

PAPER

Teaching Technologies Online: Changes of Experience in Wartime in Ukraine

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ABSTRACT

Online higher education in Ukraine has undergone changes during the Russian-Ukrainian war. Teaching online in wartime is stressful, but also encouraging; it is a way to overcome the stress of war. The purpose of the research is to showcase the changes in experience during wartime in Ukraine with respect to teaching methods and online technologies. To achieve the purpose, the methods of analysis and synthesis, questionnaires, and calculating methods, particularly MS Excel, are applied. There were 49 university teachers from Ukrainian government universities who took part in the study. The survey aims to find out how university teachers are ready to use new online teaching methods and techniques, to determine the priority in the method choice, and to indicate how to organize and have online lectures and practical classes. The following were the results observed: In the current situation, the relationship between teachers and students has become completely virtual. The teachers' responsibility towards their students has increased significantly. Teachers are convinced of the global trend prospects of perceiving online teaching as one of the relevant and appropriate education forms in wartime Ukraine. It was online teaching that allowed students to continue their learning at Ukrainian universities, as many students were forced to leave their homeland, Ukraine, to save their lives. The conclusion is that teachers became more confident in assessing their skills to organize online teaching, and they tried to develop them by mastering new Internet technologies for transferring educational content.

KEYWORDS

online, method, technique, means, university, teacher, Ukraine

1 INTRODUCTION

The higher education state in Ukraine changed after the pandemic and during the Russian-Ukrainian war. Ukrainian universities determined online education and teaching technologies, starting to work 1–2 months after the war began, including different aspects that need to be taken into account when having online education.

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The external conditions were anxious and troublesome. Being all the time under airalarm, or sometimes under bombing, shelling it was necessary to use teaching technologies online, including changes of experience in wartime. Teaching online in wartime is still going on, it is stressful, and it makes the mental health of both, teachers and students, worse, but it is encouraging as university teachers and students have a constant motivation to communicate, and socialize while teaching and learning. And it considers as it is a way to overcome war stress [1].

The world community and leading international institutions do not cease to be surprised by the “Ukrainian educational phenomenon”, because in the conditions of martial law, Ukraine managed not only to continue the educational process, but also to prepare and start a new academic year. It is clear that in the conditions of martial law, Ukrainian education faced several challenges of security, humanitarian, psychological, and infrastructural aspects, the indicators were the death and injury of people, students, and children, the destruction of educational institutions, the lack of conditions for regular food and living, internal displacement to safer regions, emigration abroad.

Thus, the purpose of the research is to show changes in experience in wartime in Ukraine in teaching technologies online.

2 LITERATURE REVIEW

The aspects of online education are analyzed in the works based on lockdown experience during the pandemic. There are some pros and cons of online education experience in different countries such as Canada, the United States, France [2], Turkey [3], Ukraine [4] [5] [6], European countries [7], as well as South Korea [8], Indonesia [9], Thailand [10], and Morocco [11].

The teachers' attitude to online education is studied too [12] [13] [14] [15].

Online education influences online teaching technologies greatly. The impact of online technologies is studied quite well all around the world. For example, continuance intention (CI) concerning online technologies was offered and updated. Different classifications of online technologies and the exploration of four key groups of CI antecedents: psychological, technological, social, and behavioral. The development of a comprehensive conceptual framework that can aid in better understanding and explaining CI for online technologies, as well as focusing on research design, aiming to investigate promising areas linked to the distinctive characteristics of emerging technologies, such as hyper-connectivity, is studied [16].

Current data and research that examines the impact of the synchronous face-to-face visual presence of an instructor in a virtual learning environment (VLE) are also analyzed and explored due to a student's mental health. The specific factors and their significance for a student's ability to sustain good mental well-being during virtual learning are determined [17] [18] [19].

The effectiveness of online teaching technologies is proven in many papers. Moreover, the predicted trend of moving towards online teaching and learning (OTL) is expected to continue to expand. There is an increased emphasis on the adoption of online teaching methods. Instructors and course designers are being encouraged to convert more courses into the OTL format. This proactive approach serves as a hedge against the possibility of having to swiftly switch to online teaching. By embracing online teaching methods, educational institutions can enhance their preparedness for potential disruptions and ensure continued educational delivery in challenging circumstances. The importance of flexible and adaptable teaching approaches, making the incorporation of OTL strategies a significant consideration for education, was highlighted [20] [21].

