MANAGING THE DIGITAL TRANSFORMATION OF THE EDUCATIONAL PROCESS: PROBLEMS AND SOLUTIONS

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Abstract: The article specifies theoretical and methodological provisions of one of the most urgent problems of modern education - digital transformation. The key problems faced by the teaching staff, students, and university administrations caused by the large-scale introduction of information and digital techniques and technologies (the necessity of transition from the model of reproductive to creative-authorized learning; adaptation of the content of educational programs and the organizational and economic mechanism of the educational process; new technologies of the motivation system for students and teaching staff, etc.) are identified and revealed. The stage of development of the strategic vision of digital transformation of the educational process is proposed.

Keywords: digitalization; digital transformation; educational process; organizational and economic mechanism; interactive digital technologies; forms of organization; educational process; master classes; expert groups; transformation efficiency

Introduction

Scientific and technological progress at the present stage has led to the formation of a fundamentally new information and digital technological mode of production and consumption in society. Its characteristic feature is innovation processes based on the large-scale introduction of digital equipment and digital technologies.

Digitalisation in recent years has become a strategic vector of innovative development of Russian society. Digitalisation is often referred to as the digital technological revolution, which is being implemented in various spheres of life. One of these spheres is education.

Digitalisation of education implies the widespread use of digital educational processes, digital models and technologies. The use of digital equipment and technologies in education contributes to a sharp reduction in costs at all stages of the educational process. This occurs as a result of the transfer of routine functions performed by the staff of educational organisations to digital technologies. At the same time, people are left with creative and intellectual types of work.

However, it must be understood that digitalisation itself is by no means a "magic wand" or a tool to replace human beings. Digitalisation is only an auxiliary tool that ensures a higher quality and more efficient learning process at a higher technological level. A serious social result of the digitalisation of education depends on the extent to which the organisational and management mechanism of the education process is adapted to the new digital realities, and how successful the process of digital transformation of educational activities, both in general and in its individual areas, is.

At the same time, many theoretical, methodological and methodological solutions related to the organisation and management of the processes of digital transformation of educational activities are still missing.

These and other topical issues of digital transformation of the educational process are discussed in this article.

Main content

Today, digitalisation is both an objective prerequisite and a powerful trigger for qualitative changes in the educational process.

Digitalisation of the educational process is the large-scale introduction of digital technology and digital technologies into the teaching and learning process.

In order to further accelerate and improve the efficiency of the introduction of digital equipment and technologies in education, the Russian Federation is implementing measures to create a digital educational environment.

From 1 September 2020, the Ministry of Education of the Russian Federation is implementing a project to create a digital environment in the education system at all levels. [2]

The main areas of focus of this project are:

- development of material, technical and information infrastructure of education;
- implementation and use of artificial intelligence in various learning processes;
- creating models for the digitalisation of learning systems;
- introduction of systems for identifying students by identifier-digital code in an automated mode;
- transition from paper-based information media to electronic media;
- improving the professional skills and competences of faculty and students in the use of digital educational technologies;
- development of systems for managing learning processes in the context of digitalisation of education, etc.

The implementation of projects to create a digital educational environment is designed to ensure the success of the educational process, to provide an opportunity to quickly and flexibly change and adapt all its components related to the effective assimilation of the necessary knowledge, skills, abilities and competences.

The results of digitalisation of educational institutions' activities have not been long in coming. Recently, based on the widespread introduction of information and digital technology, digital technologies in educational processes have become more active. The use of online courses, development of distance vocational education, including those with practical orientation, etc. have become widespread [12]

As a result, equipping the subjects of the educational process (teaching staff, students, administration) with high-performance digital equipment and technologies was a powerful factor in increasing their activity and productivity in the process of transferring and mastering knowledge, skills and abilities.

In the scientific literature, the concept of digital transformation is interpreted as a certain kind of transformation, modification, transformation, change of essential qualitative characteristics [13][14]. Digital transformation of the educational process is aimed at transforming its content and forms, as well as their institutional mechanism.

