Model of Successful Digital Transformation of Higher Education Institutions

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Abstract— **The significant impact of the recent global health crisis, combined with the possibility of using digital technologies to conduct online learning, represents an unprecedented opportunity to transform higher education on a European and global scale. We are all part of the digital world and the phenomenon of e-learning will be persistently present and further developed. The expectations are to build a sustainable model that will continue to be applied after overcoming all the challenges. The present article explores the theoretical concepts and the main features of the digital transformation of higher education institutions. As a result of the study some of the advantages and disadvantages of the digital learning have been analyzed. The scientific paper describes a model representing the six most important elements that drive the digital transformation process of the higher education institutions and overcome the identified disadvantages.**

Keywords — digital transformation, higher education, model, technologies

I. Introduction

The digital revolution is changing the world at an unprecedented speed [1]. The use of new technologies and digital devices has begun to enter people's personal and professional lives at an ever-faster pace, and institutions have had to change in a timely manner to respond to the new conditions. All this requires a rapid transition to new organizational strategies, processes and functioning that reflect the dynamics of development of the external environment and the need for adaptation to it [2,3]. The necessary change is associated with carrying out a digital transformation - a process characterized by the widespread implementation and integration of digital technologies in all domains of public and economic life. Digital transformation is becoming a critical organizational strategy for survival and achieving competitiveness in today's market. The use of ICT's is becoming more and more common in people's personal and professional lives. The global health crisis has confirmed the need to accelerate digital transformation in all economic and societal sectors and has shown in an undeniable way that making additional efforts to harness the potential of digital technologies is not only necessary but also mandatory for achieving competitiveness and sustainable development [4].

If used appropriately, digital technologies will reveal their huge potential in fostering effectiveness, quality and equity in higher education. A model of successful digital transformation of higher education institutions requires reframed national policies and action plans, an adequate strategic framework, financial support, additional training and quality assurance. A contemporary and sustainable digital learning ecosystem involves shared understanding among leaders and stakeholders about the dimensions of digital transformation.

The pandemic situation has accelerated the digitalization process of higher education, which started years ago [5,6], and higher education institutions must be able to provide quality education in conditions of digital transformation, dynamic technological innovations and accelerated changes in the educational model. Digital transformation is no longer seen as just a future trend, but is becoming a critical organizational strategy for survival and competitiveness in the modern global world.

II. Material and methods

The aim of this paper is to explore the theoretical concepts and the main features of the digital transformation of higher education institutions. As a result of the study some of the advantages and disadvantages of the digital learning have been analyzed. A model representing the six most important elements that drive the digital

transformation process of the higher education institutions have been presented. Descriptive and comparative analysis have been used in the study, applying qualitative data review.

III. RESULTS AND DISCUSSION

A. Definitions of the main terms

"Digital transformation" could be defined as the set of necessary digital processes aimed at strategic change in an individual organization. The important thing here is that digital transformation is about more than just digital processes.

Digital transformation has been defined as "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" [7].

Digitization can be seen as part of digital transformation, and additional components include the right strategic planning, trust building, organizational learning, etc. [8].

Therefore, digital transformation is understood as the set of digital processes necessary to bring about a change that will allow higher education institutions to successfully introduce the use of digital technologies.

The characteristics of higher education institutions operating in the context of digital transformation are as follows:

- need to create special departments for digital technologies in the administrative structure of the higher education institution;
- opportunities to use mobile digital devices for access to the electronic database by employees, teachers and students;
- making decisions on the use of digital resources for conducting, regulating and controlling educational activities;
- implementation of faster interaction between providers and users of educational services as a result of the use of digital technologies;
- creation of new opportunities for organizational and social interaction between the employees of the organization and the participants in the educational process;
- need for knowledge about modern digital devices and e-learning platforms;
- ability to apply digital technologies in management practices, becoming a mandatory competence for all participants in the educational process [9].

Digital readiness involves teachers' and students' "preparedness and ability to use digital technologies for learning and teaching purposes" [10]. Digital literacy, self-efficacy, organizational culture and the attitudes toward digital transformation are some of the factors influencing digital readiness [11].

Digital learning is the core of the digital transformation of higher education institutions and "can be seen as part of the ecosystem of modern higher education" [12].