No doubt, online teaching methods have been in use by prestigious universities for over a decade, primarily to accommodate the needs of those who are geographically distant from their respective universities. The significance of online teaching methods became more pronounced. Online education has emerged as a critical lifeline, allowing universities and affiliated students to continue their academic pursuits remotely. The transition to online teaching was not without challenges, as it required rapid and large-scale adaptation by educational institutions and instructors. The utilization of online platforms facilitated the continuation of academic activities, ensuring that students could access learning materials, attend virtual classes, participate in discussions, and submit assignments from the safety of their homes. It highlighted the value and versatility of online teaching methods, demonstrating their potential to be used as a viable alternative to traditional face-to-face instruction. While the circumstances that necessitated this shift were unfortunate, the experience has encouraged educators and institutions to explore and invest further in online learning technologies and pedagogical approaches. The integration of online teaching methods is likely to continue evolving, offering diverse educational opportunities worldwide [22] [23] [24] [25].

The opportunities and challenges associated with emergency online teaching, focusing on the gained experiences, are also examined. The study sought to provide valuable insights into the effectiveness and implications of emergency online teaching. By highlighting the prospects, the ongoing discourse on online education and informing future strategies for similar emergencies are discussed [26] [27] [28] [29].

The trends, shifts, and future of online education due to crises on a global scale are also debated, as are the underpinnings of online teaching as an independent form of education. Online teaching due to crises has indeed triggered a widespread and unprecedented experiment with online teaching. Educational institutions worldwide have turned to online platforms and online teaching methods to continue academic activities. This forced adoption of online teaching has the potential to bring about transformative changes in the field of education. The crisis has accelerated the integration of technology into the teaching process, and as a result, educators and students have gained valuable experience with virtual classrooms, online collaboration tools, and digital resources. The significance of this experience lies in its potential to reshape various aspects of education. Online teaching proves to be successful and effective; it leads to lasting changes in how education is accessed [30] [31] [32].

So, factually, tectonic shifts in society and education have occurred when unexpected events necessitate widespread experimentation with new concepts. In our content, the war has catalyzed such experiences in education. While challenges and adjustments are inevitable, they lead to a more adaptable, inclusive, and technologically-driven educational landscape.

However, the problem of experience changes because of the war in teaching technologies online is not analyzed in detail yet.

3 METHODOLOGY

3.1 Participants

The target group of university teachers—the respondents—who took part in our survey, were from Ukrainian universities. To begin with, we established the age, education, professional experience, and gender of our participants. There are 49 university teachers from public educational universities who took part in our study, among them men (12.2%) and women 87.8%. All respondents are residents of

Ukraine (97.9%). To systematize the results of the survey, we divided them into 5 age categories (Figure 1), which allowed us to analyze and compare the results based on their belonging to these age categories.

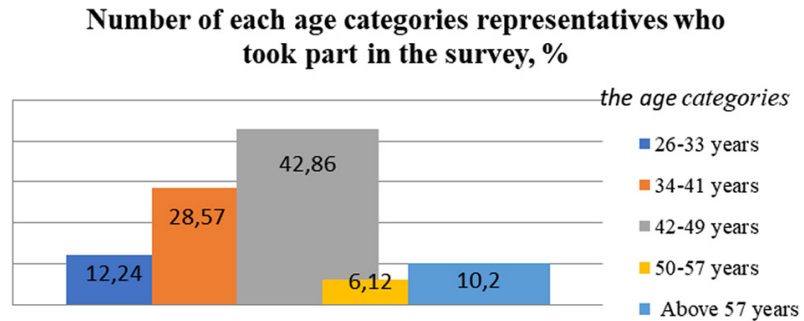


Fig. 1. Participants number in survey by age category (in percentage)

All survey participants have a rich professional teaching experience, as evidenced by a systematized chart informing them about their experience (Figure 2). Also, we found that the teaching experience increases with the age of our participants which indicates their loyalty to the chosen profession (Figure 3).

