

## IX INTERNATIONAL WORKSHOP “VIRTUALIZATION IN HIGHER EDUCATION”

### DIGITAL TRANSFORMATION OF EDUCATION: PROBLEMS, CHALLENGES, AND PROSPECTS

### TRANSFORMACIÓN DIGITAL DE LA EDUCACIÓN: PROBLEMAS, RETOS Y PERSPECTIVAS

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**Abstract:** the paper considers the main elements of the digital infrastructure of a modern university, models and characteristics of the processes of optimization and automation of interaction between subjects of educational relations. Special attention is paid to the expansion of the use of distance education technologies and problematic issues that arise during a difficult epidemiological situation. the stages of development of scientific and methodological support and educational resources for distance education are highlighted. the necessity of development of normative support, improvement of the organizational structure and personnel potential of higher education is shown, associated to the intensive use of information technologies in the basic processes of management and training.

**Resumen:** *El trabajo considera los principales elementos de la infraestructura digital de una universidad moderna, modelos y características de los procesos de optimización y automatización de la interacción entre sujetos de las relaciones educativas. Se presta especial atención a la expansión del uso de las tecnologías de la educación a distancia y las problemáticas que surgen durante una situación epidemiológica difícil, se destacan las etapas de desarrollo del soporte científico y metodológico y los recursos educativos para la educación a distancia. Se muestra la necesidad de desarrollo de soporte normativo, mejoramiento de la estructura organizacional y potencial del personal de la educación superior, asociado al uso intensivo de tecnologías de la información en los procesos básicos de gestión y capacitación.*

**Key words:** Higher education; Electronic education resources; Optimization; Digitalization; Distance education technologies.

**Palabras Claves:** *Educación superior; Recursos educativos electrónicos; Optimización; Digitalización; Tecnologías de educación a distancia.*

Digitalization is a process that has become an integral part of the modern education development. the digital transformation of pedagogical work is due to the active development of information technologies, as well as the need to expand the opportunities for interaction between the teacher and the learner, and to increase the effectiveness of learning.

As applied to educational institutions, digitalization actively involves two main areas:

- University management processes (automation and optimization of business processes, risk management in decision-making, digital format of interaction with counterparties);
- Introduction of digital technologies into the educational process (remote interaction and training, simulation, simulators, augmented and virtual reality).

Reports from distance learning platforms, such as Coursera, show a significant increase in the number of users and learners in recent years. The increasing integration and competition of higher education, additional and non-formal adult education in the context of digital transformation is also a challenge for a modern university.

The main drivers of education digitalization are as follows:

- 1) Increasing the competitiveness of the educational institution by increasing the attractiveness of education for students and other learners, as well as reducing the volume of "classic" teaching load and increasing the faculty (opportunities for individualization of the time trajectory of the educational process, content individualization of the of educational programs, improving the dynamics of education updating, etc.).
- 2) Increasing the availability of educational services and expanding student enrollment at educational institutions. It is connected with the increase in target group at the educational institution and is primarily focused on foreign students. It also involves exceptional marketing opportunities opened up by the use of infocommunication technologies.
- 3) Searching for efficiency enhancement potential. The key points here are to find trigger points for management decisions, the ability to model the consequences of situations, the monitoring of a particular situation in "real time".

The expected results of the education digitalization are often highlighted as:

- the formation of a unified information and academic space "online" and "offline", the expansion of opportunities for university communication, teamwork;
- the creation of a learner's digital profile as an alternative to the conventional student grade record and a digital profile of a teacher, taking into account the results of teaching, research and innovation activities;
- assistance in formation of an individual educational trajectory for students through the expanded use of electronic resources and modern monitoring and diagnostic tools;
- automation of the educational process planning and financing of its implementation, the use of data in making management decisions.

Digitalization forms new requirements for the significant development of information-computer and communication infrastructure (data centers, data storage systems, multimedia technology support, virtual and augmented reality); creation of local (in-house) and global services by developing and supporting specialized software, mobile applications; organization of classroom space, including technical equipment with communication means. The implementation of the educational process using infocommunication technologies, focuses mostly on providing teachers' workplaces with basic communication equipment with sufficient productivity and interactive input devices (graphics tablets, interactive panels, etc.).

Particular attention should be paid to changes in the organizational structure and the creation of specialized services (user support services, technical support, content creation and control, etc.), the introduction of new positions in the university or the implementation of these functions using outsourcing models. This requires the allocation of additional funds, at least during the transition phase, forms the appropriate competitive environment and necessitates a constant experience exchange in the overall strategic directions of priorities.

Pandemic situation has become a significant challenge for the higher education system and digitalization processes in the global space. During this period, colossal experience of the practical use of the implemented developments within the framework of local and national projects have been accumulated. The experts conclude that the higher education system is quite successful in achieving the goals, despite the initial level complexity in organization of distance learning process and the faculty incomplete readiness to work with technologies. Now we can discuss the prospects of new approaches in organizing of university level studying, which can successfully combine remote and full-time work, self-study and the formation of practical skills.

Such "hybrid" studying becomes especially relevant while training specialists in the field of information technology, the peculiarity of the professional activity is largely related to remote interaction, which will attract highly qualified specialists to the educational process.

Digital transformation causes changes in the organization of the educational process, helping partially replace classes for independent study, testing, webinars. It leads to the mobilization of learners (tasks and tests are carried out in the prescribed time limits), as well as the reducing of the educational process, a partial reduction in the amount of time-consuming work of the teacher such as testing knowledge, completing reports.

Educational digitalization provides additional opportunities for the implementation of network educational programs in terms of updating the curricula of partner universities, as well as eliminating academic differences and the availability of specialized courses.

At the same time, the huge impact of the digital transformation of the university on its competitive environment should be noted as:

- 1) increasing the attractiveness of the educational process by using interactive materials of educational resources and the redistribution of the teaching load from lectures to practical and project activities with consulting.
- 2) the improvement of feedback with the student by constant monitoring of the educational process using the tools of the e-learning system.
- 3) acceleration of interaction based on operational communication with the help of ICT between students and university employees (contingent movement, contractual relations, payment, document management, etc.).
- 4) the marketability increasing of an educational institution based on digital transformation allows to increase income of educational services (due to an increase of export), reduce training costs and increase the economic efficiency of the educational process in general.

Thus, the usage of the active cooperation potential between universities around the world in the field of higher education digital transformation can be effectively directed

to the development of network communication, the accumulation of practices and experience exchange, the introduction of joint educational platforms, the development of new tools and training programs, risk management and providing fundamental training of higher education.