Pakistan Journal of Distance & Online Learning
Volume: VI, Issue I, 2020, 231-246

Safety of Digitalization of Educational and Social Space

Liudmila Baeva[1]
Alexandr Grigorev[2]

Abstract

The digitalization of education can radically change the essence of education as a space of communication, dialogue, socialization, forming not only knowledge but social skills as well. The goal of the study is to characterize and systematize social and anthropological risks of digitalization of educational institutions. The study is based on existential-axiological approach which concerns principles of safety communicative-educational environment as a phenomenon of e-culture. Besides this, the study included pilot expert interviews of the educators working in digital education environment. It was concluded that despite the general positive background of the questionnaire answers, experts do not deny the presence of certain risks including the risks associated with information security. Study of main risk factors associated with the ICTs in education showed that the risk-related socio-psychological consequences of digitalization could cause behavioral disorders including asocial and self-destructive mindsets, Internet addiction, nomophobia, escapism, absorption in virtual worlds etc. It is suggested that to overcome the riskogenic factors, it is necessary to develop a system of safe communicative and educational environment for secondary and high education systems, following the impact of digitalization. That will allow effective monitoring of riskogenic factors and selecting the most effective forms of learning, taking into account individualization of students' educational trajectories.

Keywords: assessment of digital education impact, secure information environment, information ethics, risk factors of digitalization.

[1] *Full professor of chair of philosophy, Astrakhan state university, 414056, 20a Tatishchevast, Astrakhan, Russia. E-mail: baevaludmila@mail.ru*
[2] *Assistant professor of chair of sociology, Astrakhan state university, 414056, 20a Tatishchevast, Astrakhan, Russia. E-mail: proeu@yandex.ru*

Introduction

In the context of digital transformations of society and its main areas, social security issues have turned out to be ones of high priority and ensure the vital activity and effectiveness of a social system functioning. Since the trend for digital education developed in the world, problems related to the study of its impact on humans have become more relevant. Assessing the impact of digital education on a person has become a necessary component to achieve its positive effect. Ignoring this problem can reduce expectations from innovative transformations of an education system and lead to negative scenarios and consequences (for example in health and cognitive, social, emotional spheres).

In modern world, digital learning is widely used and relates to implementation of information and communication technologies (ICT), smart technologies and development of electronic communications throughout the world. With the spread of COVID-19, many educational institutions around the world were converted to e-learning, which allowed them to maintain educational process without direct contact with students and to reduce threat of transmission of infection. The 2020 epidemic clearly demonstrated the effective capabilities of e-education in conditions of forced isolation of students.

The Open University of Great Britain is the pioneer of digital learning which arose in the late 60s, initially in order to give migrants an opportunity to get education. A variety of learning models was tested here, and the most effective was the blended learning model as a combination of online learning and traditional face-to-face learning. In the USA distance education has been developing since 1984, when the National University of Technology of Colorado was created connecting more than 40 universities on a single platform. Nowadays, leading universities such as MIT also have a digital learning policy and post their online courses annually. In many countries, digital education is being developed by open universities which are funded by states in order to widely disseminate education free of charge. Each of them has its own specifics due to different cultural, pedagogical and other traditions. The largest Asian open universities are located in Pakistan, China, Indonesia and India where issues of overpopulation and providing citizens with high-quality educational services are timely. At the same time, traditional universities remain leading in the world rankings in terms of quality of education. At these universities (MIT, Oxford) digital education is additional, concomitant, but not a substitute for face-to-face education.

In the Russian system of higher and additional education, the format of digital learning is being implemented in many ways both in the

distance and mixed forms. Despite the fact that there are no exactly "open universities" in Russia, e-learning is actively used along with traditional in the systems of higher and additional education. Since 2016, the Russian government has set the task of digitalization of basic (school) education and launched the project "Modern digital educational environment" which should prepare the transition of education in schools to digital environment. So that digital educational space should be created and contain educational content for all subjects, large data on the students' educational achievements and a unified system of identification and authentication. Such approach means a global restructuring of the entire education system, radically changes in its nature and requires these processes to be well studied. On the one hand that poses the task of ensuring high quality digital learning and on the other hand ensuring security of educational digital environment. In this regard, the most important task posed to researchers today is development of a safe information and communication educational environment in which a student would be protected from existing information threats and risks to his health, psyche and worldview. This task forms the objectives of this study in many ways, namely, in assessment of possible risks and threats to an individual during digitalization of basic education, in identifying the greatest vulnerabilities and in preparing recommendations for prevention of negative impact of these processes.

