Revista Românească pentru Educație Multidimensională
ISSN: 2066-7329 | e-ISSN: 2067-9270
Covered in: Web of Science (WOS); EBSCO; ERIH+; Google Scholar; Index Copernicus; Ideas RePeC; Econpapers; Socionet; CEEOL; Ulrich ProQuest; Cabell, Journalseek; Scipio; Philpapers; SHERPA/RoMEO repositories; KVK; WorldCat; CrossRef; CrossCheck

2024, Volume 16, Issue 4, pages: 154-184 | https://doi.org/10.18662/rrem/16.4/911
Submitted: July 8, 2024 | *Accepted for publication:* October 24, 2024

Forced Distance Learning Chinese Experience Case. Some Lessons for the Ukrainian Education System

Oleksii NALYVAIKO [1,*]
Inna KULAKOVA [2]
Olena KUDAIEVA [3]
Anna BONDARENKO [4]
Oksana MKRTICHIAN [5]
Oksana SHTONDA [6]

[1] Ph.D. in Pedagogy, Associate Professor of Pedagogy Department, V. N. Karazin Kharkiv National University, Kharkiv, Ukraine, nalyvaiko@karazin.ua
[2] Master of Arts, Faculty of Modern and Medieval Languages and Linguistics, Cambridge University, Cambridge, UK, innaakul15@gmail.com
[3] Master of Arts, V. N. Karazin Kharkiv National University, Kharkiv, Ukraine, missellaku@gmail.com
[4] Master of Arts, V. N. Karazin Kharkiv National University, Kharkiv, Ukraine, bondarenkoannamain@gmail.com
[5] Doctor of Science (Pedagogy), Associate Professor, Associate Professor of Theory, Technologies and Methods of Pre-school Education, H. S. Skovoroda Kharkiv National Pedagogical University Kharkiv, Ukraine, mkrtichan79@gmail.com
[6] Ph.D. in Pedagogy, Associate Professor, H. S. Skovoroda Kharkiv National Pedagogical University, Kharkiv, Ukraine, stonda.oksana@gmail.com

**corresponding author:* nalyvaiko@karazin.ua

Abstract: *This article addresses the implementation of forced distance learning in universities across the People's Republic of China during the COVID-19 quarantine restrictions. The experience of 4 leading universities of the People's Republic of China was analyzed: Peking University (PKU), Tsinghua University, Shanghai Open University (SOU), Zhejiang University (ZJU). The study analyzes the main aspects of the introduction of forced distance learning into the educational process of the above-mentioned universities: the number of open online training courses, the availability of appropriate infrastructure, and the preparedness of teachers. The experience of Ukrainian universities in the development of distance education is considered. Based on the study, recommendations are given for organizing forced distance learning under quarantine restrictions caused by COVID-19 for Ukrainian higher education institutions. Chinese experience in forced distance learning is a great value for the Ukrainian educational system as an important source of data and information on the following issues: organizing the educational process based on the continuity of this process, accompanying participants in the educational process in the digital space, providing effective methodological instructions to all stakeholders, developing the necessary digital educational content and tools for supporting the educational process, adjusting existing methods and teaching aids to the new conditions for organizing the educational process.*

Keywords: *China; higher education; forced distance learning; Massive Open Online Course; Ukraine.*

How to cite: Nalyvaiko, O., Kulakova, I., Kudaieva, O., Bondarenko, A., Mkrtichian, O., & Shtonda, O. (2024). Forced distance learning chinese experience case. Some lessons for the ukrainian education system. *Revista Românească pentru Educație Multidimensională, 16*(4), 154-184. https://doi.org/10.18662/rrem/16.4/911

©2024 Published by LUMEN Publishing. This is an open access article under the CC BY-NC-ND license http://creativecommons.org/licenses/by-nc-nd/4.0/

Introduction

The COVID-19 pandemic has significantly changed the way people interact and has become a catalyst for educational institutions around the world to find new ways to organize the educational process during the lockdown. As a result, the demand for distance learning using digital platforms has increased significantly. However, it is important to note that even before COVID-19, there was already a high growth in the use of technology in education, with global investment reaching $18.66 billion in 2019 (Li & Lalani, 2020). During an open table in Davos in January 2013, it was decided that the future is with online education (Lorimer, 2013).

In connection with the transition to distance learning, an assessment of the main opportunities, prospects and problems is very important for further improvement of the interaction paradigm. Research suggests that online learning enhances information retention and is more time-efficient for students (Chen, Jones & Moreland, 2017). That is, the changes caused by the coronavirus in the global educational services market will only develop, continuing to change or even replace the classic post-pandemic education (Bardus et al., 2021, Nalyvaiko et al., 2020). In countries where education is mainly provided by the government, this can be a constant trend for the future of education, as such an organization of the educational process requires less investment in infrastructure, more students and removes geographical barriers. That is why there is an urgent need to study the features of distance education and compare ways of implementing the educational process during the global crisis in different parts of the world in order to identify fundamental ideas useful for the development of this area.

Coronavirus infection (COVID-19) has significantly affected the lives of millions of people around the world. Significant changes have taken place in the educational process. The first country affected by the epidemic was China. In the early spring of 2020, Chinese universities were forced to move quickly to unpredictable "migration" from traditional classroom learning to online learning. According to the government's demands not to stop the educational process, most Chinese universities have started online learning (Ministry of Education of P.R. China, 2020b).

Since the beginning of the 21st century, Chinese universities have begun to develop and implement online platforms for distance

learning. An important step in the development of online learning was the introduction of MOOC (Massive Open Online Course) in the educational process. MOOCs include theoretical, practical materials, audio and video recordings of lectures and seminars, open forums for communication and chat. These courses make the educational process more flexible, individualize and differentiate learning (Pokryshen, & Korniyets', 2015). The first Chinese MOOC platform is XueTangX, which was introduced on October 13, 2013 (Nalyvaiko, 2020). In the same year, Chinese universities became partners of such world-famous MOOCs as edX and Coursera (Embassy of Switzerland in China, 2014). With the rapid development of MOOC platforms, the number of courses offered by Chinese universities has exceeded 500 (Shang, 2017).

The 2020 pandemic was the impetus for the development of MOOC platforms, as their functionality is ideal for online learning. The Table 1 below shows the 2 times increase in the number of courses offered by Chinese MOOC platforms from 2019 to 2020, respectively (Rui, 2021).

Table 1. Distance learning platforms in universities of China (Rui, 2021).

Platform	Founded	Courses (2019.12)	Courses (2020.12)
XuetangX	2013	1500	3521
iCourse	2014	2500	9228
Zhihuishu	2013	3500	8330
CNMOOC	2014	1500	2022
Xue Yin Online	2017	3000	5948

In addition to educational platform courses, digital applications such as ZOOM, Rain Classroom, and Tencent Meeting were employed to facilitate online learning. As the coronavirus pandemic rapidly spread, the urgent need for the widespread implementation of distance learning arose across countries worldwide. Analyzing the development and current state of distance education in both China and Ukraine reveals that while the two nations encountered similar challenges and objectives in the process of implementation, their approaches to addressing these issues differed in certain respects.

Notably, both China and Ukraine have been discussing the concept of distance education since the early 21st century. However, prior to the pandemic, China had already made significant progress in developing online learning platforms such as XuetangX and iCourse, and Chinese universities had established active partnerships with globally recognized MOOCs like edX and Coursera. In contrast, Ukraine's development of distance learning was more focused on addressing the organizational and implementation aspects of distance education, as reflected in numerous scientific publications.

In 2024, the Prometheus MOOC platform was launched in Ukraine. Prometheus offers more than 200 courses to job seekers (Prometheus, 2024). The coronavirus did not become an impetus for the development of Ukrainian MOOCs. In both China and Ukraine, quarantine measures triggered active training for teachers and the development of online courses on learning platforms.

