Web-based community-supported online education during the COVID-19 pandemic

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Abstract: The article presents documents, measures, activities and initiatives at the state level, the levels of higher education institutions in Ukraine, at the level of secondary education, the initiatives of private firms, societies, communities in Ukraine and Poland in crisis situations, using the COVID-19 pandemic-Polish-Ukrainian experience. A review of formal experience in the country and abroad concerning formal regulations, introduction of e-learning at different levels and description of its characteristics, properties, advantages and trends of further development of e-learning taking into account the specifics of the educational policy of the region, type of institution, training and so on. This article also focuses on the questions: how can web-based communities mitigate the lack of f2f meetings during COVID-19 and similar pandemics in the future? How does the current generation of web-communities land in a transition? Do they get better tuned to fulfil the new needs during this pandemic?

Keywords: internet education; crisis situations; COVID-19 pandemic; Polish and Ukrainian experience; web-based communities; social media; ICT tools.

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1   Introduction

The COVID-19 pandemic does not stop at national borders and affects people, regardless of nationality, educational background, income or gender, this also applies to education system. Effects and opportunities can be varied and different; people from privileged groups will be able to join alternative learning opportunities faster. Economically vulnerable sections of the population may have less possibilities of continuing wide, whole education, as emphasises Andreas Schleicher, Director of the OECD (PISA) directorate of education and skills (https://nus.org.ua/articles/yak-vchyteli-ta-shkilni-systemy-mozhut-diyaty-v-umovah-pandemiyi-covid-19-porady-batka-pisa/).

The world is dynamically developing and changing. Since the beginning of 2020, the world has been living and fighting the COVID-19 pandemic. The crisis also applies to education, and it has exposed a number of shortcomings and imperfections, e.g., ranging from the technical support required for online education to a clear orientation in the online environment. Only sensible behaviour, management and methodological support can help avoid major disruptions in education systems. The problem, which is definitely related to the adequacy of the response of the education system, authorities and heads of different levels to the COVID-19 pandemic.

This article presents the vital role of web-based communities, documents, measures, activities and initiatives at the state level, the levels of higher education institutions in Ukraine, at the secondary education level, initiatives of private companies, societies, communities in Ukraine and Poland; what solutions are created in terms of distance education; how should internet-based education in crisis situations be equipped with extra mechanisms that restore a maximum 'sense of community' so that students, teachers and administrators feel they belong to the academic community? A review of recent experiences both universities in Kiev and Katowice will be presented. It shows that mere formal regulations and the introduction of e-learning are not enough to keep the social climate at an acceptable level. What are the positive trends for the further development of e-learning web communities, taking into account the specifics of the educational policy of the region, type of institution, training and so on. This article also focuses on the questions: how can web-based communities mitigate the lack of f2f meetings during COVID-19 and similar pandemics in the future? How does the current generation of web-communities land in transition? Do they get better tuned to fulfil the new needs during this pandemic?

2   Background and analysis of recent research and publications

According to the UNESCO Institute for Statistics, 190 countries at the national level have closed educational institutions in connection with the COVID-19 pandemic. Accordingly, more than 1.5 billion students were forced to switch to distance learning.

In Ukraine, the number of inhabitants is 6.5 million people (https://en.unesco.org/covid19/educationresponse). In the pandemic circumstances, both teachers and parents face a number of problems.

In particular, UNESCO identifies the following negative consequences for the mass closings of schools: *interrupted education*; *insufficient nutrition*; *confusion and stress for teachers*; *stressful situation for parents*; *insufficient child care*; *economic losses of the family* and *social isolation*.

The key issues in the organisation of distance learning were identified by the Director of the UNESCO Lifelong Learning Policy and Systems Division, Mr. Borchen Chakrun, on 17 April 2020, at the opening of the fifth UNESCO COVID-19 webinar (https://en.unesco.org/events/distance-learning-strategies-what-do-we-know-about-effectiveness-covid-19-education-webinar-5). Many families do not have access to a computer or the internet at all, namely:

- Technical readiness or having one computer per family. In such circumstances, television remains the most affordable way to ensure continuity of education in low-income settings.

- Lack of online content in accordance with national curricula. To this end, national platforms have been set up in many countries where students can find materials in their native language on a specific lesson topic.

- Pedagogical readiness. Some teachers were unaware of the specifics of using online meeting services or web services to create and distribute paperless assignments.

- Assessment and monitoring of the process of knowledge acquisition by students.

A comprehensive and in-depth analysis of the current situation in education is presented in the considerations on pedagogy in an unfolding pandemic, included in their independent report on approaches to distance learning during COVID-19 school closures aimed to spread the work of Education International and UNESCO (Doucet et al., 2020).

They stress the fact that "planning education in this pandemic era requires three approaches. The first is a stop gap approach (authors comments: a temporary approach) to ensure that the Maslow existential hierarchy is more important than Bloom's taxonomy; safety and social survival overrules students' life during the lockdown of the university premises. The second approach includes long-term solutions that threaten the equities in education when schools are not physically accessible. This sparks pedagogical innovations towards blended learning in all schools for inclusive and equitable education for all" [Doucet et al., (2020), p.1]. These reflections could be useful for solutions during the COVID-19 pandemic. "These are unprecedented times. Trust throughout the educational system, and of teachers, is key to ensure a collective approach on all fronts to mitigate the disruptions of school closures during a pandemic. This is not the time for unilateral, top-down approaches. Teachers should lead and use their professional judgement to make the best decisions for their students" [Doucet et al., (2020), p.2].

The Chinese experience of organising the educational process during the COVID-19 pandemic is well described in Huang et al. (2020). The authors suggest first of all to analyse and outline what flexible learning is during a learning disruption; flexible learning needs to be characterised and designed. An important step is to work out the concept of using online learning to provide flexible education, to expand learning through technology. It is suggested to outline online learning, ways to provide online learning, basic support elements. An important component is the provision of a reliable network infrastructure, the use of useful, friendly learning tools, the selection and processing of appropriate digital learning resources; assessing the suitability of digital learning resources.

It is suggested to identify the available digital learning resources for different levels of education and to promote effective online learning and training, and to prepare a training organisation. On the global level: "collaborations between several sectors (governmental, telecommunication, enterprise, etc.) to provide effective and inclusive education in case of emergencies, such as the COVID-19" [Huang et al., (2020), p.1]. On the mezo and micro level "we are seeing social media, video conferencing and learning management systems being used to connect students in formal school culture ways such as assemblies and talking circles, but also informally through connecting friends one on one, story time with a teacher or group guidance sessions" [Doucet et al., (2020), p.9].

It is necessary to elaborate the social organisation of educational activities, to provide support and assurance of services to teachers and students, in particular, technical services for teachers, support for student learning, enhanced cooperation between governments, enterprises, to prepare recommendations for schools (Huang et al., 2020).

