Axiological approach in the university's transformation based on the use of digital and remote educational technologies in pandemic and normal conditions

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Abstract. The digitalization of education due to constant transformation is considered as an existing reality and at the same time is a challenge of a modern age. It will invariably lead to changes in the content of education, methods and organizational forms of educational work. The article considers the issues of the university's transformation, describes the experience of using digital technologies during the mass transition to the remote studying on the example of two regional universities. Issues of axiology in transformation of education are considered.

Computers have been established in our lives quite long and substantially, although initially they were created as a means of computing but now it is impossible to imagine an educational process of schools and universities without digital technologies [1]. In two decades the computer has turned from a powerful bulky to a portable device that can perform a huge number of functions and combine various previously incompatible functions. It is a means of communication, information transfer, remote access and control systems, and even health control etc. In fact this list may be very large, many operations and inventions are impossible without a computer. In the modern world, the best personal computers are involved in many areas of production. They help in education and science, serve in the country's defense system and represent an integral part of medicine [2].

The introduction of networks made it possible to turn a computer from a computing device into a communication device. The next century in the evolution of humanity began with the emergence of the Internet. It is the age of "information technology", the age of computers and computer networks development; it is the time when the information delivered on time represents a high value. Today we have learned to communicate with a computer in a language that it understands. This device in any difficult situation is ready to suggest ways of activity in a specific case. Thus speaking of digital transformation in education, we can confidently say that learning is a way of human intellectual development, including the usage of artificial computer intelligence [3].

Today, like 100 years ago, the knowledge production depends on the nation's intelligence and determines its fate. According to the strategy of the Digital Transformation of the Science and Higher Education Sector, developed as part of the implementation of the President of the Russian Federation Decree of July 21, 2020 No. 474 "On National Development Goals of the Russian Federation for the Period until 2030", the achievement of "digital maturity"

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of the economy's key sectors and social sphere is indicated as one of the determinants of the national goal "digital transformation". It involves updating the planned educational results, the content of education, methods and organizational forms of educational work, and evaluating the achieved results in a rapidly developing digital environment for dramatically improvement of each student's educational results (individualization of training) [4].

Transformational processes in education have begun around the world. They are also needed in national education. The digital economy requires that each trainee (and not just the best) master the competencies of the 21st century (critical thinking, the ability to self-study, the ability to use digital tools, sources and services in their daily work) and can creatively (not according to a template) apply existing knowledge in a rapidly developing digital environment [5–9]. The new Federal State Educational Standard has already set the task of development of each student's ability to manage his own learning. The digital transformation of education must solve this problem.

Moreover, the most powerful breakthrough in this sphere was made in 2020, which became a challenge for everyone. The pandemic has transformed everything including politics, economics, medicine, science, education, and that is the most important it has changed worldview.

March, 2020 was a serious test for the educational system. It was necessary to restructure the educational process from the usual classical verbal communication "Teacher–student" to the remote format "Teacher–computer" assuming students as a target audience. In the transferring of all forms of the educational process to the online environment from lectures to all types of practical classes, it has been found that the educational process is not ready for such a fundamental restructuring. First, there is the lack of the actual level of academic subjects' development in the form of electronic educational resources and the insufficient level of teacher's professional training for the full and high-quality use of digital platforms and services in the educational process.

In this situation quality and content of the educational process is sharply reduced because it is not possible to use information and communication technologies in fully scale, but the volume of information itself is steadily and rapidly growing, creating an unfulfilled process in the loss of the received knowledge quality [10].

An analysis of the general and qualitative educational achievement of full-time students was carried out on the example of two regional universities—Federal State Budgetary Educational Institution of Higher Education "Ufa State Aviation Technical University" (USATU) and Federal State Budgetary Educational Institution of Higher Education "Orenburg State University" (Kumertau branch of OSU). The results of the analysis are represented in figure 1.

As it can be seen from the diagrams presented in figures 1 and 2 the qualitative and general academic achievement in two universities on different training programs and related to various areas of activity during the mass transition to distance learning during the 2020 pandemic, has significantly decreased.

The results of the session (see figures 1 and 2) showed that new pedagogical technologies are needed to create individual educational trajectories, evaluate the professional situation based on innovations and basic principles of labor functions, motivate in-depth critical study of professional experience [10, 11]. A large concentration of symbols, meanings, communications, actions, results, and, therefore, another education is needed.