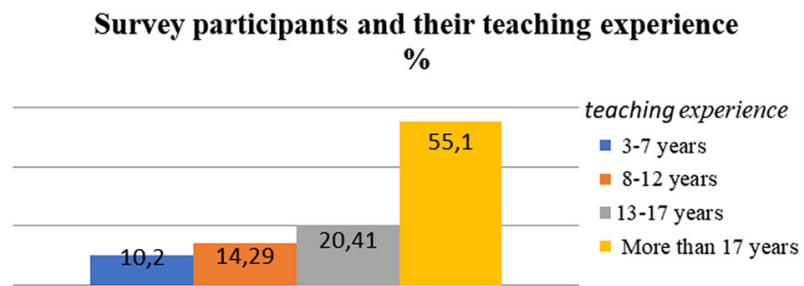


Fig. 2. Number of participants in our survey by their teaching experience in percent

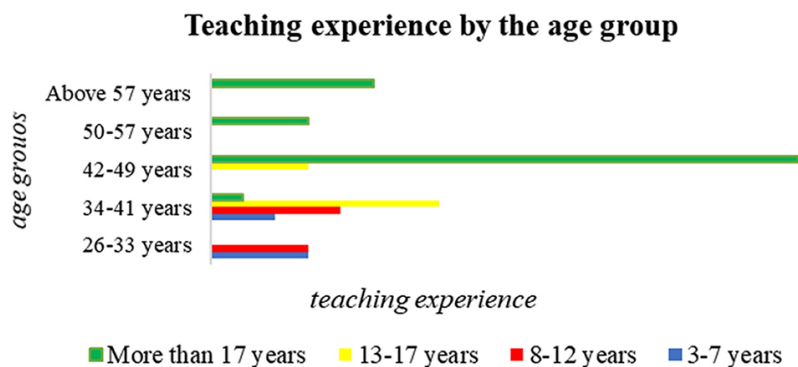


Fig. 3. Teaching experience of participants by the age group

According to Figure 3, the age categories of 42–49 years, 50–57 years, and above 57, have the greatest professional teaching experience, and this is reasonable and logical when a university teacher devotes their whole life to the favorite job.

Thus, all survey participants had a higher education, 18.4% have a Master's degree, 67.3% have a PhD degree, and 6.1% of all participants have a Post-Doctoral degree. More detailed information about the education of the participants and their

age categories is presented in Figure 4. Moreover, almost all of the respondents have professional teaching activities after graduating from their universities, and most of the participants continue their teaching and research activities at universities where they received higher education.

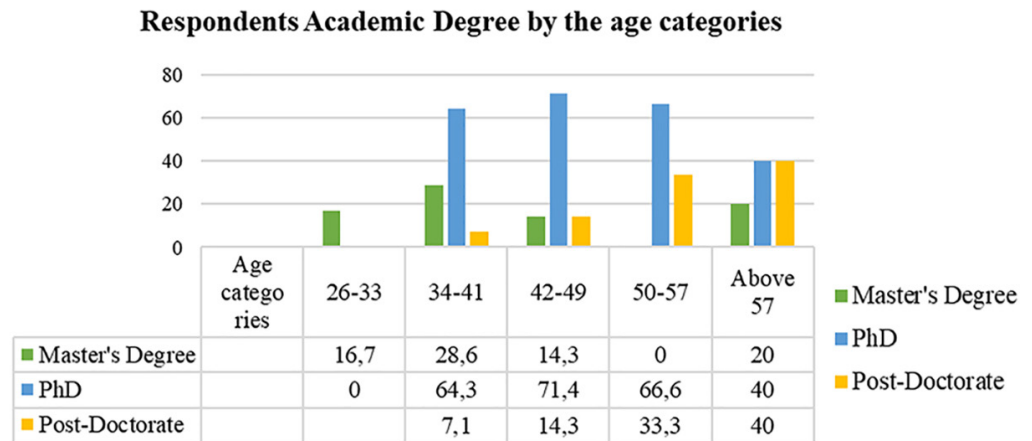


Fig. 4. Respondents academic qualification with respect to their age and in terms of percentage

3.2 Research methods

The experimental work is based on the survey methodology, which consisted of five steps. In step 1 we determine the goal and object of our research. In step 2 we discussed and prepared a list of questions, a corresponding Google form with questions that interested us, and gave it to colleagues from our universities. In step 3 we systematized the obtained data and entered them into an Excel spreadsheet. In step 4 we processed and analyzed the results using the built-in tools of MS Excel, and in step 5 we made findings and conclusions and outlined further research on the topic.

