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Tahira ALLAHYAROVA

Doctor of Philosophical Science, Professor,

Board Member of the Center for Social Research.

Baku, Azerbaijan

SEARCH FOR A NEW PARADIGM IN THE EDUCATIONAL` SYSTEM IN THE ERA OF ARTIFICIAL INTELLIGENCE AND DIGITAL TECHNOLOGIES: CHALLENGES, OPPORTUNITIES

Annotation. *The article explores the problem of searching for a new paradigm in the education system in the era of artificial intelligence and digital technologies, the transition to the VI economic order, the formation of a list of new competencies of the 21st century, and the analysis of challenges to the education and training system. It is noted that the state and prospects for the development of the higher educational system are today among the most acutely discussed issues in every society. The requirements for knowledge and competencies are dynamically changing, and what was in demand at the beginning of the new 21st century may differ significantly from the current needs of society and the state. It becomes obvious: to be in demand, you need to study all your life. In this regard, it seems necessary to consider the basic conceptual approaches and paradigms used to analyze educational policy. The state has an objective need to predict and implement new competencies, as well as to modify existing ones. At the same time, questions arise: what educational paradigms can become the driving forces for the formation of a flexible and proactive system of lifelong learning for citizens of all ages? In conclusion, the author notes that the era of digital transformation dictates the transition to a new concept of education, there are completely new drivers and trends that form the model of education of the future, including in the context of large-scale educational experiments. The educational system is already behind the*

digitalization curve. It must do more to take advantage of artificial intelligence and new technologies, while addressing possible negative trends.

Key words: *educational system, learning environment, state education policy, new paradigm, artificial intelligence, digital technologies, paradigm shift , challenges, opportunities*

Introduction. Contemporary mankind is living in the era of digital technologies and artificial intelligence, so, the traditional paradigm and philosophy of education is undergoing fundamental changes. For a greater contribution to society, the development of the educational system in accordance with existing trends, the timely response of schools and universities to the challenges of the national and global space becomes a strategic priority.

The modern world is rapidly changing, the development of new innovative technologies and their rapid implementation makes it necessary to reconsider the existing paradigms of the socio-economic structure of the whole society. Among the main trends are acceleration, digitalization, automation, globalization, greening, demographic changes, and the development of a network society. It is worth noting that processes such as digitalization and automation immediately affect the surrounding reality and are amenable to observation and tracking, while the rest, in addition to the technological and economic spheres, inevitably affect the social, changes in which are more difficult to analyze and control, despite the fact that It is she who forms the structure of society.

It is no coincidence that a number of international organizations in the field of education are dealing with these problems. For example, this issue is dealt with by various international organizations - Global Education Futures and Future Skills, whose expert studies highlight a number of trends that are already having a serious impact on the economies of almost all countries of the world.

The transition to a digital economy significantly changes the paradigm of personnel training, setting the educational system, universities the task of moving

from the usual industrial model of education to a new model that meets the needs of the digital economy. The formation of the digital economy as a new paradigm for the development of every state and society will radically affect all spheres of life.

It is known that the digital economy is understood as a set of social relations within the framework of the use of electronic technologies, services, infrastructure, analysis of a large amount of information, optimization of production business processes and an increase in the level of socio-economic development of states in a single digital space.

Problems mentioned makes necessary to consider the basic conceptual approaches regarding new paradigms used to analyze public and state policy toward development of education institution, as pre-university training, as well as higher education system respectively.

The aim of the research is to analyze the paradigm shift in the new digital educational environment, to study the problems and solutions.

Research problem: Contemporary «Paradigm Shift». As is known, paradigm shift is a term first coined by the historian of science Thomas Kuhn, twentieth-century physicist and philosopher of science. The phrase «paradigm shift» and extrapolated upon it in his book – «The Structure of Scientific Revolutions (1962)» to describe a change in the foundations of a conventional model in any field [1].

Although the notion of a paradigm shift first originated in the philosophy of science, this phrase meaning a revolutionary and dramatic change in assumptions spread to social sciences and popular culture as a buzzword.

The educational paradigm in the context of what has been said is a set of basic ideas, not always realized, that underlie educational theories and pedagogical practice. «The educational paradigm is understood as framework of key provisions and the ideas which are acknowledged by the pedagogical public during the concrete time period and are the cornerstone of scientific research. Change of an educational paradigm includes transition from the education aligned on teaching to

the education aligned on training. The criterions for the change of this paradigm are: the education which is more aligned on the student; change of teacher's role; the further definition of the main goal; transition from potential to result; change of the training process» [2].

Since the end of the 20th century and from the beginning of the current 21st century, the problem of a paradigm shift in education has been widely discussed and studied, in particular, in the frame of the transition from the classical («knowledge»-based) education system--to the modern «competence-based paradigm» [3]. One of the main factors that influenced the development of education in recent years has been the formation of a global knowledge economy, mainly used by information technology and artificial intelligence. As a result of the information revolution, the Internet's global network has effectively «destroyed» what was called the «knowledge monopoly» an area where universities once ruled. Successful innovations based on digital technologies and artificial intelligence are widespread in the process of interaction between universities, enterprises and the state.