It is explained by the following disadvantages in distance education:

1) mandatory availability of technical equipment that meets the requirements of conducting the educational process in a remote format;
2) availability of electronic lecture courses and measurement materials for intermediate and final academic efficiency evaluation;
3) lack of laboratory training using a specialized equipment;

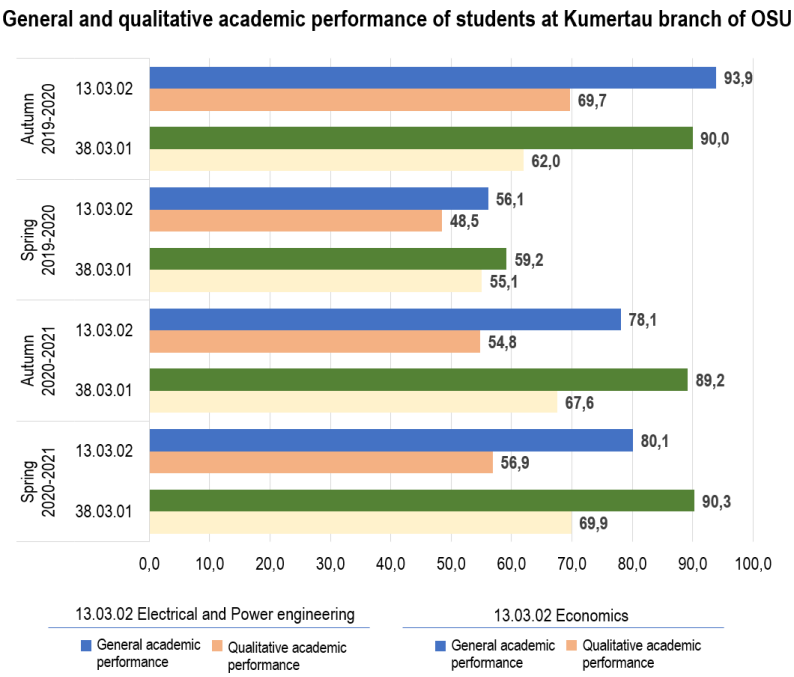

Figure 1. The analysis of the general and qualitative academic achievement of full-time students in regional university—Kumertau branch of OSU

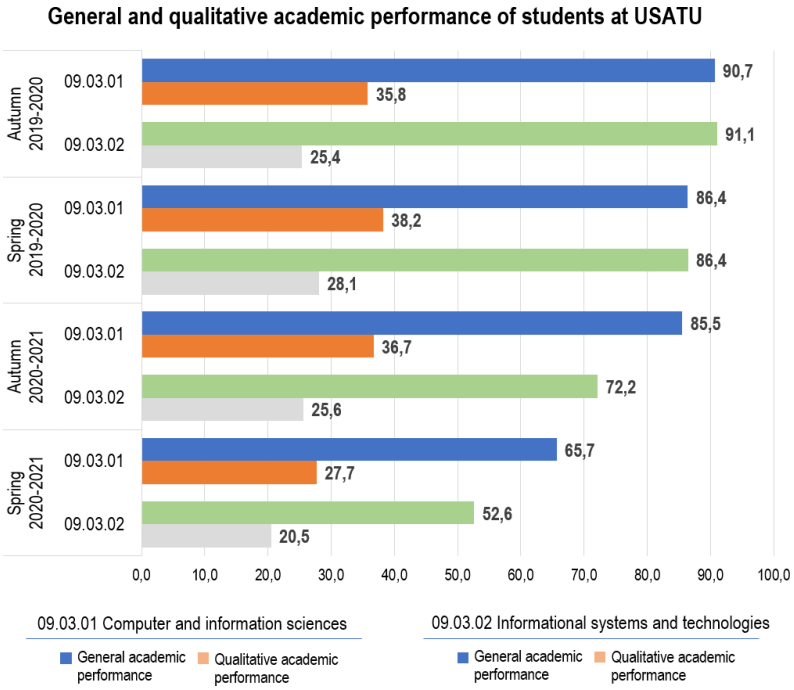

Figure 2. The analysis of the general and qualitative academic achievement of full-time students in regional university—USATU

4) the difficulty of supporting student motivation and interactivity during classes;
5) lack of direct communication with students;
6) establishing the user's identity during knowledge testing;
7) the dependence of learning success on technical skills.