The main experimental goal was to study whether there have been changes in the teaching methods and pedagogical teaching technologies that university teachers used during the start of the COVID-2019 pandemic and are using as of now in the current situation of martial law in Ukraine, as well as to find out how university teachers were ready for such changes, how they overcame the difficulties, and what experience they gained over the period.

3.3 Research procedure

In our survey, we used an adapted complex questionnaire consisting of 10 question groups. Some of them were related to identifying teachers' readiness to use new online teaching methods and their availability for the appropriate experience, their possibilities for online education in the future as the underpinnings, and teachers' readiness to use new online methods and techniques to teach, as well as determining the priority in the method choice and indicating how much time teachers spent organizing and having online lectures and practical classes. Therefore, we have devoted the current study to the consideration and analysis of precisely these questions in the questionnaire.

The questions were grouped into three categories, such as: 1) questions connected to the relationship that has developed between university teachers and

students after the COVID-2019 pandemic and continues now in the situation of the Russian invasion in Ukraine that led to the transition of online education; 2) questions regarding the teaching methods that teachers use in the new realities of education; 3) questions aimed at identifying personal abilities and skills that are obvious and necessary for organizing online teaching. We systematized the received data of answers offered to the respondents by categories and compiled a summary table, which is shown in Table 1.

Table 1. Results of answers of the questionnaire by question categories in percent

Categories	Statements-Questions	Answers, %		
		Agree	Neutral	Disagree
Relationships	It increased the responsibility towards my students	77.6	8.4	4.08
	It made the relationship between the educator and students virtual	89.8	10.2	0
	It increased the responsibility towards my students	96.8	2.04	2.04
	It made the relationship between the educator and students virtual	91.6	12.2	2.04
Teaching methods and techniques	It changed the way I teach or lecture	89.8	8.2	2.04
	It changes the mid-term and/or final exams were substituted by assignments/project papers for scoring purposes	78.6	16.3	4.08
	It made the assessment of the students' engagement with educators more effective	77.6	10.2	12.2
	It made the mid-term and/or final exams were conducted online with an open-exam type	87.8	6.1	6.1
Abilities/skills	It made me use new skills in delivering my courses' content to students	95.9	0	4.08
	It created the dire need to upgrade my technical skills to cope with the new demand of digitizing education	77.6	16.3	6.12
	I am able to use the online teaching methods to deliver courses' contents	89.8	2.04	8.2
	I have the technical backgrounds to understand and use the online teaching methods	77.6	12.2	10.2
	I possess the technical skills to use the online teaching methods	77.6	10.2	12.2
	I own the intellectual capabilities to understand, learn, or use online teaching methods	93.6	2.4	4.1
	I possess the patience to get acquainted with using the new digital methods to deliver course's content to my students	73.5	12.2	14.3
	I have the indomitable and iron will to understand, learn, or practice the new digital methods in delivering courses' contents to my students	69.4	14.5	16.1

4 FINDINGS

According to the obtained results, we can make some statements. Nowadays, the relationship between teachers and students has become completely virtual, and the teachers' responsibility towards their students has increased significantly. Teachers are more confident, friendly, and supportive of the students; they have the abilities and

skills to organize and implement online teaching. The explanation for this situation is precisely the previous experience gained by university teachers during the pandemic.

We were also interested in the methods that teachers use in online teaching. As we can see from the diagram (Figure 5), the answer is that most teachers use both online and offline teaching methods (recorded previously).

