. This process also required students to adapt to new and unusual conditions. The paper outlines the



negative aspects of distance education. It requires high self-discipline on the part of students, which can have a negative impact on their motivation and ability to create the necessary working environment. The lack of personal contact with an educational institution also leads to the loss of its cultural component. It has been found that distance education may be less effective in the absence of personal contact. However, blended learning, which combines traditional and distance methods, can address these challenges and unlock the potential of both forms of learning. This approach can compensate for the limitations of distance education, providing more effective learning and preparing students for future challenges in the globalised digital age.

Keywords: access to educational materials, increasing the interactivity of the educational process, improving the effectiveness of distance learning, information technology, adaptive technologies.

Introduction

Our era is characterised by a brutal transition of society from the post-industrial to the information stage (Zinchenko et al., 2022). This transition affects a large number of factors and processes in human life. Education, being one of the most important and, at the same time, the most innovative institutions in society, is forced to adapt, focusing on technological progress and global geopolitical events (Kutu & Olajide, 2020).

Educational technologies are of central importance and are interested in the intrinsic motivation of educational participants to learn (Laufer et al., 2021), the ability to analyse and systematise information, make quick decisions, and effectively organise the process of their own learning journey (Heck et al., 2020). Traditional forms of education no longer meet the high demands of the labour market and the development of society, and innovative technologies provide students with access to non-traditional sources of information, increase the efficiency of self-employment and offer unprecedented opportunities for creativity and personal expression.

The COVID-19 pandemic and subsequent war in Ukraine have radically changed the traditional learning process (Lavrysh et al., 2022). Faced with the new educational challenges they have generated, educators are faced with finding solutions to the problem of student isolation (Klapkiv & Dluhopolska, 2020). Distance learning, which is now combined with online learning, has become an obvious alternative to group learning in times of war. It became effective during the pandemic and continues to be so in times of war (Atamanyuk et al., 2021). The distance learning format uses the active use of computers and the Internet to improve the quality of learning. Therefore, online platforms are very useful, especially in the process of teaching mathematical disciplines that require great accuracy, precise, fast and reliable graphical display of pedagogical elements. Computerisation of the learning process has proven to be a good way to teach mathematical concepts, especially those based on geometry, calculus, statistics and functional graphs, even before the conditions for distance learning are met.

Despite the fact that distance education has been around for more than a decade, it has been the subject of considerable criticism from academics and education officials until recently (Pacheco et al., 2018). However, the pandemic and the war forced stakeholders to come to a consensus and allowed distance learning to show its full potential in the context of a new educational paradigm. Today, there are signs that distance learning will soon become a



traditional form of education and that it will be included as part of the education system after the war in Ukraine ends.

Research Problem

The problem of the study is that the experience gained during crisis situations, such as the COVID-19 pandemic and military conflict, requires teachers to take an innovative approach to distance teaching. They are forced to adapt to new realities and look for effective ways to ensure the quality of education under the constraints.

Regulations governing the educational process during martial law have become key to ensuring the continuity of the educational process in Ukraine. However, there is a challenge in implementing these regulations in practice and ensuring their alignment with the needs of different groups of educational stakeholders, including children and adolescents from vulnerable families, who are most in need of support and access to quality education in times of crisis (Estrella, 2022).

The Ministry of Education of Ukraine has already committed to working with local organisations to provide lifelong learning, but there is a need to further optimise this process to ensure that educational services are accessible to all, regardless of social status or place of residence.

Research Focus

The impact of war on the accessibility and quality of distance education is significant. The psychological impact of war on students and teachers using distance learning methods can also be severe, as stress and trauma from war can affect their ability to learn and teach. The security and data privacy concerns in the event of a military cyberattack on a distance education system are another serious aspect of the impact of war on education. Criminals can use war as a favourable time to launch cyberattacks that can cause data loss or even disrupt the learning process. Another factor is the loss of resources and funding for distance education infrastructure due to the needs of military conflict. Increased budgetary constraints may lead to a reduction in investment in the development of distance learning, which in turn may deteriorate the quality of education for students in the affected regions. All these factors point to the need for a thorough study of the impact of military conflict on distance education and the development of strategies to ensure the safety, accessibility and quality of the educational process in the context of military conflict. This study is aimed at analysing the legal framework governing the educational process during martial law in Ukraine, as well as at analysing the use of e-learning tools in higher education institutions (HEIs) of Ukraine and foreign experience in extreme conditions.