Digital transformation should be seen as a process of introducing digital technologies, as a result of which there are essential profound changes in both quantitative and qualitative characteristics of educational processes, in an inseparable system of teaching and learning.

Digital transformation in the educational process aims to apply digital techniques and technologies quickly, promptly and qualitatively for the successful acquisition of competences

and to adapt the teaching and learning process to the specifics of the current requirements of the time.

Digital transformation of education is a complex systemic process. On the one hand, it is a change in the target orientation of educational activity (learning activity), on the other hand, it is a transformation of forms, structures and ways of functioning of the entire education system. [12]

At present, digital transformation is a vector of development of modern educational processes. It reflects cardinal changes in the models of organisation and management of the educational process. [8]

However, generalisation of experience and research results show that the introduction of digital techniques and technologies often does not in itself lead to the activation of perception and mastery of the necessary competences.

Digital transformation has significantly predetermined the need for infrastructural and institutional (organisational and managerial, organisational and economic, social, etc.) transformations of all elements of the educational process.

As practice has shown, without such digital transformation it is impossible to further improve the efficiency of the educational process.

According to Sberbank CEO G. Gref, the current model of education and training in our country needs to be significantly transformed. And this, in his opinion, should be the strategic goal of digitalisation of the educational process

Digital transformation significantly predetermines the need for infrastructural and institutional (organisational, managerial, organisational, economic, social, etc.) transformations of all elements of the educational process. As practice has shown, without such digital transformation it is impossible to further improve the efficiency of the educational process.

It is the digital transformation that opens up limitless possibilities for transferring the necessary knowledge, skills and abilities to learners by utilising the potential of the world's information base platforms. Digital technologies, through the use of highly efficient digital equipment and technologies, as well as the information base, create unprecedented opportunities for fruitful interaction between teachers and students in the educational process.

At the same time, digital transformation is a complex process that can be accompanied by a radical breakdown of previous foundations and can be both progressive and regressive (digital deformation).

So what are the primary challenges of digital transformation of education today?

The first group of problems is the problems of digital transformation of personality in the process of learning under conditions of constant work with gadgets.

In recent years, much attention has been paid to the problem of digital transformation of students' personality in Russian and foreign literature. The studies have studied the specifics of this process, which allowed to identify a number of new problems in the behaviour of students that have emerged in the era of digitalisation, first of all:

- addiction to the constant use of gadgets, forming a strong digital dependence among students (social networks, etc.);
- cognitive impairment, manifested by signs of impaired memory and intelligence, inhibition of the development of proper speech;
- consolidation of the skill of clip (screen) perception of information, which does not dispose and does not motivate the development of cognitive (mental) abilities (critical, creative, constructive thinking, etc.);
- developing the skill of superficial perception of information (unthinking reading, clip perception of the text, etc.);
- formation of immersive perception of reality through the prism of altered consciousness; immersive perception is a determining factor in changing consciousness, blurring the boundary between absolute and modelled reality. Immersive perception results in immersion in artificially formed conditions "through visualisation of artificial environment" (augmented reality, etc.), etc..;
- negative impact on the formation of moral and ethical norms, development of spiritual and moral guidelines, etc.

Another group of problems is that the digitalisation of the educational process has led to the formation of a fundamentally new system of relations arising between students, teaching staff and administrations of educational institutions. These are new relations conditioned by the peculiarities of work with information and digital technologies regarding the effective mastering of knowledge, skills and abilities on the basis of extensive use of digital tools and approaches.

One challenge is to improve the content of educational programmes in the paradigm of digital transformation and bring them in line with the requirement of the time and the latest scientific knowledge.

Scientific and technological progress and the processes of digitalisation have significantly changed both the form and the content of the functioning of socio-economic

systems of social production. The world has plunged into a new era - the era of globalisation. This era is based on the deepened international division of labour, the creation of highly specialised industries located in different countries of the world and continents and working mainly on the principles of sub-item specialisation, when the production of one small element of a complex product is carried out in different industries, enterprises, their subdivisions, located in different parts of the world.

