THE ROLE OF DIGITALIZATION IN THE MANAGEMENT OF AN EDUCATIONAL INSTITUTION: INNOVATIVE POTENTIAL, IMPLEMENTATION PROBLEMS

O PAPEL DA DIGITALIZAÇÃO NA GESTÃO DE UMA INSTITUIÇÃO DE ENSINO: POTENCIAL INOVADOR, DILEMAS NO CAMINHO

EL PAPEL DE LA DIGITALIZACIÓN EN LA GESTIÓN DE UNA INSTITUCIÓN EDUCATIVA: POTENCIAL INNOVADOR, DILEMAS EN EL CAMINO

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ABSTRACT: The purpose of the article is to analyze the role of digitalization in the implementation of management by educational institutions. A number of scientific methods were used to realize the research goal: analysis, synthesis, deduction, and induction. The results identified potential threats to the functioning and further introduction of digital management methods. In particular, the problems of the functioning of digitized tools should include their cost, the need for constant improvement of the digital competence of managers (because modern technologies are dynamically developing), and the compliance of the legislative framework with the needs of education. The positive consequences of digitization in the field of quality control of the provision of educational services are also analyzed. The conclusions note that the modern development of digital technologies contributes to the application of digital solutions for the management of educational institutions.

KEYWORDS: Digitization of education. Educational management. Distance education. Administration. Educational institutions.

***RESUMO**: O objetivo do artigo é analisar o papel da digitalização na implementação da gestão pelas instituições de ensino. Vários métodos científicos foram usados para realizar o objetivo da pesquisa: análise, síntese, dedução e indução. Os resultados identificaram ameaças potenciais ao funcionamento e à introdução de métodos de gestão digital. Em particular, os problemas do desempenho das ferramentas digitalizadas devem incluir o seu custo, a necessidade de melhoria constante da competência digital dos gestores (porque as tecnologias modernas se desenvolvem dinamicamente) e a conformidade do arcabouço legislativo com as necessidades da educação. As consequências positivas da digitalização no campo do controle de qualidade da prestação de serviços educacionais também são analisadas. As conclusões apontam que o desenvolvimento das tecnologias digitais contribui para a aplicação de soluções digitais para a gestão das instituições de ensino.*

***PALAVRAS-CHAVE**: Digitalização da educação. Gestão da educação. Educação a distância. Administração. Instituições de ensino*

***RESUMEN**: El propósito del artículo es analizar el papel de la digitalización en la implantación de la gestión por parte de las instituciones educativas. Para realizar el objetivo de la investigación se utilizaron varios métodos científicos: análisis, síntesis, deducción e inducción. Los resultados identificaron posibles amenazas para el funcionamiento y la posterior introducción de los métodos de gestión digital. En particular, entre los problemas del funcionamiento de las herramientas digitalizadas cabe citar su coste, la necesidad de mejorar constantemente la competencia digital de los gestores (porque las tecnologías modernas evolucionan de forma dinámica) y la adecuación del marco legislativo a las necesidades de la educación. También se analizan las consecuencias positivas de la digitalización en el ámbito del control de calidad de la prestación de servicios educativos. Las conclusiones señalan que el desarrollo moderno de las tecnologías digitales contribuye a la aplicación de soluciones digitales para la gestión de las instituciones educativas.*

***PALABRAS CLAVE**: Digitalización de la educación. Gestión educativa. Educación a distancia. Administración. Instituciones educativas.*

Introduction

The development of the modern information society has had a profound impact on the education sector. The challenges of digitalization and globalization have made it possible to reassess the possibilities of integrating modern technologies into the educational process. It has been determined that certain areas of non-formal and distance education have developed confidently enough to take a leading position among the models of learning organization after the introduction of quarantine restrictions (due to the COVID-19 pandemic) (OSORIO; BANZATO, 2022). In addition, the results of such distance learning have not become worse than in the traditional form of organization, which once again demonstrates the likely change in development paradigms in determining the future of education (JÄRVIS; TAMBOVCEVA; VIROVERE, 2021).