This article **aims** to explore the challenges and solutions related to distance learning, with a focus on the forced transition to online education in leading Chinese universities, and to offer insights for Ukrainian higher education. The following universities were selected for the study: Peking University, Tsinghua University, Shanghai Open University, Zhejiang University.

Research Tasks:

1. Conduct a theoretical analysis of the implementation of forced distance learning in leading universities in China.
2. To highlight the current state of distance learning in China and Ukraine.
3. Provide recommendations on the leading experience of PRC universities in forced distance learning for universities in Ukraine.

Methodology

The article employs a comparative case study methodology to analyze the implementation of forced distance learning at universities in China during the COVID-19 pandemic. Specifically, the study focuses on the experiences of four leading Chinese universities: Peking University (PKU), Tsinghua University, Shanghai Open University (SOU), and Zhejiang University (ZJU). The methods used include. The article synthesizes information from various sources including academic papers, government documents, and reports from educational institutions. This comprehensive literature review helps in understanding

the context and evolution of distance learning in China. The main methodological approach is the in-depth analysis of the distance learning practices at the four selected universities. The analysis covers aspects such as the number of online courses offered, the infrastructure in place, the preparedness of teachers, and the support mechanisms for students and staff. The study compares the distance learning experiences of Chinese universities with those in Ukraine. This comparison is aimed at identifying best practices and lessons that can be applied to improve the Ukrainian education system under similar quarantine conditions. Data is collected from various sources including university reports, government publications, and previous research studies. The data is then analyzed to understand the effectiveness of the distance learning methods employed during the pandemic.

The choice of the four universities for analysis is justified based on several factors: reputation and influence (Peking University and Tsinghua University are among the top universities in China and are known for their advanced research and educational capabilities. Their experience in transitioning to distance learning provides valuable insights due to their significant influence on the educational landscape in China); diverse educational models (the selected universities represent a mix of traditional and open university models. For instance, Shanghai Open University specializes in open and distance education, offering a different perspective compared to traditional universities like Zhejiang University. This diversity allows for a comprehensive understanding of how different types of institutions adapted to the pandemic); existing online infrastructure (these universities had already made significant investments in online learning platforms and technologies before the pandemic. Their prior experience with MOOCs and other online learning tools made them well-equipped to handle the sudden shift to distance learning, providing a robust case study for effective implementation); geographical and institutional variety (the universities are located in different regions of China, which helps in understanding the regional differences and challenges faced in implementing distance learning. This geographical diversity ensures that the study covers a wide range of contexts within China); leadership in innovation (the universities chosen are recognized leaders in educational innovation. Their proactive measures and swift adaptation to the pandemic conditions provide valuable lessons for other institutions looking to enhance their distance learning capabilities.

Data saturation was achieved by collecting and analyzing information from a diverse range of sources within each institution. This includes official reports, digital platforms, and qualitative data from academic publications. The study reached saturation when no new themes or insights were emerging from the analysis of distance learning practices at the selected universities.

One limitation of this study is its focus on four leading universities, which may not be fully representative of all higher education institutions in China. Additionally, the study relies on secondary data sources, which could limit the depth of analysis. Another limitation is the exclusion of perspectives from students and faculty members directly involved in distance learning during the pandemic. Future studies could include a broader range of universities and incorporate qualitative interviews to enrich the analysis

By analyzing the experiences of these leading universities, the article aims to derive practical recommendations for Ukrainian higher education institutions to effectively organize and manage forced distance learning during similar crises.

Experience of chinese universities in Covid-19 times

General provisions for the introduction of distance technologies in the educational process of the PRC

The experience of Chinese universities during the COVID-19 pandemic showcases their rapid adaptation to distance learning. With the support of government initiatives, institutions across China implemented comprehensive strategies to ensure the continuity of education through advanced digital platforms and innovative teaching methods. Below, we explore the key provisions and strategies that facilitated this successful transition.

In response to the urgent need for a flexible online education system to accommodate over 270 million students, the Ministry of Education of China launched the "Disrupted classes, undisrupted learning" initiative. On February 5, 2020, the Ministry reinforced this initiative by issuing the "Guidance on the Organization and Management of Online Teaching in Higher Education Institutions During Epidemic Prevention and Control Period" (Ministry of Education of P. R. China, 2020a). This document outlined the responsibilities of national and local authorities in facilitating the active

participation of colleges and universities in the coordinated provision of online education. Additionally, the Ministry underscored the importance of maintaining the quality of online courses at a level comparable to traditional face-to-face instruction. Higher education institutions responded swiftly to these directives. By February 2, 2020, 22 major online learning platforms had made available 24,000 courses to higher education institutions, including 1,291 national courses and 401 pilot courses, covering 12 undergraduate and 18 higher vocational programs (Wang, 2020).

The popularity of online courses and education in China is evident, as 331 million students used these platforms in 2020 (Fig.1).

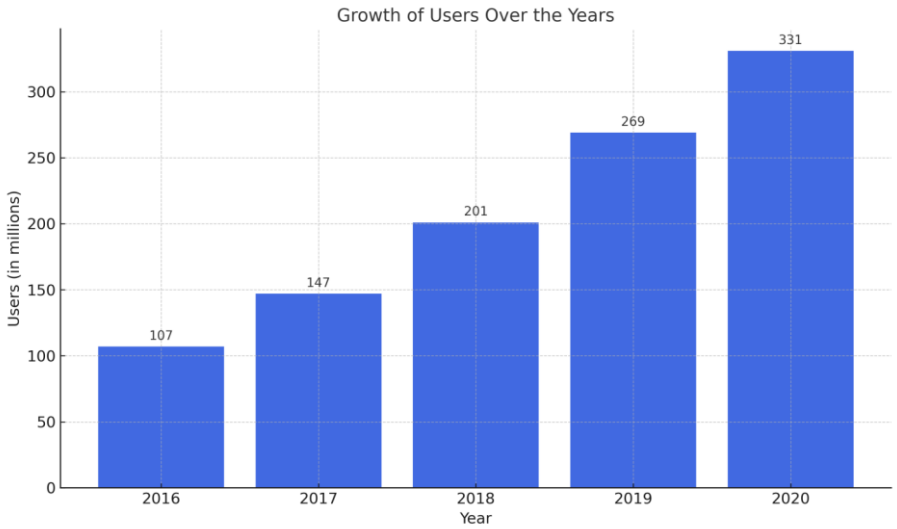


Figure. 1. Number of online education users in China from 2016 to 2020

In 2018, the number of paying users in China's online education sector reached 135 million, reflecting a 23.3% increase compared to the previous year. Projections suggest that the growth will continue at a rate of 14% to 21% over the next 3 to 5 years. Although the growth rate is expected to decline, it will remain stable over this period (Fig.2).

