"Distance learning as a tool for enhancing university academic management processes during the war"

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NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
32	0	1

BUSINESS PERSPECTIVES

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DISTANCE LEARNING AS A TOOL FOR ENHANCING UNIVERSITY ACADEMIC MANAGEMENT PROCESSES DURING THE WAR

Abstract

The ongoing war in Ukraine has posed unprecedented challenges to traditional education systems, disrupting learning and affecting education quality. As universities adapt to these challenges, the growing reliance on distance learning strategies becomes crucial for maintaining academic management processes. This paper investigates the role of distance learning tools in addressing wartime challenges and enhancing university academic management.

Utilizing a mixed-methods approach, the study combines quantitative data analysis of student performance with qualitative insights from educators and students affected by the war. The results prove the effectiveness of distance learning tools in maintaining education quality during the war while also addressing the unique challenges faced by universities in conflict areas.

The findings reveal that distance learning tools serve as a valuable resource for universities to mitigate the negative impact of the war on education quality as part of academic management processes. However, specific challenges such as developing digital competencies, ensuring access to technology, and designing effective distance learning materials must be addressed in war-related disruptions.

The quantitative analysis of student performance data highlights the potential of innovative distance learning tools in maintaining education quality during crises and wars. However, the efficiency of their use during the large-scale war in Ukraine has shown a decline and thus necessitates further research. Nevertheless, these insights provide valuable guidance for educators and academician managers to support students and educators during challenging times.

INTRODUCTION

In recent times, global crises and conflicts, including wars, natural disasters, and pandemics, have disrupted everyday life and educational systems. These disruptions have led to university closures and learning process interruptions. In such circumstances, distance learning has emerged as a practical alternative to traditional face-to-face education.

The large-scale war in Ukraine has brought new challenges to the education system. By May 2022, the war had caused over 6 million Ukrainians to flee to neigh countries, including nearly 665,000 students (16% of the total enrolled students) and over 25,000 educators (6% of the country's total educators). In addition, another 8 million Ukrainians have been displaced within their own country (The World Bank, 2022). These circumstances have created new problems for the education system and the implementation of distance learning tools.

The ongoing war in Ukraine and the necessity to adapt to the challenges resulting from russian aggression have made the digital transformation of education an urgent issue for academic management. From both theoretical and practical perspectives, it is worth examining the historical, cultural, and political factors that have shaped the development of Ukraine's education system and its current state of educational technology. Bakhmat et al. (2022) underscore the difficulties educators and students face in conflict-stricken regions, such as limited access to resources and damaged infrastructure. Bakhmat et al. (2022) also delve into the potential advantages of digital transformation in education, encompassing increased accessibility, flexibility, and innovation. Therefore, they highlighted the significance of fostering digital literacy skills and supporting teachers and students to utilize digital tools effectively.

Overall, addressing digital transformation challenges and opportunities in the Ukrainian education system amid war is essential, with further research required to examine digital technologies' impact on learning outcomes. Therefore, this study aims to analyze the challenges and opportunities of distance learning during the war, specifically focusing on its implications for education quality for Ukrainian universities that actively implement digital innovations.

1. RESULTS

1.1. The role of digital technologies in the educational process

Glazunova et al. (2017) focus on using Microsoft SharePoint for organizing group project work in higher education institutions. Glazunova and Voloshyna (2017) propose a model for a hybrid cloud-oriented educational environment for formal and informal learning of IT students. Finally, Glazunova and Shyshkina (2018) discuss designing and implementing a university cloud-based learning and research environment. These studies highlight the importance of digital technology in enhancing the learning experience for students and provide insights into practical strategies for incorporating digital tools into educational settings.

Polianovskyi et al. (2021) discuss the digital and technological support of distance learning at Ukrainian universities during the pandemic. Back et al. (2021) and Kozlovskyi et al. (2021) explore the changes to shared resource laboratory operations during the initial global COVID-19 lockdown in 2020. Finally, Dietrich et al. (2020) examine the attempts, successes, and failures of distance learning in the context of chemistry education during the pandemic. These studies emphasize the impact of the COVID-19 pandemic on education and the rapid adaptation of digital technologies to continue teaching during the pandemic.

Morze and Glazunova (2019) explore the development of professional competencies for information technology university teachers. Skrypnyk et al. (2020) and Kozlovskyi et al. (2020) discuss digital competence for the population to foster economic growth. Kuzminska et al. (2020) examine the components of digital learning environments in Ukrainian universities and their influence on the competence of students and teachers. Finally, Vdovychyn et al. (2022) focus on Google digital tools for organizing the pedagogical university's educational process during the war, such as the Ukrainian conflict. These studies illustrate the significance of digital competencies in education and strategies for developing and utilizing them effectively in war.