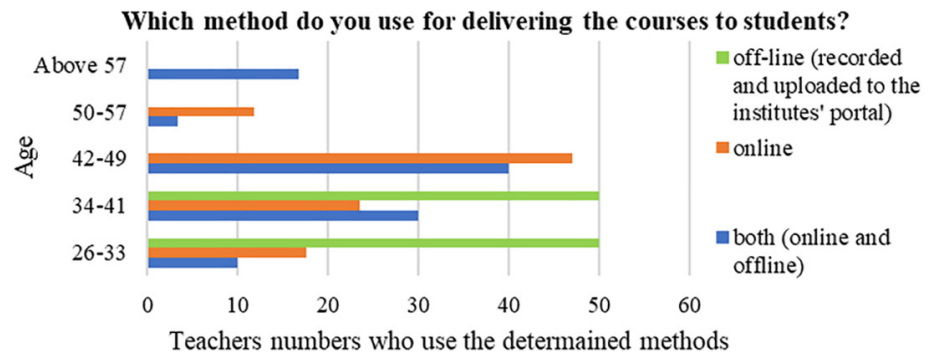


Fig. 5. Results of the teachers' survey about the methods that they use

Continuing our study of teaching methods that are relevant to the difficult conditions of martial law in Ukraine, we singled out two more categories of questions separately: 1) personal assessment of online teaching methods; 2) prospects for a new teaching organization; and the possibility of implementing online teaching as an independent new form of education in Ukraine.

We started the study of the first category questions after the pandemic, and now, after one war year, we have received other data on hostilities on the territory of Ukraine. As we can see in Figure 6, teachers' assessments of online teaching methods were heterogeneous and sometimes negative before the war. This is due to the difficulties teachers encounter with online teaching. After some time, in 2022, after the full-scale invasion of Russian troops into Ukraine started and now lasted one year, we conducted a similar survey to find out how the teachers' assessment has changed and we got the following results: a comparative diagram is presented below (Figure 6).

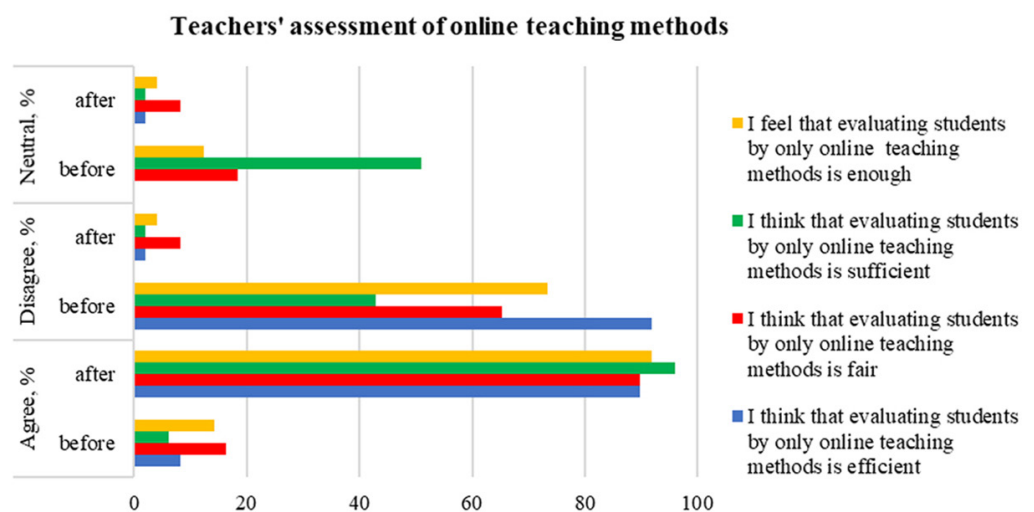


Fig. 6. Comparative diagrams of teachers' answers at different time

This comparison chart shows that both trust and confidence in fairness have increased, as measured by the teachers' responses in the survey in other matters, as well as the need to use online teaching methods. Testing became obvious.

A comparative analysis of the respondents' answers (Table 2), received after the pandemic and during the hostilities in Ukraine, allowed us to state that more and more teachers are convinced of the global trend prospects of perceiving online teaching as one of the relevant and appropriate forms of education in wartime. And as we were able to see now in Ukraine, when Russia continues its terrorist aggressive actions and many students are forced to leave their homeland, Ukraine, to save their lives, it is online teaching that allows students to continue their studies at Ukrainian universities.