Accordingly, the training of specialists in these conditions required serious changes in the content of educational programmes, taking into account the need to orient students to the awareness of a fundamentally new in the world complex integrated system of interdisciplinary and interdisciplinary educational models. [1]

At the same time, the modern education system, being an inert and conservative system, does not have time to transform itself in accordance with the constantly accelerating changes taking place in society.

The existing education system does not reflect the global processes that are taking place in society. The content and forms of education change slowly. As a result, modern education reflects the perceptions of the surrounding world adequate to the industrial era.

As a result, the rapid pace and scale of digitalisation of social production, on the one hand, and, on the other hand, the lack of adequate changes in the organisational and managerial, organisational and economic spheres and, above all, in education, lead to processes of digital deformation.

Digital deformation of the educational process is a mismatch, deviation of organisational-economic and organisational-management mechanisms that ensure the functioning and efficiency of digitalisation of educational processes. This state of affairs from the requirements of their compliance with objective laws, regularities and trends in the development of material, technical and content base of the modern education system.

Digital transformation undoubtedly leads to both constructive and destructive negative consequences with anti-social orientation. At the same time, in a number of cases, such "digital deformation" has a mass character and practically negatively affects all components of the education sphere.

The "innovative" changes in the forms of organisation of educational and methodical work within the framework of chairs, dean offices, faculties, departments can serve as a clear example of this.

It is known that the application of digital technologies in education has the potential to provide generally very noticeable cost reductions in the largely routine processes of teaching

and learning for students by transferring many of the functions performed by humans to "artificial intelligence".

However, this does not always lead to increased efficiency of the teaching staff. Often, in the pursuit of cost reduction as a result of digitalisation, a number of functions of support staff (methodologists, laboratory assistants, etc.) are transferred to the teaching staff while reducing the number of methodologists and laboratory assistants.

All this leads to a decrease in the quality of the results of the educational process, both in the algorithms of education and, to an even greater extent, education, to a decrease in the effectiveness of highly qualified intellectual labour of scientific and pedagogical staff.

This trend of digital transformation of the work of teaching staff is in deep antagonistic contradiction with the objective law of civilisation development - the law of constant deepening of the social division of labour (including in the scientific and educational sphere) based on the introduction of scientific and technological progress, including in teaching and learning activities.

The above is in no way contrary to the process of large-scale digitalisation of education. On the contrary, this approach contributes to increasing its effectiveness through the use of more highly qualified intellectual labour of teaching staff in the educational process with the use of digital equipment and technologies.

Another challenge is the shift from a reproductive to creative-authorised learning model.

The educational process today is undergoing serious transformational changes at the stage of transition to the information and digital society. Its digital transformation implies fundamental qualitative changes not only in the concept, strategy, structure, educational culture and other elements, but, above all, revolutionary changes in the models and methods of organising educational and training processes. Those educational institutions and organisations that will not be able to ensure high-quality digital transformation of their activities will remain far behind social progress and may cease to exist in the near future.

In the process of digital transformation, the philosophical paradigms of the concept, strategy, forms and models of organisation, methods and tools of the educational process are changing significantly. Today, the main direction of such a paradigm is the transition from the model of reproductive education to the model of creative-authorised education developed by us. [11]

Reproductive learning is based on the algorithm of repeated reproduction of information, knowledge, skills, abilities and ways of action, based on, as a rule, unquestioning

reproduction of knowledge, abilities and skills, transmitted to students with the help of instructions and criteria and presentation of knowledge, as a rule, not allowing spontaneous deviation from them.

And if the reproductive model of learning, which existed throughout the history of mankind, was the basic, basic, prevailing in education, today it is already gradually losing its relevance in many respects, because it does not meet the requirements of the time. It is becoming archaic and to a large extent practically is a brake for further development of education along the path of progress.