B. Advantages of digital transformation

Digital transformation offers a number of opportunities for educational institutions, some of which remain unused.

- Reduction of costs for consumables and transportation

Digital learning saves time and travel costs for students and teachers, as well as the inconvenience and stress associated with traveling to the educational institution. Working and learning in a digital environment reduces paper documents and operating costs due to storing documents and educational materials in the cloud.

- Opportunity to train students from all over the world

Digital learning enables educational institutions to be competitive in a globalized world and provides access to millions of students who could enrol and train without geographical restrictions. The shared digital space is also a suitable tool for creating a social network, allowing teachers and students to communicate effectively. The use of new technologies in the learning process will also attract the so-called "digital generation", which is familiar with the latest innovations in the digital world, uses mobile devices and expects to learn in a modern way.

- Access to learning materials from anywhere in the world and at any time

In the last two years, there has been a general improvement in the quality and quantity of online resources and learning materials. Learning in a digital environment allows access to published materials or participation in online lectures from anywhere in the world.

- Improved communication

Ineffective communication has caused huge losses for organizations due to misunderstanding of processes and ways of working. Learning in a digital environment is a solution for creating channels for effective communication, because it allows the organization, employees, teachers and students to connect and communicate with anyone and at any time. Easier interaction between students and teachers during lectures is also achieved by using the "chat function" of the e-learning platform. Through simultaneous communication and universal access to all students and employees, transparency in the educational institution and the conduct of the learning process is increased. The digital environment also allows for more creativity, sharing ideas and receiving feedback, and better communication helps in the successful management of conflicts.

- Social inclusion

The digital environment allows for the inclusion of certain disadvantaged categories of students - e.g. people with physical or other disabilities; people who take care for a family member. Education is also democratized by providing access to students who live in remote places and

do not have the opportunity to travel to the educational institution. Learning in a digital environment also helps to avoid possible discrimination based on age, race or physical disabilities.

- Cultural diversity

Cultural diversity in a digital environment has a positive effect on the development of intercultural competence of students. The different experiences of the trainers encourage creativity and viewing problems from different perspectives, so that diverse opinions are explored and taken into account.

- Environmental benefits

The benefits for the environment include reduction of traffic and pollution in large cities; protecting the environment by reducing the release of harmful emissions.

C. Disadvantages of digital transformation

Research on digital transformation shows that there are various problems and challenges for which solutions have not yet been found.

- Lack of social interaction

A very important element is missing in the digital environment: social interaction. The sense of community can be lost as a result of distance, and the emotional component and gestures are missing when sending messages. The emergence of psychological problems related to isolation or limited social interaction is also common, despite the strengthening of psychological support services implemented by many universities in 2020. To solve these problems, face-to-face meetings or video calls are necessary.

- Lack of support

Like all other systems, organizations are in a state of constant change. Every attempt of change leads to the corresponding distortion of the processes in the company in different planes than before. Resistance to change represents one of the challenges in the process of digital transformation. Technological progress requires radical organizational change, proactive leadership, adequate planning, effective communication and enough resources.

- Digital competence of academics and/or students

A number of difficulties may arise for teachers and students who are not familiar with the various digital tools and cannot use them effectively in the learning process [13-19]. The digital skills are prerequisite of a successful process of digital transformation.

With regard to higher education, it is emphasized that the digital competence of teachers significantly affects digitalization in educational institutions and is related to the synchronization of students' educational needs, their personality traits, curricula, learning process management and digital competence. With a view to introducing effective digital integrated training, it is necessary to prioritize the development of the academic staff and the

increase of their technological competence. The digital competence of students also significantly influences the introduction of new technologies in education by harmonizing digital learning methods, intercultural interaction and equal access to higher education. This applies with particular force to Bulgaria, bearing in mind the data on the percentage of individuals with basic or above basic digital skills of Bulgarian citizens (Table 1).