The need to change it arises as a result of the realization of the discrepancy between the previously established and traditional ideas of the current pedagogical practice, new facts and processes that do not fit into the previous ideas. Awareness of the discrepancy allows not only to identify the former, largely previously unconscious paradigm, but also to clarify the features of the new pedagogical paradigm.

Speaking about the formation of a new educational paradigm, we must remember that the same term is given a different interpretation, a different meaning. The result is a «semantic shift» [4]. It is all the more important the more essential the concept it touches on. When it occurs in a variety of concepts and is systemic in nature, we can talk about a paradigm shift. It is this kind of categorical shifts that will be the subject of further consideration.

The world is already surrounded by the digital environment, and the school must adapt to it very quickly, use its advantages and mitigate the risks. Thus, one of

the main barriers to the digital transformation of society can be a shortage of personnel with digital skills and the ability to work with advanced technologies.

İn our opinion—one of the main questions to be answered are as follows: «How to overcome the gap between very fast digital transformation processes and adequate respond of society and learn to live in an era of unprecedented transformations, when familiar professions disappear in a year and entire industries appear?».

What lessons have been learned from the educational challenges of teaching and learning during the COVID-19 pandemic regarding children, teachers and parents, remote online teaching etc? No secret that- under the new circumstances, the quality and inclusion of education are at stake and many children are at an increased risk of being left behind. Therefore, answer to the challenges of the 21st century can be a new paradigm in the education system responding to challenges of the era of artificial intelligence and digital technologies, which in turn involves the multilateral development of a students and trainees.

Education is one of the most important areas of social life. The structure and role of education are changing under the influence of changes in the socio-economic, demographic, political life of society, and most importantly, under the influence of the information and technological revolution.

At the same time, education often acts not as a consequence of economic growth, but as a factor contributing to dynamic changes. The content, nature and direction of changes in many cases are determined by educational traditions and values.

It’s important to emphasize that education has won the race with technology throughout history. But in the era of artificial intelligence, there is no certainty that this will ever happen.

In the context of the issues mentioned, the challenges facing education in the digital age and artificial intelligence are a hot topic of discussion among researchers- as UNESCO emphasizes in its research [5].

Another important factor dictating the search for a new paradigm is the state policy that puts the education system at the forefront as a driver of national innovation and competitiveness. Despite the fact that higher education today is under constant pressure from globalization factors, the national state continues to play a decisive role in its development, those political, social, economic and cultural-historical factors that determine the adoption of appropriate political decisions by public authorities in this area.

Accordingly, a theoretical understanding of the place and role of the state in reforming higher education systems in modern society, as well as an empirical analysis of current trends in the development of higher education, are in demand in these conditions by all actors interested not only in improving the efficiency of the process of training new personnel for the economy, but also in the progressive development of society from an intellectual and moral and ethical point of view.

As a whole, dominance of existing traditional educational-pedagogical stereotypes and approaches is no longer effective.

The report of the Organization for Economic Cooperation and Development (OECD) «Trends shaping education. 2019», identified 3 key megatrends in the modern world that affect the future of education. These megatrends are characterized as: globalization, digitalization and aging. «As we stand at a critical juncture, we need to transcend the short term and develop ways to explore future trends that may seem less familiar to us but are just as important to understand. The trends shaping education and determining of new paradigm are a vital tool in this regard,» said the OECD officials [6].

According to the study, the future of education is being created now. The report/study examines the major economic, political, social and technological trends affecting the future of education, from early childhood to lifelong learning. The purpose of the report is to inform strategic thinking and stimulate reflection on the challenges facing education around the world, at the societal level and for individuals.

With regard to the social aspect, this study emphasizes that, at the level of digitalization, it has completely changed the life of society. In our rapidly changing modern world, education cannot prepare for the future using only the lessons of the past. In many countries, education is still trying to adapt to the changes of today and is not ready for the changes of tomorrow. Responsible policies are turning these trends into opportunities to learn and prepare.

The world confronts multiple crises, each of which resists current efforts at resolution and appears intractable. The environmental crisis of climate change occupied the center stage in the mid-2000s. Fears of nuclear weapons proliferation, which had subsided into complacency in the years following the end of the Cold War, suddenly surfaced with renewed intensity , spreading havoc through financial markets across the world. It was followed quickly by a sudden and substantial slowing of economic growth in OECD countries, rising levels of unemployment and most recently a crisis of excessive government debt.

In spite of the enormous attention being given to each of these issues by specialists nationally and internationally, progress on all fronts appears to be nearly at a standstill or at least far too slow to meet pressing human concerns.

Results from PISA - the OECD Program for International Student Assessment - show that more time on the Internet at school does not automatically lead to better student achievement. In fact, heavy Internet use in school is associated with lower student achievement.

Education is already behind the digitalization curve. It must do more to take advantage of artificial intelligence and new technologies while addressing potential misuse. Right now, education is still struggling to encourage students to study STEM (science, technology, engineering, and math) subjects.

As Andreas Schleicher, Director of Education and Skills at the OECD, emphasized, «We need to think more about how human skills complement the

artificial intelligence of computers so that we end up with first-class people, not second-class robots» [7].

