

TRANSFORMATION OF SOCIAL AND EDUCATIONAL RELATIONS IN THE CONTEXT OF DIGITALIZATION

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Abstract. The article examines the influence of digital technologies on the living conditions of people, the way of collective behaviour, the forms of social and educational relations. The focus of attention is placed on multiple manifestations of digital transformation, affecting the deep foundations of the institutional nature of society, its intra-institutional and inter-institutional mechanisms, and determining the accelerating speed of socio-cultural changes. Digitalization is understood as a dominant trend in the development of the social system at the modern stage, which not only characterizes its dynamics, but also leads to the emergence of a new mode of human historical existence – a digital society. Additionally, the ambiguity of the emerging changes is analyzed, highlighting both the positive aspects associated with the progressive transformation of social practice and the entire systemic set of economic, educational and other social relations, as well as the negative features reflecting the destructive influence of digitalization on the social reality. By applying structural-genetic analysis, accompanied by the procedures of analogy, generalization and synthesis, a detailed inventory of the leading conceptual ideas has been carried out, which allows for the disclosure of the contradictory vectors of the functioning and development of digital technologies with an emphasis on developing clear ethical guidelines for their use.

Keywords: digitalization; social and educational relations; digital society; sociocultural development; institutional structure; digital inequality

Introduction to the research problem

Today, culture and society find themselves involved in a state of “technological singularity,” in other words, an exponential acceleration of scientific and technological progress, which is beginning to transform the socio-cultural sphere, human consciousness, and the global order as a whole. At this stage of civilizational development, digitalization has become one of the key factors determining the profound and qualitative modification of society, an essential change in the societal system encompassing various types of institutional structures and diverse social

connections. Multiple manifestations of digital transformation, including such as the creation of increasingly miniaturized technical devices, their high degree of interoperability, increasing volumes of digital information reflect the emergence of a pervasive networked and dynamic infrastructure, exerting a huge influence on the way people live and changing the nature of their relationships with others individuals and the environment. Following the exponential line of its development, the digitalization transcends the space of everyday communication and becomes the specific mode of human historical existence, which opens up new possibilities for searching for information, learning, receiving services, purchases, treatment, etc.

In the context of these turbulent transformational processes, it is necessary to take into account not only the interactions between individuals in the conditions of the digital environment, but also the interactions between formal and informal institutions, market and non-market institutional structures, as well as institutions with digital and non-digital profiles, and so on. Augmented reality, in essence, represents a specific, hybrid type of system that combines the digital with the analog, the real with the virtual, while the real still predominates in the current conditions.

Apart from the obvious advantages of digitization (reduction of transaction costs such as office space rent, transport costs, introduction of flexible work organization systems, exceptional opportunities for professional growth, training, personal development, etc.), this process brings and many new challenges.

Digitization as a specific social phenomenon

For the first time, the concept of "digitalization" was introduced into the terminological apparatus of science in 1995 by the American computer scientist Nicholas Negroponte (Negroponte 1995), although it rather reflects the summary trend of change gaining legitimacy in the expert field of scientific communication, while the real processes of digitization, at least in the technological, economic, educational and to some extent cultural spheres, had begun long before that. Subsequently, the digital transformation of the economy, education and society became a dominant field of research not only by technical specialists, but also by representatives of the social sciences and humanities – economists, sociologists, psychologists, educatos, linguists, etc. It also finds its permanent place in the space of broad public discourse (Tapscott 1995; Evans et al. 2000; White 2014; Schwab 2017; Greengard 2015; Barbe et al. 2019; Colangelo et al. 2019). In modern scientific literature, the term "digitization" is used in a narrow and broad sense of the word. Digitization in the narrow sense of the word is associated with the conversion of information into digital form, which in most cases leads to a decrease in expenses, an increase in organizational efficiency, the emergence of new technical, technological, etc. opportunities. As a transition to digital information across all areas of economic and sociocultural life, digitization evolves from being a simple method of optimizing various private aspects of social institutions into a driver of global social development, enhancing economic efficiency

and improving the quality of life. Therefore, in the broad sense, digitization refers to the modern global trend of socio-economic and sociocultural development, which is based on the transformation of information into digital form and leads to an increase in production scales, expanding the spectrum of offered goods and services, as well as improvements in the material-technological environment and living conditions.