Research Aim and Research Questions

In this context, the main research questions are:

What features of e-learning have emerged during martial law in Ukraine?

What e-learning practices exist in the world in extreme conditions?

What experience has been gained from implementing e-learning in other countries?



These questions will allow us to systematise and analyse the current state of e-learning in higher education during crisis situations, as well as identify key aspects for further improvement of this form of education in Ukraine.

Literature Review

The purpose of this literature review is to find out the impact of the military conflict on the distance education system in Ukraine. This topic requires a systematic analysis of the consequences of this conflict, as well as the identification of unexplored problems that arise in the context of this situation. One of the possible aspects, the actual impact of the war on the infrastructure of distance education in Ukraine, should be investigated first. This review also examines the impact of the military conflict on the psychological state of students and teachers who participated in distance education programmes. It also analyses the possibilities of expanding distance education in times of war and develops new methods and approaches to ensuring the quality of education in conflict. The presented literature review will help to develop effective strategies for the restoration and reform of the distance education system in Ukraine after the end of the conflict.

The study by Hwang (2018) examined the implementation of individualised curricula, as well as the peculiarities of developing a student-centred distance learning programme. Pedagogical and psychological tools to increase students' motivation for distance learning were studied by Bennett et al. (2020). Promising ways to increase student engagement in distance learning, as well as methods of encouragement in this format, are presented by Kavitha and Dhanalakshmi (2019).

The key features of the personal journey model, namely the ability to learn at one's own style and pace, were explored by Hussar et al. (2020). Shevchenko (2019) studied the improvement of students' academic performance and success through online teaching. The development of critical thinking among humanities students in the context of distance education was the subject of a study by Raes et al. (2020).

Forms of implementing individual learning in a blended learning format were considered by Aghion et al. (2021). Group activities and interaction of students in the distance learning format were studied by Yang and Spitzer (2020). The characteristics of feedback as a psychological phenomenon in distance learning were studied by Abubakar (2020).

In order to study the possible problems and risks of distance learning, it is advisable, in our opinion, to compare it with the experience of other countries and to identify its advantages and disadvantages.

Materials and Methods

This study used a systematic analysis to examine the impact of the war on the distance education system in Ukraine. The methodology included a systematic literature review using specific databases and inclusion and exclusion criteria. Research topics were investigated and various methods were used, such as bibliometric analysis and document analysis. Bibliometric analysis was used at the initial stage of the research to answer the first and second research questions. At a time when empirical contributions generate a large volume of disparate and debated research areas, bibliometric analysis is of particular value for mapping science.



Bibliometrics is particularly useful for mapping scientific knowledge. The WoS database provides information on results, dissemination, collaboration and impact. Thus, bibliometric analyses can be performed using data related to research outputs.

Data Collection

In the second phase of the study, documentary analysis was used to address the third research question. Documentary analysis, as a qualitative method, involves a systematic process of analysing and evaluating documents through the identification, selection, evaluation and synthesis of the data contained in them. The literature search was conducted using leading academic databases, including Web of Science, Scopus and Google Scholar. These databases were selected for their comprehensive coverage of academic articles, conference proceedings and other relevant publications related to both distance education and the impact of war.

Other types of review studies focus on specific issues in education policy, such as narrative reviews, voice studies, meta-analyses, meta-syntheses, best evidence syntheses, and meta-ethnography. All of these types of studies can be considered systematic reviews. Studies that provided empirical evidence, theoretical findings or practical implications were considered. Exclusion criteria included studies that were not directly related to distance education or did not have significant relevance to the Ukrainian context.