The reproductive system of education should be replaced by the creative-authorised model. Creative-authorised learning is "a technology based on giving students autonomy and unlimited opportunity to mobilise (activate) their subjective cognitive-creative potential". The goal of creative-authorised learning is "to create an environment of creative energy that engages students in the process of self-learning".[6] In the conditions of total digitalisation, the relevance of the application of this model is immeasurably increasing, as it makes it possible to solve one of the main and key problems of education - the transition from clipped to creative-authorised independent acquisition of knowledge, skills and abilities [4].

The next problem is the problem of improving the organisational and economic mechanism of the educational process. Today in the country there is almost total commercialisation of educational institutions. The introduction of such key efficiency criteria as marginal income and profitability of educational programmes and everything related to them into the organisational and economic mechanism of their activities negatively affects the quality of personnel training. The introduction of such a mechanism in universities of federal and sectoral importance, which determine the strategic prospects for the development of science and scientific and technological progress of the country, the place of its economy in the global innovation development, is particularly dangerous for society.

The existing organisational and economic mechanism of education is practically anti-motivating in its essence. Given a certain moral and ethical background of society, the desire to survive at any cost in difficult socio-economic conditions (meaning also the desire for self-preservation of the functioning of the educational institution), there is a certain deformation of moral guidelines.

The interests of key participants of the learning process (students, administration, teachers) in conditions of almost complete commercialisation rather inhibit than contribute to effective motivation aimed at developing the quality of training.

For example, university administrations, realising the serious dependence of the budget on contract students' payments, often act towards teachers according to the principle "if even one contract student is expelled, you will not work here".

A significant part of students, understanding the dependence of the budget of a higher education institution on their tuition fees, deform their behaviour in the direction of decreasing motivation (in other words, they are guided by the principle "I will get a satisfactory grade anyway").

Teachers are also indirectly interested in maintaining the number of even weak contract students, as their remuneration depends on it.

In such conditions, the issues of quality of educational programmes implementation take a back seat.

A serious problem is the problem of the system of motivation of students to master, acquire knowledge, skills and abilities at the stage of digital transformation. Today, the motivation system is primarily aimed at maximising the achievement of various abstract attributes-characteristics, supposedly reflecting the level of acquired competences (e.g. sum of points, etc.) within the framework of the point-rating system.

As a result, the existing motivation system does not allow to objectively assess the results of acquired knowledge, skills and abilities, but reflects only their formal, often ungrounded abstract attributes-indicators.

The introduction of point-rating system of accounting and assessment of knowledge level practically aims students to "earn" by any means the maximum number of points and practically does not motivate them to master real knowledge, skills and abilities. The use of such a system of motivation of knowledge assessment forms distorted ideas about the goals of the educational process.

The use of such a mechanism of motivation in the learning process not only does not orientate to the acquisition of real knowledge, skills and abilities, but, on the contrary, promotes the development of false ideas of success, according to external formal requirements, rather than internal immanent need.

In fact, such a system does not motivate learners to acquire real skills and self-development and requires a fundamental improvement of motivational mechanisms for acquiring and recording knowledge, skills and abilities through the extensive use of digital tools and approaches.

To solve the problem of control and motivation, in our opinion, can be based on the search for new most effective organisational forms (forms of organisation) of classes with the

introduction of new motivational mechanisms in the process of training and education. One of such forms is a "motivated team". Participants of such a team will be able to be inspired by the idea, understand and realise the goals of transformational changes, interact effectively in order to achieve successful final results. Here an important role belongs to the mechanism of motivation of the teaching staff, which should directly be a generator, a trigger, and a manager of digital transformation processes.

The problem of control is closely connected with the system of students' motivation. As noted above, the widely used point-rating system of control is aimed practically not at consolidation of knowledge, skills and abilities, their demonstration. Therefore, in most cases such a system has zero effect. Our expert assessments of the effectiveness of modern control system and in particular anti-plagiarism technology show that they often have even the opposite effect and target students (from 20 to 60%) for various kinds of manipulations: the use of digital "anti-antiplagiarism", "outsourcing" and others.

