

Teaching Amidst Turmoil: Challenges for Online Higher Education in Ukraine from the Teachers' Perspective

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ABSTRACT

This study is based on an initiative within the framework of providing capacity for HE in Ukraine, aiming to investigate the challenges for online higher education in wartime Ukraine from the teachers' perspective. Initially, four exploratory interviews were conducted at Ivan Franko National University of Lviv which provided the basis for a larger-scale survey reaching 10 universities. According to the survey (220 responses), teachers wanted more education and training in the following areas: 1) Online course design, 2) Improvements in students' wellbeing and engagement, 3) Communication online and 4) Assessment online. Co-creation and community of practice were identified as potential areas contributing to a higher quality of university education in Ukraine. The benefits of a training program were significant. Participants reported enhanced competencies in practical task development, student communication, and collaborative opportunities. The project-based approach facilitated a structured exploration of these issues, leading to actionable insights and recommendations for improving online higher education in wartime Ukraine. Co-creation and the establishment of a community of practice were identified as potential strategies for further enhancing the quality of university education in Ukraine. The study underscores the necessity for continuous professional development and collaborative approaches to support educators in these challenging times.

Keywords: *Online teaching; Higher education; Capacity-building; Ukraine; Needs analysis*

INTRODUCTION

Since the Russian invasion of Ukraine, higher education has been functioning under the turmoil of war with online teaching/learning becoming predominant. The experience from the period when the world shifted to remote teaching and learning because of the COVID-19 pandemic in 2020 showed both the advantages and disadvantages of this form of education. The two main problems identified by students were limited live communication leading to decreased motivation to learn, and reduced socialization causing the feeling of not belonging to a group (Filipenko, 2023). The lack of sufficient competence to carry out distance instruction was one of the main reasons for many teachers not being able to shift from face-to-face or blended mode to online learning. This transformation from physical to online requires specific knowledge and skills on how to create courses that encourage

students and keep them motivated to study (Grynyuk et al., 2022). Although some challenges might be similar to any form of higher education transformation from classroom to online, the state of war creates additional problems. For example, because of the displacement, new categories of displaced students and educators have emerged. Besides, many students are involved in voluntary work or have to work part-time to support themselves and their families. Under such circumstances, managing the education process is even more difficult as the psychological problems of educators and learners are also an additional burden. Contemporary research highlights the importance of putting students at the centre of the learning/teaching process, however, the role of teachers is missing in those discussions. Historically and typically teachers are expected to create syllabi, provide instructional resources, to suggest communication tools and learning strategies before the start of an online course. When the course is running, they should monitor and assess learning and provide feedback, identify and resolve instructional, interpersonal, and technical problems and create a learning community in which learners feel safe and comfortable (Guri-Rosenblit, 2018). During the pandemic, a survey among 822 teachers and students showed that about half of the universities were only partially ready for this switch (Grynyuk et al., 2022; Koval & Lytvyn, 2022). Adequate training of the teaching staff is essential, but how to design and deliver quality online courses that address the abovementioned challenges must be associated with the training programs. This study addresses the exact gap in research and systematically explores the needs and challenges from the perspective of the teachers. Thus, two research questions are set up 1) What are the challenges teachers in Ukraine encounter during their online teaching in higher education during the wartime? and 2) How a teacher training program can be tailored to address the challenges? The outcome of the gap analysis will be the basis for the design of the training program, which will be evaluated by teachers for its adequacy in bridging the skills gaps of the teachers.

The rest of the paper is organised as follows. The next section briefs the context of the study including the situational analysis of Ukraine, and we next provide an overview of the research methods and the instruments. Later in the paper we summarise the outcomes of the empirical study and finally, we conclude the paper with a discussion on further work.

Background and the context of the study

Internet access in Ukraine is still reliable and of good quality except for villages and remote areas that do not have and/or have partial coverage (Lucenko et al., 2023). The costs for Internet services are low and Ukrainians are generally used to digital tools. This points out a good level of readiness for the two main actors in the higher education online teaching/learning process, the teachers and the students. For example, (Blayone et al., 2018) shows that a large number of students have a high readiness for communicating via social networks and finding information via social media sites. Based on empirical data (Grynyuk et al., 2022) revealed that teachers use free online educational platforms, web services, and other cloud-based technology for distance education. The Internet infrastructure and general ICT skills among teachers and students are mature in Ukraine (Lucenko et al., 2023). This is an important point of departure for the transition from campus education to online education necessitated in wartime.

Previous studies about the challenges with online courses in higher education institutions (HEIs) in the United States (Kebritchi et al., 2017) reveal that issues related to teachers may be summarized in four categories; 1) changed faculty role, 2) transition from face-to-face to online mode, 3) time management, and 4) teaching styles. Online instructors have four different roles, the pedagogical role related to teaching methods, the social role which is about establishing social relationships with students, the managerial role which involves administrative and organizational tasks, and the technical role which entails working with technology. A large part of the empirical studies report challenges with the ability to deliver content, transfer from teacher-centred to student-centred education, and use new kinds of communication channels. Transferring a course from face-to-face to online mode is one of the major challenges as the teachers have difficulties in delivering the

course content in an effective online classroom, problems facilitating interactions between students, and engaging learners, thus having less control over the class. Time management is yet another challenge because planning, creating, and delivering an online course usually takes twice as much time as a face-to-face course. Finally, the teaching style challenge comes from having problems establishing effective interaction and timely feedback to students, creating dynamic presentations and laboratory tutorials, simulations, and conceptual discussions.