Data Analysis

The sample for this systematic analysis included studies and publications identified during the literature search. The selection process included a comprehensive search strategy using keywords such as 'distance education', 'war', 'Ukraine' and other relevant terms. The articles were subjected to a rigorous review based on predefined inclusion and exclusion criteria.

The study used the advanced functionality of the search engines of each database to ensure full coverage of the relevant literature. Boolean operators and specific search phrases were used to refine the search results.

These reviews help to ensure that policy decisions are not based on the findings of a single study. Policymakers and researchers use multiple studies to identify patterns, consistency, fragility and variability across similar studies. In this way, these reviews contribute to the knowledge base of education policy. However, these reviews focus on specific questions to see if there is consistency or variability in findings across studies on specific issues, such as improving low-performing secondary schools. Once the articles were identified and retrieved, a systematic approach to data analysis was applied. This included categorising the articles by thematic focus, methodologies used, key findings and implications for the distance education system in Ukraine during the war.

Results

Due to the war situation in Ukraine, most educational institutions have been forced to remain in a distance learning format (Bakhmat et al., 2022). The Internet has already succeeded in changing the world of education not only for students and teachers, but also for coordinators and administrators. The war in Ukraine has limited many opportunities for students and teachers across the country and made it virtually impossible to implement traditional forms of education in



these dangerous conditions. In this context, regulations governing the educational process during martial law have become key to ensuring the continuity of the educational process in Ukraine, but there are certain aspects that are beyond the control of the government (Table 1):

Table 1

Regulations Governing Distance Education

Aspect	Responding entity
Responsibility of parents	Parents are required to provide safe learning environments, technical facilities and access to the Internet.
Legal regulation	Distance learning in wartime can be used without the separate consent of parents, but is temporary.
Organisation of the educational process	Ensuring safe learning environments, including compliance with health and safety regulations and personal data protection.
Labour relations	Remote work for teachers requires a clear formalisation through an order on the introduction of a remote mode.
Legal aspects of distance education	The absence of a separate legal status for distance schools complicates their regulation and organisation.

Source: Author's development.

Responsibility and self-discipline are key in distance education. Students have the option to remain formally present in a distance learning session even when they mute their videos and microphones, which is a convenient option for students (it allows them to deal with personal or domestic issues that distract them from the learning process) (Pacheco, 2021). However, this practice has a demobilising effect on other participants (Huer et al., 2019). This is due to the fact that other students are less actively involved in the educational process, drop out of the general discussion, and teachers are forced to interrupt the course and exclude inactive people (Langset et al., 2018). The lack of effective learning tools to address such situations can significantly reduce the effectiveness of online teaching.

Before the pandemic and the war, the educational institution was a meeting place for students, and at the same time an important psychological resource, a social place for communication and part of the educational environment. In some cities of Ukraine, the physical existence of the institution has become scarce since February 2022 due to the war. Educational institutions may disappear in the future if students decide to study remotely after the war ends. The culture of universities risks being gradually eradicated by the distance education model (Namestyuk et al., 2020).

In some places, the high requirements for technical equipment for the distance learning process and the constant availability of an internet connection, which is an integral part of distance learning, can be an insurmountable obstacle (Nørgård & Hilli, 2022). This makes this form of education vulnerable and dependent on external factors, which was not a limiting factor in face-to-face education. In this context, Ukrainian HEIs have introduced e-learning tools to minimise the disadvantages of distance education (Table 2):

**Table 2***Experience of Using E-Learning Tools in Some Higher Education Institutions of Ukraine*

HEI	E-learning tools	Results achieved
National University of Kyiv-Mohyla Academy	Use of mobile solutions at the corporate level, cloud infrastructure, virtual environments by teachers	Improving access to educational materials, increasing the interactivity of the learning process, and improving the effectiveness of distance learning.
National University of Ostroh Academy	Systematic application of information technologies, social and educational networks	Increase the level of student self-organisation, improve communication between students and teachers, and stimulate collaborative learning.
Ivan Franko National University of Lviv	Use of modular learning platforms, adaptive technologies	Increasing the individualisation of learning, increasing the availability of educational resources for students with different levels of training.