Turning to global trends in education, we are clearly aware that education plays the role of the genetic matrix of culture, being an essential element of the mechanism for translating the information code in the structure of culture, ensuring its reproduction and development. Axiology (science of values) is in general line with the search for answers to acute questions and challenges of our time [12].

Axiology considers objective reality combining the laws of the objective and subjective relationships, current and potential, external and internal, essential and proper, traditional and innovative, natural and random, stable and dynamic in the capacious axiological dimension of the modern world. As the axiological dominant of the modern specialist training, it is necessary to designate computerization and its strongest impact on the student's modern world [13]. Without modern attributes of communication, teaching, leisure activities such as gadgets, a modern student is unthinkable, he feels flawed, confused, suspended. Education cannot ignore this fact; therefore, it is necessary to look for options for using this phenomenon as an instrument of strategy and tactics of interaction between a teacher and a student in the university's educational process.

The axiological approach involves considering not only the external factors of the university's transformation, not only external circumstances and situations of the modern person's life, but also the internal peculiarity of the student's personality, his needs, motives, value orientations, aspirations, expectations and claims.

COVID-19 was a major shock to the educational system around the world. Russian education was no exception, but there are also positive points in this situation: people began to master new professions, educational structures, learned to work with new formats, and the model of "mixed learning" from the perspective becomes a reality [8].

The pandemic changed the Internet. In 2020 during the period of self-isolation many professions and activities went online and will not return completely offline. According to the results of the Institute of Statistical Research and Knowledge Economics of the Higher School of Economics (HSE University) about three quarters (76%) of respondents began to use digital tools more often to solve various everyday problems. Half of respondents (49%) installed additional applications and programs. Every third (34%) has mastered a new skill, and 48% plan it in the near future [14, 15].

To meet the needs for mass digitalization providers have significantly increased the speed, quality and Internet coverage over the past year. At the beginning of 2020 more than 4.5 billion people used the Internet, that is, almost 60% of the world population is already online and there is a minimization of digital inequality. At the beginning of the transition to distance learning throughout the country (March, 2020) there were problems with both Internet access and the availability of telecommunications, then in 2021, according to the Ministry of Digital Development of the Russian Federation, mobile communications will appear in 1198 villages, and settlements inhabited by 100–500 people. Mobile communication of the 4G/LTE standard will become available to residents of these settlements; it will also provide sustainable access to the Internet.

There is a significant increase in online education, and the concepts of "education" and "learning" are eroded and embedded in youth leisure through the Internet. New skills for a modern student become prevalent and essential and a new quality of education such as "Connectivity" is formed. That is the ability to be connected. A habit of information concentration

is created. It is necessary to receive several professions and study continuously since the development of technology and the reduction of the professions' life cycle have led to the obsolescence of the classical school-university education model. It was replaced by the concept of lifelong learning [16–18].

Some digital practices have become more popular in conditions of forced self-isolation, but have also shown the possibility of replacing traditional methods of activity. The active use of digital services and devices has stimulated people to improve their skills, which may lead to an increase in digital literacy rates in the near future.

The competence "ability to work in a team" and in an online format, is increasingly appreciated by the employers.

There is clear competition in the field of educational services in the rapidly developing conditions of digitalization. So the share of the population of the Russian Federation according to the Rosstat (Federal State Statistics Service `https://www.gks.ru/`) at the end of 2020 the population of Russia was 145,963,350 people. In 2020 the population of Russia increased by about 59,820 people. Taking into account that the population of Russia at the beginning of the year was estimated at 145,903,530 people, the annual growth was 0.04%, and the natural population growth was 167,789 people. As a result, you should not expect an increase in the number of students and schoolchildren. Sometimes it is enough to take short-term online courses to master new professions and soon most of humanity will study remotely, since now there are all the technical possibilities for creating online courses that are not inferior to classical (including university).

Considering the current situation and the primary importance of improving the quality of bachelor's professional training for the requirements of the economic sectors the main task arises. This task is to improve the individuals development, both trainees and teachers in the field of the digitized environment through the development and implementation of new technological, methodological and information opportunities with the transition to the formation of a unified information-and-communication educational environment.

Digital reality education is a new research opportunity, high students' educational performance and innovations in learning and research.

Other kinds of technologies, other types of people, and another culture are needed to achieve these goals. Digital transformation is a series of profound and coordinated changes in culture, staff and technology that engender new educational and operational models and lead to the transformation of institutional operations, strategic directions and value propositions [6, 19].