Literature review

In the broad sense, the founders of cybernetics and the theoretical researchers of the post-industrial or information society, starting from N. Wiener, began to deal with the issues of the impact of digital technologies on culture, society and man. The impact of society informatization on communication and social processes was studied by D. Bell (Bell, 1986); J. Baudrillard (Baudrillard, 1993), J.-F., P. Virillo (Virillo, 1984), P. B. Heller (Heller, 2012), M. Heim (Heim, 1993), B. Girard (Girard & Siochrú, 2003), P. S. Rivoltella (Rivoltella, 2008) and others. These problems concerned, first of all, the issues of virtualization of communication, weakening of interpersonal interaction, and formation of dependencies on the technological environment. The issues of information ethics were raised in the writings by R. Capurro (Capurro, 2010), A. Duff (Duff, 2008), L. Floridi (Floridi, 1999) and others, referring to the topics of copyright, digital inequality, regulatory crisis in the context of using numerous open information resources.

At the same time, the problem of assessing the impact of digitalization on education system in the field of students' personal

security is relatively new and little studied. Since the 2000s, the topic of digitalization of education has been closely related to the assessment of both positive and negative effects of this process. One of the first large-scale works in this area was the monograph by D. Johnston and L. Baker, "Assessing the Impact of Technology in Teaching and Learning," published in Michigan in 2002 (Johnston & Baker, 2002). This study presented the results of the online teaching technologies application that were innovative for that time and assessed their impact in various fields: in cognitive and affective spheres, in the education results in teaching of adults, in changes in pedagogy, in improving teachers' technological skills and in technological integration in studying.

The positive impact of digital education on students' skills development is presented in the studies by M. Ragard (Ragard, 2018), G. Gable, D. Sedera, & T. Chan (Gable et al., 2008), Gaskell (Gaskell, 2009), Ghosh S., Nath J., AgarwalSh. & Nath A. (Ghosh et al., 2012), Mansour E., B., & Mupinga, D. (Mansour & Mupinga, 2007), Tomsic, A., & Suthers, D. (Tomsic & Suthers, 2006), Weller, M. (Weller, 2004) etc. Besides these authors stress that digital learning allows students to widely use the possibilities of individualization, interactivity, visualization, gamification of studying and it creates great opportunities for education management based on artificial intelligence and big data concerning learning outcomes and its problems.

At the same time, a number of studies identify some significant problems and risks in digital learning implementation associated with decrease in motivation to learn, impaired cognitive functions, and harmful effects to interpersonal communication skills, healthy lifestyle etc. For example, the problems of a healthy lifestyle distortion were studied in the work of R. Mustafaoğlu (Mustafaoğlu, 2018). The study by Y. Alghamdi (Alghamdi, 2016) showed that the introduction of educational digital technologies at young age can lead to social exclusion, cause depression, serious mental and physical illnesses and disorders.

The study of negative effects of mobile learning conducted by analyzing the cognitive load and students' educational progress is presented in an article by Hui-Chun Chu (Hui-Chun Chu, 2014). The author substantiates the thesis that, without proper accompaniment, educational progress of the students using existing online learning strategies (that are considered to be "effective") can be disappointed. Besides, negative consequences can be caused by a large cognitive load that is an effect of the incorrect tasks design.

Thus, modern research shows that assessing the impact of digital education on a person is crucial to achieving a positive effect.

Assessment of possible risks in the field of digitalization of secondary and high school education should be a starting point for building of a secure communicative and educational environment.