Another important aspect is the functioning of educational institutions, which has been significantly transformed using digital models. The emphasis on technological development has led to the emergence of new academic disciplines, the evolution of technological support for classrooms or other premises, and the use of cloud-based learning environments that are equally accessible to students from home and from classrooms. However, the management of educational institutions has not been so decisively affected. At least, against the background of studies of other aspects, this issue has been on the margins of researchers' interest. Therefore, the purpose of the article is to analyze the role of digitalization in the management of educational institutions, to identify opportunities for improving their potential, and to trace the likely difficulties that will arise as a result of the introduction of innovations in the field of educational administration and marketing.

Literature Review

The problem of the impact of digitalization on education management is of interest to many contemporary scholars, whose works form the methodological basis of this study. Osorio and Banzato (2022) characterized the main modern innovative technologies of educational management. Bygstad *et al*. (2022) described the peculiarities of the formation of the modern managerial educational space. At the same time, Kubitskyi *et al*. (2022) studied the problem of managing educational institutions against the background of global challenges. The development of modern higher education in the context of digitalization was characterized by Sapiński and Ciupka (2021). Jordan, Zabukovšek and Klančnik (2022) studied the main forms

and models of transition to digital platforms for educational administrative work. Järvis, Tambovceva and Virovere (2021) described the main innovative changes in the higher education system, analyzed the features of the use of advanced technologies in the educational system.

Kosonen and Ikonen (2019) described the importance of communication competence in management processes. These researchers characterized the problem of building trust through discursive leadership through the prism of analyzing communicative interaction in higher education management. Audu (2022) characterized the role of entrepreneurship education and vocational education in innovative education management. At the same time, Michael and Elser (2019) explored models of waste management in educational activities.

Organizational aspects of digital educational documentation are one of the important parts of the management space. Therefore, the work of authors who have considered the features and specific mechanisms for using digital document management in the education sector is important for analysis. For example, Lvovich *et al*. (2021) characterized the main optimization solutions for the rational, efficient operation of digital institutional support. Abaci (2022) outlined the organizational mechanisms for the formation of digital document management tools. Regla and Marquez (2020) analyzed the modern types of interaction of digital documents in current innovative organizational systems (cloud services). The features of document management using blockchain technology were studied by Das, Tao and Cheng (2021). A similar issue was also studied by Guo, Jahren and Turkan (2021), who investigated the main aspects of the implementation of an electronic document management system. The main terminological definitions of the education of the future are presented in Devadze, Gechbaia and Gvarishvili (2022).

Nevertheless, the innovative potential of the management of educational institutions has not been fully explored in view of the active modern transformation processes in the education sector. Nevertheless, modern authors have paid little attention to the review of the main barriers to the digitalization of educational institution management.

Materials and methods

General background

The choice of methods used in this study was based on the practice of scientific research and correlation to identify the most appropriate solutions that have the potential to be implemented, considering the key aspects of the functioning of the management system in the education sector. Therefore, the study uses interdisciplinary methodological tools.

Materials

The main materials for this study are legislative documents such as the Order of the Ministry of Justice of Ukraine on the Procedure for Working with Electronic Documents in Record Keeping, and the Strategy for the Development of Higher Education in Ukraine for 2022-2023 (2022). The methodological basis of the article is also based on the works of modern scholars (DEVADZE; GECHBAIA; GVARISHVILI, 2022).

Data analysis

Based on the analysis, the main subject of the study is divided into the following parts: analysis of the main digital technologies in ensuring the management of the quality of education; characterization of problems; and prospects for further digitalization of management in the field of education. By means of synthesis, these elements are combined, and further conclusions are formed. Through the prism of content analysis, a review of current research is carried out, their main results are characterized, and little-studied issues are highlighted. The paper also uses concretization and abstraction.