The ongoing military aggression by the russian federation against Ukraine has exposed new challenges in academic management at all levels. As a result, further advancements are needed to enhance the effectiveness of distance learning under war conditions. Moreover, it is crucial to analyze the achievements of Ukrainian universities, which use innovative distance learning tools to maintain education quality (Koziuk et al., 2020).

The literature suggests that digital and technological support was crucial in improving distance learning during the COVID-19 pandemic. Various digital tools and platforms, such as Microsoft SharePoint and Google digital tools (Glazunova et al., 2017; Vdovychyn et al., 2022), have allowed for effective organization and management of the educational process. Moreover,

hybrid cloud-oriented educational environments (Glazunova & Voloshyna, 2017) and university cloud-based learning and research environments (Glazunova & Shyshkina, 2018) have provided students and teachers with a more comprehensive and collaborative learning experience. However, digital technologies also brought about challenges, such as the need to develop digital competencies among teachers and students (Skrypnyk et al., 2020) and adequate digital infrastructure and resources (Polianovskyi et al., 2021).

Regarding academic process support, learning management systems (LMS) have been widely adapted to control and deliver online courses (Morze & Glazunova, 2019). Aldosari et al. (2022) also suggest that instructional design models can be utilized through an LMS to develop effective online learning strategies. Furthermore, Ifenthaler (2022) used data and analytics to monitor and improve the quality of distance education. Ukrainian universities must adopt and adapt these practices to maintain education quality and provide adequate distance learning opportunities during the war. By building on the experiences and insights from the COVID-19 pandemic and incorporating LMS, instructional design models, and data-driven strategies, these institutions can better support students and educators in navigating the unique challenges posed by the ongoing conflict.

However, this improvement in distance education systems requires increased digital competencies among teachers and students. For example, Kuzminska et al. (2020) showed that a lack of digital competencies among teachers can lead to limited use of digital tools and platforms and difficulty adapting to changes in the online learning environment. Similarly, students with low digital competencies can experience difficulty accessing and navigating online course materials (Ifenthaler, 2022).

To improve digital competencies, various strategies have been proposed in the literature. For instance, teacher training programs focusing on developing digital competencies can enhance teachers' ability to design and deliver effective online courses (Skrypnyk et al., 2020). Such programs can include training on using digital tools and platforms, instructional design models, and effective online teaching strategies.

Similarly, the literature suggests that student training programs can enhance digital competencies and improve online learning outcomes. These programs can include training on digital literacy, information management, and digital communication skills (Dietrich et al., 2020). In addition, interactive digital learning materials and gamification can enhance student engagement and motivation in online learning (Li & Wang, 2021).

Therefore, strategies such as teacher and student training programs, interactive digital learning materials, and valuable instructional design models can enhance digital competencies and lead to more successful online teaching and learning experiences. These approaches are particularly crucial for universities in Ukraine during the war, as they strive to maintain education quality and accessibility in challenging circumstances.

1.2. Challenges and opportunities for distance learning during times of war

During the war, traditional education systems can be severely impacted, leading to disruptions in learning and decreased education quality. Universities may be damaged or destroyed, making it difficult or impossible for students to attend classes. Academic staff and students may also face safety risks, leading to further decreased attendance and participation. In addition to physical disruptions, wars can lead to economic instability and poverty, which can significantly impact education. Families may struggle to afford tuition fees or need their children to work to support the family, leading to decreased enrollment and attendance rates.

By May 2022, Ukrainian refugees and internally displaced persons (IDPs) were primarily composed of vulnerable groups, such as children, women, and older people, with over 74% of IDPs having children in their households. The displacement has had a significant impact on the provision of education services and the damage and destruction of educational facilities. As of May 6, 2022, the Ministry of Education and Science of Ukraine (MoES) reported that 1,635 schools and universities (5% of the total) have been damaged by the war impact, and 126 have been completely destroyed (The World Bank, 2022).

Furthermore, during the war, there may be a shortage of qualified teachers and resources, such as textbooks and technology, leading to further challenges in providing quality education. Distance learning can offer an alternative solution to these challenges. By utilizing digital technologies and online platforms, students and teachers can continue their education remotely, regardless of physical location or safety concerns. This can help to ensure continuity of education and improve access to learning opportunities during the war, specifically for Ukrainian universities implementing digital innovations in their academic management processes.