Another study consolidates the evidence from online teaching and learning in HEIs all over the world during the era of COVID-19 (Mseleku, 2020). The study lists similar challenges academics face with online courses. Understanding of online teaching is not very good and some of them lack knowledge in using technology. Concerns regarding their capabilities to engage students in an online platform while maintaining the same level of interaction as face-to-face formats are yet another challenge. Assessment online has also been reported as a challenging task, particularly in how to avoid plagiarism.

The pandemic in 2020 forced the first radical shift in higher education in many countries including Ukraine. To prevent the spread of the virus, campus education was replaced by e-learning. This shift was relatively easy for those having experience with online classes previously. For others, the transition was not smooth and was plagued by resource challenges, particularly concerning IT devices and other related resources. This urgent transition to distance learning in Ukraine due to the COVID-19 emergency was not smooth (Shevchenko et al, 2021). The main causes were the inability to quickly adapt traditional curricula and educational programmes to the online mode and limited online teaching practice prior to the quarantine (ibid). In Ukraine, a systemic and consistent policy towards online teaching/learning had not been developed before the COVID-19 pandemic. Thus, once the nationwide quarantine was announced, each university selected its own approach and used different tools and processes to accommodate emergency remote teaching. It took two to three weeks for all universities to adjust and effectively progress to online teaching/learning (Stukalo, 2021). The teachers spent twice as much time when working in remote mode as compared to face-to-face teaching. Furthermore, some teachers had problems with understanding remote teaching tools and distance technologies (ibid). Although some of them had no experience in online teaching, familiarity with the use of the Internet and experience with various online tools for communication and collaboration helped them quickly adjust to the virtual environment. Besides, the technical skills of teachers have significantly improved due to the efforts of offering online education, since there were more opportunities to implement an interactive approach to knowledge transfer and to include students who live in remote areas (Filipenko, 2023).

The Russian invasion in February 2022 caused severe material, economic and human losses that affected all the sectors of society including higher education which has gone through a process of innovative transformation, personalization, and greater individualization meaning that it no longer requires teacher-lecturer; it requires a teacher-scientist, a researcher, a facilitator. Hence the focus of current reforms is to integrate science and education and change the role of the teacher (Kolomiets, 2022).

The war has altered the lives of the citizens with everyone's priority being shifted to staying safe. The activities, including education, have been impacted. According to the operational information of the Ministry of Education and Science of Ukraine, as of August 1, 2022, during the first wave of displacement, 29 HEIs and 64 structural units of HEIs were relocated to safer regions of the country ([URL: https://mon.gov.ua/ua/ministerstvo/pro-ministerstvo/najposhirenishi-zapitannya-vidpovidita-aktualni-kontaktimon-pid-chas-voyennogo-stanu/najposhirenishi-zapitannya-vidpovidifahova-peredvisha-visha-osvita](https://mon.gov.ua/ua/ministerstvo/pro-ministerstvo/najposhirenishi-zapitannya-vidpovidita-aktualni-kontaktimon-pid-chas-voyennogo-stanu/najposhirenishi-zapitannya-vidpovidifahova-peredvisha-visha-osvita)). Practically all education activities were transformed to online mode. For teachers without previous experience or skills in using technology, recommendations for effective and useful web tools were made to improve their educational electronic environment (Matviichuk et al., 2022).

A study of students and teachers' challenges and priorities during the time of war shows that the greatest negative effect of the war is mental health, in particular the psychological imbalance that causes depression and deteriorates the educational process (Pypenko et al., 2023). An online survey conducted among students and faculty of Ukrainian HEIs revealed that 97.8% of respondents reported a deterioration in their psycho-emotional well-being, with many experiencing symptoms of depression (84.3%), burnout (86.7%), loneliness (51.8%), anxiety (84.4%), and anger (76.9%) (Kurapov et al., 2022). The majority of students require psychological support more than acquiring professional knowledge and skills. Constant air raid sirens and blackouts disturb online teaching by forcing teachers and students to leave their homes and interrupt the education process. There is a growing number of demotivated students due to psychological problems, displacement, and broken families. Many students and teachers combine their studies and work with volunteering in supporting displaced colleagues and the Ukrainian army. At the same time, for teachers of Ukrainian HEIs, the main motivation factors are their students (40%), the feeling of duty and responsibility (24%), and faith in Ukraine's victory (18%) (Lavrysh et al., 2022).

The findings from empirical research performed in four HEIs in Ukraine (Mospan, 2023) show that university teachers have considerable responsibility in transitioning traditional teaching methods into a virtual educational environment and have successfully coped with this challenge. Their efforts and dedication in time of war were the main reason for this outcome despite the presence of many problems already described in the literature. Nevertheless, during wartime teachers face many challenges, some being to teach in stressful situations, having a decrease in students' activity, coping with students' dissatisfaction with online learning, and providing opportunities for students to communicate with their peers (Ma et al., 2022).