Results

Digital Technologies in Education Quality Management: Theoretical and Practical Aspects

One of the main directions of modernization of educational systems is digitalization and the use of information and communication technologies in the field of education management, which makes it possible to improve the quality and competitiveness of the sector in accordance with the needs of modern society. It is also important to consistently reform all systems of education, ensuring equal access to quality education for all (RAKHIMOV; MUKHAMEDIEV, 2022). An adequate response to changes in the education market requires a quality management

system based on the requirements of end users and focused on assessing the quality of education services.

Researchers perceive digital transformation as an inevitable process taking place all over the world, which consists in the integration of high-tech achievements into people's lives (SAPIŃSKI; CIUPKA, 2021). This forces teachers to continuously improve their level of knowledge and skills in parallel with their main activities, as digital technologies become more widespread. The concept of globalization of education is also commonly used today, defined as the process of digitalization and globalization that determine the life and development of modern society (DEVADZE *et al.*, 2022). Digital transformation makes it possible to simplify access to information and to digitize various types of information using digital technologies.

Digital technologies have become the main trend of our time and are radically changing the nature of processes in all spheres of life. Digitalization is a conscious approach to the fundamental transformation of processes using digital technologies (BOND *et al*., 2018). In order to develop effectively in the modern world, it is necessary to update the ways of interaction using digital technologies, which has had a significant impact on transformations in education. For example, in European countries (EU) and the United States, standard school courses combine all forms of e-learning. Today, the transfer and assimilation of knowledge and the development of skills is carried out through a computer and a network, which changes the way educational material is presented, methods, forms, and means of forming knowledge, skills, and abilities. The environment of learners is also changing. Digitalization contributes to the growing demand for education regardless of age. In such circumstances of a complex combination of various elements, the education management system is considered one of the most useful tools of digitalization.

Managing the quality of education is a large-scale problem that needs to be addressed at the scientific and practical levels. Assessment of the quality of education should be based not only on pedagogical and educational parameters but also on criteria that go beyond the educational sphere and are adjusted based on global categories such as living standards and quality of life. Education quality management involves a targeted, comprehensive, and coordinated impact on the state of the educational process and its components (REGLA; MARQUEZ, 2020). This is achieved by setting standards for the process, planning, monitoring, ensuring, and improving its quality to meet the requirements of direct consumers of services. The management of the quality of educational services in educational institutions by means of

information technology (IT) is to carry out targeted impacts on the object of management by means of IT to ensure the quality of educational services.

The process of managing the quality of educational services in educational institutions is implemented through a quality monitoring system based on relevant indicators (PUCCIARELLI; KAPLAN, 2016). This system covers all aspects of quality management of educational services in educational institutions: administrative, educational, extracurricular, methodological, financial, economic, medical, etc. The development of a school information system can be viewed from different perspectives. The operational position reflects the totality of information used in the educational process (LVOVICH *et al*., 2021). The technological position involves a combination of various means of storing, maintaining, and using information, telecommunication systems, and networks that operate according to common principles and rules, and ensure interaction between participants in the educational process. The organizational position describes the structural units that ensure the accumulation and input of information, as well as the management of information resources (JORDAN; ZABUKOVŠEK; KLANČNIK, 2022). The information position describes interconnected information objects that ensure the implementation of information processes in the management of education systems with unified rules for description, formalization, storage, and use.

The overall goal of digital education quality management is to create a single information space where all participants in the educational process (students, parent committees or partner organizations, teachers, and administrative staff) are involved and connected at the information level.

Problems and prospects of digitalization of education management

Historically, educational institutions have been characterized by a decentralized organization to meet the local and regional, as well as professional needs of teachers and students in national and international dimensions. This has led to a certain contradiction between the attempts of governmental and administrative structures to use centralized management methods, which are characterized by elements of strategic control, and the needs of various structural parts of educational institutions for self-management and self-control, which are characterized by localized management (KUBITSKYI *et al.,* 2022). Therefore, the digitalization of education takes place at several levels, which sometimes conflict with each other. While the use of information technology at the managerial level (strategic) is aimed at concentrating control and management functions for more efficient process support, academic

staff are much more interested in digitalization tools to support research and the pedagogical process (BYGSTAD *et al*., 2022).