TABLE 1 INDIVIDUALS WITH BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (PERCENTAGE OF INDIVIDUALS) [20]

GEO (Labels)	Time	
	2021	*2023*
European Union - 27 countries (from 2020)	53,9	55,6
Belgium	54,2	59,4
Bulgaria	**31,2**	**35,5**
Czechia	59,7	69,1
Denmark	68,6	69,6
Germany	48,9	52,2
Estonia	56,4	62,6
Ireland	70,5	72,9
Greece	52,5	52,4
Spain	64,2	66,2
France	61,9	59,7
Croatia	63,4	58,9
Italy	45,6	45,7
Cyprus	50,2	49,5
Latvia	50,8	45,3
Lithuania	48,8	52,9
Luxembourg	63,8	60,1
Hungary	49,1	58,9
Malta	61,2	63,0
Netherlands	78,9	82,7
Austria	63,3	64,7
Poland	42,9	44,3
Portugal	55,3	55,9
Romania	27,8	27,7
Slovenia	49,7	46,7
Slovakia	55,2	51,3
Finland	79,2	81,9
Sweden	66,6	66,4

Considering the critical importance of students' digital competence, it is necessary to make decisions at the political level and take the necessary measures to increase it, with a view to successful technological adaptation.

It is noteworthy that the digital competence in Bulgaria is at a low level and this can be seen from the presented data for the period 2021-2023, the comparison with other European countries and the average level for the European Union (55,6% for 2023). It is necessary to take urgent measures to increase the technological competence in Bulgaria. Increasing digital competence is a priority at both European and national level, and its importance for digital transformation and higher education is key. Investments in the development of people and their digital skills will be

repaid many times over, and the whole society will benefit from the positive effects.

The digital competence of the academic staff and students significantly influences the introduction of new technologies in education by harmonizing digital learning methods, intercultural interaction and equal access to higher education. The rapid technological progress requires the adoption of a proper legal framework, especially concerning the creation of digital learning content. Concerning the digital competence of teachers, the European Commission's Digital Competence Framework for Teachers (DigCompEdu) defines and describes "the skills that teachers should acquire in order to teach and introduce innovations through the use of digital technologies" [21].

- Program characteristics

Certain difficulties are encountered in teaching subjects with experimental or practical activities such as medicine, nursing, fine arts, architecture, engineering, etc. Students and researchers in the humanities and social sciences also face a number of challenges when access to libraries with fully digitalized resources is not provided.

- Technological challenges

Socio-economic divide, which makes it difficult to conduct the learning process and the participation of teachers and students who do not have modern mobile devices or access to high-speed internet. Using paid programs for preparing assignments or other learning activities is also a challenge for students.

- Lack of attention and concentration

Some students, especially younger ones, find it difficult to focus during long online lectures in the same way as in face-to-face classes.

- Equipment and maintenance costs

Organizations must allocate funds for appropriate equipment (hardware and software), as well as for maintenance and updating [1,16,18,22-25]. Due to the continuous improvement of technology, additional costs are also required for employee training. In the process of adapting to changes in new systems, it is possible to deteriorate the participation in the learning process and performance of students and teachers who are not so familiar with new technologies. At the same time, if the wrong digital platform is implemented, this can have a negative effect on the overall learning process.

- Data security and privacy protection

All devices – desktops, laptops and tablets – require the same protection because they may contain critical information for the educational institution and their use must be monitored to avoid cyber threats or information loss. The security and privacy risks could hinder the entire process of digital transformation [13,15-17, 23]. This requires additional protection and maintenance of information technology, as well as costs for network security. Cyberattacks can have an extremely negative effect on the organization and stakeholders. Despite increased efforts to maintain security, there is always a risk of attacks that can be carried out by both outsiders and employees with access to information. Password protection and access to information are challenges that add costs to the educational institution.

- Loss of interpersonal communication skills

The use of mobile phones, sending messages and emails has largely replaced live communication. Interpersonal communication is fundamentally different in a digital environment. At the same time, sending messages and using virtual video platforms significantly reduces traditional communication. Face-to-face and group meetings are becoming obsolete as educational institutions rely on digital environments to conduct learning. The lack of physical communication and social interaction can lead to a sense of isolation and an inability to complete face-to-face tasks.

- Dependence on technology

Teachers and students can become very dependent on technology to perform their daily tasks. The majority of educational organizations rely on computer technology and its smooth functioning. If a system failure occurs, it can interfere with the activities of one or more teachers, as well as disrupt the learning process or the work of employees in the institution as a whole. Restoring computer systems provides additional costs for the organization and therefore it is necessary to plan available resources to cover these costs in the event of a crisis of any nature.

The described disadvantages of the digital transformation require special attention and methods for overcoming them. One possible solution could be the proposed model of digital transformation of higher education institutions.