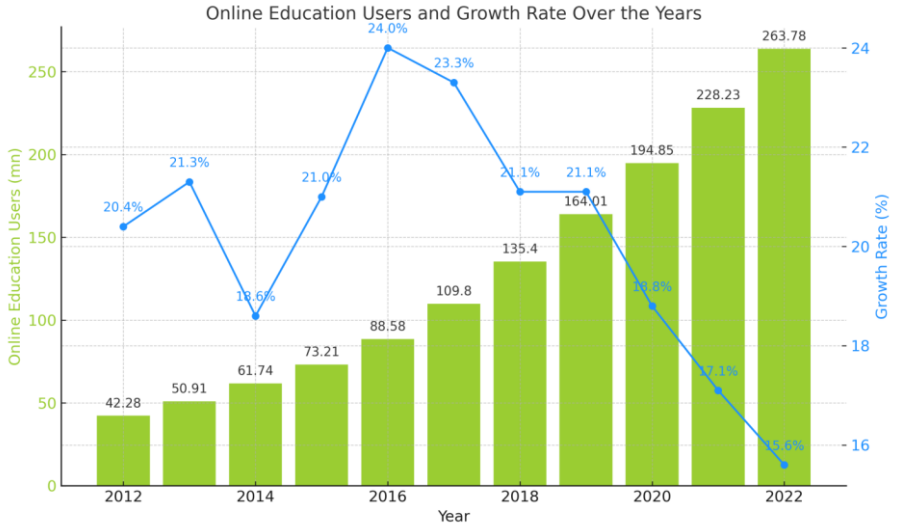


Figure. 2. China's online education paying users

We can see that the online education market and the number of students involved in online forms of learning is one of the highest in the world, making the Chinese system of online and distance education a "flagship" in the development of these digital learning tools. Building on these findings from China, the Ukrainian education system can draw valuable lessons for adapting its distance learning programs

Analysis of the experience of implementing forced distance learning in chinese universities

Peking University is one of the leading educational institutions in the People's Republic of China. It encompasses 30 colleges and 12 faculties, offering 93 undergraduate majors, 199 master's programs, and 173 doctoral programs. The university is home to 216 research institutions, including two national engineering research centers. Peking University holds a leading position in China in terms of its academic staff, including the number of professors, doctoral advisors, and members of the Chinese Academy of Sciences and the Chinese Academy of Engineering, as well as a student population exceeding 40,000. Prior to the COVID-19 pandemic, the university had already engaged in the development of online education and Massive Open Online Course (MOOC) platforms. For example, in 2013, Peking University established

partnerships with international platforms such as Coursera and EdX, and later collaborated with domestic MOOCs, including XuetangX, iCourse, and ClassIn. Despite these initiatives, the availability of online courses remained relatively limited, with most participants being external learners rather than university students. However, the abrupt outbreak of the COVID-19 pandemic necessitated a swift expansion of the university's online education system. As a result, 2,613 programs were introduced for undergraduate students, along with 1,824 courses for bachelor's degree students, ensuring that 44,700 students continued to receive high-quality education during the quarantine period.

Teachers encountered a significant challenge in rapidly transitioning their course materials to an online format within just a few days. Generally, a comprehensive online course requires careful planning, which includes creating a lesson outline, developing video lectures, audio resources, and coordinating with a technical support team. Wei Bao (2020), an associate professor of higher education at the Graduate School of Education, Peking University, identified six key strategies for effectively transitioning to online learning. These strategies are designed to facilitate student engagement in the educational process and enhance their concentration levels, drawing from research on online learning conducted at Peking University:

1. Development of contingency plans related to congestion of online platforms or due to technical problems. Students must be notified in advance about the availability of plans B and C.

2. Division of the study materials into smaller units (25-30 minutes) for better concentration.

3. Emphasis on the teacher's "voice" involvement. The necessity of holding live online classes has been emphasized, as it allows for real-time interaction and engagement between students and instructors, fostering a more dynamic learning environment.

4. Engaging the assistants of the department. Considering that not all the teachers are technically competent, the assistants' support is also very important.

5. Encouragement of active students' learning when performing tasks individually. Assignments of home tasks should take into account the involvement of active learning methodologies, ensuring that students engage critically with the material rather than passively consuming it.

6. Effective combination of online education and individual work. (Wei, 2020).

Peking University has played a pivotal role in advancing online education in China, collaborating with both prominent international educational platforms and Chinese MOOC platforms (Shi, 2020). On December 26, 2020, the university further solidified its commitment to online learning by launching its own platform, PKU Academy. This platform offers a wide array of continuing education courses, covering disciplines from the natural sciences to the humanities (Ning, 2020). Additionally, Peking University is a member of the International Union of MOOCs, which enables students globally to access high-quality education. Throughout the COVID-19 pandemic, the university leveraged digital platforms and tools for educational delivery, incorporating live streaming, recorded video and audio lectures, online discussions, and MOOCs.

Similarly, Tsinghua University, one of China's most prestigious institutions, was founded in 1911 and is a member of the C9 League. It consistently ranks as the top university in China, and its alumni include many renowned scientists, artists, and politicians. The university is also well known for its scenic campus, which occupies the former Shuimu Tsinghua Imperial Park in the northwest of Beijing.

Following the outbreak of COVID-19, Tsinghua University implemented a comprehensive set of measures aimed at preventing the spread of the virus while maintaining continuity in education through a distance learning format (Tsinghua University, 2021). According to Peng Gang, vice-president of Tsinghua University, "Tsinghua University was the first in China, and possibly in the world, to fully adhere to the academic schedule by transitioning all courses, except a few practical ones, to an online format during the pandemic" (Ning, 2020). Most of the courses were conducted via Tsinghua's Rain Classroom platform, along with the use of MOOCs and video conferencing applications.

In addition, the university quickly established a study group comprised of online education specialists, teaching assistants, and student volunteers to provide comprehensive online teaching training for instructors through test-based learning. This initiative led to collaborative instruction sessions for over 50,000 Tsinghua faculty members and students, all hosted on the Rain Classroom platform. These sessions outlined the steps for pandemic prevention and control at the university, adjustments to the academic schedule, and various aspects of online teaching. The session was broadcast nationwide as well.

In less than two weeks, more than 2,600 Tsinghua University faculty members had been trained in online instruction, supported by over 2,300 volunteers who offered technical assistance. The new semester began on February 17, with over 4,000 courses being delivered online.

In just one month, despite facing limited time, information, and resources, alongside significant uncertainty and the urgent need for rapid adaptation, Tsinghua University implemented a series of strategic decisions, which can be divided into three distinct phases. During the first phase, spanning from January 21 to 24, 2020, the university fully prepared to tackle the challenges posed by COVID-19 by assembling a dedicated team of distance education instructors and support staff. As the pandemic intensified, the university entered the second phase, from January 25 to 28, 2020, during which officials made the decision to delay the return of students to campus. During the third step (January 29 - February 17, 2020), the university prepared for continuing online learning and improving this process by refining digital infrastructure, training staff, and enhancing communication channels with students. In general, the early actions taken by Tsinghua University have effectively contributed to the development of online teaching and learning.

During the COVID-19 outbreak, Tsinghua University transitioned various extracurricular activities to an online format, including events that were traditionally held in-person, such as sports competitions and group meetings. For example, the Tsinghua University Student Union launched an online initiative titled "Morning Exercise at Home," which involved a structured "In-Room One-Hour Exercise Plan." This plan required participants to complete at least one hour of daily exercise under the guidance of an online coach. Participants then reported their attendance by uploading photos as proof of participation via WeChat. In addition, students organized virtual group events, such as live streaming sessions of the Chinese Poetry Competition Season 5, where they engaged in real-time commentary, fostering online interaction among peers.

The University's Awards and Subsidies Department quickly responded to the needs of students facing financial difficulties due to the pandemic and challenges related to online learning. Following the release of the "Notice on the Provision of Special Grants to Students in Difficult Financial Situations and Victims of COVID-19," the department received 334 applications. University representatives

contacted each eligible student and ensured the timely distribution of financial aid.

Tsinghua University also addressed the needs of students nearing graduation. Master's students were given the flexibility to modify their thesis topics and research methodologies to prevent delays caused by the campus closure. For undergraduate students, the university maintained its commitment to upholding graduation standards while increasing the number of available graduation paper submissions from four to five times in 2020. During the spring semester, 3,395 students completed their thesis defenses online, with the graduation rate comparable to the previous year, and a total of 4,037 undergraduate students successfully graduated.