Methodology

This study is based on the understanding of digital learning as an element of the e-culture system, the purpose of which is to adapt the student to life in the information society. Thus, E-culture (Digital Culture)is considered as the sphere of human activity and the totality of the results of creativity and people communication in the context of the IT innovations introduction. It is characterized by creation of a single information space, a virtual form of expression, usage of distance technologies, and liberal content (Baeva, 2014).Such features of e-culture as openness, remoteness, an interactive mechanism, easiness of commercialization, high updatability, pluralism of content form new ethical and existential conditions for a person. In these conditions, he gains, on the one hand, significant opportunities, new forms of freedom, on the other, - new restrictions, dependencies and challenges. New challenges are mostly associated with alienation of a person from real communication, weakening of ethical regulators in a virtual environment, preoccupation with virtual communication and entertainment, formation of internet-gaming addictions, etc. An important methodological basis for this study is the theory of security which is associated with protecting a person from harmful influence that can cause self-destruction, affecting person's basic values and meanings.

The theory of risk society by U. Beck (Beck, 2000) plays a remarkable role in researches of the risks that the information society is currently facing. According to it, the present-day society is characterized as a "risk society" and it tends to distribute hazards and arising risks. The risks that this society faces are different from the risks of the past, since they have no boundaries either in space or time, or in the political sphere. Beck stresses that owing to development of the technological and scientific base, risks do not disappear, but on the contrary emerge in larger amounts. Risks are generated not only at enterprises, but also in all the spheres of social activities: in its economy, politics and social sphere. This is a specific feature of the risks that are related to modernization. Changes in generation of risks imply that the "wealth generation" logics is substituted with the "risk generation" logics; consequently, the society becomes a "risk society". Our research concerns the risks related to human security in the virtual communicative environment – existential, ethical, and axiological ones.

As an empirical method of research, an expert survey of educators, who use digital technologies in their job, was chosen.

Choosing the research method, the authors were faced with the task of hypotheses formulating concerning the degree and directions of impact of digitalization of education on learning process, as well as potential risks of these processes for students. To solve this problem, “soft”, qualitative research methods are best suited. They do not limit respondents to the strict framework of standardized tools, but rather contribute to the greatest freedom in expressing one’s own opinion. That was the reason for choosing this research method.

The selection of experts was carried out using the "snowball" method. During the selection process, such criteria as the degree of usage of digital technologies in educational process and country of residence were taken into account. Thus, 20 experts from various countries of the world were selected (Russia, the USA, the Netherlands, Spain, Brazil, India, Pakistan, China, Indonesia, Zambia, etc.). Half of them partially use digital technologies in educational activities, while another part of the respondents builds their educational course with a predominance of digital learning. The experience of experts with digital educational resources varies from 3 to 10 years or more. The narrative data obtained during the interview were subjected to qualitative analysis (i.e. were generalized and categorized) which means that at first the data from all the interviews were put all together and then sorted according to the asked questions. Afterwards the sorted data were categorized: common ideas of the expert narrations were found and then linked together consequently new categories were created. The result of these processes was the hypotheses about the degree and directions of the impact of digitalization of education on the learning process, as well as the potential risks of these processes for students.

Results

The expansion of digital education, which is being observed in modern world, is a kind of a new paradigm for the global education system that moves towards greater liberalization and emancipation. At the same time, new conditions of a person’s socialization and self-development nowadays have both positive and dangerous trends.

The data of the obtained expert survey show a certain optimism in assessments of digitalization of education. At the same time the experts recognize the presence of a number of risks caused by implementation of these processes. Therefore, experts for the most part positively assess digitalization of education and accept transition of educational procedures to a digital basis. The respondents note that the main advantages of this process are, first of all, a significant increase of education availability for

various categories of students. Besides, the experts note a possibility of more flexible, individual approach to maintain the educational process as another advantage of digitalization of education. At the same time, it is worth emphasizing that these assessments relate primarily to higher education. Most experts speak in favor of this thesis, and only a few of them believe that digital education is effective in schools. These data are confirmed by other surveys, in particular, in 2018, scientists from the city of St. Petersburg conducted a survey of teachers in the Leningrad Region. According to these data, only 10% indicated that digital education is much more effective than traditional (Strekalova, 2019).

We conducted a study to identify and assess possible threats and risks for students (possibly for teachers) to understand how to prevent them or minimize their negative impact.