In order to grasp the meaning of the emerging changes affecting the economy, education and other societal spheres, it is reasonable, from a theoretical and conceptual standpoint, to use the periodization of societal development as presented in the civilizational approach. This approach is based on the works of A. Fisher, C. Clark, J. K. Galbraith, D. Bell, A. Toffler, M. Castells, and others. Within this framework, societies are categorized into pre-industrial, industrial, post-industrial, and informational societies. Additionally, the five-sector model of the economy is outlined: the primary sector (agriculture, mining, fishing), the secondary sector (manufacturing, construction), the tertiary sector (transportation, services, tourism), the quaternary sector (trade, finance, real estate), and the quinary sector (healthcare, education, culture, etc.).

The new type of societal organization, which is inherently linked with the transition from the quaternary to the quinary sector – *the informational or digital society* – passes through two stages in its development. In the first stage, the quaternary sector and information and communication technologies, mainly applied in the business sector, dominate and aim to build a high-tech infrastructure. During the second stage, a large-scale shift from analog to digital technologies occurs. The greater capabilities of digital information compared to informatization and computerization lead to the point where digitalization begins to shape complete technological environments (ecosystems, platforms) within which a user can create the necessary supportive surroundings (technological, instrumental, methodological, partnership, etc.) to address entire classes of tasks (Litvintseva et al. 2019).

In this way, the digital society represents a specific, complexly structured system of political, economic, educational and other social relations formed in connection with the development of the digital economy and is based on the production, distribution, and use of digital information technologies. Digital information enables the collection of massive data sets (Big Data), the processing and distribution of which facilitate the extraction and application of new ideas and knowledge, contributing to the achievement of strategic goals in economic and social development. The Fourth Industrial Revolution means that technologies more efficient than those previously used will be applied. These include not only innovative ICT technologies, such as API (Application Programming Interface), but also quantum communications, sensors, mechatronics, genomics, Big Data, multi-cloud operations, the Internet of Things, blockchain, neurotechnologies, artificial intelligence, robotics, and more. Digital technologies are used to form digital platforms that serve as the foundation for creating ecosystems reflecting the co-evolution processes of traditional and virtual

subjects – individuals and communities, goods, markets, and their interaction through the services provided by these digital platforms. These platforms create new business ecosystems by reducing production and transaction costs, ensuring alignment between supply and demand, forming new digital markets, and attracting investments (Moore, 2006)².

As a result, the institutional environment, intra-institutional and inter-institutional mechanisms, and rules of interaction are changing, leading to significant alterations in social relations. It should be noted that within this process of change, formal social regulators often fail to adapt to the new environment, unlike informal institutions. The following key changes can be pointed out, affecting socio-economic relations, which go far beyond the sphere of business and exert a significant reflection on the sphere of education (Markova 2018; Lapidus 2018):

1. Existing business models are undergoing significant transformation. Business is becoming open and network-based, with flat organizational structures and various forms of sourcing. Integration is being enhanced through both cooperation and collaboration. The similar network mode of interaction turns out to be more and more broadly represented in the field of educational relations as well.

2. There is an increasing *personalization* of various types of connections in the delivery of goods and services including in the field of education. On the one hand, customization allows production to be individualized according to new consumer demands, and on the other, commercial and financial intermediaries, including banking structures, are being eliminated. Platforms like Google, Microsoft, Amazon, and others are beginning to fulfill these functions.

3. A particular type of partnership is emerging in the relationships between consumers and producers – a kind of *co-creation*, based on the principle of jointly creating value with consumers and partners within business and education ecosystems. A good example of this is *crowdsourcing* – engaging a wide range of people (crowd formations) to solve various problems by tapping into their creative abilities, knowledge, and experience using ICT. One of the global leaders in this type of innovation is the company InnoCentive, which draws on the knowledge of various researchers to solve business, scientific, educational and technical problems. InnoCentive connects companies, educational institutions, public sector and non-profit organizations in the crowdsourcing platform Open Innovation Marketplace. InnoCentive is implemented in 1 Expert Collection, including Education Technology (Edtech). These companies offer tech-enabled solutions that facilitate the different types of processes and relations in the sphere of education. The term “peering” is also increasingly used, referring to equal partnerships, primarily in the information space. A notable example is the free Linux system, which competes with Microsoft and is worked out by developers worldwide based on peering principles.