Source: Kotyk et al. (2021).

According to Howard et al. (2021), the use of technical means and prolonged concentration on the monitor screen as a prerequisite for the inclusion of a student in the distance learning environment affect the personality. Existence and successful activity in a new space for the student also puts forward a large number of specific requirements, such as the ability to isolate and analyse the necessary information from the general flow, the ability to formulate questions or requests concisely and competently, the ability to properly distribute the workload and quickly process the information received (Malimon et al., 2022).

Therefore, it is safe to say that distance education has a number of negative characteristics and is not a perfect form of education. High requirements, dependence on technical equipment, psychological artefacts that appear in the learning process, all of which can negatively affect a student's adaptation to new conditions and, as a result, their academic performance (Nashir & Laili, 2021). A number of scholars suggest blended learning as a more effective alternative to distance learning alone. After analysing the foreign experience of e-learning implementation, the following results can be identified (Table 3):

Table 3*Foreign Experience of Implementing E-Learning in Extreme Conditions*

Country	What was implemented and results
United States of America	Use of virtual classrooms, video conferencing and online platforms to provide learning during natural disasters or epidemics. Increasing the accessibility of the educational process, reducing interruptions in education, and maintaining the stability of the educational process.
Japan	The widespread use of online learning platforms during natural disasters, including earthquakes and typhoons.



Ensure continuous learning, reduce the impact of natural disasters on the educational process, and improve emergency response.

India

Use of mobile technologies and online platforms to provide education in regions with low access to education.
Increasing accessibility of education for vulnerable groups of the population, growing interest in learning through innovative technologies.

Source: Nouraey et al. (2023).

Distance education provides various options to improve performance. One of the subtypes of distance education is becoming popular - blended learning. Blended learning refers to the combined use of face-to-face learning in the traditional sense of the term and distance learning using Internet technologies (Weerathunga et al., 2021), which allows students to combine self-education through effective online technologies (virtual laboratories, distance learning internships, communication and exchange of experience with teachers and specialists from around the world) and group learning at the university.

Thus, it is sometimes referred to as flexible blended learning (Alam, 2022). Blended learning is the best answer to the needs of modern learners for flexibility in choosing what topic they want to study, when, where and how, and in accordance with a student-centred learning model (Sohel et al., 2024). According to Galagedarage and Indrasena (2023), hybrid learning technologies will reach more education participants around the world and achieve sustainable development goals. Hybrid learning, a synergy of face-to-face and distance learning, is gaining momentum and seems to be favoured by students as it actively integrates student-centred curricula and is flexible to meet student needs depending on external factors and individual characteristics (Tomczyk & Walker, 2021).

Although the distance component of blended learning is considered by many scholars to be the key component, blended learning can significantly expand the understanding of face-to-face learning, change the learning environment, and provide more freedom for students (Sherman et al., 2022). Blended learning allows learners the flexibility to follow their own plan and rely on their own learning style, learn at their own pace, pursue their personal project, and adapt their education to challenging or dangerous life situations. Hybrid learning also offers a high level of accessibility, allowing students to access materials from anywhere and at any time, while benefiting from personal support and teacher intervention (Hamzah et al., 2021).

Modern education must meet the expectations of students in order to make effective use of the relevant technologies. In the context of distance learning, the creation, formatting, storage, sending, delivery and review of learning materials is entirely dependent on technical support. Technology is the main condition for a smooth transition from classroom to blended learning (González et al., 2020).

The effectiveness of this step is highly dependent on the technical resources and skills of the IT team. Technological support for distance learning involves a one-time investment, as well as further support for the educational infrastructure (Fuad et al., 2020). The COVID pandemic and the war have made distance education a possible new step to save education in crisis, and the



technologies developed for this purpose have become the main means of its implementation (Cherng & Davis, 2019).