D. Model of digital transformation of higher education institutions

An adequate and modern management vision implies massive use of all new trends and technological renewal of educational institutions, which is able to qualitatively change the process of education development. Such a contemporary vision starts with an analysis of students' expectations, followed by development of human resources and change management in order to introduce innovative technologies, services and business models in an organization with proactive leadership and positive culture.

The process of digitization of higher education can be represented by a model that describes the relationship between six distinct elements:

- Expectations/experience of students - before undertaking digitization, it is necessary to know the expectations, behaviour and experience of the main users of educational services - the students. Treating them in response to their needs is essential for any educational institution;

- Human resources are the critical part of the digitization process. It is necessary for the

organization to be able to attract talent and have qualified professionals who are also committed to the organization and the achievement of its goals. Educational institutions that invest in their employees, commit to their development and respect their ideas, build loyalty in them that makes managing change much easier. Digital technologies have already widely entered the educational sphere, but the important thing is not to forget who we are. Technology must be used to create meaningful experiences that reach students, faculty, and staff at a deeper level, connecting human to human;

- Change - any transformation is fundamentally about change and to be successful, people must support it. That is why an adaptive, flexible, and adequate way is sought to implement changes in an already functioning system, such as any organization. Resistance to change is one of the challenges in the process of digital transformation [1,6,15,17,22,25-32]. Resistance to change can be defined as an individual or group reaction aimed at thwarting or delaying attempts at change. Resistance itself can take many different forms and manifestations – from intelligent, subtle and invisible undermining of change or blocking of information to active actions, such as strikes. There are different forms of resistance: resistance to the content of the change – for example, to a specific change in technology; resistance to the process of change - this refers to the way in which the change is presented to employees or the way in which it is acted upon, rather than to the change itself. Leaders need to be aware of the importance and strength of resistance in order to be able to react adequately when it is detected. In general, the reasons for resistance can include things like: loss of control, shock from the new, uncertainty, insecurity, anxiety and fear regarding acquired status and competence. As wishful or taken from good textbooks it may sound, it is important to try to identify the reasons for resistance. Thus, efforts to redirect employees' energy towards constructive actions can be focused and much more successful. Which inevitably reflects on their motivation. Change is always difficult and requires strategy and communication with employees to provide the right tools and environment for change to succeed. If done effectively, it will take the organization to the next step of digital transformation;

- Innovation – transformation and innovation are interconnected and interdependent. Innovation is a necessary condition for digital transformation and requires a space of open communication, freedom for creativity and collaboration. Innovation must be constant to create new and improve existing services, products or processes;

- Leadership – for a change to be successful, it must be led. The lack of proactive leadership is one of the barriers in front of digital transformation [6,15,17,19,25,27,33,34]. The role of leaders is to lead by example, to be proactive. Technology is evolving rapidly and leaders must act in a timely manner. All other options need to be explored, not just digital transformation;

- Culture – organizational culture is more important than the choice of technology. Digital transformation cannot happen without the right organizational culture. If the organizational culture is too conservative, it would be difficult to go through a process of digital transformation [15,17,24,26,33,35]. By creating an open space where employees and students have positive experiences, where people matter, change is planned and innovation is central, the organization will be led to a culture where it transforms itself. University culture significantly influences the introduction of digitization in the learning process. The socio-technical perspective, technological leadership and learning outcomes are relevant. Various studies have observed the tendency for positive organizational cultures to provide adequate support and encouragement for the use of technology in the learning process.

The various parts of the digital transformation process are interconnected and relate in a circular model. The presented model in Fig. 1 consists of six elements that interact with each other:

Fig. 1. Model of digital transformation of higher education institutions

Students' expectations are related to more effective communication and collaboration with better digital services, offering the possibility to study from everywhere and without time limitations [36]. In response to these expectations higher education institutions should focus on innovative teaching and research, digital learning, flexible curricula development and personalized courses and experiences [17]. Meeting the students' expectations means also that teachers need to provide more innovative teaching, research and management experiences [17], while ensuring the quality of education. Higher education

institutions have to face the technological and financial constraints along with providing and maintaining the necessary infrastructure. Innovation is related to introduction of new technologies, curriculum modernization, digital educational content creation and re-engineering of business processes. Leaders should introduce and implement the change, driven by digital technologies, using effective business strategies while improving the organizational efficiency in higher education institutions.