Furthermore, Tsinghua University placed a strong emphasis on supporting graduate employment during the spring semester. The university organized over 85 online recruitment events, offering more than 50,000 job opportunities, which was approximately 1.5 times the number available during the same period in previous years prior to the COVID-19 pandemic. Additionally, online career guidance programs were introduced to assist graduates in their job search. By June 20, 2020, the overall employment rate for Tsinghua University's 2020 graduates surpassed that of previous years during the same timeframe (Bin & Cheng, 2020).

One of the university's notable achievements in distance education was the launch of the international version of the XueTangX platform on April 20, 2020, enabling educators and students worldwide to continue their education during the pandemic (Callan, 2020).

Tsinghua University also collaborated with UNESCO to host a global event that focused on the role of online education in response to the pandemic. The event, titled "Online Education in Response to COVID-19 and Beyond," featured case studies, best practices, and experiences with online learning shared by approximately 30 participants, including university rectors, professors from 21 universities across 15 countries, and international experts, as well as representatives from UNESCO's higher education division. Educational policy advisors, teachers, students, and other key stakeholders in education also participated in the event. The discussion was moderated by Yang Bin, vice president and vice-rector of Tsinghua University, and Marielza Oliveira, director of the UNESCO Beijing Cluster Bureau. Stefania Giannini, UNESCO's assistant director-general for education,

acknowledged Tsinghua University's pioneering efforts in online education, stating, "Tsinghua University was one of the first institutions in the world to move all courses online, and it is fitting that you are part of this conversation today. Learning must continue, and it should not stop" (Guo, 2020).

Shi Zhongying, dean of the Tsinghua University Institute of Education, highlighted the university's commitment to addressing educational inequalities by establishing a foundation to support students in remote areas who lack access to the internet. He emphasized that educational inequality is a global issue that requires concerted efforts from all nations to resolve (Chen, 2020).

At the same event, the Tsinghua University Institute of Education presented a progress report titled "Evaluation and Implications of Required Online Education at Tsinghua University." This report examined the organization and significant educational experiences of both students and teachers and provided recommendations for the future of education (Chen, 2020).

Shanghai Open University is a modern educational institution funded by the Shanghai municipal government, approved by the Chinese Ministry of Education, and overseen by the Shanghai Education Commission. Originally established in 1960 as Shanghai Television University, the institution primarily offers bachelor's degree programs and provides 46 academic programs. Currently, the university serves 80,000 enrolled students and has graduated over 470,000 students since its inception. Shanghai Open University collaborates with UNESCO through the UNITWIN network in the areas of distance and open learning, and it has been recognized with the UNESCO Prize for the Use of Information and Communication Technologies in Education (Shanghai Open University, 2021).

Following the directives of the Shanghai Municipal Education Commission (2020), the University of Shanghai gradually transitioned to online learning from the spring semester in March. On March 2, 44 universities and 11 postgraduate research institutes and higher vocational colleges spearheaded the development of online education. That day, over 700,000 students participated in 7,000 courses. To further enrich the academic programs of universities, the Municipal Education Commission developed a platform to produce and share educational resources across universities in Shanghai. This platform featured videos of lecturers delivering two public courses on

"Fundamentals of Computer Programs." During the pandemic, 40 branches and training centers of Shanghai Open University, located in both urban and rural areas, were connected to the distance learning network. The sharing of educational resources enabled students to complete their academic tasks from home. Shanghai Open University currently hosts 745 courses on the platform (Website of the Ministry of Industry and Information Technology, 2020).

During the period of epidemic prevention and control, Shanghai Open University responded to the increased demand for home-based education by integrating resources from multiple platforms and launching its own version of the "Air Class" (Xiaojing, 2020). Since February, the university's online courses have been made entirely free of charge. These educational materials cover six key topics: Humanities, Art Design, Preschool Education, Professional Skills, Public Safety, and Healthy Lifestyles.

Additionally, the university prioritized students' mental well-being by offering virtual "walks" and "excursions" through a series of routes developed using virtual reality technology, creating a 720-degree panoramic map experience. Furthermore, Shanghai Open University collaborated with Shanghai East Radio to establish the "Open University Lessons" broadcasting station. This station features a carefully curated selection of 102 online courses from the university's curriculum, providing access to over 1,000 educational video resources (Shanghai Open University, 2021).

Among the students at Shanghai Open University, more than one-third are actively involved in starting their own businesses. During the pandemic, the university transitioned its entrepreneurship training camp, known as the Business Incubators, from an offline to an online format. The camp focuses on nurturing innovative thinking and enhancing practical skills. This model has been successful in fostering critical thinking among students and has become a benchmark for innovative education. To address the challenges of online learning in terms of interaction, the camp adopted a "learning-results-feedback-improvement" strategy. Each day focused on a specific theme, such as teamwork day, competition day, resume-building day, discussion day, or homework review day.

The training camp employed a highly interactive learning model known as "knowledge crowdfunding." During the program, students were frequently encouraged to explain newly acquired knowledge and

share their experiences by exchanging homework and discussing challenging topics. According to the data, a total of 23,800 "effective interactive messages" were exchanged within 14 WeChat training camp groups, with an average of 140 interactions per student, resulting in a 98.9% user activity rate. Over the same period, students submitted 568 valid assignments and provided 4,951 valid interactive comments, with an interaction rate of 98.7%.

Efforts to enhance student life during the pandemic included several initiatives:

- Expanding employment opportunities for graduates of higher education institutions and increasing access to further education. The university's employment platform integrated business services with career counseling, enabling students and graduates to navigate career options.
- Improving dormitory management, with special attention given to the health and well-being of each student. This was supported by the creation of a WeChat group, where students received daily updates on health and safety protocols.
- Disseminating official information in both Chinese and English, and organizing communication groups according to the students' native languages to ensure timely and accurate information delivery.
- Holding online meetings with international students to provide additional support and ensure their well-being while they remained outside their home countries (Wang et al., 2020).

Zhejiang University (ZJU), one of China's most esteemed and oldest institutions of higher education, was founded in 1897 and is located in Hangzhou. The university employs 3,941 faculty members, including 50 members of the Chinese Academy of Sciences and the Chinese Academy of Engineering. ZJU's total student enrollment stands at 62,122, with over 54% being graduate students, including those in correspondence programs. The university is organized into 11 departments, encompassing a wide range of disciplines, such as philosophy, economics, law, education, literature, history, research, engineering, agriculture, medicine, and management (Zhejiang University, 2020).

ZJU is consistently ranked among the top three universities in mainland China and frequently appears in the top 100 of both The Times Higher Education World Reputation Rankings and the QS World University Rankings. Among the university's key innovations are the establishment of a high-level platform for intellectual property exchange

and the creation of influential think tanks, such as the China Western Region Development Academy, the National Agricultural and Rural Development Research Center, and the Public Policy Institute, all aimed at broadening ZJU's research scope in the social sciences. ZJU has established partnerships with over 190 institutions across 30 countries, including leading universities such as Imperial College London and the University of Sydney.

In response to the COVID-19 pandemic, Zhejiang University initiated its spring semester online on February 24, 2020, adhering to the pre-established academic calendar. This contingency plan encompassed all students at ZJU, including international students, and extended the availability of numerous courses to learners globally.

Zhejiang University delivers its online education primarily through two key platforms: "Learning at ZJU" and "DingTalk for Zhejiang University," an app specifically developed for virtual teaching. Within the first two weeks of its launch, the university made more than 5,000 courses accessible to both undergraduate and graduate students. The "Learning at ZJU" platform attracted nearly 570,000 visitors, while the "DingTalk ZJU" application, co-developed with Alibaba, gained approximately 300,000 users. During the spring semester of 2020, around 2,500 graduate students successfully defended their dissertations, with the option of completing their degree requirements through an online oral defense.