Thus, this need for technology has made experience and technical know-how imperative for all teaching and administrative staff as well as students (Downton, 2017). The main factor influencing the use of technology is its perceived value to students as part of the organisation.

The ease of use of technology related to teaching and learning will influence the actual use of the distance learning system. Most learners prefer to use technologies based on platforms that allow them to connect personal computers, mobile devices or smart tools. The main thing is that the complexity of their use is significantly reduced (Chen et al., 2017).

The relative benefit of using technology to implement distance learning reduces barriers and increases educational potential, while the foreseeable risks are minimal, given the current military situation in Ukraine (Mykhailyshyn et al., 2018). The obvious transformations in the structure of the educational process determine the nature of the professional activity of academic staff. A teacher working in a distance education system is forced to rebuild, master a new set of professional skills to become a facilitator who organises and directs forms of group work to increase their effectiveness.

In the new system of interaction, it is the student who is central to the learning process, while the teacher is entrusted with the function of advising, organising the learning and creative process, but is no longer the main resource for information (McIntyre et al., 2021).

A number of scholars also note that the human factor is crucial in the implementation of a distance learning system (Sutisna & Vonti, 2020). The administration of the educational institution should not only promote awareness of the need for change, but also ensure a smooth and "painless" transition through social and psychological training, professional development programmes, exchange of experience, etc.

The development of e-learning in Ukrainian higher education institutions requires a comprehensive approach and a careful strategy. Here are some recommendations for the further development of e-learning in Ukrainian higher education institutions: strengthening infrastructure and technical support, expanding the availability of information and communication technologies (ICT) and learning platforms such as Learning Management Systems (LMS), introducing mandatory training programmes for teachers on the use of e-learning, content creation, student support, monitoring and evaluation, and stimulating innovation.

These recommendations are aimed at creating favourable conditions for the effective implementation of e-learning in higher education in Ukraine, which will improve the quality of education and training of future professionals in the digital age.

The literature review allows us to conclude that the successful implementation of distance learning technology in a crisis situation was made possible by addressing the problems, advantages and disadvantages described above. Neglecting or ignoring any of the above conditions would prevent the achievement of the expected results and significantly reduce the effectiveness of distance education.



Discussion

Thus, the purpose of the study was to assess the impact of the military conflict on the distance education system in Ukraine. In this context, it should be added that the current experience of other countries allows us to highlight the following strengths of online teaching:

- Students can better manage their schedules and study programmes with online tools. This gives them the opportunity to take online courses and live the same way without risking their lives, sacrificing work and family life for the sake of their studies (Syarifah et al., 2020). Distance education serves the purpose of psychological harmony in their lives, which is an important factor for successful learning (Stukalo & Simakhova, 2020). It also allows students to improve their skills without leaving their workplace.

Some scholars, such as Vilorio et al. (2020), believe that distance learning is currently the only way to fit teaching into the busy schedule of the average person.

In addition, according to VanScoy (2019), travel costs to an educational institution are significantly reduced or eliminated, and direct costs of education are reduced by lowering tuition fees, costs of maintaining facilities, and staff salaries. All of this increases the accessibility of education and makes it available to a wider audience of students.

The classroom can be replaced by a comfortable home environment for students (Petrenko et al., 2020). With the necessary technical equipment, students have the opportunity to train from any safe and comfortable place in the world, increasing the volume of educational flows and at the same time reducing the cost per student. The same applies to teachers, who have the opportunity to create their own classroom in a location of their choice. The initial cost of investment is high (especially for equipment and technical support), but it is a one-time investment, while the profits will pay for the investment in the following months.

At the same time, there are a number of negative aspects of distance education that scientists mention in their works.

Distance learning is demanding on a student's self-discipline, as it depends on a much larger number of factors in a distance learning environment, while in a classical full-time situation, the conditions are set by the administration of a higher education institution (Reed & Jahre, 2019). In a related study, Tsekhmister et al. (2021) emphasise that a high level of self-discipline is one of the distinguishing features of a mature person. As a consequence, the effectiveness of distance teaching is likely to be reduced in the first years of university study due to the lack of skills students need to control and regulate their educational activities.