In the most general form, two main approaches can be distinguished regarding to the issue in modern age*: positivist and postpositivist.* They differ from each other in their ideas about the very nature of knowledge and, hence, different definitions of what issues should be the focus of policy in this area, its possibilities of influencing universities, understanding the decision-making process itself.

Regarding different countries, there are several types of paradigms that reflect the attitude of authors to certain aspects of the pedagogical process in modern domestic pedagogy:

- paradigms of authoritarian-imperative and humane pedagogy;\
- paradigms of cognitive and personal pedagogy
- paradigms of traditional pedagogy;
- paradigms of scientific-technocratic and humanitarian pedagogy;
- paradigms of natural science, technocratic, esoteric, humanistic and polyphonic pedagogy etc [8].

The implementation of Artificial Intelligence (AI) technologies into educational activities are topical issues for researchers

The digital transformation of education is associated with the introduction of developing technologies to solve various pedagogical problems and improve the efficiency of the educational process. Accordingly, the use of AI in the organization of educational activities is a topical issue.

Artificial Intelligence is a branch of science producing and studying the machines aimed at the stimulation of human intelligence processes. The main objective of AI is to optimize the routine processes, improving their speed and efficiency (provided it has been implemented and supported properly). As a result, the number of companies adopting AI continues to grow worldwide. According to Research and Markets, «The analysts forecast the Artificial Intelligence Market in

the US Education Sector to grow at a CAGR of 47.77% during the period 2018-2022» [9].

The use of AI in the field of educational technologies contributes to the solution of a set of practical problems. The introduction of AI is also aimed at designing a flexible individual educational trajectory for students, built on personalized teaching methods and timely monitoring of the results of educational activities, thanks to the possibilities of qualitative and quantitative data analysis.

The use of AI, as well as complex data analysis, provide teachers with the opportunity to make the learning process more fun and productive.

However, despite all the above factors, the use of AI technology raises a number of concerns among representatives of the academic community. The introduction of AI into the system of modern education carries not only positive aspects, but also potential threats to all aspects of the educational process. Some of the challenges associated with the use of AI are:

Accessibility and equality, digital divide, the problem of providing access to information and connecting to the Internet.

- Ethical aspects. Among the main concerns related to the use of AI, in scientific and analytical publications, there are problems of confidentiality, the legality of using students' personal data.

- Potential dependence on technology. There is a fear that the active use of AI will increase human dependence on technology, and our own abilities to perform cognitive functions and solve analytical problems will weaken [8]. According to some studies, the threshold for concentration has decreased from 12 to 8 seconds [9]. Scientists have found that representatives of the modern digital generation have memory impairment compared to older people [10].

With the development of computing and information processing techniques, artificial intelligence (AI) has been extensively applied in education. *"Artificial intelligence in education"* (AIEd) opens new opportunities, potentials, and challenges in educational practices. In its short history, AIEd has been undergoing

several paradigmatic shifts, which are characterized into three paradigms by researchers:

1. AI-directed, learner-as-recipient;
2. AI-supported, learner-as-collaborator;
3. AI-empowered, learner-as-leader.

In three paradigms, AI techniques are used to address educational and learning issues in varied ways. AI is used to represent knowledge models and direct cognitive learning while learners are recipients of AI service in Paradigm One; AI is used to support learning while learners work as collaborators with AI in Paradigm Two; AI is used to empower learning while learners take agency to learn in Paradigm Three. Overall, the development trend of AIEd has been developing to empower learner agency and personalization, enable learners to reflect on learning and inform AI systems to adapt accordingly, and lead to an iterative development of the learner-centered, data-driven, personalized learning [11].

Conclusions. The era of digital transformation and artificial intelligence dictates the transition to a new concept of education, there are completely new drivers and trends that form the model of education of the future, including in the context of large-scale educational experiments. The education system is already behind the digitalization curve. It must do more to take advantage of artificial intelligence and new technologies, while addressing possible negative trends.

Contemporary learning spaces, often termed ‘new generation’ or ‘innovative learning environments’, have been developed in schools and universities in a number of countries during the past decade. Across all educational sectors, it appears that new building evaluation methodologies are required if a deeper understanding is to be attained regarding how effectively learning environments can support the educational programs and practices of the twenty-first century

The use of Artificial Intelligence (AI) is now observed in almost all areas of our lives. Artificial intelligence is a thriving technology to transform all aspects of our social interaction. In education. AI will now develop new teaching and learning

solutions that will be tested in different situations. Educational goals can be better achieved and managed by new educational technologies.

The modern world is characterized, on the one hand, by the processes of globalization, the growing interdependence of global, national and local problems, on the other hand, by the spread of the sixth technological order, accompanied by such cardinal innovations as the widespread use of information and communication technologies and robotics in various industrial, financial and economic and other processes, which inevitably entails the need for changes in the training of new personnel for all sectors of the economy and socially significant areas of society.

The emergence of new opportunities in educational and scientific activities, intensive internationalization, contributes to the growth of scientific results due to the exchange of information and the concentration of research efforts on the most complex problems of various branches of scientific knowledge, are changing the paradigms of the modern educational environment.

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