4. *Sharing mechanisms* are becoming increasingly widespread – mechanisms of shared consumption. Their essence lies in the efficient use of resources by allowing

them to be shared by other parties on a permanent or temporary basis. Examples of this can be found in various areas of public life: car-sharing, shared housing rentals, Christmas trees, event outfits, and more. This contributes to resource savings and reduces excessive profits.

5. Institutions of trust, confidentiality, and security are developing. Social institutions of trust, like all other informal institutions, are formed over a long period and then operate with practically no additional costs, permanently reproducing themselves within the social space.

Ambivalent nature of the impact of digitalization on social and educational relations

Reflecting on these transformations of the material and technological environment, the mechanisms of its interaction with the institutional structure of society, and the new forms of social relations arising from this, it can be concluded that digitalization affects not only the technological aspects of the economy and business but also the diverse institutional structures impacting all aspects of public life. Social experience, the surrounding environment, and social practices are all changing under the influence of digital civilization. At the same time, the nature of these changes demonstrates a high degree of variability and ambiguity, combining both positive trends and negative aspects, reflecting the destructive effects of digitalization on the nature of social reality.

In the research literature, the following most significant positive social effects generated by digitalization are most commonly noted^{1,2}:

1. New opportunities for effectively carrying out various work processes, learning and recreational activities with the help of digital technology, various gadgets, the internet, “smart” homes, “smart” classroom etc. This gives rise to the *digital well-being* of the population, which contributes to the modernization and optimization of the educational environment, improves people’s social standard and quality of life.

2. Changes in individuals’ attitudes, skills and habits, leading to essential update of different dimensions of the personality. The permanent growing flow of knowledge and innovations determines, in the mode of correspondent response, a new type of cognitive and epistemological adaptability to the rapidly changing high-tech environment, which implies a constant striving for new knowledge and lifelong learning, both in real-time and online.

3. The use of digital technologies for buying, placement, dissemination and selling a wide range of goods and services, as well as obtaining quality government electronic services.

4. Transformation of working conditions, the environment and circumstances in which teaching and learning take place with digital technologies being used in business, production, management, and marketing, education and science, contributing to the growth of human capital and the implementation of cognitive recruiting. In these

conditions, firms, companies and institutions can attract not only full-time employees but also freelancers, workers in the “gig economy,” and even crowd-based workers.

5. The transformation of the social services sector (open education, “smart” healthcare, “smart” cities, media consumption, autonomous transportation, etc.) and modifications in the financial services sector, which are provided to the population (internet finance, the transition to digital money, electronic banking services, and more). All of this contributes to better meeting people’s needs, social cohesion and integration of the population, inclusion of deprived groups, increasing accessibility and convenience in service delivery.

6. Accelerating economic and social development aimed at creating new industries, training and business models, management models, new forms and standards of consumption, and generating economic and social effects from digital technologies not only for business, but also for the entire society.

Alongside this, digitalization is capable of exerting negative forms of influence on structures and social relations (Muro et al. 2017):

1. Changes affecting the labor market and the sphere of labor relations, accompanied by the release of unskilled workforce and workers from several shrinking traditional professions, which could lead to a general reduction in the number of jobs. There is a mismatch between the increasing diversity of activities and the inclusion of certain social segments and individuals in the labor market. Therefore, the issue of developing and implementing programs for skill enhancement, retraining, continuous education and professional growth of personnel relevant to the needs of the national economy and regional development becomes particularly significant.

2. Increasing the gap between high-tech skilled labor and low-skilled work. In relation to the risks of layoffs due to the obsolescence of professional skills and the *rise of social inequality*, there arises a need for restructuring and modifying those institutions that regulate structural unemployment and various forms of social and educational inequality.

3. Insufficient development of digital culture, often associated with the emergence of fears and phobias from digital manipulation and the influence of harmful (including educational) content on the structures of individual and collective consciousness and accompanied by the emergence of new traditions and social practices. This gives rise to the problem of *digital trust*, focusing on establishing correspondence between formal and informal institutions.