The Polish authors tried to analyse changes in education in the time of the COVID-19 virus pandemic, when remote learning was carried out on coercion, not on their own initiative, as it was earlier (Pyżalski, 2020). They analyse some psychological, didactical, organisational, methodological as well as technological issues emphasising that it is only the tip of the iceberg (Pyżalski, 2020). Experts stressed the psychological and emotional matters are very important in crisis situations. "The dynamics of an emotional burden for children and adolescents (the way they experience crisis) depends on three key elements:

1   social context (consists of: changing their daily lives, mobility restrictions, information about the situation in the country and abroad, behaviour of peers, etc.)

2   family context (economic situation, demographic situation, quality of family relationships – features of the family system, previous problems in the family, i.e., violence, addictions, etc.)

3   personality traits of a young person (maturity of defence mechanisms, level of sensitivity, temperament, etc.)" [Pyżalski, (2020), p.9].

UNESCO recommended some special "resources to provide psychosocial support, in particular:

• Inter-Agency Standing Committee guidelines to protect and improve people's mental health and psychosocial well-being in the midst of an emergency

• WHO mental health and psychosocial guidance during the COVID-19 outbreak

• UNICEF guidance on how teachers should talk to children about COVID-19

- UNICEF guidance on how parents and caregivers can talk children about COVID-19." (UNESCO, 2020)

Lazreg (2016) proposes an approach to improve the analysis of social media in crisis situations in order to gain a better understanding and support of decision-making during a crisis.

Previously, the analysis of eLearning implementation in different countries, in particular in Australia, Czech Republic, Netherlands, Poland, Portugal, Russia, Slovakia, Spain and Ukraine, was deployed in (Smyrnova-Trybulska et al., 2014) conceptual aspects: analysis of legal, ethical, human, technical, social factors of ICT development, e-learning and intercultural development in different countries, theoretical model is described in detail in Smyrnova-Trybulska et al. (2015a). The next indicator and important feature of research is the new conditions, in a crisis that will bring leaders, network users, students and changes to their storage.

Experts from different countries signal new trends: the development of the specific relationships among individuals and the creation of communities in/via the internet. In particular, Issa and Kommers (2013, p.11) in their research stressed that "using social networking will create new challenges and threats to organizations and their employees as both are sharing the same concerns in relation to social networking integrating in the workplace. Social networking creates new challenges to organizations and employees in relation to privacy/security, scams/harassment, intellectual property, control and access, law/cyber-attacks, time consuming, and bullying." "Twitter for crisis communication: lessons learned from Japan's tsunami disaster" studied by Acar and Muraki (2011, p.392).

3 Methodological aspects

The practice of distance learning in most Eastern European countries has shown that 'distance learning' during the quarantine period has become a process of delivery of content, and there is almost no real learning process involving cooperation, students to perform common tasks, joint research. One of the reasons is the lack of understanding by many educators and teachers of the methodological aspects of the organisation of distance learning, not only during a pandemic and other possible global and regional natural disasters. Well-known scientist in the field of development of the theory and methodology of distance learning, Picciano (2017, p.172) emphasised that "just as no single learning theory has emerged for instruction in general, the same is true for online education." Simultaneously some theories could be more adequate to online education or their combining. One of the methodology which could successfully use in online education is "technological pedagogical content knowledge (TPACK), as a way of thinking about the teachers' knowledge they need to understand in order to integrate technology effectively in their classrooms" [Koehler and Mishra, (2008), p.3]. Experts stressed that "integrating technology into teaching is not easy. Many researchers have accounts of it either not happening, happening too slowly, or happening with no effect on teachers' or students' learning (e.g., Cuban, 2001; Dynarski et al., 2007; Ross et al., 2004)" [Mishra and Koehler, (2008), p.2]. The integration of PBL would be a good option and effective methods (Kommers, 2019) in online education in the COVID-19

time. Kommers (2019) in his research asks the three main questions about problem-based learning:

1   "From your current good practices, does the choice for problem-based learning (PBL) as a framework for gaming, storytelling and simulations look as an appropriate one?

2   What do you see as the most important steps to be undertaken before PBL can be integrated in courses throughout your organization?

3   What additional elements would you like to be articulated sharper in the years to come?" [Kommers, (2019), p.32] and response and comments this inquiries.

In internet education within the TPACK framework, understanding arises from multiple interactions among content, pedagogical, and technological knowledge and WBC components – environment, social media, blogs, process, methods, people, tools, apps (Figure 1), which should be flexible and compatible in the scope of cooperation and effective support aimed at online education (learning, teaching and feedback).

Figure 1   The TPACK framework: its knowledge components and web-based communities (see online version for colours)
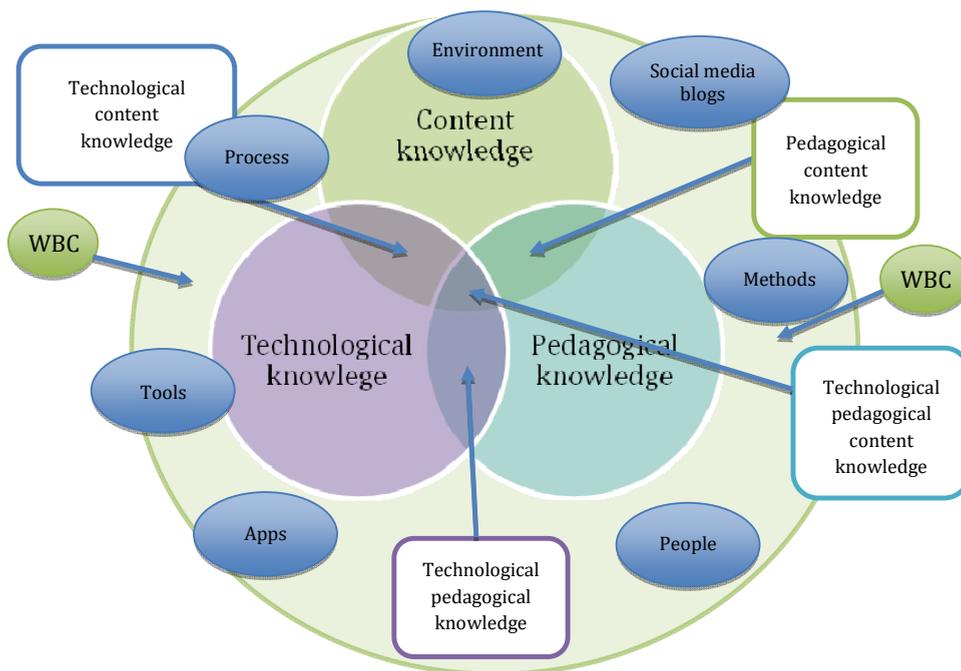

Source: Own work based on Koehler and Mishra (2008)

One such proposal for an integrated *multimodal model for online education* is provided based on a pedagogical purpose (Picciano, 2017), which could be of good use in education online in COVID-19 time. "This multimodal model of online education attempts to address the issues that others, particularly Terry Anderson, have raised regarding elements that might be needed for an integrated or unified theory or model for

online education. Whether or not this model finds acceptance is not yet clear. It is hoped that this article might serve as a vehicle for a critical examination of the model" [Picciano, (2017), p.182]. Figure 2 shows the updated multimodal model for online education, which could be successfully integrated to social media and WBCs (e.g., Facebook, Twitter, Instagram), services and offices, APPS (Google, Microsoft Teams).