Table 2. Prospects for online digital education before and after Russian troops invasion into Ukraine

Statements	Agree, %		Neutral, %		Disagree, %	
	Before	After	Before	After	Before	After
I believe that totally digitizing education would be compulsory around the globe	53.06	77.6	26.5	12.2	20.4	10.2
in my opinion, digitizing education would be per se an educational authorities' requirement	59.2	67.3	28.6	16.3	12.2	16.3
in my opinion, digitizing education would be the common trend of the education institutes	65.3	71.4	16.3	14.3	18.4	14.3
in my opinion, digitizing education would facilitate the recognition of distance-learning academic certificates in many countries	51.02	77.6	24.5	10.2	24.5	12.2
in my opinion, distance-learning would be more acceptable and recognized in public life, Ministries of Education/ Authorities or recruiting bodies	30.6	46.9	40.8	30.6	26.5	22.4

So, we can state that in the most difficult situation of martial law in Ukraine, university teachers continue to work online. Teachers mainly use online methods, while they spend less time preparing for such online classes (Figure 7) compared to the period after the pandemic in 2020. It testifies to the acquired experience of teachers and the methodological developments of online classes prepared by them.

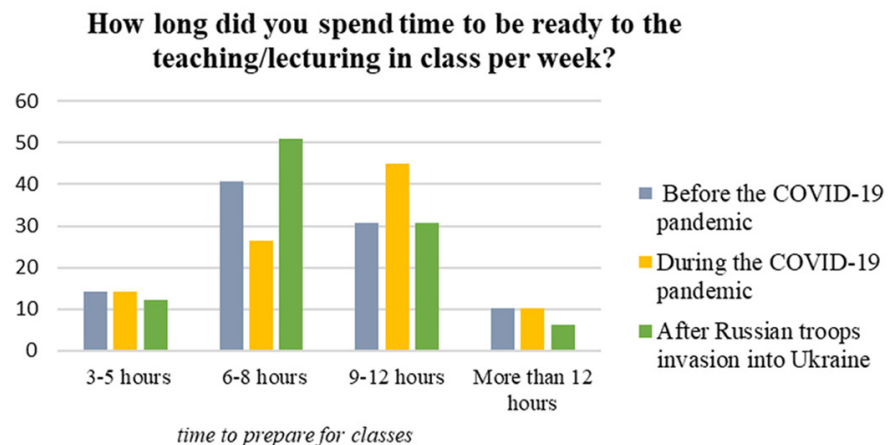


Fig. 7. Comparative diagrams of teachers' answers at different time

5 DISCUSSION

Since the beginning of hostilities in Ukraine because of the war, the weaknesses and threats associated with online education have intensified, especially at the beginning of the war. To discuss this issue, it is necessary to state that some students and teachers were physically and psychologically not ready to continue their education. Sometimes students and teachers did not have the conditions for having lessons (a stable Internet connection, computers, a separate room, etc.).

The encouraging aspects revealed during the analysis of online education made it possible to discuss this problem. First, many training courses are organized for educators to improve digital literacy and master tools to ensure academic integrity. Second, some foreign sponsors, grants, and scholarships to finance the technical needs of higher education institutions are attracted. Third, international cooperation and experience exchange to develop professional communication networks between higher education institutions are developed. It may come to the consideration that online teaching as a separate education form, not as a temporary alternative to face-to-face education, taking into account all opinions and previous experience, in Ukraine may be the main education form for the next several years.

6 CONCLUSIONS

University teachers have become more confident in the online methods that they have mastered; they often use various methods, techniques, and means. They combine written tasks with tests and also organize real-time surveys through chats on educational platforms that their universities use (Zoom, Google Classrooms, Google Meeting, MC Teams, Moodle, etc.). Teachers feel a huge responsibility for having and organizing quality teaching. Relationships and connections between teachers and students became completely virtual; however, they maintained a trusting relationship and provided psychological mutual assistance. Teachers promoted having and attending additional classes, tried to keep in touch with their students, and provided free access to teaching materials (as a university repository, distance courses, international open courses, and Moodle courses).

As we saw, the survey we conducted showed that teachers became more confident in assessing their abilities and skills to organize online teaching, and they tried to develop them by mastering new Internet technologies for transferring educational content. They become more and more confident Internet users.

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