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## **Strategic Aspects and Problems of E-learning in the Context of Pandemic and National Security**

### **Abstract**

The article highlights the problem of e-learning relevant status, psychological, organizational and technical aspects in conditions of pandemic and quarantine. The possible perspectives of e-learning development are reflected.

**Keywords:** e-learning, pandemic COVID-19, quarantine, e-learning system, e-learning model, information trauma

### **Introduction**

The world will have to live with virus danger of COVID-19 for quite a long time finding under such conditions rational solutions for problems and open questions in everyday life, in strategic development on national, regional and global levels. The pandemic became not only a test of the health systems of the world community and the ability of government and national security to withstand such challenges and threats, but also revealed many problems in all spheres of society.

First of all, due to quarantines there was a crucial change in the established rhythm of life, work and study of all segments of the population in almost all countries of the world. For the first time, humanity faced a pandemic of this level in the context of a high-tech information society, globalization of the world and the possibility of quick physical access of people to almost anywhere in the world, high business, tourist and migration activity and population mobility, which were disrupted overnight. At the same time, the development of high technologies not only helps to solve many problems, but also generates new hazards, risks and threats. Relevantly to the announced quarantine, the population's dependence on IT solutions, the Internet of Things (IoT), cyber-physical and robotic systems, telemedicine, telecommunications, e-learning and cyber-information security has rapidly grown.

Real e-learning, its presence and development, about which specialists talked for years, is not only information exchange with the help of cyber information and telecommunication technologies. It turned out to be much more difficult task and due to quarantine prolongation provoked even more questions from people who are concerned with education. So, for a number of years in education and in society, the idea of the supposedly cheapness, accessibility and high efficiency of e-learning and even the possibility of a complete transition to it in many sectors of society has been actively promoted. However, the realities of life and the experience gained during the quarantine again gave the answer that the truth is somewhere in the middle and that the formation of e-learning, as a widely practically applicable area of study, requires a very serious attitude to this issue. First of all, there is a demand in methodological, didactic, information and content, technical, technological, organizational and personnel support, and, accordingly, significant economic investments, which will constantly increase due to the development and rapid change of generations of technical means and software products that support it, as well as the appearance of more and more new content, e-learning courses and the need to pay for their development, as well as for intellectual property for them. Besides, practice has shown that e-learning, at this stage of the development of society, cannot be an alternative to classical, traditional, full-time education, but can only supplement it to a certain degree, involving correct approaches to all aspects mentioned above and in this way increasing effectiveness of traditional education.

Nevertheless, under certain conditions, due to circumstances, e-learning may even be the only form of studying for some (and not always definite) time. Therefore, it becomes necessary to study the main aspects associated with the problems arising from the mass transition to e-learning and blended learning<sup>1</sup> and ways to solve them. The results of a survey of young people conducted by Radio Svoboda correspondent Andrey Dubchak in the streets of Kiev<sup>2</sup> on e-learning is as follows: e-learning does not improve rather impairs learning; you can make a tick and you are free; everything works crookedly (in a wrong way), because no one was ready for this; more tasks; everything is less comprehensible than when you are physically present in class; remotely you are conducting one online training for 5 hours, instead of doing the same thing in an hour during your physical presence; it is impossible to provide a normal explanation; when you are physically present in class, then learning and comprehending the material is much easier and faster; the Internet did not work for two days, and I did not study for two days; it's not learning at all.

According to polls conducted in Ukraine in July 2020, and estimates of various organizations, e-learning in schools is not supported by 48% of parents and 45% of students<sup>3</sup> to 49.7% of respondents<sup>4</sup> and only 9.9% fully support. On July 22 all over Ukraine - in Lviv, Vinnitsa, Khmelnytsky, Zaporizhzhia e, Nikolaev and other cities – mass meetings were held against

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<sup>1</sup> Blended learning combines distance learning and face-to-face, traditional learning. Brian Tomlinson, Claire Whittaker "Blended Learning in English Language Teaching: Course Design and Implementation", British Council, 2013, 258pp.

<sup>2</sup> presented in the review of 05.04. 2020 "Young people in quarantine. Changes in communication, life and study" (изложены в обзоре от 05.04. 2020 «Молодежь на карантине. Изменения в общении, жизни и учебе»)

<sup>3</sup> data from the State Service for the Quality of Education of Ukraine

<sup>4</sup> data from the Razumkov Center and the "Democratic Initiatives" foundation named after I.Kucheriv

e-learning, which were organized by the parents of schoolchildren with demands on September 1 to resume school activities as usual.