All this requires the search and application of more effective (innovative) forms and technologies that replace traditional lectures and seminars, classical credits and exams. Today science and practice face the problem of mastering innovative forms of organising interactive classes based on the use of digital equipment, digital technologies, the Internet, etc. The problem is to develop innovative forms of interactive classes.

One of the key points is adaptation in student-faculty interaction.

Education is a specific managed and organised process of interaction between students and teachers, which is aimed at assimilation of knowledge, skills, abilities, competences, development of mental strength and potential capabilities of students, formation of their worldview, as well as consolidation of self-education skills.

It is obvious that the issues of planning the organisation, motivation and control of the learning process should be fundamentally different in the conditions of the model of face-to-face reproductive learning in the classroom and the online model, which involves working in a remote mode, which, of course, significantly reduces the effectiveness of the available tools of control of the teacher over the activities of the student.

New forms of organising classes based on digital technologies, in our opinion, should be, first of all, interactive. These are, first of all, problem lectures; problem discussions; master classes; creative workshops; expert groups (brainstorming groups); demonstration-competence credits; demonstration-qualification exams, etc.

Our application in practice in Odintsovo branch of MGIMO MIEP, at the Department of "Innovation Management" such forms of organising classes (of course, with the use of

methods adapted to the peculiarities of the discipline [6][8][9]) allows us to significantly increase motivation and improve the quality of assessment of the level of mastery of the necessary professional competencies by students.

At present, it is obvious that one of the key issues in the formation of an effective model of digital transformation in the educational sphere is the development of an organisational and management mechanism for its implementation and the formation of an effective management system for digital transformation of the educational process.

This is one of the most difficult tasks. Its solution requires the formation of a strategy for digital transformation of the educational process in an educational institution [3].

The strategic vision of the model of digital transformation of the educational process should be one of the management tools. Such a vision at each level should reflect the peculiarities and specifics of the possibilities of its realisation. [5]

Strategic vision is a model of an ideal image of the educational process in the future, which should reveal the features and outline how the process of digital transformation will look like in the educational institution. Such a vision implies a simplified model of the general understanding of the direction of development of digital transformation of the educational process over a certain period of time.

The success of digital transformation of educational activities is determined, first of all, by a strategic vision of the goals, objectives and directions of digital transformation of the teaching and learning system. The strategy should emphasise the key areas of large-scale implementation of digital techniques and technologies on the way to successful digital transformation. It is such a strategy that is intended to serve as an indicator of the success of digital transformation of an educational institution.

The strategy of digital transformation of the educational process should include at least four main directions.

The first is the formation of an organisational and didactic mechanism for managing the mastering of competences.

The second is the development of a phased programme of transition to digital education.

The third is the formation of an effective management system for the digital transformation of the educational process.

The fourth is the creation of a system for managing the effectiveness of digital transformation of educational processes.

The formation of the strategy of digital transformation of the educational process should be carried out on the basis of a systematic approach.

The development of such a strategy should, of course, be based on information and digital technologies and techniques, the application of which ensures the mastery of the knowledge, skills and abilities necessary for students in the direction of training.

In the educational process, an increasing place should be given to the so-called digital platforms. Digital platforms, being integrated information systems, make it possible to ensure effective systemic multilateral interactions of various user entities (teachers, students, methodologists, supervisors, etc.). Such systems (digital platforms) algorithmise the relationships of students in a single information and educational space, providing a significant reduction in transaction costs.

In the strategic vision of digital transformation, a huge role belongs to the creation of a new system of organisational and management tools and mechanisms of the educational process, including teaching methods, systems for organising communication links and control over the assimilation of knowledge, skills and abilities; models of digital corporate culture, etc.

The strategy of digital transformation of the educational process should necessarily include an organisational and didactic mechanism, which is a system of measures to organise and manage the assimilation of competences (knowledge, skills, abilities), the formation of beliefs and the development of moral principles.