Despite the prior existence of online education, not all instructors were equally skilled in utilizing digital tools or managing virtual classrooms. To address this disparity, ZJU initiated training sessions for 3,670 faculty members in mid-February as part of its commitment to maintaining quality in online teaching.

Recognizing the challenges of unequal access to online education, ZJU began providing financial support in January to more than 1,000 students from low-income backgrounds. The university also secured agreements with several internet service providers to offer subsidized internet access to both students and faculty. For students with unstable internet connections or limited access to live broadcasts, ZJU made recorded lectures and other educational resources available. In early March 2020, the university launched the "Research at ZJU" platform, designed to enable online collaboration between researchers and students, thereby ensuring the continuity of academic and research activities during the pandemic.

It is important to highlight that in early 2020, over 500 doctors from Zhejiang University actively contributed to the fight against COVID-19 in Wuhan, the epicenter of the initial outbreak. Drawing from this experience, the university later compiled the COVID-19 Prevention and Treatment Handbook, which was distributed to more than 230 countries and regions worldwide. In this era of rapid scientific revolutions, education is undergoing transformative changes. Information technology is driving educational processes to new heights, while the global movement toward "education for all" is gaining momentum, with globalization transforming traditional campuses into international online platforms.

Universities must evolve to meet the demands of the changing landscape by encouraging a harmonious relationship between humans and technology, strengthening teacher-student interactions, and promoting lifelong learning. Online education serves as a prime example of how institutions can improve the quality of learning. Although the COVID-19 pandemic has posed substantial challenges for educational institutions worldwide, it has also provided a unique opportunity to rethink and transform the educational process, making it more flexible and seamlessly integrated with modern technological advancements.

Experience of the ukrainian higher education system

In Ukraine, distance education is still largely viewed as an innovative approach, despite the approval of the "Concept of Development of Distance Education in Ukraine" in 2000 (Decree of the President of Ukraine, 2000), which outlined the rationale, goals, primary objectives, and anticipated outcomes of implementing such a system. In 2013, another key document, the "Regulation on Distance Learning" (2013), was approved, providing detailed scientific and methodological support, as well as guidelines for organizing the educational process using distance learning technologies. The right to receive education in various forms, including distance education, is guaranteed by the Law of Ukraine "On Education" (2017). In May 2020, guidelines for organizing distance learning were introduced, with these recommendations being formally approved in the Report of the Educational Institution on June 18, 2020 (Methodological Recommendations on the Organization of Distance Learning at School). In addition to legislative frameworks, the organization and implementation of distance learning have been the focus of numerous studies by both Ukrainian and international

researchers: O. Bazelyuk, L. Maiboroda, L. Petrenko (2016), V. Kukharenko (2018, O. Mukoviz (2016). During 2000-2016, National Technical University "Kharkiv Polytechnic Institute" published manuals and monographs (Kukharenko et al., 2016; Bykov et al., 2008; Kukharenko, Rybalko & Sirotenko, 2002), which presents methods of creating modern distance learning courses, conducting distance learning process, provides recommendations for the organization of distance learning and examination of distance learning course.

During the rapid transition to distance learning during the quarantine of 2020, teachers frequently had to explore the functionality of online learning platforms through a trial-and-error approach, often without any prior theoretical knowledge. This required them to quickly identify the most convenient, efficient, and, crucially, free tools for delivering education in practice. These efforts demanded significant time, which inevitably impacted the quality of the educational process organization. Although distance education was not an entirely new concept in Ukraine, its implementation had been sporadic and carefully planned until March 2020. The pandemic introduced new challenges, chief among them being the complete shift to online learning in an emergency mode, necessitating a comprehensive overhaul of the organizational structure of the education system.

To consider the implementation of remote control in Ukraine, it is proposed to review the experience of some Ukrainian institutions of higher education:

In February 2020, the faculty and staff of the Horlivka Institute for Foreign Languages participated in training focused on the specifics of the Modular Object-Oriented Dynamic Learning Environment (Moodle) and its integration into the educational process. This training was part of the project titled "Improving the Quality and Relevance of Vocational Education for the New Ukrainian School in the Donetsk Region," funded by the European Union under the European Neighborhood Instrument Program 2017: Special Events, "EU Support for Eastern Ukraine." The project was managed by the "Center for Philological Development," a public organization affiliated with the Horlivka Institute for Foreign Languages (Kukharenko & Bondarenko, 2020). The Horlivka Institute for Foreign Languages distance education system on the Moodle platform for each of the disciplines included training and work programs, lecture notes, video lectures with YouTube content, seminar and laboratory plans, assignments for individual work,

recommended literature, control questions and self-control, test tasks, evaluation criteria, etc. Given the urgency of populating the platform with educational materials, not all courses met the expected quality standards.

Classes were conducted as scheduled through online meetings between teachers and students. Tools such as Zoom, Skype, and the BigBlueButton module integrated into the Moodle platform were employed for this purpose (Nalyvaiko et al, 2021).. A notable advantage of these tools is their capacity to schedule video conferences in advance and send reminders for upcoming meetings. Additionally, for students who were unable to attend the live video sessions, recorded versions of the meetings were made available.

The order on the transition to distance learning in Kharkov National University of Radio Electronics during quarantine provided that for all subjects of the spring semester of 2019/2020 academic year it was necessary to create (in 4 days) appropriate distance courses and register teachers and students for all forms of education. Thus, in a relatively short period of time, more than 1,500 courses were created, with about 7,000 students and about 500 teachers registered (Kukharenko & Bondarenko, 2020). All teachers received notifications about the created courses as well as the necessary recommendations at their own e-mail addresses. Google Meet was recommended for conducting lectures, seminars, workshops, consultations and other pedagogical activities. This was due to the fact that according to corporate capabilities this tool allows you to meet with a large number of users (250), make videos for all participants and has no time limits for conferences.

Filling the bank of distance courses of V. N. Karazin Kharkiv National University reached 1,800 distance learning courses in early 2020. The number of full-time courses (attended by students) was 1234 in 2019. But it was necessary to teach university teachers to work in "Moodle", teach to create distance learning courses, design them and show how to work with them. 868 teachers and employees of the university (22 faculties and educational and research institutes) were trained. Another key component of the university's information and educational space is the integration of e-learning into its distance learning system. By the end of the 2019/2020 academic year, 698 students were enrolled in extramural studies through distance learning courses, utilizing 290 available online courses. These courses were

created and supported by 186 teachers at 14 faculties of the university (Kukharenko & Bondarenko, 2020), the use of distance courses was carried out on a full cycle in some faculties, that means in all undergraduate and graduate courses.

Discussion

W. Bao's (2020) study examines the implementation of online education at Peking University, outlining six key strategies that encapsulate the current best practices for university instructors delivering online courses under similar conditions. The study identifies five core principles of effective online learning, which include: (a) a strong alignment between the course design and student learning objectives, (b) the efficient online dissemination of educational content, (c) sufficient support from both teachers and teaching assistants, (d) active student engagement to enhance the depth and scope of learning, and (e) the necessity of having a contingency plan for unexpected disruptions on online learning platforms (Bao, 2020).

Following the outbreak of COVID-19 in China, the government imposed a nationwide ban on face-to-face instruction, leaving over 270 million students unable to return to their schools and universities. In response, the Ministry of Education of the People's Republic of China initiated the "Ensuring Uninterrupted Learning When Classes Are Disrupted" program, which involved a comprehensive overhaul of the educational system to integrate online learning. However, this rapid shift in response to an unforeseen crisis posed significant challenges, including limited preparation time and the isolation of both teachers and students.