The peculiarities of the student's value self-determination in the axiosphere of the Internet are relevance, speed, intensity, multi-vector, great freedom, a large number of opportunities and innovative technologies, a specific space of self-determination. The Internet can be seen as a very rich space and a means of developing creative potential only when the person is focused on humanistic values, the values of self-realization, self-improvement, and ready to create new, unique and beautiful things.

Determining the coordinate system in which the main meanings of the educational transformation of the university are presented and revealed axiology focuses on identifying priorities, dominants as basic vectors of the socio-cultural practices development in the digital world [6, 12]. The intensity and speed of the changes taking place in the context of computerization concerns every person. Intense searches for solutions to the optimal combination of the traditional and innovative nature of the educational activities of the university are carried out. The educational community has to estimate the obvious difficulties, risks, identified problems, see unforeseen, uncertain trends and circumstances. It will be necessary to re-understand the traditional methods and fundamental foundations of the education development in order to be ready to realize the set goals of educating and teaching students in a new, radically changed situation of educational development.

In this regard we outline the prospects for the educational digitalization (figure 3).

1. Digital transformation is a system, a process, a series of objective, profound and coordinated changes in culture, personnel and technologies that involve new educational and operational models and lead to the transformation of strategic directions and technological solutions. This will certainly determine positive developments in education.

2. Environment. The saturation of university practice with new information resources and technologies is unopposed (despite the difficulties that are inevitable). This means that it is necessary to continue to create a special educational environment that the best educational organizations have already been able to provide for teachers and students. It requires broadband Internet access to work with big data for productive educational interaction between teachers and students on Zoom, Teams, etc.

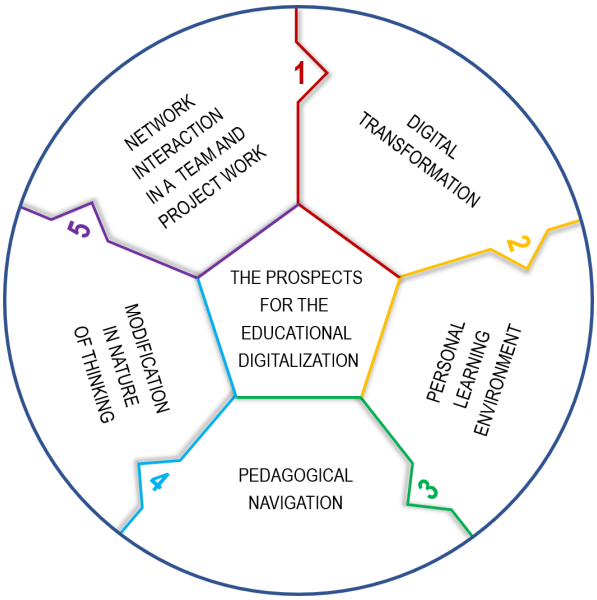

Figure 3. Model of digitalization of education

The essence of the digital transformation of education is that there is a great opportunity for everyone to achieve the necessary educational results through the personalization of the educational process, including the use of artificial intelligence methods and virtual reality tools. The usual tasks of the IT educational environment are supplemented by new ones. For example, the problem of creating a teacher's personal environment as an axiological resource for improving the quality of education becomes relevant. Personalization of education today is a necessary attribute of the educational system quality. Competence in the field of personal knowledge management today cannot be dispensed with, since the teacher needs to create his own Personal Learning Environment (PLE).

The personal educational environment as a learning environment is focused on the subject of education. A personal educational environment is a set of the educational process objects (content, forms, methods, means of training and educational communications) obtained from the information and communication educational environment by adaptation in accordance with the goals, content and planned results of training, the needs and abilities of the student and acting as a means of individual personalization (S.K. Vasilchenko). The teacher's personal educational environment is a resource of training and interaction with the students'

personal learning environments and the colleagues' personal environments through which the teacher implements the achievement of educational goals and professional activities.

3. Content for learning knowledge requires pedagogical navigation. These are the basic guidelines for students to design their own knowledge. It is stated that information turns into real knowledge only with the hard thinking, the application of theoretical knowledge in practice, and in the creation of various projects.