Fostering such digital transformation requires building a culture of active participation by students, faculty, and administrators to support the change. A number of educational institutions in the EU face additional challenges as well, including financial and technological constraints. Public higher education institutions will also need to function in the situation of reduced public funding, while experiencing a drop in the number of students due to the recent and ongoing financial crisis. Investments will also be needed to improve the technical capabilities of European higher education institutions. Despite all these challenges, educational institutions in the EU are rather optimistic regarding the digital transformation. In a recent survey of institutions from all countries of the European Higher Education Area, most universities confirm that they "plan to explore new ways of teaching (92%) and improve its digital capacity (75%) after the crisis" [19].

In order to move to more sustainable model of e-learning, educational institutions need to utilize the existing technologies to reinvent learning processes, transform the roles of the traditional faculties and focus on quality through reinvention and the self-renewal of the educational service model and teaching methods. The digital transformation of higher education institutions could be successful only when all the stakeholders participate actively in the process.

IV. CONCLUSION

The present paper examined the concept of digital transformation along with the advantages and disadvantages of the process in the higher education institutions. As a result of the identified disadvantages, a circular model of six elements have been developed. The described model represents one possible solution for overcoming the challenges in the process of digital transformation of higher education institutions. In view with the rapid technological development all the organizations need to go through a digital transformation.

The digital age affects all participants in the educational process: both individuals and higher education institutions could not avoid the radical changes that technology initiated. Stakeholders are not even presented with a choice - it is inevitable to adopt and implement new, completely different approaches to digital practices that were considered unthinkable for most institutions in the recent past.

REFERENCES

[1] A. Mikheev, Y. Serkina and A. Vasyaev, Retraction Note: current trends in the digital transformation of higher education institutions in Russia. Educ Inf Technol 28, 15455, 2023. https://doi.org/10.1007/s10639-023-11828-z.

[2] A. Scholkmann, Resistance to (Digital) Change: Individual, Systemic and Learning-Related Perspectives. In Digital Transformation of Learning Organizations, Springer: Cham, Switzerland, 2021, pp. 219–236. ISBN 9783030558772.

[3] C. Shahi and M. Sinha, Digital transformation: challenges faced by organizations and their potential solutions, International Journal of Innovation Science, Vol. 13 No. 1, 2021, pp. 17-33. https://doi.org/10.1108/IJIS-09-2020-0157.

[4] I. Gigauri, V. Vasilev Z. Mushkudiani, In pursuit of sustainability: towards sustainable future through education. International Journal of Innovative Technologies in Economy, Vol. 1 (37), 2022, pp. 1-11. https://doi.org/10.31435/rsglobal_ijite/30032022/7798.

[5] G. Westerman, C. Calméjane, D. Bonnet, P. Ferraris, A. McAfee, Digital transformation: A roadmap for billion-dollar organizations. MIT Cent. Digit. Bus. Capgemini Consult. 1, 2011, pp. 1–68.

[6] P. Reid, Categories for barriers to adoption of instructional technologies. Educ Inf Technol 19, pp. 383–407, 2014. https://doi.org/10.1007/s10639-012-9222-z.

[7] G. Vial, Understanding digital transformation: a review and a research agenda. The Journal of Strategic Information Systems 28(2), 2019, pp. 118–144. DOI: 10.1016/j.jsis.2019.01.003.

[8] E. Cameron., M. Green, Making Sense of Change Management. A complete guide to the models, tools & techniques of organizational change. 2nd edition. London & Philadelphia: Kogan Page, 2009.

[9] O. Popova, Transformation of higher education in the conditions of the digital economy. Management Issues, 5(35), 2018, pp. 158-160.

[10] K. Ling, M. Cheng, A. Ling, C. Sin and Z. Li, Readiness of Digital Transformation among Malaysian Digital Talents. International Journal of Business and Management, 18(4), 2023, p.161. https://doi.org/10.5539/ijbm.v18n4p161

[11] B. Nair and S. Solanki, Student perceptions of knowledge management and institutional readiness for online classes amid Covid-19 pandemic. Knowledge Management and E-Learning, 15(2), 2023, pp. 287–302. https://doi.org/10.34105/j.kmel.2023.15.016.