4. One of the most severe consequences of digitalization is the *erosion of the middle class*, which traditionally serves as the foundation of the mechanisms of political power and provides providing a serious social-stratification balance and stability to society.

5. Deepening polarization between different social strata and groups, including as a consequence of *digital inequality*, which can lead to serious social tensions and escalating social conflicts.

6. The widespread implementation of new ICT in the provision of government and administrative services to the population may carry with it some additional challenges and still poorly studied political risks.

7. Increased risk of *digital fraud* and “*cyber threats*,” which can be generated by more digitally advanced entities and states. Examples include cyberbullying, deliberate misinformation, or hacking. This raises the need to address cybersecurity issues, which vary across an extremely broad spectrum – from individual dimensions to sectoral, regional and systemic ones.

8. Lack of the necessary legal acts regulating the processes of digital transformation and cyber security, such as sectoral regulation of the use of Internet of Things devices or legislative regulation of platform solutions, including cloud platforms and commercial platforms for data collection, processing, and storage of information.

In addition to the risks affecting the sphere of socio-economic relations, digitalization also pertains to the value-existential dimension of society. The rapid tempo of the socio-technological transformations is reshaping the inner space of social relations and the trajectories of social actors’ life activities that can be realized within it. The everyday lives of social actors are becoming virtualized, the human personality is being digitized, and the saturation of information is increasing while significantly diminishing properties such as dimensionality and reflexivity.

The oversaturated eventfulness narrows the depth of individual experienced moments and leads to a change in everyday practices in favor of those that carry a much sharper emotional response, accompanied by easy and quick decoding by the individual’s social receptors. In such conditions, the habitual reading of books – a sufficiently prolonged process of immersion in the atmosphere of artistic images – begins to lose its appeal and encourages a shift toward easily digestible products in the online space, such as TikTok videos, Instagram memes, or provocative comments on Twitter (X). *Customization*, *personalization*, and the *digitization of the individual* are just a few of the key terms that define changes in relationships (Kosmopoulos 2018).

Digital technologies, combined with powerful audiovisual tools, displays, and gadgets, create a new space for social-behavioral models that constantly surround individuals in various aspects of their daily lives, beginning to program their activities on an increasing scale. This makes it possible to exert influence on the individuals and manipulate their consciousness. The virtual world can significantly differ from the real world, serving as a kind of illusion or media construct in which individuals are placed. However, the main problem of this virtual “*digital cave*” is that real facts and events are often distorted within it, making it difficult to determine what is true and what is not. The created constructions can be extremely believable, which does not allow them to be easily distinguished from the real ones. Furthermore, if real events do not have a corresponding reflection in virtual media, questions arise about their real existence. Thus, a new ontology is formed – the *ontology of real virtuality* and *virtual reality*, which are closely intertwined and difficult to differentiate.

All of this decreases social protection under modern conditions and increases the potential for manipulating information. The threat of unauthorized access to personal information or information of significant corporate and governmental importance arises. Additionally, the issue of the need for continuous education becomes apparent due to the risk of losing qualifications, constant psycho-emotional overload, as well as paradoxical risks for the post-modern information society, such as *information overload* and *under-information*. Due to a constant uncontrollable information flow, the individual often finds himself in a difficult situation and cannot successfully navigate the information space and obtain valuable, objective and, above all, reliable information. This gives rise to another paradox that implicitly exists in contemporary culture – *under-information*, which triggers a new form of social inequality known as “information poverty,” which in turn contributes to the “digital divide” within society.

When understanding the impact of digital technologies on the field of social relations, the outlined duality must always be considered. The ambivalent nature of digital technologies and artificial intelligence (AI) manifests itself in the field of education in a particularly vivid way, as it represents a very powerful transformative factor in the modern educational process, generating both significant opportunities and potential challenges.