However, online learning tools are only tools and should be used for supporting. For successful implementation education via internet should also fulfil other indicators, such as smart didactics, the teachers' well being, their cooperation, peer relationships and collaboration, digital inequalities, students motivations and engagement, cooperation with parents and mentors, digital competences (Pyżalski, 2020).

Figure 2   Multimodal model for socially engaged online education (see online version for colours)
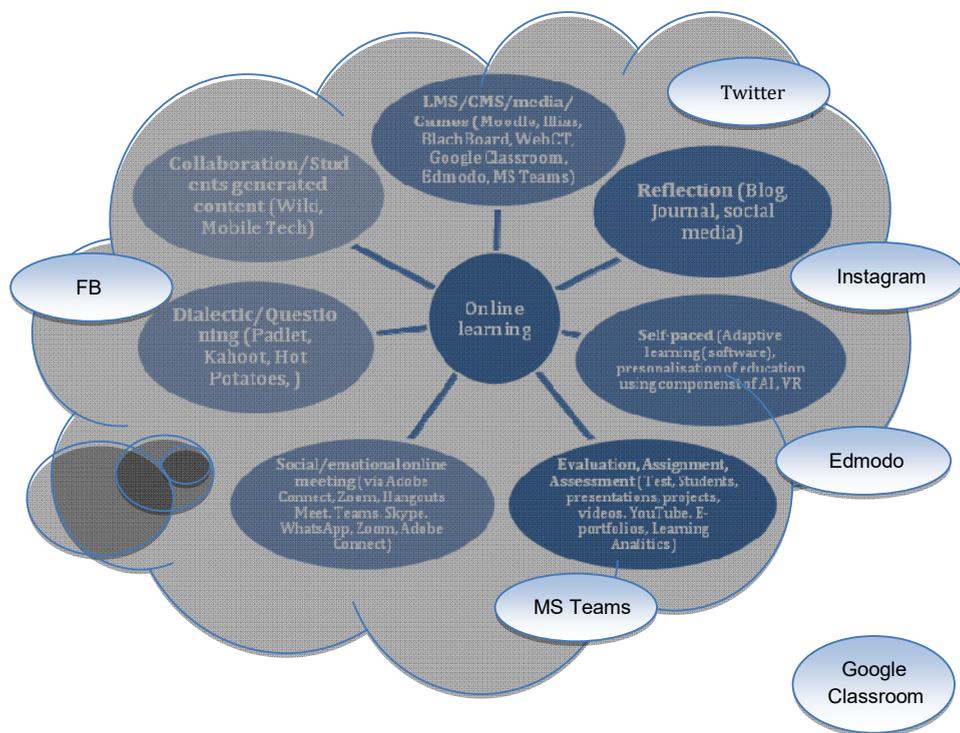
Source: Own work, based on Picciano (2017)

"The 'community of inquiry' model for online learning environments developed by Garrison et al. (2000) is based on the concept of three distinct 'presences': *cognitive, social, and teaching*…. While recognizing the overlap and relationship among the three components, Anderson et al. (2001) advise further research on each component. Their model supports the design of online and blended courses as active learning environments or communities dependent on instructors and students sharing ideas, information, and opinions" [Picciano, (2017), p.173].

This model should serve as a basis for the introduction of a successful distance learning for all participants in the educational process.

4   Selected international experience

According to the multimodal model of DN, we will consider what steps during quarantine have already been taken at the level of two countries – Poland and Ukraine.

4.1   Selected state-level initiatives in Poland and Ukraine

China, where the epidemic started and where later it turned into a pandemic, responded quickly to COVID-19, in a muddle of a national cloud a platform was launched offering free digital learning resources to students in schools. Additionally, a wide range of entrepreneurs, educators, IT companies have provided a seamless process – from free Wi-Fi and student devices through innovative guidance systems to the social support of teachers and schools (https://nus.org.ua/articles/yak-vchyteli-ta-shkilni-systemy-mozhut-diyaty-v-umovah-pandemiyi-covid-19-porady-batka-pisa/).

Educational ICT policies should be established at the state level. In many countries, there are certain obstacles to its creation and implementation:

- ignorance of the heads of educational institutions of different levels (state, local, at the level of educational institutions about the essence of digital policy

- misunderstanding of the importance of implementing digital policy due to insufficient dissemination of conceptual principles of design and coverage of the results

- lack or limited resources (both material and human) for implementation

- active resistance to changes caused by the implementation of digital policy

- ineffective management in the implementation of digital policy

- misunderstanding of the negative consequences in case of non-implementation of digital policy tasks, etc.

And it was during the quarantine period caused by COVID-19 that such obstacles began to be quickly removed at all levels. This can be traced to the examples of two countries – Ukraine and Poland.

Below we provide selected data, documents, activities, initiatives initiated in Ukraine and Poland concerning the restart of the education system and educational institutions at different levels and illustrate compatible and different actions.

The Ministry of Science and Higher Education (Gov.pl Portal) published the information for the rectors in connection with the limitation of the obligation to work at the university (https://nus.org.ua/articles/yak-vchyteli-ta-shkilni-systemy-mozhut-diyaty-v-umovah-pandemiyi-covid-19-porady-batka-pisa/). As well as a recommendations of the Ministry of Science and Higher Education on distance education (https://en.unesco.org/covid19/educationresponse). Due to the need to go to universities for distance learning of undergraduate and doctoral students to prevent the spread of the SARS-CoV-2 virus, the ministry published some recommendations. The website

of the Republic of Poland, distance classes (https://www.gov.pl/web/zdalnelekcje; https://www.gov.pl/web/zdalnelekcje/poradnik-dla-dyrektorow; https://www.gov.pl/web/zdalnelekcje/poradnik-dla-nauczycieli), coronavirus: current information and recommendations remote lessons tutorials, directors' guide, teacher's guide basic resources, Epodreczniki.pl (see on the website and below), Ministry of Digitization, master, teach online lessons! 12/03/2020 – suspending classes in schools is a big challenge for teachers. However, this does not mean that students are doomed to a forced break in their studies.

In summary, the main recommendations are:

"1 The use of university resources that have the infrastructure and competencies, using tools available at these universities for the remote transfer of knowledge, training materials and professionals.

2 The use of online communication platforms available at universities (webinars, videoconferences, virtual meeting rooms, etc.) to replace the classes traditionally held in the form of a lecture or seminar.

3 The involvement of existing university support structures in the creation of e-learning resources to provide assistance and advice to those with little experience in the field.