Many studies have focused on the analysis of independent work. According to Hylén (2021), home studying can have a negative impact on student motivation or even interfere with the necessary work environment, although research shows that some people can combine it with home comfort and family life, achieving success in the learning process. However, home learning environments can have a negative impact on a student's adjustment and academic performance, mainly due to the large number of distractions (parents, household chores, noise, etc.). Creating a space conducive to learning is one of the prerequisites for an effective process, especially when it comes to distance education, which is characterised by social distancing and lack of close contact with other participants in the educational process.



In a related study, Riyanda et al. (2022) describe the essence of distance education, which is the transfer of key elements of the learning process and the transformation of the role of the teacher and the student's responsibility for their learning. According to the authors, the teacher is no longer the main person who transmits information. It gives way to other sources (primarily the Internet environment) and there are prerequisites for the development of cooperative learning (peer-to-peer learning, collaborative learning, cooperative learning). In the current learning environment, this model is based on the active implementation of online learning, as well as on the increased role of independent work and creative activity of students, which, in turn, requires special attention to the problem of planning, forecasting and designing a course, as well as organising the learning process.

Existing research has shown that the distance education model significantly increases the level of autonomous work of students in extracurricular activities (Qureshi et al., 2021). In addition, using this model simultaneously increases the level of educational autonomy of participants, which contributes to increasing their intrinsic motivation in the learning process, allows them to effectively use various pedagogical tools, which, in combination with the teacher's pedagogical competence, allows them to jointly build individual educational trajectories.

The main limitations of the presented study are as follows: geographical limitations: the study will be conducted only in Ukraine, given the impact of the military conflict on the distance education system in the country; time limitations: as the study focuses on the period from the beginning of the military conflict to the present, limited resources and restrictions on access to financial, human and material resources may affect the depth and scope of the study.

Conclusions and Implications

The COVID-19 pandemic that the world has had to face, followed by the war in Ukraine, has had an impact on education that can be considered irreversible. By limiting the available teaching tools of teachers through quarantine restrictions and almost completely destroying the teaching environment in war zones, these geopolitical shifts have challenged the classical and established learning process.

In answering the research questions, the following can be emphasised:

During the martial law in Ukraine, e-learning has been challenged by the need to provide education opportunities for pupils and students despite limited connectivity and movement. Some of the practices for implementing e-learning in such circumstances may include the use of special online learning platforms that can be accessed even in the case of limited Internet access, the use of electronic manuals and interactive materials, webinars and online lessons via video.

In other countries in extreme conditions, there are also some e-learning practices that can be useful in similar situations. For example, in Africa or South America, where infrastructure and access to education may be limited, mobile learning platforms, special offline learning apps, video courses and online tests are used.

The experience gained from implementing e-learning in such environments shows that with the right technologies and methods, access to education can be ensured even in the most difficult times. Adapting to extreme conditions requires creative and innovative approaches to learning,



but such challenges can lead to the development of new and important learning methods that will be useful in normal circumstances.

Suggestions for Future Research

Future research is increasingly focused on evaluating and comparing the effectiveness of different hybrid learning models. These models combine traditional face-to-face learning with online components, aiming to optimise learning outcomes and educational experiences. Hybrid learning has gained importance, especially in response to the COVID-19 pandemic, which has accelerated the adoption of digital tools and distance learning methodologies. One of the main goals of future research is to better understand how different hybrid learning models affect student engagement, knowledge retention, and overall academic achievement. In addition, future research could focus on the technological infrastructures and support systems required for successful hybrid learning implementation. Another critical area of research is the socio-economic and cultural factors that influence the adoption and effectiveness of hybrid learning models in different educational environments. Future research could also consider the long-term effects of hybrid learning on student outcomes beyond academic achievement, such as socio-emotional development, critical thinking, and readiness for career challenges. By improving these models and strategies, educators will be better able to prepare students for the changing demands of the globalised digital age.

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Conflict of Interest

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