The study of practice of online learning usage from the beginning of the XXI century shows that the main challenges for students in the context of digitalization of education are the following:

1. Possible digression of cognitive skills (including creative, critical thinking) associated with the way of information supplying which is "in a ready-to-use" form (not requiring analysis and processing). This has simplified perception, reduced learning outcomes, the ability to create new independent verbal presentation knowledge, analytical, critical, logical thinking skills. The students who concentrate on solving typical tasks, conducting knowledge control exclusively through testing are at a special risk.
2. Possible weakening of interpersonal communication skills, social skills (dialogue building, mutual assistance, responsibility, involvement, teamwork, leadership, etc.) associated with the virtualization of communication and training. The risk group includes students who are deprived (fully or substantially) of social interaction in a real educational environment and extracurricular activities, starting from the initial stage of education.
3. In extreme cases existential disorientation, withdrawal into virtual worlds, a tendency to self-destructive behavior, a high susceptibility to addictions and manipulative effects, including negative are possible. These negative consequences are due to underdevelopment of independent, critical thinking and high susceptibility to manipulative impact through online resources. The risk group includes students for whom digital education would be carried out from the elementary school level, as well as students with a predisposition to various kinds of dependencies who are in crisis

conditions, deprived of social support and a high susceptibility to external influences.

4. Risks of moral pluralism and tolerance for asocial and immoral phenomena in information environment, which is associated with the lack of a pedagogic component in digital learning, on the one hand, and virtualization of lifestyle, its likening to a game with multiple choices of behavioral scenarios.
5. Possible deterioration of basic health parameters in the absence of physical exertion and dominance of "screen time". All subjects of digital education experiencing absence of regular physical activity are at such risk.
6. Increased overall addiction to gadgets and Internet communications may be riskogenic as well. Internet gaming addiction has been well studied and it is characterized by its devastating effect on gamers' lifestyle. Dependence on social networks, Internet entertainment of various kinds is also in the field of scientific interest since it has a negative influence potential. Complete transition of the learning environment to digital space can strengthen dependence on network communication, and making him dependent from it.
7. Threats to personal security may be associated with a violation of human rights in digital environment, including copyright, honor and dignity, confidentiality etc.
8. The most dangerous threats may be those caused by targeted cyber attacks and cyber terrorism, which may concern not only gaining access to sensitive information, disseminating fake information, but also cyber bullying and cyber fraud in various forms (including social networks used for educational process and insecure online services).

Each of the risks is a complex of various threats to people, which can be activated in the presence of certain vulnerabilities. These threats increase depending on a considered risk group. In this regard, development of the digital environment in an education system should take into account assessment of the degree of certain threats to individual's physical and mental health and be focused on creating a safe information and communication educational environment, including information technology, ethical, communication, psychological and other components.

The presence of certain risks for students was also indicated by the participants of the expert survey. Among them, information security risks and risks to soft skills development were recognized as the main ones. Therefore, speaking about the most common, according to experts, risk group for students - information security risks - violating the confidentiality

of information and copyright of the generated content are concerned. Investigating the risks to students' soft skills, it is worth saying that, according to experts, the ability to work in teams and social communication skills may suffer from digitalization of education. Speaking about other risk groups, for example, risks to students' health, experts suggest that digitalization of education contributes primarily to development of neurological pathologies and visual impairment. Analyzing threats to cognitive abilities, experts noted that digitalization of education reduces the ability to critical thinking and causes the predominance of visual perception of information over its other types. The experts recognized plagiarism and ignoring etiquette as the most common ethical threats. Finally, experts were asked whether digitalization processes contribute to formation of various kinds dependencies. Answering it, experts were divided in their opinions approximately equally: half of them admitted that there was a risk of addictions, the other half noted that digitalization processes do not contribute to the emergence of harmful addictions.

An important step in digital transformations of education system should be a system of a secure communicative and educational environment, protected from threats to person's rights and freedoms. It should properly protect his personal data, as well as possibility of a flexible response to formation of addictive behavior, weakening motivation for learning and cognitive skills, loss of social adaptation and communication skills etc. Based on the combination of modern theories of information security and digital culture, the modular system of institutional and communication security is the most effective for educational environment. It includes managerial, psychological, pedagogical, value-motivational, cognitive-informational and ethical-moral modules. Its composition requires not only tools to protect personal data of students, but also elements of recognition of students' psycho emotional state. That allows effective monitoring of risk ogenic factors, including those associated with programming behavior (self-destructive, aggressive or addictive behavior, loss of self-control etc.). Another important element of a safe communicative and educational environment is associated with selection of the most effective forms of learning, taking into account individualization of students' educational trajectories in order to reduce the risks to the cognitive sphere. Such a system will help to diagnose risks, allocated at the first stage of the project, and enable a teacher to draw up a psychological portrait of students, to identify risk groups and reference groups that can teach others (the principle of peer education).