Examples of available resources for universities:

1 open educational resources for universities

2 free platforms and online applications and tools for distance education and training (https://en.unesco.org/events/distance-learning-strategies-what-do-we-know-about-effectiveness-covid-19-education-webinar-5)

3 support from other universities (https://nus.org.ua/articles/yak-vchyteli-ta-shkilni-systemy-mozhut-diyaty-v-umovah-pandemiyi-covid-19-porady-batka-pisa/)."[1]

In Ukraine, during the period of quarantine, the post of Deputy Minister of Digital Development, Digital Transformations and Digitization has been introduced to all ministries by the decision of the Cabinet of Ministers; on the initiative of the President and the Cabinet of Ministers of Ukraine, a national online platform on digital literacy (https://osvita.diia.gov.ua/) was started. There was introduced a project for the 5–11th grade students from all over the country. As part of the 'all-Ukrainian school online' project, lessons in 11 subjects will be broadcast by Ukrainian TV channels and the YouTube channel of the Ministry of Education and Science. The Ministry of Education together with the Ministry of Digital Transformation of Ukraine has created an initiative group of IT specialists and educators to create an index of the digital readiness of educational institutions for the development of a standard of digital competence of the citizens and educators, for the purpose of shaping the digital culture among citizens and primary school teachers a special educational channel on YouTube has been launched, a state educational platform for primary and secondary schools has been created, there have been amended the regulations on the organisation of distance education of 2013, considered ways to implement at the state level self-assessment tool for the use of digital tools in secondary education – SELFIA, which will be used for the purpose of analysing the quality of distance learning by the Committee for Education Quality Services,

a survey was conducted among high school students, teachers and parents on distance education, developed regulations on the academic integrity of students and teachers in the use of distance learning technologies, the Ministry of Digital Transformation created and maintained a site to help teachers to organise distance learning (https://thedigital.gov.ua/news/servisi-distantsiynogo-navchannya-dlya-vchiteliv).

4.2   *Initiatives at the university level in Poland and Ukraine*

All initiatives for the digital transformation of higher education should focus on the digital transformation of the educational process.

The ministry also asks the rectors to support, as far as possible, "education departments in their area in preparing online training courses. A support centre at e-learning@opi.org.pl has been set up to support the university in distance education. The help centre is open 8–20 AM throughout the week."[2]

Most universities in Poland practically immediately implemented online learning using previously available tools, first of all, the Moodle, BlackBoard, Illias, WebCT LMS distance learning support systems and other tools. Below we have provided some examples of initiatives of selected universities and activities aimed to implement the new form of education entirely online. Initiatives at university level In Poland higher education institutions have long been using e-education and delivering blended learning. But it was just support by that time. In the face of a pandemic, training has almost completely shifted to the web.

The Ministry of Science and Higher Education has worked out recommendations that can be useful and successful for universities. Universities are encouraged to introduce and/or intensify some additional educational activities to support the online learning process, including:

1   Conduct a "university-owned analysis of e-resources and make available online selected courses and e-learning materials that can show examples of good successful distance learning materials.

2   In the case of exchange of courses and open electronic resources, it is advisable to specify licenses in a simple manner [for example, common creative ((https://creativecommons.pl/wybierz-licencje/)][3] which will allow the use of other materials in accordance with copyright principles.

3   Using the http://www.navoica.pl platform belonging to the Ministry of Science and Higher Education. This tool allows you to create and host online courses and training materials (http://www.gov.pl/web/nauka/rekomendacje-mnisw-dotyczace-ksztalcenia-zdalnego)."

The ministry also asks the rectors to support, as far as possible, "education departments in their area in preparing online training courses. A support centre at e-learning@opi.org.pl has been set up to support the university in distance education. The help centre is open 8 AM–20 PM throughout the week." The University of Silesia (US) during the period of quarantine shared the *e-learning* web service (https://www.koronawirus.us.edu.pl/e-learning), which includes a lot of useful information and tools prepared by the University of Silesia for effective implementation of e-learning, access to databases, and tips for pursuing distance learning, for example: how to get started; e-learning tools recommended by the university, e-learning tutorials, e-learning support tools, the way to

implement remote education, electronic databases, online materials UŚ TV, distance learning centre, Silesia University Training Center, e-learning FAQ and e-learning copyright. The University of Silesia Distance Learning Center provides support for distance learning for all academic teachers and students of the USA (https://el.us.edu.pl/cko/?page_id=1492), e.g., a lot of video tutorials and instructions: Moodle – video tutorials, how do you find the platform of your faculty?, How do I enter the teachers' platform? How to book a course? How to get started with the course? Most universities, e.g., Pedagogical University of Krakow (PUK), Warsaw School of Economics (SGH), Warsaw University of Technology, Bialystok University, University of Technology in Gdansk (PG) in the first week of the quarantine ran the global use of LMS systems and other tools for global support of conducting all online courses and modules. Generally, Polish universities use first of all the Moodle system as well as other LMS systems such as Blackboard, Illiasias, WebTutor. Other proprietary tools are also allowed as well as applications such as Zoom, ClickMeeting, MS Teams, Skype etc.

Below presented are selected initiatives at the level of higher education institutions in Ukraine.

Most universities have prepared regulations to organise distance learning and conduct all classes using digital tools. Some universities have so far built a distance learning system based on the use of LMS (Boris Grinchenko Kyiv University, Kherson State University, Ternopil National Pedagogical University and NUBiP), which allowed the whole school to easily switch to distance learning, as most study materials (presentations, video, tasks for individual and project activities) had been already placed in the relevant LMS system allowing the teachers and students to gain experience in its use. Such a system included a system of assessment of knowledge, skills and competencies, providing the teacher with the electronic gradebook and elements of formative assessment. Most Ukrainian universities use LMS Moodle.

The following tools were used to organise video communication and webinars at most universities (BGKU, Ternopil National Pedagogical University, Kherson State University, Kharkiv National University VN Karazin and NUBiP): Hangouts Meet, Skype, Webex, Google Classroom, Zoom, etc. For many universities, the situation with the introduction of quarantine has become a catalyst for the creation of e-learning courses, which stimulated teachers to fill the LMS system (Kherson State University, Kharkiv National University VN Karazin and M.P. Drahomanov National Pedagogical University).

4.3 *Level of secondary education*

Secondary education in Ukraine and Poland, as in most European countries, was not ready to translate the learning process into distance learning. The main reason is that Ukraine has not yet had a state educational policy in the field of digitalisation, such a policy of digital transformation is absent in the vast majority of secondary schools. Confirmation of this conclusion is the results of a survey conducted in Ukraine in April 2020 by the Committee on the State Service for Education Quality.