Methodological approach

The methodological approach followed in this study is multifaceted. The mixed method approach is required by the context and the nature of research questions, which are associated with a gap and needs analysis followed by developing a process to address the gaps and the needs identified. As described subsequently, four different research instruments are used in this study: 1) Interviews with teachers to acquire an understanding of the challenges and major concerns of contemporary online higher education in Ukraine, 2) A survey study reaching a wider teacher population for exploring the level of the complexity of the identified challenges by the interviews, 3) A focus group discussion with experts from Sweden and Ukraine for learning from each other and co-creation of the training program 4) project-based professional development training program design and development based on application of the 4A approach (Katernyak et al., 2018) for Online Course Improvement Activity (OCIA).

The general approach followed in this study is action research. The reasoning behind this methodological choice is the ability of action research to test and adapt ideas and interventions actively during the whole process. It enables capture of the essential problems and to create a basis for educational change projects in Ukraine from teachers' authentic and specific needs. Therefore, the process includes developing a project-based professional development program based on a needs analysis, involving teachers who are trained as a part of the program, as well as a mentoring program for preparing their own online courses, and communities of practice are created where teachers will share their own experience, generate new knowledge and distribute it in the academic network.

Interview study

Data collection. The first empirical activity of this study is the in-depth interviews to learn about the key challenges and concerns faced in online teaching. The purpose is to identify the key challenges and lessons learned by the four university professors (associate professors) at Ivan

Franko National University of Lviv who were purposively selected for the interviews. The interviews are semi-structured and focussed on their experiences of online learning design and delivery, including their success and lessons learned. The first interview was conducted face to face, and video recording was done with the interviewee's consent. The recorded interview was made available online to all teachers in their faculty for comments; verifications, additional remarks etc. The other three interviews were conducted online to elaborate and get further reflections on the feedback obtained.

Data analysis. The interviews were transcribed and analysed qualitatively. The emerging themes were directed to the design of the questions in the questionnaire.

Survey study

Data collection. The purpose of the online questionnaire was to acquire the country-wide perceptions of teachers about online education during wartime. The questionnaire was disseminated to 10 universities in all parts of Ukraine. The questionnaire consisted of 31 multiple choice and open-ended questions structured and divided into several categories: (1) General information about the respondents (university, field of knowledge/specialty, teaching experience etc), (2) Communication channels used in their courses (skills of using communication tools to facilitate online courses), (3) Preparation of training materials for their courses (including access to online resources), (4) Course design and facilitation, comprising a combination of resources, activities, support, evaluation and feedback required for the full achievement of the course learning outcomes (Fox, 2019, p.9), (5) Assessment of outcomes and capabilities achieved by the student (online assessment tools, plagiarism), where assessment methods are both "formative and summative, and designed to ensure progress in all learning outcomes can be demonstrated and verified" (ibid), (6) Course evaluation reflecting the effectiveness of courses in developing the graduate capabilities and course learning outcomes; "the quality of teaching in the courses/program; and students' learning outcomes and experiences" (ibid), (7) Feedback from/to students, (8) Comfort and involvement of students (online creativity tools, student socialization tools, student motivation tools/methods, emotional support of students in a crisis situation), and (9) New challenges faced when teaching online courses during wartime (ways to overcome these challenges, problems remained unsolved, exchange of experience and best practice). The questionnaire was filled out by 220 educators from various HEIs of Ukraine, with the two largest groups of respondents representing Ivan Franko National University of Lviv and National Technical University "Dnipro Polytechnic".

Data analysis. According to the respondents, the main problems in teaching courses online during wartime are related to (1) effective communication aimed at creating the environment of trust, mutual emotional support, students' social presence and co-creation, including AI in online learning & teaching; (2) course design and course evaluation; (3) students' knowledge assessment, including digital examinations, peer assessments, monitoring of students' progress; (4) students and teachers' well-being, motivation and incentives, ensuring safety and confidence through understanding copyright, academic integrity, ways to find and use resources for teaching etc.

To address these challenges, the study recommends the development of a comprehensive professional development program for university educators. This program should include training on the design and implementation of asynchronous e-courses, the integration of AI technologies in education, and the creation of a virtual community of practice for sharing best practices. The use of AI in course development and assessment is particularly emphasized as a means to reduce educators' workloads and enhance the functionality of online courses, especially in the context of post-war reconstruction.

Focus group and knowledge co-creation

The focus group consisted of eight education and technology experts from Sweden and Ukraine. Online video conference discussions between project partners have been conducted almost every week since the start of the project in December 2022, systematically capturing the ideas for planning the training program based on the outcomes of the survey study.

The focus group were also conducted as two face-to-face meetings in Stockholm, for knowledge exchange about conducting online education including staff training, ICT infrastructure, educational software, policies and pedagogics. Partners visited several campuses and organisations including a state-of-the-art video production studio dedicated to online course material production. Software and issues of using AI in higher education were discussed with researchers and commercial providers of digital examination systems.

Ethical implications

There were no questions in the questionnaire targeting collecting sensitive information from the respondents. All the respondents provided their consent for participation in the study. Those participants who exposed themselves in the interviews for others to comment on were also well-informed about the process and purpose before obtaining consent.

Results and Analysis

Change 1: NEEDS

Overview of the survey participation. Altogether there were 220 university teachers from different Ukrainian universities that took part in the online survey. The majority of respondents were from Ivan Franko National University of Lviv (68,6%) and National Technical University “Dnipro Polytechnic” (27,3%). They teach online courses at the following levels: bachelor’s level (94 %), master’s level (67%) and postgraduate level (20%).