An important component of such a system as a part of an ethical and moral module should also be compulsory study of the disciplines "Ethics and Security in the Digital Environment" in secondary schools and "Ethics and Security of the Digital Society" in colleges and universities. It should help to prevent risk-related consequences of information impact on students and to create digital culture of behavior.

Analysis of the main risks of digitalization shows that a system of a secure communicative and educational environment should cover components related to information, communication, cognitive, anthropological and spiritual safety, including the following:

1. The system of students' personal data protection
2. Studying the code of ethics for digital learning
3. Feedback system for students and parents
4. Built-in online and offline monitoring of learning outcomes
5. Social environment of communication
6. Monitoring psychological and cognitive development of students
7. Team based learning
8. Studying of defending against cyberthreats and online communication

Creation of a safe educational environment for digital education, thus, includes several main areas and modules: 1. Improvement of technical sources of information and personal data protection; 2. Creating safe communication for students; 3. Ensuring a healthy lifestyle and protection from negative effects on the physical parameters of health; 5. Protection against dependencies in a digital environment. Each of the modules includes elements and forms of work related to ensuring safety of students in the face of increasing risks of a highly dynamic open informational environment, where each of participants is an active source of information and influences all other participants.

Discussion

Modern researchers note that the influence of the information sphere on culture is twofold. On the one hand, it provides an opportunity for the development of new forms of preservation of cultural heritage objects, manifestation of human creativity, overcoming barriers in communication, education, access to cultural values (Ronchi, 2009).On the other hand, these resources can be used as a source of public opinion manipulation, spread of threats to life, health, human rights and freedoms, deformation of the traditional culture and social institutions norms related to its reproduction.

Over the past 50 years there have been active discussions in scientific community concerning assessment the impact of digital technology on a person and his consciousness, physicality, worldview and skills. Optimists note that digital culture leads to an ever-increasing freedom of access to resources (in space and time), to emergence of new ways of knowledge transferring, democratization of the information obtaining system, unprecedented creativity and self-realization of its users. Skeptics thus emphasize a qualitatively new level of manipulation of an individual's consciousness, loss of critical and logical thinking skills, weakening of memory, increasing attention deficit, value disorientation, ethical pluralism, loss of interpersonal communication culture, intellectual passivity (the phenomenon of "digital dementia", "clip" thinking, deficiency of meaningful multi-sensory interaction with cultural objects), a growing psychophysiological dependence on technologies.

The socio-psychological consequences of digitalization include growing behavioral disorders as well as a social and self-destructive attitudes, Internet addiction, nomophobia, escapism, absorption in virtual worlds and communication. So V.G. Budanov, for example, stresses "dehumanization" of a person under the conditions of "uncontrolled immersion of a person into "digital worlds" (Budanov, 2016). In turn, A. Duff points out not only anthropological, but also ethical and social risks, notes that information society has generated a normative and ethical crisis (Duff, 2008).

In socio-political, ethical and legal terms, the most risky consequences of digitalization are growth of inaccurate, "fake" information, impunity associated with anonymous use of Internet, which also affects security, rights and freedom of a person (Savchuk, 2009).

Significant risk-generating effect from information and simulation of interpersonal communication is associated with the states of a person "self-blocking", his closeness, isolation from the world. This is manifested, among other things, in the growth of autism, which experts consider to be a kind of "epidemic of our time" (Dachel, 2007), conscious escapism in the digital environment, in the growth of teenage suicides (for which Russia has long been in 1st place in Europe and 6th in the world), including those associated with the impact on adolescents of suicidal "death groups" (Baeva, 2020). In the most extreme manifestations, avoiding reality in a simulated online communication or playing space is associated with the risk of abandonment of a family, school, work, social activity, loss of communication and cognitive skills that determine a person.