The issue of providing education under pandemic conditions has become, in fact, a strategic issue with far-reaching implications for the whole world. UN Secretary General António Guterres noted that about 1 billion students and schoolchildren in 160 countries of the world were unable to receive education in full due to the closure of educational institutions due to the coronavirus epidemic, which threatens the world with a "generational catastrophe". It can lead to the loss of enormous human potential, neglecting decades of progress, and enforcing rooted inequalities. That is why resuming normal learning process should be a number one challenge.

Thus, the study of the problems and peculiarities arising from the massive introduction and use of e-learning and ensuring its effectiveness, in these conditions, is relevant.

In the previous decades, a lot of theoretical and applied research conducted by specialists in various related branches of knowledge in most countries of the world has been devoted to the issues of e-learning. General provisions of the theory of e-learning, its content and organization, psychological and pedagogical issues and the peculiarities of creating courses and researching models of e-learning were developed in the works of J. Andersen, A. Andreev, R. Bell, V. Bykov, J. Bloomstuk, Ch. Vedemeer, V. Gura, N. Datsun, R. Delinka, N. Zhevakina, A. Kirsanova, D. Keegan M. Moore, V. Oleinik, M. Tanakhe, T. Edward, V. Sheiko and other researchers.

The purpose of the article is to investigate the problems, characteristics and strategic aspects of e-learning in the context of the COVID-19 pandemic and national security.

### **Material and methods**

The authors' research is based on the complex use of methods: bibliographic, historical, sociological, conceptual modeling, expert assessments and systems analysis. The analysis of the classic and recent publications, the features of the applied application of the principles and provisions of the emerging theory of e-learning and the practical experience gained on the issues of its mass implementation and application during a pandemic.

### **E-Learning System and Model**

E-learning officially appeared in the middle of the 19th century. In 1840, Isaac Pitman proposed training through the postal service for students in England. It was a correspondent form of education, which received new content and powerful development at the end of the 20th century. Officially the term "distance learning" was recognized in 1982, when the International Council for Correspondence Education changed its name to International Council for Distance Learning, thanks to an innovative advancement in info communication technology. Soon a new form of it appeared which received a clarifying name – electronic learning or e-learning. New technologies made it more accessible and contributed to significant increase in the share of e-learning application in

specialists' training in comparison with traditional training, up to a complete transition to e-learning training in some areas, which was argued by many experts.

The development and implementation of e-learning forms and methods in education was also supported by the rapid high-tech development of society. The rapid aging of the knowledge of specialists and an increase in the amount of information that must be processed by those who study under a tight time limit and its constant updating promoted e-learning progress. It gave birth to the concept of continuous education throughout the entire active life of a person and gave a freedom of staying in specialized educational centers.

Therefore, the centers of distance (e-learning) were created and continue to be created and developed in almost all higher educational institutions of the leading countries of the world. Their creation and development are accompanied by powerful theoretical and applied research, psychological and pedagogical experiments, and etc.

A typical generalized model of a e-learning system contains preparation of a specific training course based on the educational needs of a specific group of people; organization and making access to course materials; organization of communication between participants in the educational process; passing by those who study control points and completion of the course by exam or control test.

One of the holistic models of e-learning system is presented in the works of R. Delling<sup>5</sup>. He recognized e-learning as a multidimensional system of learning and communication processes using an artificial signal carrier. It designates eight dimensions of this system: a student, society (including legislation, government, family, etc.), an organization (e-learning institution) that helps a student in mastering knowledge, the goal of studying, the meaning of things, which need to be studied, the result of studying, distance, signal carrier.

According to M. Zgurovsky, a technically covering project of on-line learning consists of a block of learning management (learning management system (LMS), an information block (information resource management (IRM), a control block (testing and evaluation mechanism), a communicative block (interactive teaching system), and service system<sup>6</sup>.

A. Khutorsky highlights five types (models) of e-learning based on educational interactions between learners, teachers and educational information objects for example web materials<sup>7</sup>.