However, distance learning also presents its own challenges. For example, students may lack access to technology or internet connectivity and need additional help with self-directed learning. Teachers may also require additional training and support to effectively utilize digital technologies and provide quality distance education.

As a response to the challenges of traditional education systems during the war, distance learning has emerged as a viable alternative for continuing education and improving access to learning opportunities. In the context of the Ukrainian war, academic management processes must adapt and address these challenges to maintain education quality and ensure students and educators are equipped to succeed in a digital learning environment. One such solution that has gained traction in recent years is MOOCs (Massive Open Online Courses) for delivering online education to many learners, including during times of crisis and war. MOOC platforms such as Coursera, edX, and Udemy.com have provided learners with access to a wide range of courses from top universities and institutions (Gómez Gómez & Munuera Gómez, 2021; Rajas-Fernández et al., 2021).

Given the full-scale war in Ukraine, free access to MOOC platforms for Ukrainian citizens has offered an innovative international approach to education. This accessibility has allowed teachers and students to continue their education despite the challenges imposed by the war. However, the debate surrounding the effectiveness and quality of MOOCs is ongoing, with some studies supporting their role in providing access to education

and promoting lifelong learning (Gómez Gómez & Munuera Gómez, 2021), while others question their efficacy in improving learning outcomes and skills (Butnaru et al., 2021; Stracke & Trisolini, 2021). To optimize the potential of MOOCs in the context of the war in Ukraine, it is crucial to address these limitations. This can be achieved by incorporating personalization strategies, such as adaptive learning and personalized feedback, and by implementing robust assessment methods (Ilyash et al., 2020; Kuzheliev, 2015) to accurately measure learning outcomes and skills acquisition. By doing so, MOOCs can better support the educational needs of Ukrainian citizens during this challenging time.

Video materials and screencasts have become valuable tools in distance learning, providing an alternative to traditional lecture-based teaching. Various platforms and tools, such as Webex, Zoom, Google Meets, Microsoft Teams, and OBS, have enabled educators to create and share engaging content that students can easily access through learning management systems and other digital platforms.

Giannakos (2013) and Kay (2012) showed that video materials and screencasts can be more effective than traditional lectures in improving student engagement and understanding of complex concepts. However, as mentioned, the effectiveness of these materials may depend on factors such as video quality, content, and alignment with students' learning goals.

The video materials and screencasts can enhance the learning experience and give students access to high-quality, engaging educational content. However, the design and implementation of video materials and screencasts should be carefully considered to ensure their effectiveness and relevance to the student's learning goals. Indeed, video materials and screencasts can significantly improve the learning experience for students in distance education. They can offer an engaging and interactive way to learn new concepts, providing students with visual and auditory elements to enhance their understanding.

In summary, distance learning is crucial in enhancing university academic management processes during the war by providing continued ac-

cess to education, utilizing digital technologies, and fostering the development of digital competencies. Additionally, distance learning emphasizes personalization, collaboration, flexibility, and adaptability, while offering targeted training programs for both teachers and students to ensure successful online education experiences during challenging times.

1.3. Impact of distance learning tools on education quality during the war

Distance learning can provide an alternative solution to the challenges faced during the war, allowing students and teachers to continue their education remotely, regardless of physical location or safety concerns. However, the effectiveness of distance learning may vary across different disciplines and fields of study. Therefore, this study analyzed a dataset related to the academic achievements of more than 200 bachelor-level students enrolled in the National University of Life and Environmental Sciences of Ukraine and the National University of Kyiv-Mohyla Academy during 2019–2022. To ensure the sample's statistical homogeneity and protect personal data, the

information was normalized using the max-min method in the range from 0 to 1 (from the minimum passing score to the maximum score obtained on identical scales) (Table 1).

Column 2 of Table 1 ("All Disciplines") shows the average value between the minimum and maximum grades on the normalized scale for all disciplines and students for the considered period (excluding students who had academic debts). Columns 3 and 4 show the grade values for all students in the considered period, divided by disciplines that used traditional distance learning methods (column 3) and innovative (active or interactive) distance learning methods (column 4). Column 5 reflects the average performance for 4th-year students, with the enrollment year of 2019. Finally, column 6 represents the average academic debt percentage for the entire period.

Table 1 illustrates that students' academic performance before COVID-19, during the pandemic, and during the large-scale war in Ukraine did not exhibit significant differences except for the number of academic debts. It should be noted that the analysis of average grades excluded students with academic debts.