Ruslan Gurak (Ukraine, Kiev), Head of the State Service for Education Quality noted that there was conducted "a survey of the State Service for Education Quality reaching a total of 180 thousand respondents: 100,000 – parents, 40,000 students, 37,000 teachers, 3,343 – school directors. Among questions in proposed survey were: *question 1: what*

tools do the teacher use during distance learning (9–11 grade answers), more often answers are: Viber; Google Classroom; e-mail; Zoom; TV. *Question 2: has the teacher-student communication been established during the day-to-day teaching?* (2) 61% – all teachers communicate in different ways. Only 20% of individual teachers communicate; 13% of communication with teachers is through the class teacher; 3% – communication does not occur; 2% – teachers communicate with students through the class leader; *question 3: how do teachers provide teaching material?* The answers are: 41% of students-teachers submit a list of paragraphs of the textbook and self-study materials, 18% conduct online lessons, 13% carry out individual assignments and tests, 8% – submit homework only; *question 5: did the distance learning on the level of knowledge?* Answers were: 52% – nothing has changed; 27% of some items improved, some of them got worse; 17% – knowledge gain has improved; 14% – knowledge deteriorated. *Question 6: what exactly does not suit in DL?* Among answers are: unsatisfactory specifications; non-variability of criteria for evaluation of completed tasks; I feel a decline in my own knowledge; the level of motivation to study decreased; teachers do not adhere to the class schedule; I lack communication with teachers, classmates; *question 7: the time the teacher spends preparing for the training during quarantine*. Answers were: 2% – less; 36% – more; 46% – much more; *question 8:* was directed to parents: *has the educational load on the child increased:* answers were: 38% – yes; 29% – partially; 27% – no; 6% is difficult to answer; *question 9: the main problems that arise in the process of distance learning*. The received answers are: 60% – it is difficult to motivate a child to study; 25% – find it difficult for a child to learn a new topic; 10% – the teacher does not explain new topics; 5% – no gadgets" (Gurak, 2020).

As we see, 60% parents said that it is difficult to motivate a child to study; 67% – *the educational load on the child increased*.

To create an educational policy in any country requires an analysis of the real state of the educational process of the educational institution and the solution of the following tasks:

- clear formation of a common vision of digital policy in educational institutions, creation of an appropriate working group that will develop a strategic digitalisation program

- synergy of seven components: leadership; management of an educational institution; curricula and the system of assessment of educational achievements of students; professional development of teachers; ICT; research and evaluation; resource provision

- availability of a library of resources to support the development, implementation and improvement of educational policy with the ability to add own resources: development plan, estimates, monitoring plans, etc.

- openness and transparency of group work and communication in the preparation of documents[4].

Digital educational policy has an impact on the education system as a whole and directly affects the activities of all participants in the educational process: teachers, students, administration, etc.

From the point of view of the analysis of the activity of secondary education institutions, i.e., the main step, which precedes the development of ICT policy, the SELFIE tool [SELFIE (n.d.) should be considered relevant], the use of which is, in our opinion, a necessary condition for the establishment of educational policy in the field of digitalisation of educational process.

SELFIE is seen as a tool for self-reflection of the educational institution by promoting the use of innovative educational technologies. It is designed to help educational institutions effectively implement digital technologies in the educational process. With its help, you can comprehensively analyse and draw sound conclusions about the results of the entire team, identify problems and outline further development. One of the main features of SELFIE is that it helps to set priorities for ensuring the quality of the internal educational environment. Thanks to this resource, you can get information from students, teachers and school administration about how digital technologies are used in a particular educational institution.

Designing future changes through the use of SELFIE is possible only if the interest and joint action of all participants in the educational process. SELFIE is just an additional tool for meaningful hard work called 'digital educational transformation'. Through reflection, subsequent discussion and planning, it is possible to form a common collective vision of the future educational policy of the educational institution.

The experience of many educational institutions in Europe has shown that the use of SELFIA and in-depth analysis of the results of self-analysis, allows you to properly select tools and services for distance learning, set up an effective communication system between all participants in the quarantine.

The most important criterion for choosing tools for the organisation of distance learning should be compliance with the set methodological objectives, i.e., the extent to which a particular service or resource allows to achieve the expected learning outcomes in the distance format. It is also desirable to consider the versatility of these tools to reduce the number of different platforms used for training. When comparing several tools, it is worth considering the clarity of the interface for both teachers and students. At the same time, it is important to take into account the possible special needs of students and the principles of universal availability of software. When learning with personal devices, you should consider the variety of these devices and choose the resources that are most suitable for different platforms (personal computers, tablets, Apple mobile devices, android, etc.).

Young people, students should feel that they have contact. They cannot be bored and given to themselves. Peachey (2019) practical guidelines for reformatting your teacher workplace online:

- working with a webcam

- your workspace

- work with sound

- provision of technical support

- working with text chat

- working with couples and groups.

When introducing distance learning in secondary schools, one of the main problems was the organisation of interaction of all participants in the educational process, which is one of the most important factors in the successful functioning of any school community.

For any teaching, communication is an integral part of the pedagogical process. Its effectiveness depends on the level of communication, and distance learning is no exception. The interaction between students and teachers in distance learning takes place within an artificially created communicative space. The communicative space presupposes the formed situation of interaction, in which there is a place, time and mutual desire for communication, aimed at achieving the goals of the learning process. In the conditions of distance learning, this process is more complex, generated by the need for joint activities, perception and understanding of others in cyberspace. The difficulty of distance learning is not only to stimulate students to inner work, but also the ability to develop a dialogue that allows students to express a variety of proposals. The main purpose of communication is to involve and motivate participants to learn. The main forms of online communication: video conferencing, forum, chat, blog, e-mail, questionnaires, social networks, instant messaging services and mobile applications such as Viber, etc. How to technically organise distance learning, keep the balance of theory and practice, different types of tasks and at the same time capture students? Oksana Pasichnyk, a teacher of computer science at Lyceum Sikhivsky, a participant of the working group on development of the state standard of education for NUSH, said this during a broadcast on the website of the New Ukrainian School. Among the main recommendations there are: don't be afraid to experiment; the tools that are offered just need to get started; clearly state which of the selected and offered resources are mandatory and which are optional. Balancing time for online classes and time for individual exercises. There should be no child overload; three theses that will help in structured approach to the formulation of tasks: "the less – the more, the less – the better." It is not necessary to burden students with all possible online resources on students; "who works – he learns"; "we learn not only from experience, but from reflection" (Pasichnyk, 2020).

"Broadcasting video lessons on television is a great help. However, the teacher may say that these lessons do not coincide with his schedule. And that's another factor we can't change." The author advises "to release something that cannot be changed. If possible, great. If this is not possible, you should stop using your resources. Otherwise it will be difficult to work productively further. If the child does not have access to electronic resources, then she learns from the textbook and re-educates after the training is resumed. Unfortunately, this is still the only possible option" (Pasichnyk, 2020).