Six major e-learning models are offered by E. Polat: education by type of external studies; university education; training based on the cooperation of several educational institutions; training in specialized educational institutions; autonomous learning systems; informal, integrated learning based on multimedia applications<sup>8</sup>. She also drew attention to the fundamental importance of distinguishing the terms of

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<sup>5</sup> Delling, R.M. (1966). "Versuch der Grundlegung zueiner systematischen Theorie des Fernunterrichts", in L.Sroka (ed.). Fernunterricht Hamburg: Hamburger Fernlehrinstitut, s.186. (in English).

<sup>6</sup> Zgurovsky, M. Z. (2003). Development of the system of distance education in Ukraine. Higher Education Open and Distance Knowledge Base for Decision-Markers, Materials of the Meeting of the IITE Focal Points in the CIS and Baltic Countries, Kiev IITE. (in English).

<sup>7</sup> Khutorskaya, A.V. (2001). Suchansna dydaktyka [Contemporary didactics: a textbook for high schools]. St. Petersburg Peter, 544 p.(in Ukrainian).

self-directed learning, part-time studying and distance e-learning. Lack of differentiation between these terms leads the organization of e-learning process to transfer of lectures, books and other didactic materials into electronic version and familiarization of learners with the content.

But there are a number of e-learning peculiarities that limit the effectiveness of using its capabilities, which have not yet been sufficiently and systematically explored by none of the researchers, but have fully represented themselves in the conditions of a massive transition to e-learning, both in higher education institutions and schools, and therefore require careful research.

### **E-Learning Stress Factor**

The forced, real, rapid and massive transition to e-learning in all spheres and at all levels of education became stressful for all participants of the educational process, who were forced to hastily master new tools and methods. It also significantly influenced the level of knowledge of students.

The problem lies not only in the essence of e-learning, but also in the socio-technical contradictions associated with it. It is multifaceted and multidisciplinary. The issue includes technical, social, demographic, psychological, content-informational, methodological, didactic, organizational, cyber and other aspects, as well as training personnel for the implementation of e-learning and the students themselves for its correct and effective use, protecting their health in these conditions.

First of all, all the components of the education system turned out to be in varying degrees of organizational and technical readiness for the transition to e-learning. Despite the fact that institutions of higher education in almost all countries of the world, to one degree or another, have already worked on the creation, development and use of e-learning systems, during the quarantine they faced many difficulties of a various nature. With regard to the secondary and initial schools, there was nothing practically significant created concerning organization and implementation of such training. It should also be borne in mind that e-learning is to varying degrees effective for various categories of learners and its results significantly depend on the age, aptitudes, degree of preparation and psychological readiness of all participants in the educational process, the presence or absence of previous experience in its implementation, the essence of such experience (positive or negative), perception and attitude to electronic materials. So, for example, up to 4, and according to many researchers even up to 7th grade, this is the least effective form of learning, if only because it is difficult for children to concentrate. In addition, studies have shown that e-learning is fully effective for less than 10 percent of learners (from 15 to 23 years old), and about the same number have no inclination to use it at all. Another 40-50% can be quite effective to use the opportunities provided by it, and about 30% of the trainees have significant difficulties in using it with a low final learning outcome (results of learning process)<sup>9</sup>.

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<sup>9</sup> Khutorskaya, A.V. (1988). *Yevresticheskoyebucheniye*[Heuristic teaching. Theory, methodology, practice] Moscow: International Pedagogical Academy, 266 pp.(in Russian).

In connection with the pandemic and quarantine, both teachers and students, and in the case of schoolchildren and their parents had to urgently master new learning management systems and ways of the learning process. Support and understanding of the situation by the parents, and especially their good knowledge of the school course, significantly improved the situation in learning process of their children. But the problems turned out to be in gathering trainees for classes at the same time, organizing their communication, monitoring homework, ensuring the participation of trainees in online classes, the lack of real programs and methods for e-learning, clear instructions for the formation and filling out of documentation, creating individual plans and filling of report logs, lack of the necessary equipment, both at the workplace and at home, irrational reporting requirements, lack of specific criteria and requirements that would ensure the quality of education in these conditions.

### **Technical Support**

Technical problems, as shown by the experience of using e-learning in the conditions of quarantine pandemic, have been recognized to varying degrees, in all countries of the world. The main conclusion from all of it is that there is no country in the world, where educational system was technically and technologically prepared for a full transition to e-learning. First of all, not only within each state, but even within each individual educational institution, there were different opportunities for access to networks. Teachers and students were equipped with various gadgets (smartphones, computers, tablets, etc.) with different characteristics and capabilities.