According to iResearch, the share of online education in China's higher education system has been gradually declining in recent years. However, it continues to offer more benefits compared to school education and vocational training. This trend suggests that online learning is not only becoming more integrated into higher education but is also increasingly adopted in general education, significantly enhancing the digital skills of future university students (Jiang et al., 2023). As a result, this expansion broadens opportunities for prospective students in the digital era, enabling self-directed learning and allowing individuals to chart their own educational pathways, particularly in contexts such as compulsory distance learning (Fig. 3).

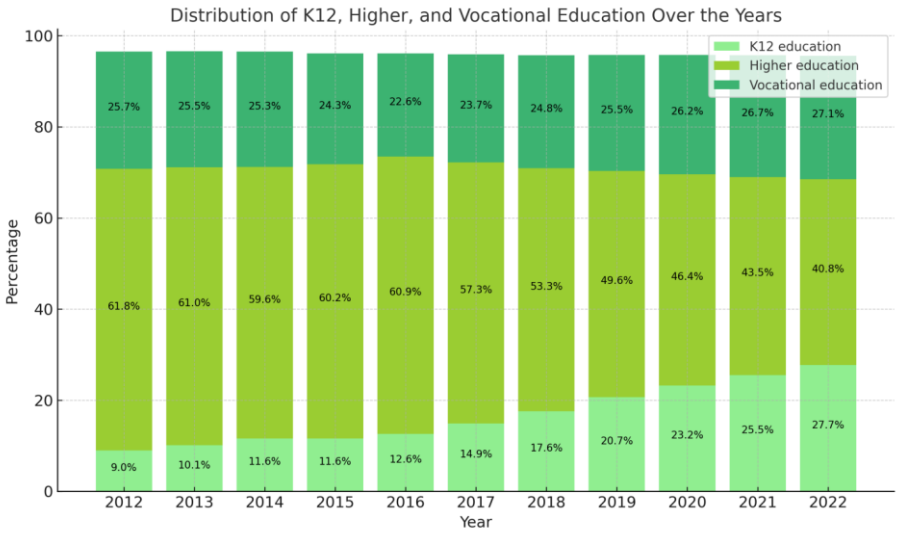


Figure. 3. Structure of online education in China

This paper explores the potential of Open Educational Resources (OER) and Open Educational Practices (OEP) as effective solutions to address the challenges faced in education. The study first establishes a foundational understanding of OEP, drawing from existing definitions of open practice. Using this framework, along with insights gathered from two national online workshops attended by Chinese educators, a set of recommendations for the effective application of OER and OEP in both teaching and learning contexts is provided. Additionally, the paper offers guidelines for the improved future implementation of OER and OEP. The findings from this study aim to assist researchers and educators in leveraging OER and OEP to enhance learning outcomes during the COVID-19 pandemic (Huang et al., 2020).

In March 2020, the Ukrainian education system was significantly impacted by the shift to distance learning, resulting in substantial changes to both the organization of the educational process and the preparation of its participants. This research will focus on examining the most prominent effects of the transition to forced distance learning within higher education institutions.

The imposition of quarantine restrictions in March 2020 placed the Ukrainian higher education system in a challenging position, forcing institutions to either suspend the educational process entirely or risk diminishing the quality of education by relaxing these restrictions.

Notably, at the onset of the pandemic, universities were largely left to manage the situation independently. The responsibility for continuing the educational process rested heavily on individual instructors and their ability to transition their courses into an online format.

Until May 2020, the Ministry of Education and Science of Ukraine had not issued clear guidelines for organizing the educational process under the conditions of forced distance learning. This lack of direction significantly complicated the situation, exacerbated by the underdeveloped legal framework for distance learning. The primary regulatory document governing distance education in Ukraine remains the Ministry of Education and Science's Order No. 466, dated April 25, 2013, which approved the "Regulations on Distance Learning."

Given the year of its issuance, it is evident that the document is outdated, failing to account for advancements in digital and distance technologies both within education and in other related fields. It no longer adequately reflects the current state of distance education, either globally or in Ukraine.

In this context, one of the most urgent challenges was to enhance the digital competence of educators and students. However, the absence of a cohesive national strategy to address this issue resulted in a significant imbalance within the higher education system. Nevertheless, the efforts of the Ministry of Digital Transformation of Ukraine deserve recognition, particularly their 2021 development of the digital competence framework "DigComp Ua for Citizens 2.1." This framework outlines the components and descriptors of digital competence for Ukrainian citizens, which is expected to significantly support the development of digital skills and abilities across both younger generations and adult learners.

Recommendations for the effective construction of the educational process in the conditions of forced distance learning:

1. Enhancing Stakeholders' Capacity to Utilize OER

Both students and educators often lack the necessary skills to create, publish, and effectively use Open Educational Resources (OER). To address this, it is essential to organize training sessions that not only equip them with the ability to select high-quality OER but also cover fundamental technical skills, such as video editing, audio mixing, and understanding open licenses. These sessions would also help mitigate issues related to low-quality OER.

2. Establishing Institutional Policies to Support Open Education

Many universities in China lack internal policies governing the use of OER and Open Educational Practices (OEP). Research suggests that institutional policy is critical for encouraging educators to create and publish their materials as OER (Atenas et al., 2019). Universities can incentivize OER contributions by offering financial rewards or recognizing OER publication as a criterion for academic promotion. Additionally, university leaders often lack a clear understanding of OER and their potential to enhance learning outcomes, which can be addressed through national seminars aimed at increasing awareness of OER and OEP among decision-makers. This, in turn, could foster greater knowledge sharing and rapid implementation of open educational practices.

3. Promoting Inclusivity and Equity through Open Education

While distance education is widely used in China to reach students in rural and remote areas, students with disabilities often receive less attention. Before the pandemic, there were no OER repositories specifically designed for students with disabilities, and such resources were rarely tailored to their needs. To address this, low-cost technologies should be developed to enable offline access to OER, ensuring that students in areas with poor or unstable internet connectivity can still benefit. This would help close the "digital divide" and increase educational equity (Dobroskok et al., 2020).

4. Developing Sustainable Models for Open Education

Many OER projects in China, such as the Chinese Quality Course and the National Cultural Information Resources Sharing Project, have been government-funded for limited periods (typically 3 to 5 years) without clear long-term sustainability plans. To ensure the longevity of these initiatives, sustainable OER development models must be established. Downes (2007) proposed several strategies for sustaining OER, such as sponsorship, where the costs of producing and distributing open content are covered in exchange for advertising or promotional space. Mengual-Andrés and Payà Rico (2018) argue that sustainable strategies should be carefully tailored to specific cultural and financial contexts. By sharing successful examples of sustainable open education initiatives worldwide, educational leaders and managers can better develop customized strategies for their own institutions.

5. Fostering International Collaboration in Open Online Education

China's educational policy experience can serve as a valuable model for promoting international cooperation in open education. Through initiatives like the "One Belt, One Road" framework, China has established the International Community of Open Educational Resources (OER), which aims to facilitate collaboration and knowledge exchange among participating countries. This initiative includes developing international open curricula for universities and translating high-quality OER into Chinese and other widely spoken languages. Such efforts can reduce the costs and time associated with creating educational materials, particularly in crisis situations such as the COVID-19 pandemic (Huang et al., 2020).

According to Sun et al. (2020), theoretical and social science research has been relatively unaffected by the pandemic, largely due to the availability of numerous online libraries, archives, and databases. In the current context, scientific computations and simulations can be conducted from home or via supercomputers by submitting tasks online. The processes of literature review, data analysis, and manuscript preparation have remained largely unchanged. Moreover, regular online meetings allow for improved monitoring and support of students by their supervisors. Digital technologies have made it easier to conduct dissertation defenses online, which not only saves time but also reduces the costs associated with bringing in external examiners. The forced adoption of distance learning has enabled research supervisors to adjust the focus of undergraduate research projects, assigning tasks that can be completed at home or in easily accessible locations.