Tutor Taras Pavlov in his blog, draws attention to the fact that "now, in the educational community, there is a lot of talk about form and very little about the essence. Many articles on how to set up online – and no articles about what it's all about."[5] He analyses and provides specific examples of problematic situations that are generalized. In particular: "problem # 1: without the help of teachers, children often (not always) do not understand in which direction to develop; issue # 2: teachers are responsible for the knowledge of children, and it is important for them to understand what is happening at the moment; issue # 3: the program must be mastered. And for some reason it doesn't."[6]

Figure 3 Global monitoring of school closures caused by COVID-19 in Poland and Ukraine (see online version for colours)
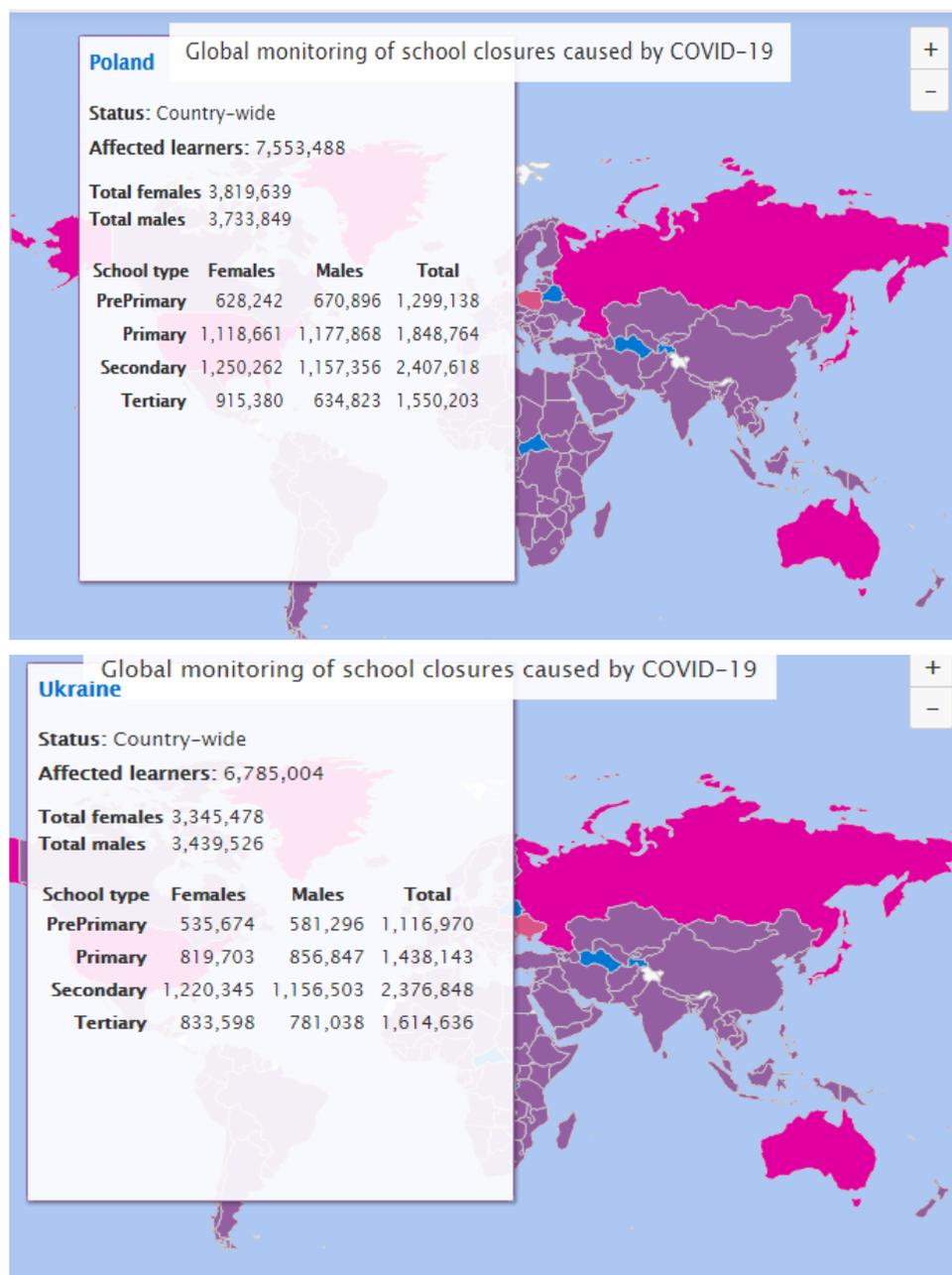
The situation, excellent as well as difficult, challenges of online education in secondary school are best exemplified by the comments in blogs, conducted by educators, tutors, mentors. The reflection of the teacher of the year Przemysław Staron from Poland[7], correlated with opinion of Ukrainian tutor and educator Taras Pavlov who in his blog emphasises that education is about gratitude and motivation, not constant assessment and demand. Pandemic time is a test of empathy. Classes online require more time and engagement than in the traditional form, emphasised by many teachers and educators. Teachers and students trapped in their homes, often with their own children, have to teach lessons through Librus, the latest e-learning platforms, online meetings classes on Zoom or Microsoft Teams while supporting your children in distance education. And this is a great challenge that must also be analysed and researched by scientista and methodologists.

Among the tips, the author points out and recommends that "tasks should now be thought out as clearly and clearly as possible." With children it is also very important to get feedback from your children and understand who they are now. Respond deeply and help if needed. COVID-19 impact on education and global monitoring of school closures caused by COVID-19 in all countries, and in particular in Poland and Ukraine shared in Figure 3. The data is dynamically updated.

We agree with other experts that "in the face of the current needs of online education during the epidemic and its future development, the government should play multiple roles in policy guidance, overall coordination and effective supervision, etc." [Huang et al., (2020), p.37].

4.3.1 *Selected digital tools and methods recommended in online education*

MOOCs could be very useful for all categories of students. A part of MOOCs could ensure the certification that can useful in credit of modules at the educational institutions. Well-knows services (Coursera, Khanna, Udemy, EdX, Alison, Canvas Network, European Schoolnet Academy, Icourses, Future Learn, others) opened a lot of courses for learners and users around of the worlds free of charge. In Poland use of the Navoica (http://www.navoica.pl) MOOCs platform belonging to the Ministry of Science and Higher Education. Prometheus – is the Ukrainian public project of mass open online courses (MOOC).

Some other recommended tools included based on open sources publications, our experience and UNESCO proposals (https://en.unesco.org/covid19/educationresponse/ solutions):

- *digital learning management systems* (Moodle, Illias, BlackBoard, WebCT, Google Classroom, Edmodo and MS Teams)

- *classtime* (Padlet, Office 365 and GSuite)

- *systems built for use on basic mobile phones* (Cell-Ed, Eneza Education, Funzi, KaiOS, Ubongo and Ustad Mobile)

- *collaboration platforms that support live-video communication* (Dingtalk, Lark, Hangouts Meet, Teams, Skype, WhatsApp, Zoom, Adobe Connect and Viber)

- *comics* (StayBoardThat and MakeBeliefsComix)

- *video editors, screencast recording* (OBS studio, VideoPad, ACDSee, HyperCam, Magisto, Rocketium and Stupeflix)

- *multimedia maker content* (Powtoon, Prezi, MS PowerPoint, Impress, Slideful and Emaze)

- *imagemaker* (HyperSnap and Animoto)

- *impressions diary* (Blogger).

- *questioning, interactive board* (Padlet, Kahoot, Hot Potatoes, Quizziz, Kahoot and Quizlet)

- *create your own game program* (scratch) [how to technically organise distance learning – a step-by-step guide (https://nus.org.ua/articles/yak-tehnichno-organizuvaty-dystantsijne-navchannya-pokrokova-instruktsiya/)].

ZOOM – an application for online video lectures with a possibility of displaying/sharing the screen content, recording, lecturing, checking, testing and presenting with the use of the board.