One of the key advantages of digital technologies is their ability to provide personalized learning. By adapting educational material to the individual needs, pace and learning style of students, they contribute to more effective learning. In addition, the automation of administrative tasks, such as checking tests and managing learning resources, significantly reduces the workload of teachers, freeing up time for more meaningful and creative pedagogical activities. Virtual assistants and chatbots provide immediate feedback and support the learning process through interactive methods, which significantly increases student engagement. Digitalization allows for the analysis of large volumes of data on student progress, which facilitates early identification of difficulties and timely measures. In addition, the use of digital technologies improves the accessibility of education, providing education in remote areas and supporting students with special educational needs. Despite the potential for optimizing educational processes, their active implementation raises several significant challenges. Excessive automation can lead to atrophy of cognitive functions, in particular critical thinking and analytical abilities, due to a reduction in the need for independent problem solving. The reduction of direct human interaction can cause social disintegration, limiting the development of emotional intelligence and interpersonal skills.

From an ethical perspective, privacy concerns and potential misuse of information pose serious risks. Algorithmic bias arising from incomplete or biased data sets may exacerbate existing educational inequalities rather than reduce them. Technological dependency and the associated risks of system disruptions due to technical failures or cyberattacks also pose significant challenges. Economic aspects, including high implementation and maintenance costs, can create additional barriers, especially for

educational institutions with limited resources. At the pedagogical level, the reduction of the role of the teacher and the limitation of creativity in the learning process are significant issues. Subjectivity in automated assessment and misinterpretation of knowledge due to the lack of human context are also important considerations. Furthermore, the reduction of intrinsic motivation for learning and the atrophy of intellectual abilities due to over-reliance on technology represent long-term risks that need to be carefully analyzed and managed.

In order to capture not only these challenges and risks that affect individual aspects of the educational process, but also the existential threat that is potentially rooted in the field of the digital as such, an analogy can be drawn between the fascinating seduction of artificial intelligence and the temptation of man by the Grand Inquisitor, insightfully described in F. Dostoevsky's brilliant novel "The Brothers Karamazov". Dostoevsky essentially presents a deeply philosophical conflict – freedom versus security. The Grand Inquisitor accuses Christ of giving people too much freedom that they cannot bear and claims that the church (or the authorities) must relieve them of this burden by providing them with order, bread and happiness. If we look at artificial intelligence through this prism, some parallels can be drawn. AI is increasingly making complex decisions for people – from what content they consume to how their work is optimized. AI systems can make life easier, remove uncertainty, and provide comfort, but they also risk taking away people's ability to make independent choices, especially if the algorithms are controlled by corporations or governments. Like the Grand Inquisitor, AI can offer "happiness" in exchange for freedom – convenience and predictability in place of independent thought and risk. The question is whether people will be willing to give up their autonomy, as the Inquisitor believes they would.

Conclusion

In the whole world there is a dramatic increase in the demand for digital technologies due to the obvious advantages in their use in various types of human life: products, services and utilities are maximally adapted to human needs and are becoming easier to use, not requiring significant resource support and time costs for their assimilation. The growth in demand for digital technologies leads to a reduction in the time required for the development of innovations, significantly dynamizes the process of creating and implementing innovative educational technologies. In recent years, new areas of use of digital technologies have emerged, there has been a qualitative rethinking of their application in people's lives with an obvious shift in the vector of public and technological interest to the everyday needs of the individual. Gradually, the trend towards the merger of digital and physical reality (*phygital*) is becoming more and more obvious.

The mass dissemination of digital technologies contains a revolutionary component, not because it serves as a marker of technical and technological progress,

but as a result of the socio-economic and socio-cultural transformations it provokes. Thus, the emergence and unfolding of digitalization become a significant factor in the development of society, social and educational relations, driving rapid progress in all areas of society while simultaneously outlining a number of substantial problems that humanity still has to address.

To overcome these problems and challenges, it is necessary to develop contextually supported social strategies and educational policies that ensure the effective use of digital technologies for the benefit of learners. Teachers must be trained to work with digital technologies so that they can apply them in a way that complements, rather than replaces, traditional teaching methods. Ensuring transparency in algorithms and protecting personal data are key to building trust in these technologies.

Digital technologies are increasingly entering the fabric of educational reality, revealing serious potential for transforming the education system, but their implementation must be carried out with clear ethical guidelines and attention to the social and psychological aspects of the learning process. A balanced approach that combines their advantages with traditional pedagogical practices is essential to ensuring quality and accessible education for all.

NOTES

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