This, in turn, aggravates the issue of education accessibility and educational inequality, which is already a huge problem, and now it will acquire catastrophic scope.

Even within the same educational institution, various platforms and tools were used for conducting classes, communication with students and their control (teachers conducted classes in ZOOM, Skype, YouTube, used Viber, e-mail, etc.). At the same time, the most effective and necessary platforms and tools were often not available to many of the educators and trainees, including access to the Internet with the required characteristics, capacity and throughput.

As for the information and content support, there was recognized a syndrome similar to the one called "French" (although this can equally be attributed to technical support and technologies). Its essence lies in the dispersal and wasteful use of resources in the creation of high-tech developments. So in the French Republic on the eve of the Second World War, in order to maximize the creative potential of developers and obtain, as it seemed, the best options for military aircraft, it was proposed to develop, build prototypes and test many of them. Negative consequences soon came out. First of all, all government agencies, involved in this issue, were overwhelmed by a huge number of developments, from which there was no objective opportunity to choose the best. At the same time, due to the efforts of lobbyists of different competing projects, several samples

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<sup>9</sup> data from the Razumkov Center and the "Democratic Initiatives" foundation named after I.Kucheriv

were often launched in parallel in series, which practically did not differ from each other. It led to a senseless and dangerous dispersal of resources on many overlapping projects. Something similar is now taking place with e-learning.

Despite the fact that in many countries of the world by the time the pandemic began, national educational platforms for e-learning had been selected, developed and, to one degree or another, implemented. Various courses with relevant content were created in many educational institutions in electronic format. But systematization, unification and standardization of these courses and the content included in them was not organized and purposefully and systematically was not carried out. Thus, when, due to the announcement of quarantine, the transition to e-learning at all levels of education took place, each teacher in each subject was forced to independently develop and create their own digital content based on the search for selection, analysis, processing and generalization of various kinds of materials, films, presentations, interactive quests, tests and the like on certain topics. Also, they had to create their own systems and control tools to test the knowledge of students in these conditions. Of course, due to a certain significant share of subjectivity in these processes, the used content turned out to be very diverse and of different levels of quality. Moreover, due to the need to independently prepare specialized content for e-learning and very often the lack of experience, knowledge and professional skills of most participants in the educational process in this type of activity, the load of work on already overburdened teachers undoubtedly negatively affected the learning outcomes in general. That is all mentioned above must still be performed by specially trained professionals.

Thus, it is necessary to develop standardized and unified e-learning materials for all subjects for learners of different ages and different categories, which can be used by teachers and learners. Teachers need to be given the opportunity to receive such ready-made material. It is difficult to prepare for each lesson on their own, and the teachers have to spend a lot of time and effort to create their own materials. Now it is necessary to intensively develop high-quality, unified and standardized educational content for e-learning (which certainly does not exclude the creation of separate author's courses that strengthen and develop the basic ones).

Therefore, now a serious task for responsible agencies and organizations is to collect all the developments, organize them, evaluate them, identify "white spots", carry out the necessary improvements, structure and standardize this content in compliance with copyright for intellectual property, in accordance with training plans and programs. Also, it should consider the real level of technical support of educational institutions and trainees and, accordingly, the choice of the best and available platforms and e-learning tools. In this case educators and trainees are not forced to spend time and effort on the development of the full range of resources available on the market. I to estimate how much time the trainer and the trainees will spend on preparing for classes, especially taking into account the fact that in a blended learning each type of activity is independent.

In addition, it is necessary to organize targeted advanced training of teachers. Each teacher should learn to use e-platforms, undergo appropriate trainings and understand how he can rationally organize the e-learning.

Another significant consequence of the remote mode of work and study due to quarantine is the increase of working time with various electronic gadgets and stay in cyberspace. It led to information and ophthalmological (on the visual system) overload on people. For example, a person's condition is significantly affected by prolonged focused attention and the work of the organ of vision in the near zone, when the normal vision for a person is a combination of visual work both far and near, and much more.