Almost all respondents (99.6%) have some experience in online teaching (using various tools for organising classes online). Among them, 61 % of teachers have been using IT tools for teaching for three or more years. Most often, they use such communication channels as video conference platforms (Zoom, Teams, Google Class, Skype - for synchronous communication), email (for asynchronous communication), and social media (groups with students using Telegram, Viber, WhatsApp, Facebook for both synchronous and asynchronous communication). At the same time, teachers seldom use or don’t use online collaboration tools and chats or forums in LMSs. Only 39% of the respondents believed they knew how to use the learning management system implemented by the university.

The findings suggest a significant gap in the adoption of advanced digital tools for communication, learning automation, and asynchronous course delivery. This gap is partly attributable to the ad-hoc transition to online learning in 2020, which led educators to rely heavily on familiar tools like video conferencing and social networks. Consequently, many educators lack the skills and knowledge required to effectively use learning management systems (LMS), collaboration tools, and automated learning processes.

65% of the respondents believe they are proficient in using communication tools for facilitation in e-courses. But they still have many questions about the right application of facilitation methods in order to maintain students’ motivation and encourage them to actively participate in group work. However, 77% wanted to learn more about communication channels online.

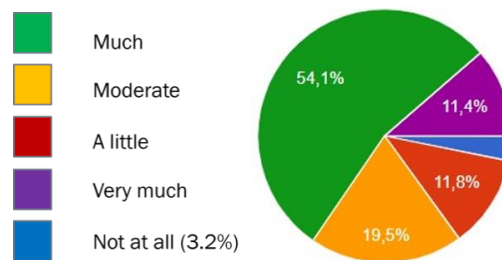


Figure 1: Participants proficiency in using communication tools

Teachers mainly use texts (articles) and videos from the Internet, their own produced texts and articles, videos and notes while developing their online course materials, but they do not use materials (presentations) produced by students. For assessing students' knowledge, teachers use the following methods: oral presentations, multiple choice questions, project work (presentations), surveillance exams at home, essays/written home assignments/papers, seminars online, and classroom exams (on campus). However, the following methods are seldom used in online courses: self-reflection, peer assessment (only 17% of the teachers used it) and self-assessment (only 16% of the teachers used it).

Overall, the survey showed that:

- 83% of respondents would like to learn more about online course design and facilitation.
- 78% of the respondents would like to learn more about how to improve students' well-being and engagement.
- 77% of the respondents would like to learn more about communication channels online.
- 77% would like to learn more about assessment online.
- 74% of respondents would like to learn more about course evaluation online.
- 69% of the respondents would like to learn more about feedback.
- 41% of respondents are not satisfied with the assessment methods they use in e-courses.
- 14% of the respondents consider plagiarism as a problem in their courses.

In the open-ended questions, several respondents highlighted copyright issues and academic integrity rules. Some of those comments regarding communication channels are: *"For efficient and timely transmission of information"*, *"For conducting lectures, practical classes, demonstrating presentations, providing educational materials in the chat"*, *"Presentations, sharing screen"*, and *"For holding meetings, lectures and seminars, group and individual consultations, speeches at scientific and practical events of various levels"*. All these comments reflect the use of digital technologies is mostly for demonstration and repetition of classes and lectures conducted in a classroom but with limited possibilities.

Online courses. Preparation, production of training materials and the development of courses are weak points for most teachers, so 83.1% of them want to learn more about online course design and facilitation. Challenges highlighted by educators include course material preparation, content production, and innovative course design. Thus, the majority of respondents would like to improve their courses because they feel that there are certain gaps in communication and student engagement, which prompts teachers to look for solutions that can be provided within a professional development programme.

Assessment of students' knowledge. In the domain of student assessment, 76.9% of respondents expressed interest in improving online assessment methods. The complexity of adequate assessment of knowledge in the online format raises the question of what should be done and how. The prevalent assessment techniques include multiple-choice tests, oral presentations, and written assignments. As an answer to the open-ended question about other ways and methods of assessment, most respondents mentioned *"Database of test questions in Moodle"*, *"Tests of*

various types and levels of complexity, problem-solving", "Testing", and "Automatic verification of the correctness of computer programs written by students, using software tests", while self-assessment, peer assessment and automated quizzes are less frequently utilized. This limited use of advanced assessment tools may stem from educators' unfamiliarity with AI-driven solutions and automated processes, which could streamline online assessment. The propensity of teachers to use oral, and written tests and surveillance exams to assess students' knowledge and skills perhaps stems from their teaching practice prior to the eLearning format. Most respondents are comfortable with having the assessment format unchanged. Besides, wide use of tests is the result of the influence of educational institutions, which require teachers to use them.