Overall, video material is considered by many researchers and educators to be the most inherent and effective form of teaching didactic material. Articles (dos Reis et al., 2018; Smyrnova-Trybulska et al., 2015b) provide a detailed analysis of video features, properties, features, and conditions of effective use, tools for framing videos. Creating an online community through video sharing and the 'WeTube' in YouTube was researched by Rotman and Preece (2010).

This study (Ozan and Ozarslan, 2016) "looks at student behavior while watching online video lectures to understand students' preferences. [....] The main results show that there is a tendency to fully watch video lectures in interview style. In addition, the percentage of browsing behavior was completely higher in shorter videos, and a tendency for long video lectures to be searched through search." According to the researchers, "the characteristics of the review were also influenced by the characteristics of the lecturers. The frequency of women's full lectures was significantly different from that of men in favor of women, as well as in FullScreen mode. In addition, students who had fully watched online video lectures had higher scores on the final exam than others. The analysis can help those who plan to optimize online video lectures in e-learning programs" (Ozan and Ozarslan, 2016).

What should be taken into account is different modes of learning – synchroneous, asynchronous, blended and selected adequate tools.

"It exists in two main temporal forms:

- synchronous, comprising of same place <-> same time, and different place <-> same time models

- asynchronous, comprising of same place <-> different time, and different place <-> different time models (Boston, 2004).

Principle models and corresponding features of communication are:

- the communication tools, identified for analysis (Hart, 2015) have been subjected to typology according to the featured activity profile.

Table 1   Collaboration tools typology according to education activities

Collaboration activities	*Collaboration tools*
Composition	Cloud, wiki, Google Classroom, Evernote, Lectora Inspire, Wordle
Storytelling	Writing.com, Google Translate, Scoopit, Haiku Deck, Wordle
Presentation	Google Classroom, Google presentation, Go Visually, YouTube, Prezi, Pinterest, Adobe Connect, Udemy
Problem solving (project, applied task)	Scribblar httD://www.scribblar.com, ConceDtboard https://conceptboard.com/
	Trello https://trello.com
	Team Gantt http://team.gantt.com/.
	Dropbox, Padlet, Socrative, Adobe Connect, Edmodo, Nearpod, Blackboard Collaborate, IFTTT, Poll Everywhere
Assessment of object or process according to criteria	PaperRater, Google Classroom, Schoology, Poll Everywhere, Udemy
Assessment of object or process according to criteria	writina.com. Red Pen (Criticism) httDs://Redpen.lo/. Gooale Doc. WordPress, Kahoot, Scoopit
Brain storming, problem solving, argumentation	mural.ly, http://www.drafboardapp.com/, MindMeister https://www.mindmeister.com/ru, Socrative. Adobe Connect, Diigo, SharePoint, Evernote
Composing a bibliography	Cloud, wiki, Academia.edu, Google Search, Pinterest, Khan Academy, Google Scholar, SharePoint, Schoology, Blackboard Collaborate
Communicative skills	social networks (Facebook, Academia) , blogs (BlogSpot, Twitter, Tumblr)
	Scribblar, WordPress, Linkedln, Kahoot, WhatsApp, Yammer, Socrative, Adobe Connect, Scoopit
Role fulfillment	blogs (BlogSpot, twitter, Tumblr), social networks Trello,
	WordPress, Scribblar, Linkedln, Kahoot, Yammer, Blackboard Collaborate

Thus, selected communication tools have been identified according to collaboration models:

- Same place, different time

  Academia.edu, Google Search, Pinterest, Khan Academy, Google Scholar, SharePoint, Schoology, Blackboard Collaborate, PaperRater, Google Classroom, Schoology, Poll Everywhere and Udemy.

- Same place, same time

  Skype, mural.ly, http://www.draftboardapp.com/, MindMeister https://www.mindmeister.com/ru, Socrative, Adobe Connect, Diigo, SharePoint, Evernote, Cloud, wiki, Google Classroom, Lectora Inspire and Wordle.

- Different place, same time

  Blogs (blogspot, twitter, tumblr), social networks, Trello, WordPress, Scribblar, LinkedIn, Kahoot, Yammer, Blackboard Collaborate, writing.com, Red Pen (criticism) https://Redpen.Io/, Google Doc, WordPress, Kahoot and Scoopit.

- Different place, different time

  Cloud, wiki, Academia.edu, Google Search, Pinterest, Khan Academy, Google Scholar, SharePoint, Schoology, Blackboard Collaborate, PaperRater, Google Classroom, Schoology, Poll Everywhere and Udemy.

The second major collaboration tool typology has been conducted according to identified prominent education activities (Table 1).

A total number of 242 of communication and remote collaboration tools have been analyzed by the expert group, chosen out of the top 100 efficient learning tools ratings (Hart, 2015).

Participants of reciprocal educational communication include universities, educators and students. In its turn, student's collaboration environment includes:

1 students from university

2 teaching staff of university

3 administrative staff

4 experts

5 peers

6 tutors (MOOC)

7 family

6 employers.

Among the indicators (or maxims) of effective communication are:

- *the maxim of quantity:* one tries to be as informative as one possibly can, and gives as much information as is needed, and no more

- *the maxim of quality:* one tries to be truthful, and does not give information that is false or that is not supported by evidence

- *the maxim of relation:* one tries to be relevant, and says things that are pertinent to the discussion

- *the maxim of manner:* one tries to be as clear, as brief, and as orderly as one can in what one says, and where one avoids obscurity and ambiguity (Townsend et al., 1998).

The given indicators are traced across educational paradigms" [Morze et al., (2016), p.358].

The highest ranking communication tools identified include:

1   social networks

2   blogs

3   Skype

4   Writing.com

5   Mind Miester (mind maps)

6   Scribblar

7   Google Classroom

8   Trello

9   Google presentation

10   YouTube

11   Adobe Connect

12   Red Pen

13   Evernote

14   PaperRater [Morze et al., (2016), p.360].

The efficiency trend for top 16 rated collaboration ICT tools for the years (2013–2015) is gaining the following dynamics (Figure 4) [Morze et al., (2016), p.359].

Figure 4   Efficiency trend for top rated communication ICT tools (see online version for colours)
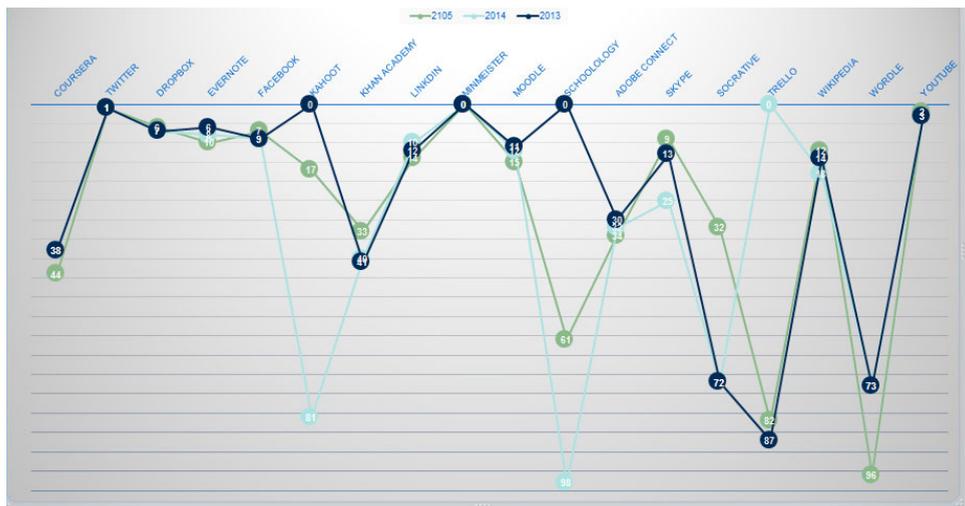
Note: Model 1.