Such a mechanism, as evidenced by domestic and foreign experience, assumes the organisation of the work of the teaching staff on the principle of narrow specialisation, when each teacher, deeply and systematically concentrates his activity on a deep systematic study of individual sections of the discipline he is in charge of, taking into account its interdisciplinary nature.

The key elements of the process of improving the mechanism of digital transformation of educational activity should be the forms of its organisation, systems of adaptation and motivation of all participants of the educational process.

All this requires the improvement and introduction into the educational process of fundamentally new didactic forms and methods of organising the educational process, adequate to the features of the emerging fundamentally new digital educational environment. The most famous of them can include, as noted, author's problem lectures, master classes, creative workshops, various technologies of critical, situational, systemic, process thinking; technologies of project and problem-based learning; technologies of integrated learning, etc. The most popular of them are the following.

Conclusion

Digital transformation is a very long, complex, systemic, technologically and psychologically costly process. Its successful implementation requires the development of science-based programmes of strategic vision of the model of digital transformation of the educational process.

Digitalisation and digital transformation of the educational process should be carried out in a phased, consistent and systematic manner.

Generalisation of the experience of digital transformation of the activities of educational institutions allows us to identify the following main stages.

The first stage is the change of educational technologies on the basis of identifying shortcomings and defining ways to solve problems. At this stage, the concept and strategy of creating a digital infrastructure are formed, when educational processes and technologies are implemented partly in analogue and partly in digital mode.

The second stage - in the process of digitalisation, work is carried out to improve digital literacy and intensify digital educational processes. At this stage, digital pilot educational programmes are implemented.

The third stage - introduction of new digital educational technologies and resources; conducting experiments and creating new directions of digitalisation of educational activities.

The fourth stage is the development of a system of strategic directions of concepts and programmes of digitalisation and digital transformation of the educational process (improvement of the organisational structure of educational process management, corporate culture, system of monitoring the effectiveness of the educational process, etc.). Intensive cooperation and collaboration in the implementation of digitalisation and digital transformation processes

Fifth stage. Formation of a model of digital convergence of digitalisation and digital transformation processes, creation of a digital infrastructure base for the implementation of educational activities, ensuring high efficiency of digital functioning of the educational process. Defining new strategic directions and a model of digitalisation and digital transformation.

Stage Six. Adaptation of teaching staff and students to constantly changing educational digital technologies. This requires personal adaptation of the activities of each member of the "motivated team" to new digital learning technologies, new opportunities and requirements, new models of their joint interaction in fundamentally new conditions. To this end, it is

necessary to create a permanent system of training both faculty and students in new knowledge, skills and abilities to operate in the constantly changing conditions of digital technologies (master classes, coaching, trainings, etc.).

Seventh stage. Development and improvement of an innovative and adaptive system of management of digitalisation and digital transformation of educational activities, ensuring its systematic and continuous development and improvement on the basis of mastering new digital opportunities.

The most important issue in developing a digital transformation programme for an educational institution is to assess the impact of the results of its implementation on the effectiveness of the educational process.

It should be taken into account that the effectiveness of digital transformation of the educational process is determined by a system of factors, the key ones being:

- availability of personnel with the necessary qualifications to ensure the digital transformation of the educational process. The solution to this problem lies in the continuous improvement of the knowledge, skills and abilities of teaching staff and students in the field of digital techniques and technologies, the development of their ability to learn quickly and effectively due to the limited timeframe for the introduction of innovative digital technologies, as well as the mastery of such specific competences as flexibilisation, creativity, etc.;

- conservatism of views of heads of educational institutions, administrative and managerial staff, personnel of educational and methodical departments, who determine strategic directions of improvement of educational activity;

- inertia and unwillingness of many staff to recognise the role and importance of digitalisation of educational processes and their potential, etc.

It is also necessary to remember that the effectiveness of digital transformation is determined to a large extent by the nature of its systematic nature, the scale of changes in all elements and links of the educational process model. Only a balanced model of digitalisation and digital transformation of educational processes can provide a synergetic effect in improving the quality characteristics of educational technologies.

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