Comfort, well-being and involvement of students. 78.2% of the respondents would like to learn more about how to improve students' well-being and engagement. The issue of student engagement is very complex in the case of asynchronous eLearning. Regarding the open question about how they work with creative tools and methods online, the respondents mentioned either "*I am not working with them*" or "*Only tests to check knowledge*". This is a consequence of the fact that some teachers do not have enough information or knowledge about tools to increase student engagement. However, some teachers do their best such as "*I add something interesting to my lectures (video experiments, for example); in practical classes, I suggest that students do their own research, record a video and share it with the class.*", and another teacher mentioned that the "*Students in my courses use Padlet, perform SWOT analysis, critically evaluate a specific research topic, etc.*" and also, "*I create educational games based on topics. We carry out classes at different times, testing in a game form (3 top prize places, etc.), discussions on the topic of video examples from the activities of enterprises - with focus on the topic of the discipline.*"

The situation is similar to the methods used for socialization (social presence) and motivation of students. According to respondents "*Working in groups - without a teacher, students communicate more. When I come in, I can suggest something, but they are discussing themselves. Feedback tools, including the ones about emotional state and support – "Reflect" in Teams.*" Or "*We work in small teams: project development, participation in debates, team building, games, business games, simulations*".

When it comes to how to increase motivation, the teachers perceive "*Scholarship and exam session are the best motivators*" or "*Motivation is formed by the deadline for completing the test.*" Other similar examples include "*At the beginning of the course, I inform them about the conditions for obtaining a credit/exam based on the cumulative system. When students understand that each piece of their work will be evaluated, they choose the path (learning trajectory) that is convenient for them.*", and "*I give examples of well-known persons, outline the real perspective of the development of their professional training*". Teachers recognise the difficulty of engaging students in online courses; "*Motivating students online is a complicated issue. I motivate them by explaining where they will need this knowledge, and I give students the opportunity to propose topics of interest to them within the course.*"

As the answers to the questions show, there is a problem in disseminating information among teachers about the means and methods of student involvement. For online courses, some teachers try to apply certain methods that they know about, or try to invent something themselves, then the difficulty also arises in asynchronous online courses.

Challenges of online course design. Many of the teachers who took part in the survey expressed their opinions about the new challenges they encountered due to online education during the war and how they overcame them, or which problems were left unsolved. In their words,

"The main problem is apathy, lack of motivation, students' lack of confidence in tomorrow. It is difficult to fight this because not much depends on us, but we can show that we are already working on the future restoration of the country, helping the front, etc. It inspires many students, but not all".

Some teachers worry about the

"Formal attitude of some students towards their assignments. Unfortunately, it is not possible to effectively involve all students in discussions and perform tasks during online classes, to monitor the emotional state and contribution of everyone during task performance in groups."

The main challenges and unsolved problems include 1) combining synchronous and asynchronous forms of online classes, especially when different teachers even from different departments/faculties teach, 2) poor attendance of students in synchronised online classes due to lack of motivation, 3) asynchronous mode turns into an analogue of correspondence education (students may not perform tasks during the time of classes but outside of the scheduled time and generally postpone tasks until the exam time), 4) Students do not perceive online education as a full-fledged formal education, possibly due to the gaps in interactions, and increased responsibility on students for their learning compared to traditional education.

Teachers also shared their experiences of student's challenges in online education during the war, such as the challenges of keeping up the phase due to the life threats from war, affecting student well-being, concentration, focus and motivation, which are intuitive in a war-torn society. Students also had to choose volunteer work to support the community on their own education. More demonstrations in e-class of how concepts and theories work in reality are favoured over lectures. Furthermore, there is a lack of visualization tools or platforms when working on a project. Some students have complained about the lack of motivation to work in teams in activities, mainly due to issues of communication, and group collaboration. It is also difficult to create a team online if participants are not friends. So, teachers generally lack knowledge and skills for actively involving students in the exchange of information, knowledge, cooperation and co-creation in small groups.

The last question of the questionnaire was about the ultimate need. The unanimous verdict was the **need for a comprehensive professional development programme for university teachers** and as a result of participation in such a programme, teachers will have ready-to-launch online courses (or complete units). Summarising from the above, the main problems in teaching disciplines online during wartime are related to (1) effective communication aimed at creating an environment of trust, mutual emotional support, students' social presence and co-creation, including AI in online learning and teaching; (2) course design and course evaluation; (3) students' knowledge assessment, including digital examinations, peer reviews, monitoring of students' progress; (4) students and teachers' well-being, motivation and incentives, ensuring safety and confidence through understanding copyright, academic integrity, ways to find and use resources for teaching kin.

This programme should include the formation of a virtual community of practice for sharing experiences, cases and best practices, guest lectures and webinars, practical classes and individual tasks performed under supervision.

Teachers also mention the difficulty of using and maintaining both synchronous and asynchronous teaching in their online courses. This is due to many reasons, both local (the impossibility of predicting the presence of an air alert, problems with power supply or Internet connection) and demography (students can be in different countries, different time zones, and in areas of danger, or maybe forcibly displaced, and therefore be in unfavourable conditions for learning). Most of these problems will remain for some time after the end of the war until the overall reconstruction of the country begins.

A problem that is mentioned through all the answers is student engagement and motivation. Teachers try to solve this problem by using available methods, but as can be seen from statistics and comments, they do not always succeed. Having a comfortable workspace for the teacher and student online, where students would have access to knowledge and could conduct self-assessment and peer-assessment at a convenient time to monitor at what speed they are moving

towards the goal could be a solution. It is essential to raise here the issue of using algorithms, systems and platforms based on AI in the educational process. AI can contribute to the reduction of the direct workload on the teacher in the future and it is already being used to check texts for plagiarism. Advanced technologies will play a decisive role in the future of developing, designing and conducting asynchronous online courses, especially during the post-war reconstruction of the country.