Besides, it should be taken into account that the results of the interviews could be under sufficient influence of the pandemic and

forced transition to distance learning of those educational programs that were not originally oriented for that. This caused a kind of digital crisis for education since such a form of learning had previously been used only as an additional resource. The overload of teachers who were to create a digital environment for basic education in a short period of time and in some cases their incomplete readiness for this in terms of competencies, could be the reasons for skeptical and critical assessments of such a transition.

The empirical results of the study may have limitations due to the fact that some of the experts did not have long-term experience in distance learning, which did not allow them to develop effective tools for such educational activities so that it could cause negative assessments of online education. However the data of our survey is also confirmed by all-Russian surveys of teachers of various educational levels (Strekalova, 2019), which noted decrease in student motivation, low quality of their education results, increase of the "screen time", weakening their health as well as violations of educational content through hacker attacks etc.
Further studying of the ongoing transformations in the educational system, which will obviously be irreversible, is necessary for deeper investigation of security issues in electronic education,

Conclusion

In modern world digital education plays an increasingly important role and assessment of its impact on humans is becoming a crucial element in ensuring the overall safety of a person. The conducted expert interviews showed that the advantages of digital education are obvious and it deserves its further widespread use. At the same time, it is extremely important to preserve the basic functions of education system in order to ensure not only transfer of knowledge but transfer of meanings, familiarization with cultural values, ensuring the conditions for individual's socialization. Digital education related to virtual communication has certain risks for a student and their assessment is necessary to ensure his safety. Based on expert interviews, it was revealed that the most significant risks can be associated with students' informational security and dysfunctions or disorientation of a person in communicative, cognitive and ethical spheres. Digitalization of education can also have a significant impact on physical parameters of health, increasing "screen time", forming dependencies on gadgets, affecting vision and musculoskeletal system and healthy lifestyle skills in general. Complete transition of education to digital environment, starting from high school, can cause risks of formation of such social skills as:

ability to work in a team, leadership, respect for people, empathy, responsibility. These risks and threats can be supplemented if this problem be considered from a position of information security, where the negative influence can be associated with the use of big data, personal information, with cyber attacks and cyber fraud. It is worth noting that the experts interviewed during the sociological research identified the risks associated with information security as one of the most common. And, despite the general positive background of the questionnaire answers, experts do not deny the presence of the risks, mentioned above.

Study of the mentioned risks leads to a need for creation of a communicative and educational environment system for digital education. That includes modules, elements and subsystems that ensure a safe and effective entry of a person into a digital educational space. The system proposed by authors is largely sketchy and requires deepening and further elaboration of its components, which will be presented in our future works. As one of the directions for working to reduce the risk ogenicity of digitalization of education, the following proposals could be offered: creation of an ethical code for digital education and the expansion of group work within the framework of digital educational technologies usage. This will reduce a number of threats to information security and soft skills, as well as to other areas that are subject to the negative impact of digitalization of education. Besides, it can help to create "common rules of the game" that allow all participants of the digital educational environment to feel confident and protected.

We believe that development of education in the field of digitalization can become both a source of new promising opportunities and a high-risk area, therefore, setting up a system of a safe communicative-educational environment is an important step for positive digital transformations, taking into account the choice on the part of parents (in the system of basic education) and students (in higher education).

List of acknowledgments

We express our gratitude to the RFBR Fund for supporting the project No. 19-29-14007 MK "Assessing the Impact of Digitalization of Educational and Social Spaces on a Person and Developing a Safe Communicative-Educational Environment System", within the framework of which this article was prepared and to reviewers for critical comments that helped to improve presentation of the research results.

References

Alghamdi, Y. (2016) *Negative Effects of Technology on Children of Today*. Retrieved fromhttps://www.researchgate.net/publication/318851694_Negative_Effects_of_Technology_on_Children_of_Today

Baeva, L. V. (2014) New Challenges for Humans in the Context of E-Culture. *International Journal of Technoethics, 5*(1), (59-68).

Baeva, L.V. (2020). Internet "Death Groups" in the Online Culture. In Mehdi Khosrow-Pour(Ed.),*Encyclopedia of Criminal Activities and the Deep Web* (660-667). USA: IGI Global.