For example, at the tactical level, many new opportunities have emerged in pedagogical roles. The introduction of technological innovations has given teachers the opportunity to use and experiment with new ways of teaching processing large amounts of informative data, and using and engaging lecturers from outside the same educational institution. These changes can be considered a new definition of roles in education. Traditional lectures with a certain duration have become much less central and have been replaced by shorter ones that are pre-recorded on video resources and are part of the teaching trajectory (AUDU, 2022). With so many digital resources available, the role of teachers will be much less about direct teaching and more about managing educational resources. The role of the teacher will also be to plan and monitor the work over a period of time. Classes (regardless of their actual duration) will turn into an element of pedagogical activity that should facilitate the formation of educational trajectories of students, enable them to independently process educational material using digital sources of information.

Many European educational institutions are now using strategic transformation programs to respond to significant changes in educational trends, funding policies, and to improve their competitive academic advantage (DAS *et al*., 2021). Flexibility in organizational structure has become an important issue in modern educational management. The ability of organizations to implement changes and transform in accordance with the challenges of the external and internal environments is an important component of organizational flexibility. The flexibility of organizational structures is usually manifested in the time aspect, scope, focus, and area of influence. Thanks to the digitalization of many of these processes, work at the tactical level of educational institutions has become easier, as the speed of information transfer has increased significantly.

Information technology makes it possible to accelerate communication with educational institutions on the part of governing authorities through electronic documentation (GUO *et al.*, 2021). This solution makes it possible to speed up the transfer, processing, and implementation of control functions over the work of educational institutions, increase public awareness of the work of educational institutions, assess their effectiveness in comparison with the performance of others, etc. Cooperation at the strategic level between different institutions allows for distance digital learning for students, the organization of additional access to modern educational resources, the active involvement of cloud environments, a system of media

libraries and media centers, the digitization of resources necessary for learning and the provision of access to them.

At the same time, some aspects of digital management of educational institutions have been implemented in a rather limited way (HORDIICHUK *et al.*, 2022). The issues of concern can be summarized in Table 1.

Table 1 – Some problematic aspects of the implementation of digital management of educational institutions

	Problem	Description
1	Competence	The need to improve the digital competence of specialists, bringing it at least to a level that would be sufficient to implement digital educational and management processes (KOSONEN & IKONEN, 2019). Unfortunately, many managers, due to their rather conservative methods of action, perceive modern digitalization as an optional element.
2	Legal regulation	Difficulties in legal regulation, which remains conservative and does not always keep pace with the development of technological capabilities (JACKSON, 2019), lead to a slowdown in the introduction of current requirements and needs in educational management.
3	Lack of funds	A possible lack of funding does not contribute to the implementation of the full range of digital educational services (JALILBAYLI, 2022), which also include a management system.

Source: Developed by the authors of the article on the basis of the authors' study of scientific literature (JACKSON, 2019; KOSONEN; IKONEN, 2019)

From this point of view, the use of legal regulation of digitalization tools is a promising way to overcome the current challenges of the digitalization of educational institutions. Through the formation of certain working models of cooperation at the strategic and tactical levels, it is possible to reach a compromise that would maximize the benefits for teachers and students, but also make it possible to optimally use all the advantages of using digital elements.

Discussion

Thus, the digital transformation of higher education has been actively discussed in the last decade, and the main research concepts relate to many aspects, in particular:

1. Management strategy (OSORIO; BANZATO, 2022; JACKSON, 2019; BYGSTAD *et al*.,2022);
2. Asynchronous collaboration (HAZEMI; WILBUR; HAILES, 2012);
3. Use of communication tools (BOND *et al*., 2018; KOSONEN; IKONEN, 2019).