Capacity building program design and development

The capacity-building program is created as a way forward to address the shortage of teachers' digital skills in developing online courses and to answer the second research question of this study. The contents of the program consist of topics namely AI in higher education, course design, communication and course evaluation, Digital examinations and peer reviews, and students and teachers' well-being, motivation and incentives, that emerged from the need analysis. The online course called "Modular course for teaching online" in Autumn-Winter 2023 is estimated to require **180 hours** of work, worth **6 ECTS** (European Credit Transfer and Accumulation System). These are academic hours equal to 45 minutes.

The first four modules of the program include online seminars, which discuss theoretical and practical issues related to online courses, technology, challenges, and examples. They are designed to prepare the participants for Module 5, which consists of an Online Course Improvement Activity (OCIA), project work focused on improving certain aspect(s) of online course(s). This project is performed individually or in a team in collaboration with the supervisors who are experts from the U-train project. After finishing the program, the teachers are expected to be able to:

1. Analyse at least one online course they created/delivered
2. Reflect on issues that need improvements
3. Distinguish between different methods for online assessment
4. Reflect on the advantages and disadvantages of online assessment methods
5. Discuss how to improve students' well-being and motivation for learning in online courses
6. Realize what tools can be used for better wellbeing and motivation for learning
7. Share experiences and debate on the recent technologies to be used in online teaching/learning
8. Identify some or several aspects (parts) of the online course that need improvement based on their previous experience
9. Search through the literature on how the aspects (parts) can be improved
10. Create a new design or improve the aspects (parts) of the online course
11. Present and evaluate the new design

Course modules. Modules 1, 2, 3 and 4 (60 hours, 2 credits) consist of four seminars with active participation. Seminars will be recorded and available for course participants after the live sessions. The four seminars are open to all teachers in Ukraine. For teachers who want to proceed with Module 5, active participation in the seminars is required. Active means attending the seminars or watching the video recordings afterwards, reading relevant information before the seminar, discussing it during/after the seminar, reflecting on each seminar, and sharing useful resources on the course page.

There is a Module 5 (120 hours, 4 credits) which consists of:

- Preparing the project proposal for your Online Course Improvement Activity (OCIA) using the provided template. The text should describe the selected problem in an online course to be addressed with OCIA, should explain the context, should present the time activity plan and the expected outcomes from the project. A single teacher or a team of up to three teachers submit the proposal for the project/OCIA on Moodle platform.
- Working on the project/OCIA and creating a draft text describing the project.

- Taking part in the peer assessment of the draft projects
- Taking in consideration suggestions from the peer assessment and creating the text for the final project

Because of the limited resources of the U-train project, 15 projects were carried out within Module 5. All modules as they appear on the Moodle platform are listed below along with the hours the course participants should spend on each module and corresponding ECTS credits. The Moodle platform <https://udl.org.ua/> is primarily used for asynchronous communication and learning management. All necessary information about the course was made available on this platform. Email and social media also could be used for asynchronized communication. Synchronous communication in all five modules, such as seminars, Q&A sessions, collaboration meetings, and presentation sessions is conveyed via Zoom. The Zoom links are provided on the course platform.

Change 2: BENEFIT- Assessment of the capacity-building program

17 participants of the professional development programme took part in the final survey. The four training modules; were received by the participants as in Figure 2.

- Module 1: AI in higher education / Recent technologies, such as ChatGPT and other applications based on Artificial Intelligence
- Module 2: Course design, communication, and course evaluation
- Module 3: Digital examinations and peer assessment / Methods for assessment
- Module 4: Students and teachers' well-being in wartime, motivation, and incentives

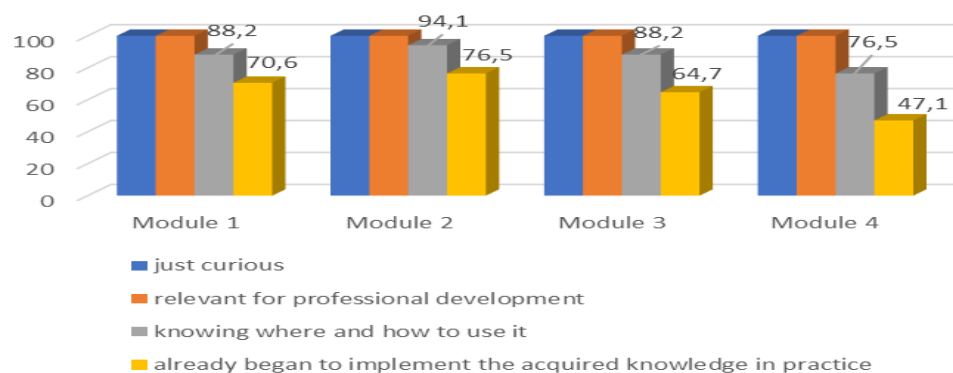


Figure 2: The perception of the usefulness of the four modules.

Accordingly, the findings from the course evaluation in Figure 2 are summarized as follows;

1. **Attention and Actualisation Stages:** all participants were interested in the training content (Attention) and found it relevant for their professional development (Actualisation).
2. **Attraction Stage:** a high percentage of participants (76% to 94%) knew where and how to apply the acquired knowledge in their teaching practice. Module 2 had the highest percentage (94.1%), while Module 4 had the lowest (76.5%).
3. **Action Stage:**
 - *Module 1:* 70.6%
 - *Module 2:* 76.5%
 - *Module 3:* 64.7%
 - *Module 4:* only 47.1% of participants implemented the methods and tools.