Baudrillard, J. (1993).*Symbolic exchange and death.* LA: Sage Publications.

Beck, U. (2000).*Risk Society. On the way to another modern*. MA: Progress-Tradition.

Bell, D. (1986). Social framework of information society. *InT. Forester (Ed.),New technocratic wave in the West*(330-342). Cambridge: MIT Press.

Budanov, V. G. (2016) New digital life technoclass – prospects and risks of transformations of the anthroposphere*Philosophical Sciences*. (6). (47-55)

Capurro, R. (2010). Information ethics for the Information society. *Information society*, 5,6-15.

Dachel, A.M. (2007).*The Search for the Elusive Autism Gene*. Retrieved from https://www.counterpunch.org/2007/03/22/the-search-for-the-elusive-autism-gene/

Duff, A. (2008) The Normative Crisis of the Information Society. *Cyber psychology: Journal of Psychosocial Research on Cyberspace*, 2(3). Retrieved fromhttps://cyberpsychology.eu/article/view/4207/3248

Floridi, L. (1999) Information Ethics: On the Philosophical Foundations of Computer Ethics. *Ethics and Information Technology, 1* (1), (37-56).

Gable, G., Sedera, D., & Chan, T. (2008) Re-conceptualizing information system success: the IS-Impact Measurement Model. *Journal of the Association for Information Systems, 9*(7), 377-408.

Gaskell, A. (2009) Conceptions of teaching and learning: revisiting issues in open, distance and e-learning. *Open Learning: The Journal of Open and Distance Learning, 24*(2), 109-112.

Ghosh S., Nath J., Agarwal Sh. & Nath A. (2012)Open and Distance Learning (ODL) Education System: Past, Present and Future Systematic Study of an alternative education system. Journal of Global Research in Computer Science, 3(4), 53-56.

Girard, B., & Siochrú, S. O. (2003) *Communicating in the information society*. Geneva: United Nations Research Institute for Social Development.

Heim, M. (1993) *The Metaphysics of Virtual Reality*. New York:Oxford University Press.

Heller, P. B. (2012) Technoethics: The Dilemma of Doing the Right Moral Thing in Technology Applications. *International Journal of Technoethics, 3*(1), 14-27.

Hui-Chun, C. (2014) Potential Negative Effects of Mobile Learning on Students' Learning Achievement and Cognitive Load- A Format Assessment Perspective. *Journal of Educational Technology & Society*. 17(1), (332-344).

Johnston J., & Barker L. T. (2002) *Assessing the impact of technology in teaching and learning.* MI: University of Michigan.

Mansour E. B., & Mupinga, D. (2007) Students' positive and negative experiences in hybrid and online classes. *College Student Journal, 41*(1), 242-248.

Mustafaoğlu, R. (2018) The Negative Effects of Digital Technology Usage on Children's Development and Health. *Addicta: the Turkish Journal on addictions*, 5, (13-21).

Rivoltella, P. C. (2008) Knowledge, Culture and Society in the Information Age. In P.C. Rivoltella (Ed.),*Digital Literacy: Tools and*

Methodologies for Information Society(1-25).Hershey: IGI Publishing.

Ronchi, A. (2009) *E-Culture.*New York : Springer-Verlag, LLC.

Savchuk, V. V. (2013) *Media Philosophy.* SPb.: Publishing house of Russian Christian Humanities Academy.

Strekalova, N.B. (2019) Risks of digital technologies implementation in education. *Samara University Bulletin: History, Pedagogic, Philosophy. 2*(25), (84-88).

Tomsic, A., & Suthers, D. (2006) Discussion tool effects on collaborative learning and social network structure. *Educational Technology & Society, 9*(4), (63-77).

Virillo, P. (1984) *The Lost Dimension*. New York: Autonomedia.

Weller, M. (2004) Learning objects and the e-learning cost dilemma. *Open Learning: The Journal of Open and Distance Learning, 19*(3), (293-302).

Citation of this Article:

Baeva, L. & Grigorev, A.(2020).Safety of Digitalization of Educational and Social Space. *Pakistan Journal of Distance and Online Learning, 6*(1). 231-246