In particular, the study by Kosonen and Ikonen (2019) determined that innovative management should be based on the formation of trust as an organizational phenomenon, in particular, building trust through discursive leadership through the prism of communicative interaction (p.1-2). Therefore, communication competence is important in the management of modern educational institutions. At the same time, we believe that digital culture of communication is important in the organization of modern innovation management. Therefore, we agree with Osorio and Banzato (2022); Sapiński and Ciupka (2021) that digital literacy is important for all educators in today's transformational environment.

Historically, educational institutions have been defined by decentralized structures to meet the local or regional as well as professional needs of academics based on local or international networks. Therefore, according to Pucciarelli & Kaplan (2016), there is currently a certain contradiction between the desire of governments to apply the adopted centralized approaches dominated by strategic decisions. However, it has been proven that in the education sector, the process of digitalization is both top-down and bottom-up (BYGSTAD *et al*., 2022). However, while the strategic level focuses on models of IT centralization and management to ensure more efficient processes, “academic staff are more interested in how digitalization supports education and research” (BYGSTAD *et al.,* 2022, p. 104463).

At the same time, according to modern scholars, the main approach to reforming the management process of higher education is the use of modern technologies and, accordingly, the development of a digital educational management space (JACKSON, 2019; ABACI, 2022). In the current literature, the digital management space can be defined from several perspectives: technical (OSORIO; BANZATO, 2022), pedagogical (ELLIS; GOODYEAR, 2016), and organizational (JACKSON, 2019). However, the fundamental thesis is that the starting point is that modern educational institutions should not see it as something completely new and innovative that can be copied, but as solutions that are based on certain specific existing practices and structural solutions (BYGSTAD *et al.*, 2022).

We agree with the thesis of Osorio and Banzato (2022) that the future task of modern researchers is to understand the possible contribution of innovative trends in education management to help create a balance that will facilitate the process of introducing digital technologies into education while achieving humanitarian goals that will give new meaning to the educational system as a whole.

At the same time, the digitalization of educational institution management has actualized a number of little-studied security challenges (BYGSTAD *et al.*, 2022). For example, the Ukrainian experience of implementing digital management has faced a significant military challenge. The point is that in the context of open Russian aggression, stable digital work, access to e-learning systems, electronic journals, electronic document management systems, and other resources that operated on the server equipment of educational institutions proved difficult. In the context of the physical seizure of educational institutions by the Russian invaders, they also gained access to relevant digital accounts, digital keys, signatures, and classified information. Due to a lack of funding, Ukrainian educational institutions did not resort to placing critical data on external servers that were physically located outside the war zone for a long time. Many evacuated educational institutions faced the risk of losing access to important information stored electronically. The problem was partially solved by removing computer and server equipment and partially restored later. However, this problem poses a serious threat in times of proliferation of hybrid and cyber threats. The issue of establishing security when working with digital control elements should be a priority.

Conclusions

The modern development of digital technologies facilitates the use of digitalization in the management of educational institutions. Digitalization is an objective process that also aims to facilitate the administration of the education sector. However, it encounters a number of obstacles on its way, including a lack of necessary competencies, lack of funding, and legislative regulation that sometimes does not keep pace with the possibilities of digital administration. On the other hand, digitalization provides a tangible bonus for the field of education quality regulation. It is proved that the need to use digital tools rationally is formed both at the level of teachers and administration of educational institutions and at the level of higher state authorities. Although the goals of these two vectors are somewhat different, the urgent task of future research will be to find digital solutions that are not complicated and costly to use but would allow for the effective implementation of strategic plans of educational policy

in general. It is also important to emphasize the security aspect, which is of particular importance in the era of cyber threats. Digital tools are just as vulnerable to illegal actions as other elements of the digital environment. Therefore, the development of effective protection mechanisms will also become a topical task for the following analysis.

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