Misinformation associated with the COVID-19 (or Infodemic) pandemic also leads to the formation of pandemic information stress, violation in the psychosomatic state of people and an aggravation of diseases. And all this, in turn, becomes a catalyst for the growth of conflict potential in the family and society and can have significant negative consequences in the future, which requires serious targeted research.

Therefore, it is necessary to organize the educational process in a remote mode and make a schedule in such a way that during the day the trainees have a properly organized work and rest regime, exercises for the eyes, physical movements, lunch, and the like are provided.

Thus, full-fledged e-learning still needs to be created.

Today, e-learning contributes to the individualization of learning. It makes it possible to get some information, remember something and once again revise individual modules of the course, but it cannot completely replace the possibilities of full-time traditional study.

First of all, from the moment of its inception and almost until the mass transition to it in connection with the pandemic, e-learning services were mainly used by learners motivated in all aspects and psychologically and technically ready for e-learning process. Those who did not have the motivation, ability, or willingness to use this method of education could try to use it, but they could also refuse to use it in favor of other traditional educational options. Secondly, before the appearance and spread of the e-learning, remote or distance learning did not require specific technical and other knowledge, special equipment and the ability to use it.

Third, its effectiveness was not influenced by the ergonomic aspects of the gadgets and the offered content and its specific perception by the learners.

These are just a few aspects that are currently at an early stage of their research and require the solution of a set of interrelated issues to ensure the further effective development of the e-learning.

In addition, there are areas and specialties of training specialists in which the use of e-learning is ineffective, professionally and economically unprofitable or generally unacceptable.



From a pedagogical point of view, training requires in its process the presence of direct social interaction between students and teachers. Its absence has a very bad effect on the intellectual processes of trainees, the effectiveness and success of their training. Traditional education is very important, and not only for socialization, but also for increasing the motivation of children, which decreases greatly, as studies show, with continuous e-learning. Learners should interact and think without being constantly immersed in the cyber information space. Long-term continuous use of electronic gadgets during study or work can significantly negatively affect the physical and psychosomatic state of a person, and even more so a child. Therefore, e-learning, at this stage of society's development, cannot replace a traditional educational process. E-learning can be effective only as an addition to traditional education, for example, within the framework of the blended learning model.

### **Conclusion**

Education issues also directly affect all spheres and areas of national security and not only in terms of training specialists. In general, this is a question of the fate of the state and the statehood of their further existence and development. In the absence of government control and regulation, e-learning can potentially lead not only to an increase in inequality in education and the loss of human potential, but also to significant, highly dangerous changes in the cognitive sphere of learners that may influence on their perception of reality. In the modern world, there is a struggle for the cognitive space, encompassing perceptions, awareness, beliefs, understanding and values, the intellectual environment of both individuals and social groups, and society as a whole to manage them. Cognitive influences can be intentional and accidental, multi-vector and complex, general or targeted, aimed at society as a whole or at specific communities or individuals, at achieving a short-term or long-term effect, immediately or after a latent phase, with or without variation in values etc. The main result of successful cognitive influences is a change in the model of the world and its perception in a person, social groups of society, and in society as a whole, which provide an opportunity to take them under control and exercise external control over them at the emotional, moral, cultural, worldview and mental levels, with the formation of stereotypes for the perception of reality through their prism. At the same time, the imposition and promotion of false scientific, social, economic, state, military theories, paradigms, concepts, strategies, narratives are of particular importance. They are most effectively promoted and implemented through educational institutions and scientific institutions, public organizations, electronic, social networks and the blogosphere.

As a result, as studies have shown, objects targeted by cognitive influences can not only be introduced into a state of cognitive resonance, dissonance or imbalance, but can also receive informational and cognitive trauma, reach the cognitive boundary of perception of such influences, partial or complete cognitive disorientation and even to information-cognitive collapse, followed by

a transition to a state of aggression or disappointment in everything, apathy and depression. All mentioned above cause stress disorders due to information-cognitive trauma.

Thus, e-learning is a very important, and in modern conditions in some cases is a single option of the learning process. But it is still in the initial stage of its development in relation to mass application. To a greater extent it provides an effective support to the classical technologies of traditional education. Due to development of creative approaches and diversity in the presentation and content, it is necessary to unify and standardize basic courses and regulate them at the state level.

Unfortunately, the study of problems highlighted in the article, have received insufficient attention so far. Meanwhile, their relevance increases with the coverage of e-learning by an increasing number of users.

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