While COVID-19 has caused considerable disruption to traditional academic progress, universities have the opportunity to use this crisis as a way to address existing shortcomings and accelerate the transformation of online education. This can be achieved by developing innovative course content, adopting advanced technologies, and implementing robust governance frameworks. The pandemic offers a chance to turn this emergency into a catalyst for boosting international collaboration, facilitating the exchange of experiences, knowledge, and resources, and fostering the creation of a global online education network (Sun et al.,2020).

Larger universities, with greater access to resources, have been better positioned to navigate the shift to e-learning compared to smaller institutions. For example, Zhejiang University in eastern China, leveraging its smart campus infrastructure, professional development

programs in online instruction, and digital learning platforms, managed to resume digital classes just two weeks after the need arose. Post-transition, more than 5,000 courses were delivered according to the original schedule. The university's "Learning at ZJU" course center, accessible to students worldwide, recorded 570,000 visits, while "DingTalk ZJU," a live-streaming platform developed in collaboration with Alibaba, attracted an audience of 300,000. Additionally, around 2,500 graduate students successfully defended their Ph.D. dissertations, completing their studies as scheduled. To ensure the quality of teaching, Zhejiang University organized training sessions for 3,670 instructors in mid-February, with one of its top MOOC instructors demonstrating how he adapted his course for online delivery (Wu, 2020; Rui, 2020).

However, the pandemic has created substantial financial challenges for universities. Public funding for higher education is expected to decrease in the coming years, as governments redirect their budgets toward stabilizing economies in crisis. Throughout 2020, universities across China faced cuts to research funding and other expenditures as a result of the economic impact of COVID-19. Government directives set the tone for austerity, prompting institutions to adopt more frugal financial practices. A similar situation unfolded in Ukraine's education system. According to ScienceNet, many Chinese universities were instructed to reduce their budgets to 75% of their original allocations for the remainder of the year, with some projects being halted altogether. Institutions were required to show tangible outcomes from these budget cuts by June 30. This financial tightening has affected not only leading universities like Zhejiang University, Tongji University, and Huazhong University of Science and Technology but also second- and third-tier institutions (Rui, 2020).

Recommendations for the higher education system of Ukraine

Given that China has shown more successful results in the implementation of distance learning, we can highlight a few recommendations for Ukrainian higher education institutions:

1) Defining a basic standard for distance learning and training processes at the state level can be a starting point for creating new educational platforms.

2) It follows from the previous paragraph that the establishment of the vector of distance education, namely strategy and personnel training, should be developed at the level of the university and the state.

3) An important component that would promote effective online education can be considered as a single information retrieval system that would accelerate the process of selecting the necessary educational resources not only within a particular university, but also among other higher educational institutions in the country.

4) The introduction of online telephone support for teachers and students can help solve many of the problems that arise when using distance learning platforms.

5) Planned internships for teachers should include not only one-time, but also regular training in distance learning courses.

6) Motivational elements can include competitions, where remote platforms of universities could win certain nominations.

7) Expanding the scope of online learning may include the creation of platforms for inter-university conferences and workshops in order to promote the expansion of educational opportunities for teachers and students (Kukharenko & Bondarenko, 2020).

Conclusions

In conclusion, we would like to note that the issue of forced distance learning and its impact on the transformation of the educational system around the world requires further research and the collection of more data on the results obtained from all stakeholders involved in the educational process. A valuable asset along this path can be the study of the experience of the Chinese educational system, because China is the first country that faced the need to introduce forced distance learning in higher education. The experience of Chinese educators offers valuable insights for Ukraine's educational system, serving as a crucial resource for addressing several key areas. These include ensuring the continuity of the educational process, providing support to participants within the digital space, and delivering clear and effective methodological guidance to all stakeholders. Additionally, this experience highlights the importance of developing appropriate digital content and tools to facilitate education, as well as adapting existing teaching methods and materials to suit the new conditions required for organizing the educational process.

References

Atenas, J., et al. (2019). Fostering openness in education: Considerations for sustainable policy-making. Open Praxis, 11(2), 167-183. https://doi.org/10.5944/openpraxis.11.2.947

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115. https://doi.org/10.1002/hbe2.191

Bardus, I., Herasymenko, Y., Nalyvaiko, O., Rozumna, T., Vaseiko, Y., & Pozdniakova, V. (2021). Organization of Foreign Languages Blended Learning in COVID-19 Conditions by Means of Mobile Applications. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(2), 268-287. https://doi.org/10.18662/rrem/13.2/421

Bazelyuk, O. Maiboroda L. & Petrenko L. (2016). Distance learning in the system of vocational education[Dystantsiyne navchannya v systemi profesiyno-tekhnichnoyi osvity]. Kyiv, Ukraine: Institute of Vocational Education.

Bin, Y., & Cheng, H. (2020). Turn crisis into opportunity in response to COVID-19: Experience from a Chinese university and future prospects. Studies in Higher Education**,** 46(2), 303-315. https://doi.org/10.1080/03075079.2020.1859687

Bulletin of the Verkhovna Rada. (2017). Law of Ukraine on education. https://zakon.rada.gov.ua/laws/show/2145-19?lang=en#Text

Bykov, V., Kukharenko, V., Syrotenko, N., Rybalko, O., Bohachkov, Yu. (Eds.). (2008). *Tekhnolohiya rozrobky dystantsiynoho kursu [Distance learning technology]*. Kyiv, Ukraine: Millennium.

Callan, Q. (2020). Tsinghua University launches int'l learning platform. The PIE News. https://thepienews.com/news/tsinghua-uni-launches-intl-version-of-xuetangx/

Chen, C., Jones, K. T., & Moreland, K. (2017). How online learning compares to the traditional classroom: measuring accounting course outcomes. The CPA Journal, 87(9), 44-47.

Chen, X. (2020). Tsinghua University launched global event with UNESCO to discuss online education amid COVID-19. Global Times. https://www.globaltimes.cn/content/1186713.shtml

Decree of the President Of Ukraine (2000). On measures to develop the national component of the global information network Internet and ensure wide access to this network in Ukraine. № 928/2000. https://zakon.rada.gov.ua/laws/show/928/2000?lang=uk#Text

Dobroskok, I., Nalyvaiko, O., Rybalko, L., & Zhernovnykova, O. (2020). Vprovadzhennya tsyfrovykh resursiv u protses pidhotovky muzykantiv-pedahohiv u navchal'nykh zakladakh KNR [Introduction of Digital Resources in the Process of Training Musicians-Teachers in Educational Institutions of the People's Republic of China]. *Professional Education: Methodology, Theory and Technologies*, (12), 66-89. https://doi.org/10.31470/2415-3729-2020-12-66-89

Downes, S. (2007). Models for sustainable open educational resources. *Interdisciplinary Journal of E-Learning and Learning Objects*, 3(1), 29–44.

Embassy of Switzerland in China. (2014). *Massive Open Online Courses (MOOCs) in China*. Beijing, China: Embassy of Switzerland in China. https://swissnexinchina.org/academia/2014/3/18/report-situation-analysis-massive-open-online-courses-moocs-in-china

Guo, L. (Ed.). (2020). *Online Education in the COVID-19 Response and Beyond.* Retrieved from https://www.tsinghua.edu.cn/en/info/1399/9844.htm

Huang, R., Tlili, A., Chang, T. W., Zhang, X., Nascimbeni, F., & Burgos, D. (2020). Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open educational practices and resources. *Smart Learning Environments*, 7(1), 1-15. https://doi.org/10.1186/s40561-020-00125-8

Jiang, Y., Shang, J., & Jiao, L. (2023). Review of China's Online Education Policy, 1999–2022. *ECNU Review of Education*, 6(1), 155-182. https://doi.org/10.1177/20965311221099581

Kukharenko, V. (2007). Dystantsiyne navchannya [Distance Learning]. Kyiv, Ukraine: Computer.