5 Conclusions, summary, discussion and recommendations, prospects for further research

In conclusions some reflections and practical suggestions for polices-makers in education, institutions, teachers.

The "ways in which professional learning is happening during this pandemic include" could include:

1 "Professional learning communities – colleagues helping colleagues with planning, learning technologies, remote pedagogy, feedback strategies and ways of assessing.

2 Webinars offered by teacher experts.

3 Schools, where possible, providing one-on-one, online, or telephone support from IT, either internally or from outside experts.

4 Social media platforms in which teachers, school and system leaders, and education organizations around the world are sharing resources, processes and learnings as they address education needs in this uncertain time" [Doucet et al., (2020), p.31].

Good experience is an active development of virtual space and WBC, where content proposed by students and teachers can penetrate, are all kinds of open blogs, shared folders, dedicated educational platforms or network tools for joint 'gathering' information on any topic and above all on good practices, e-learning experience (including during a pandemic): Symbaloo (https://www.symbaloo.com), Pearltress (https://www.pearltrees.com) or Padlet (https://padlet.com) [Ścibor, (2020), p.61]. "Forced by circumstances, we began to look for other sources of knowledge and skills. Although we were looking for tutors before the school, now this catalog has grown significantly – not only textbooks, but also peers, MOOCs and even YouTube have become a source of knowledge, and some futuristically reach for AI-based virtual teacher applications. Some will notice how much their teachers helped them, some how little. Some students and teachers will see how effective independent work can be and that time at school is not always well spent" (Szala, 2020).

One can completely agree with the expert that "this crisis may put at the forefront the need for effective leadership at every level of the education system.

In the beginning was some relatively chaos at all levels – macro, institutional, community and school.

In uncertain times, people need those who can provide order. In education, these will be school leaders who have to address the pressing needs of students, families, staff and communities as they prepare for change in learning.

School leaders who quickly create crisis teams that update social media every day and know who is doing in a crisis. School leaders who liaise with their teachers and staff who understand what additional resources are needed and prioritize them."

Also important is the role of e-learning coordinators, managers, in particular, who will prepare for the Borys Grinchenko University's, Faculty of Information Technology and have the competencies and experience of e-learning questioning and management in institutions and enterprises. And in crisis situations, these competencies become even more important, goal-oriented and applied.

Issues to be explored (based on UNESCO documents and open sources, in particular regular use of digital technologies in education; distance learning experience; standard of

work with children with disabilities; age structure of the teaching community; availability of online platforms, quality and cost of services and delivery; availability of PC; level of motivation of pedagogical staff, students' level of motivation; territorial accessibility of educational institutions; the availability and accessibility of methodological developments; teacher readiness; students' readiness; willingness of parents; quality of internet connection.

Based on our and other countries' practices and experiences, we could identify the following ten core elements of effective online education in emergencies.

"1   *Ensuring reliable network infrastructure*, which can handle millions of users simultaneously, is crucial to support smooth online learning experience without interruption when:

   a   providing synchronous online teaching using video conferencing

   b   using (watching, downloading, uploading) interactive learning resources (videos, games, etc.)

   c   collaborating with peers via social platforms.

2   *Using friendly learning tools* is beneficial to learners in finding and processing information, constructing knowledge, collaborating with peers, expressing understanding, and evaluating learning effects in concrete ways. It is also vital that instructors avoid overloading learners and parents by asking them to use too many applications or platforms. In this context, schools should coordinate between all the instructors to use consistent learning tools or platforms.

3   *Providing interactive suitable digital learning resources*, such as online video micro-courses, e-books, simulations, animations, quizzes, and games. The criteria for selecting digital learning resources should include licensing, accuracy, interactivity, ease of adaptability, cultural relevance and sensitivity, and also the suitability of content, difficulty, structure, media, and organization.

4   *Guiding learners to apply effective learning methods* can be used individually or in groups. Specifically, the online instructional practice should involve using online communities, via social networks, to ensure regular human interactions and to address potential online challenges, such as learners' perceived loneliness or helplessness.

5   *Promoting effective methods to organize instruction by adopting a range of teaching strategies*, such as case studies, open debate and discussions, learners-led discovery, experiential learning, etc.

6   *Providing instant support services for teachers and learners* on learning about urgent school and governmental policies, using effective learning technologies, tools, and resources and collaborating between the government, schools, enterprises, families, society, etc.

7   *Empowering the partnership between governments, enterprises, and schools.* Specifically, the governments should also coordinate enterprises, schools, research institutes, and families to build smooth communication platforms to exchange urgent notices and to keep everyone safe" [Huang et al., (2020), p.40].

8   *Crises drive innovations*. In education, the tools do exist and teachers could be able to pivot to a blended model with the proper professional development [Doucet et al., (2020), p.7].

9   *Online and blended learning* will increase as more adequate and flexible mode of learning and teaching at all institutions and corporations.

10   *Online education will be a strategic priority* for functional effectiveness development at every institution as well as digital and online education competences at teaching and administrative staff will be necessary and required.

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Notes

1   Ministry of Science and Higher Education recommendations regarding distance education, https://www.gov.pl/web/nauka/rekomendacje-mnisw-dotyczace-ksztalcenia-zdalnego.

2   Information for rectors in connection with the limitation of the obligation to work at the university: https://www.gov.pl/web/nauka/informacja-dla-rektorow-w-zwiazku-z-ograniczeniem-obowiazku-swiadczenia-pracy-na-terenie-uczelni.

3   Ministry of Science and Higher Education recommendations regarding distance education, https://www.gov.pl/web/nauka/rekomendacje-mnisw-dotyczace-ksztalcenia-zdalnego

4   Intel® Education Transformation Tool Policy (http://edutransform.org/wp-content/uploads/2015/04/Intel®_EduPolicy_Guide_Ukraine.pdf).

5   Pavlov (2020) tutor blog (https://osvita.ua/blogs/72713/).

6   Ibidem.

7   P. Staron blog. Teacher of the year: through this experiment we multiply stress and trauma for children (https://noizz.pl/opinie/nauczyciel-roku-pisze-jak-wyglada-system-edac-edacw-czasie-pandemii-koronawirusa/jgdzxer).