Knowledge implies understanding. In this regard, difficult questions arise in the educational process: What is to be taught in the university auditorium and what will the student learn on his own? Will everyone master the educational material himself or herself or does he/she need the constant assistance of a teacher? The content of education today changes not only quantitatively reducing the volume of reported information, but changes functionally. "Why do I need this?" the student constantly asks himself. He cannot fully assess the feasibility and prospects of the educational process. Much seems superfluous to him. The attitude to the value of knowledge, the motivation of knowledge becomes decisive in the success and quality of education.

The rapid development of the Internet, the rapid spread of social networks like Facebook, Instagram and Twitter, the profound impact of these phenomena on the social, cultural and commercial activities of people, as well as the Internet and social media significantly change the learning process. It made teachers review approaches and methods, finding ways to work with new technologies to stimulate learning regardless of the academic subjects. The driving forces for the Internet development were not only innovation and technology, but also the release of the creative fantasy of millions of users who are quenching their growing needs, giving rise to further advanced technologies [8, p. 58].

4. The nature of thinking has already changed significantly. The nature of the formation of neural connections in representatives of generations Y, Z, AlFA is already different.

On the one hand is the frame perception of information, the dominance of visualization, clip thinking, the speed of the switching processes from object to object, irritation in the absence of quick answers to interesting problems (the teacher does not have time (as quickly as Google) to satisfy lightning-fast emerging and rapidly fading cognitive needs, and interests).

The emphasis in teaching the digital transformation of education shifts to the development of new abilities: abilities for analysis, expertise and transfer of learned knowledge and skills to new situations. Many digital technologies have a rich didactic and axiological (significant for education) potential, the characteristic of which is the freedom to search for information in a global information network. The goal of learning is to form and develop the students' ability to learn, understand the logic of new solutions that move science forward, form the educational independence of schoolchildren and students, and develop their abilities and personal potential.

5. Network. Information and communication technologies in the educational process radically change the nature of educational activities. The horizons of applicability of the acquired knowledge expand significantly with a new understanding of the of project and teamwork capabilities in network interaction. The network optimizes critical thinking, reduces the time of cooperation, and connects the "developed blocks" of the project into a whole by the Lego type. It saturates the process of communication emotionally. It provides opportunities to attract remote project participants and experts to create and evaluate products of creative joint activities. However, the role of the teacher as a moderator of activities and the project manager increases. The success or failure of this type of activity depends not only on the professional competence of the teacher, but also on his axiological literacy (the ability to create an atmosphere of passion, interest, corporatism). This problem stems from a relatively new phenomenon that is the joint creativity of students in the network. In recent years the collective design work of students in the Network using a number of services such

as Google Docs, Zoho Writer, Teamer and a number of others in the school educational process is used. These services are originally designed for collective creative activity and allow simultaneous work with text, graphic and multimedia material by many users involved in the collaborative project [2].

Many digital technologies have significant didactic potential with the following characteristics:

- Freedom of the information searching in the global network.
- Personality. It is the presence of unlimited opportunities for personal adjustment for the needs and characteristics of each student, including the choice of the material presentation method, the level of complexity, the pace of work, the number of fixing repetitions, the nature of educational assistance, partners, game entourage.
- Interactivity. It is the ability to provide multi-entity in the process of communication and interaction.
- Multimedia. It is the ability to use comprehensively various channels of perception (auditory, visual, and motor) in the educational process.
- Hypertext. It is the freedom of movement through the text, compressed presentation of information in the form of infographics, the text modularity and its optional continuous reading, the reference nature of the information, the folding-deployment of information, the use of cross-references.
- Subculturalism. It is the conformity with the usual image of self-development.

With a well-organized work of a student team united by a common task the speed of work (creating fragments, correcting them, making corrections, creating several solutions) can be rather high. Therefore, the teacher who implements such a project with his students and observing the dynamics of joint work perceives it as the activities of not individual students but a certain "collective" subject.

The key unit of the modern age is no longer a separate qualified employee as "a person in his place" but a team capable to solve tasks of a design or functional nature effectively. The processes of "compressing time and space" caused by the spread of digital telecommunications, globalization, the emergence and spread of new models of labor organization (coworking, remote offices, distributed project teams, freelance, crowdsourcing, etc.), and the professions' convergence present fundamentally different requirements for workers, including those related to the willingness to work in conditions of uncertainty.

The above-mentioned technological factors and personal changes in the conditions of digitalization set to education a new vector for the development of pedagogical methods and technologies. It inevitably will lead to educational transformation.

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