Kukharenko, V. (2018, December 12). Pereshkody vprovadzhennyu dystantsiynoho navchannya [Obstacles to the introduction of distance learning]. In Distance education: realities and prospects (1st All-Ukrainian scientific-practical conference). H. S. Skovoroda KHNPU. Kharkiv, Ukraine. https://repository.kpi.kharkov.ua/handle/KhPI-Press/39602

Kukharenko, V., Berezens'ka, S., Buhaychuk, K., Oliynyk, N., Oliynyk, T., Rybalko, O., Syrotenko, N., Stolyarevs'ka, A. (Ed.). (2016). *Teoriya ta praktyka zmishanoho navchannya: monohrafiya [Theory and practice of blended learning: a monograph]*. Kharkiv, Ukraine: NTU "KhPI".

Kukharenko, V., Bondarenko, V. (2020). Ekstrene dystantsiyne navchannya v Ukrayini [Emergency distance learning in Ukraine]. Kharkiv, Ukraine: City Printing House.

Kukharenko, V., Rybalko, O., Syrotenko, N. (Ed.). (2002). *Dystantsiyne navchannya: Umovy zastosuvannya. Dystantsiynyy kur*s (3rd ed.) [Distance learning: Terms of use. Distance course]. Kharkiv, Ukraine: NTU "KhPI", "Torsing".

Li, C., & Lalani, F. (2020). The COVID-19 pandemic has changed education forever. This is how. World Economic Forum. https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

Lorimer, L. (2013). Imagining the universities of the future. World Economic Forum. https://www.weforum.org/agenda/2013/01/imagining-the-universities-of-the-future/

Mengual-Andrés, S., & Payà Rico, A. (2018). Open educational resources' impact and outcomes: The essence of Open Knowledge and its social contribution. *Education Policy Analysis Archives*, 26(119), 1-18. https://doi.org/10.14507/epaa.26.3667

Ministry of Education of P.R. China (2020a). Guidance on the organization and management of online teaching in the higher education institutions during epidemic prevention and control period. Beijing, China: Ministry of Education of P.R. China. http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/202002/t20200205_418131.html

Ministry of Education of P.R. China (2020b). Do a good job in the organization and management of online teaching in colleges and universities during the epidemic prevention and control period. Beijing, China: Ministry of Education of the People's Republic of China. http://www.moe.gov.cn/jyb_xwfb/s5147/202002/t20200206_418480.html

Mukoviz, O. (2016). Osnovy orhanizatsiyi dystantsiynoho navchannya u systemi neperervnoyi osvity [Fundamentals of distance learning in the system of continuing education: [guidelines]. Uman, Ukraine: Private individual Zhovty O.

Nalyvaiko, O. (2020). Tsyfrovizatsiya osvitn'oho seredovyshcha v zakladakh vyshchoyi osvity kytays'koyi narodnoyi respubliky [Digitization of the educational environment in higher education institutions of the People's Republic of China]. Current issues of the humanities, 32(2), 188-194. https://doi.org/10.24919/2308-4863.2/32.214696

Nalyvaiko, O., Reznichenko, H., Kulakova, I., Kudaieva, O., & Bondarenko, A. (2020). Learning chinese using digital applications. *Scientific Notes of the Pedagogical Department*, 47, 64-77. https://doi.org/10.26565/2074-8167-2020-47-08

Nalyvaiko, O., Zhukova O., Ivanenko, L., Shvedova, Y., & Nekrashevych, T. (2021). Gamification as a New Format of Projects Method in Blended Learning Conditions Studying Disciplines of the Pedagogical Cycle. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(4), 17-30. https://doi.org/10.18662/rrem/13.4/468

Ning, H. (2020, December 13). Online course is still on at Tsinghua University as pandemic eases. CGTN. https://news.cgtn.com/news/2020-12-13/Online-course-is-still-on-at-Tsinghua-University-as-pandemic-eases-Wc0TPhQAk8/index.html

Order of the Ministry of Education and Science of Ukraine. (2013). On approval of the regulation on distance learning (№ 466). https://zakon.rada.gov.ua/laws/show/z0703-13?lang=en#Text

Pokryshen', D., & Korniyets', O. (2015). Open online courses as an innovative form of learning. *Bulletin of Chernihiv National Pedagogical University. Series: Pedagogical Sciences*, (132), 114-116. http://nbuv.gov.ua/UJRN/VchdpuP_2015_132_30

Prometheus (2024). Prometheus. https://prometheus.org.ua/courses-catalog

Rui, M. (2021). Massive List of Chinese Language MOOC Providers. The Report. https://www.classcentral.com/report/chinese-mooc-providers/.

Rui, Y. (2020) China's higher education during the COVID-19 pandemic: some preliminary observations. *Higher Education Research & Development*, 39(7), 1317-1321. https://doi.org/10.1080/07294360.2020.1824212

Shang, J. (Eds.). (2022). Internet plus and the reform of higher education: A preliminary study on the development strategy of higher education informatization in China. *China Academic Journal Electronic Publishing House*. https://cit.bnu.edu.cn/docs/2022-05/20220526162518557651.pdf

Shanghai Municipal Education Commission (2020, July 15). Shanghai Online Classroom continues its new chapter: Fall courses will start in September. http://edu.sh.gov.cn/xwzx_bsxw/20200715/85c70941037845fca9d6e7f9430367ae.html

Shanghai Open University (2021). History. Shanghai, China: Shanghai Open University.

Shi, S. (2020). Opening Ceremony of Peking University Online Education Platform Held. https://news.pku.edu.cn/xwzh/b15f2ef9f027445c90619f8e162ddb9e.html.

Sun, L., Tang, Y. & Zuo, W. (2020) Coronavirus Pushes Education Online. *Nature Materials*, 19, 687. https://doi.org/10.1038/s41563-020-0678-8

Tsinghua University (2021). *Education.* Beijing, China: Tsinghua University. https://www.tsinghua.edu.cn/kyzten/Education.htm

Wang, H., Wang, S., Guo, Y., Yuan, L., Knyazeva, S. (2020). *Online and Open Education in Shanghai: Emergency Response and Innovative Practice during COVID-19 Pandemic.* Moscow: UNESCO Institute for Information Technologies in Education.

Wang, Y. (2020). *How does the Chinese education system cope with the virus outbreak challenge?* https://news.cgtn.com/news/2020-02-18/China-s-online-learning-sector-thrives-amid-epidemic ObnQfU8hfW/index.html.

Website of the Ministry of Industry and Information Technology. (2020). Record management system Guangdong. https://www.163.com/dy/article/F4KMMLVV053469KO.html

Wei, B. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Hum Behav & Emerg Tech*, 2, 113-115.

Wu, Z. H. (2020, March 16). How a top Chinese university is responding to coronavirus. *World Economic Forum*. https://www.weforum.org/agenda/2020/03/coronavirus-china-the-challenges-of-online-learning-for-universities/

Xiaojing, L. (2020). Learning Prevention and Control are Both Correct. Shanghai Open University creates "Air Classroom" to serve citizens' home learning. https://www.163.com/dy/article/F4KMMLVV053469KO.html

Zhejiang University (2020). 2020: the year in review https://www.zju.edu.cn/english/2020/1231/c19573a2240710/page.htm.