Overall, Modules 1, 2 and 3 were well-received and considered useful by the participants, with a significant majority able to apply the acquired knowledge effectively. However, Module 4, which focused on students' and teachers' well-being in wartime, motivation, and incentives, saw less than half of the participants able to apply their knowledge in practice. This indicates a need for improvement and expansion of Module 4, particularly considering the current wartime situation in Ukraine.

The following ideas and implementations were of interest to the teachers:

Integration of AI

- For peer assessment, course evaluation, and test updates
- ChatGPT and Microsoft Bing-like tools in assignments, rubrics, and test development
- To conduct SWOT analysis for team projects
- In the practical task of preparing the concept of a strategic document
- For creating AI-generated content such as pictures and presentations

Course design enhancements:

- Transitioning from a 'resource platform' to a comprehensive e-course
- Inclusion of cross-cutting practical exercises, like team projects focusing on local development strategies
- Adding tasks for self-assessment and mutual peer assessment among students
- Developing a matrix for evaluating strategy concepts as part of peer assessment activities
- Implementing peer assessment to foster collaborative learning
- Updating course structure to align with modern concepts

Interactive tools and techniques:

- Utilizing H5P, quizzes with GPT quiz generator, Mentimeter, and reflection tools
- Developing and using plugins for the course and presentation design
- Using tools in Moodle, like Workshop, Assignment, and Test, along with Google Forms
- Creating video instructions for the course to enhance understanding

Module 5. The usefulness of the training modules 1-4 in the Project work or Online Course Improvement Activity (OCIA), is analysed and the tools and methods learnt in the course have been implemented by the participants as illustrated in Figure 3. It is interesting to observe that some teachers have already tested several tools and methods already in their courses.

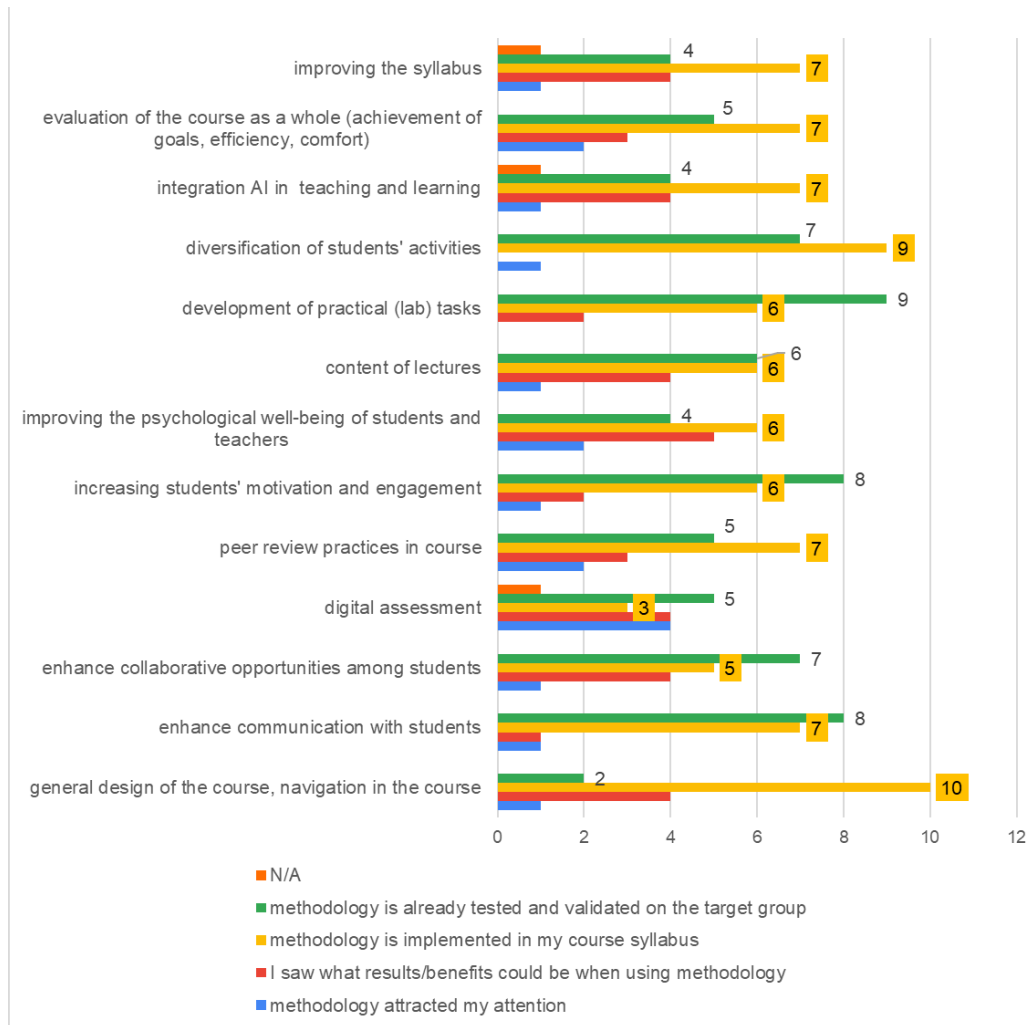


Figure 3: The usefulness of the components of the capacity building modules.