Table 1. Students' academic accomplishments during 2019–2022 (specialty "Economics")

Years \ Semesters	Average Standard deviation of Student Grades*				
	All Disciplines	Selected Disciplines		All disciplines for the 2019 enrollment groups	Academic debt (adjusted percentage)
		Traditional DL tools	Innovative DL tools		
2019 / 2	0.35	0.22	0.34	0.37	0.00
	0.25	0.18	0.25	0.26	0.00
2020 / 1	0.36	x	x	0.38	0.00
	0.27			0.28	0.00
2020 / 2	0.40	0.39	0.27	0.29	0.12
	0.27	0.33	0.24	0.26	0.30
2021 / 1	0.40	x	x	0.31	0.11
	0.32			0.27	0.31
2021 / 2	0.54	0.41	0.55	0.36	0.06
	0.29	0.28	**0.32**	0.26	0.05
2022 / 1	0.44	x	x	**0.29**	0.11
	0.48			0.28	0.07
2022 / 2	0.39	0.33	0.38	**0.38**	0.04
	0.26	0.27	0.32	**0.31**	0.09
p-value for ANOVA	0.002	0.256	0.060	0.108	0.043
p-value for Kruskal-Wallis test	0.0002	0.147	0.031	0.097	0.001

Note: * student grades are normalized and presented without academic debts; "x" means that the data are available for only one semester; bold values show the presence of significant changes for this observation.

The analysis results (Table 1) indicate that student performance is heterogeneous across the years of pandemic and war. However, for disciplines that employed innovative technologies in teaching during 2021 (the active implementation of key distance learning innovations during the COVID-19 pandemic), education quality significantly improved, as evidenced by the increase in average grades from 0.27 to 0.55. Unfortunately, for these disciplines, a considerable decline is observed during the war period, with average grades dropping from 0.55 to 0.38. This decline suggests that while innovative distance learning tools improved educational outcomes during the pandemic, their effectiveness diminished during the war, highlighting the need for further investigation and adaptation of these tools to address the unique challenges presented by the ongoing conflict.

In general, the findings suggest that the application of distance learning technologies, particularly innovative ones, enhances the quality of education for students engaged in learning (i.e., those without debts). However, during the COVID-19 crisis and the war, the number of academic debts for students with more than one per semester has increased substantially.

The observed improvement in average grades for disciplines utilizing innovative technologies in 2021 implies that incorporating advanced tools can positively affect student performance during challenging times. Nevertheless, it is crucial to acknowledge that other factors, such as student motivation, adaptability, and access to resources, may have contributed to this improvement.

The decrease in average grades during the war period (2022) can be ascribed to a range of factors, including heightened stress, disruptions in internet connectivity, or limited access to educational resources. To develop targeted interventions that can effectively mitigate the impact of these factors on education quality during times of the full-scale war in Ukraine, it is essential to conduct further investigations.

The increase in academic debts during the COVID-19 crisis and the full-scale war in Ukraine indicates that some students faced challenges adapting to these situations. Identifying specific obstacles and providing tailored support is crucial for their academic success. A deeper understanding of factors affecting education quality during such periods is essential. Future research should explore individual and contextual factors influencing academic performance during crises and wars. Continuous evaluation and adaptation of distance learning strategies are vital for maintaining education quality across disciplines during times of war.

CONCLUSION

The aim of this study was to investigate the role of distance learning in maintaining education quality during the war. The findings demonstrate that effective management strategies, the development of digital competencies, and thoughtful design and implementation of distance learning materials can address the challenges posed by such situations.

The literature review and quantitative analysis revealed that distance learning technologies can maintain or even improve education quality during the wars, despite varying effectiveness across different fields of study. In addition, the student performance data showed stable average grades throughout the crisis and the war period, indicating the potential of distance learning in maintaining education quality during challenging times, particularly for traditional distance learning tools.

Critical opportunities for improving education quality during the war include developing digital competencies through training programs, using digital learning materials, implementing effective instructional design models, and leveraging MOOCs as supplementary resources. Additionally, implementing innovative learning methods during wartime requires an individualized approach and psychological support.

Further research should explore the impact of distance learning tools on other aspects of academic management processes during the full-scale war in Ukraine, identify additional strategies for improvement, and examine the specific challenges faced by different student populations during wars to ensure equitable access to high-quality education.

AUTHOR CONTRIBUTIONS

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