The key competencies developed by the program participants include:

Developing practical (Lab) tasks in e-courses: **53%** of participants were able to implement and validate practical tasks in their online courses.

Enhancing communication and Increasing student motivation and engagement: **47%** of participants succeeded in improving communication with students and boosting their motivation and engagement.

Diversifying student activities and Enhancing collaborative opportunities: **41%** of participants were able to diversify activities and promote collaboration among students.

At the same time, the less developed competencies include:

General course design and navigation: only **12%** of participants managed to test and validate tools for improving course design and navigation.

Improving course syllabus and Integrating AI: **24%** of participants were able to enhance their course syllabus and integrate AI in teaching and learning.

Improving the psychological well-being of students and teachers: 24% of participants addressed the psychological well-being of students and teachers, a challenge that aligns with previous assessments.

We can conclude that the program has effectively developed participants' competencies in practical task development, student communication, and collaborative opportunities. However, challenges remain in areas such as general course design, AI integration, and psychological well-being, which require further attention and support.

DISCUSSION AND CONCLUSION

Analysis of the Improvement:

The teachers indicated challenges related to their teaching online, although all of them have more or less experience in providing online courses. They brought up diverse challenges such as promoting the students' well-being, collaboration possibilities and assessment methods to avoid plagiarism. For the provision of quality education, these aspects have to be considered holistically and it requires different interventions.

The study brought to the fore individual challenges such as worries of keeping control of their teaching material when used in online settings. Also, the challenge to design activities to keep the students motivated during an online course was an overall challenge. The U-train capacity-building program for university teachers in Ukraine has demonstrated significant improvements in several key areas. Participants overwhelmingly found the program content relevant and beneficial for their professional development, as evidenced by the high ratings in the Attention and Actualization stages. The modules on AI integration, course design, communication, and digital examinations were particularly well-received, with most participants reaching the Action stage of implementing the acquired knowledge. This indicates that the program effectively addressed the current educational needs and leveraged modern technologies to enhance teaching practices.

Modules 1, 2, and 3 demonstrated substantial implementation rates, with participants actively applying AI tools, refining course designs, and incorporating peer assessment methods. These changes have the potential to significantly enhance the quality of online education by making courses more interactive, personalized, and effective in assessing student performance. The integration of AI in particular shows promise in automating routine tasks, providing real-time feedback, and facilitating more sophisticated assessments, thus freeing up educators to focus on more complex teaching activities. However, Module 4, which dealt with the well-being of students and teachers during wartime, saw lower implementation rates. This suggests that while participants recognized the importance of well-being, they faced challenges in applying these concepts in practice. The complexities of addressing psychological well-being in a wartime context likely contributed to this outcome, highlighting the need for more targeted support and resources in this area.

Future Improvements:

To further enhance the U-train program and address the identified challenges, several improvements can be made:

1. *Enhanced practical support.*
 - *Module 4:* Given the lower implementation rates, future iterations of the program should provide more practical support and resources for addressing well-being. This could include workshops with mental health professionals, practical strategies

- for fostering a supportive learning environment, and case studies of successful implementations.
 - *Interactive Tools and Techniques*: Increasing hands-on training with interactive tools and practical applications can help participants feel more confident in using these technologies effectively.
2. *Clear guidelines and consistent feedback*. Providing clear descriptions of program requirements and maintaining consistency in program rules will help participants understand expectations and reduce confusion. Regular feedback sessions and follow-up support can ensure participants are on the right track and can make necessary adjustments promptly.
 3. *Increased collaboration and networking opportunities*. Facilitating more opportunities for collaboration and networking among participants can foster a sense of community and provide additional support. Creating a Community of Practice where participants can share experiences, challenges, and solutions can enhance learning outcomes and sustain motivation.
 4. *Focus on well-being*. Expanding the well-being component to include more detailed strategies and practical exercises can help participants implement these concepts more effectively. Providing tools for monitoring and improving well-being, along with success stories, can inspire participants and give them the confidence to apply these strategies.
 5. *Refinement of report requirements*. Simplifying the reporting process by replacing lengthy reports with concise summaries can make it easier for participants to document and share their improvements. This approach can also facilitate more efficient peer assessments and foster a more streamlined evaluation process.

CONCLUSION

The U-train capacity-building program has made significant strides in enhancing the professional competencies of university teachers in Ukraine, particularly in integrating modern technologies and innovative teaching methods. The high levels of participant satisfaction and the successful implementation of AI tools, peer assessment methods, and improved course designs underscore the program's effectiveness. However, the lower implementation rates in addressing well-being indicate areas for further improvement.

Future iterations of the U-train program should focus on providing more practical support, clearer guidelines, and increased collaboration opportunities to address the identified challenges. By refining the well-being component and simplifying reporting requirements, the program can further enhance its impact and ensure that participants are well-equipped to apply the acquired knowledge in their teaching practices.

Overall, the U-train program has proven to be a valuable initiative for professional development in higher education, offering relevant and innovative solutions to contemporary educational challenges. With targeted improvements, it can continue to empower educators and contribute to the advancement of online education in Ukraine and beyond.

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