[12] M. Alenezi, Digital Learning and Digital Institution in Higher Education. Education Sciences. 13(1):88, 2023. https://doi.org/10.3390/educsci13010088

[13] A. Marks, M. AL-Ali, R. Atassi, R. A. Abualkishik, Y. Rezgui, Digital transformation in higher education: A framework for maturity assessment. Int. J. Adv. Comput. Sci. Appl. pp. 504–513, 2020.

[14] M. Alenezi, Deep Dive into Digital Transformation in Higher Education. Educ. Sci. 11, 2021.

[15] T. Gkrimpizi, V. Peristeras, Barriers to digital transformation in higher education institutions. In Proceedings of the 15th International Conference on Theory and Practice of Electronic Governance, Guimarães, Portugal, 4–7 October 2022; Association for Computing Machinery: New York, NY, USA, pp. 154–160, 2022.

[16] M. Al-Ali, A. Marks, A digital maturity model for the education enterprise. Perspect. Policy Pract. High. Educ. 26, pp. 47–58, 2022.

[17] L. S. Rodrigues, Challenges of digital transformation in higher education institutions: A brief discussion. In Proceedings of the 30th IBIMA Conference, Madrid, Spain, pp. 4490–4493, 8–9 November 2017.

[18] G. Robertsone, I. Lapina, Digital transformation as a catalyst for sustainability and open innovation. J. Open Innov. Technol. Mark. Complex. 9, 2023.

[19] V. García-Morales, A. Garrido-Moreno, R. Martín-Rojas, The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario. Front. Psychol. 12, 616059, 2021. doi: 10.3389/fpsyg.2021.616059.

[20] Eurostat [online]. Available: https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21_ _custom_15582494/default/table [Accessed: 13 Feb 2025].

[21] European Commission, Directorate-General for Education, Youth, Sport and Culture, Key competences for lifelong learning, Publications Office, 2019. [online]. Available: https://data.europa.eu/doi/10.2766/569540 [Accessed: 12 Jan, 2025].

[22] S. Packmohr, H. Brink, Impact of the pandemic on the barriers to the digital transformation in higher education-comparing pre-and intra-COVID-19 perceptions of management students. In Proceedings of the International Conference on Business Informatics, Bolzano (Virtual), Italy, 1–3 September 2021, Springer: Berlin/Heidelberg, Germany, 2021, pp. 3–18.

[23] L. Benavides, J. Tamayo Arias, M. Arango Serna, J. Branch Bedoya, D. Burgos, Digital transformation in higher education institutions: A systematic literature review. Sensors 20, 3291, 2020.

[24] P. Vicente, M. Lucas, V. Carlos, P. Bem-Haja, Higher education in a material world: Constraints to digital innovation in Portuguese universities and polytechnic institutes. Educ. Inf. Technol. 25, pp. 5815–5833, 2020.

[25] S. J. Marshall, Shaping the University of the Future: Using Tehcnology to Catalyse Change, Springer: Singapore, 2018. ISBN 9789811076190.

[26] J. Serna Gómez, F. Díaz-Piraquive, Y. Muriel-Perea, A. Díaz Peláez, Advances, Opportunities, and Challenges in the Digital Transformation of HEIs in Latin America. In Radical Solutions for Digital Transformation in Latin American Universities, Springer: Singapore, 2021, pp. 55–75.

[27] D. C. Brooks, M. McCormack, Driving Digital Transformation in Higher Education; EDUCAUSE: Washington, DC, USA, 2020, p. 16.

[28] A. Teixeira, M. Gonçalves, M. Taylor, How higher education institutions are driving to digital transformation: A case study. Educ. Sci. 11, p. 636, 2021.

[29] K. Drechsler, R. Gregory, H. T. Wagner, S. Tumbas, At the crossroads between digital innovation and digital transformation. Commun. Assoc. Inf. Syst. 47, 2020, pp. 521–538.

[30] B. Alzahrani, H. Bahaitham, M. Andejany, A. Elshennawy, How Ready Is Higher Education for Quality 4.0 Transformation According to the Lns Research Framework? Sustainability, 13, 2021.

[31] G. Rodríguez-Abitia, G. Bribiesca-Correa, Assessing digital transformation in universities. Future Internet 13, 52, 2021. https://doi.org/10.3390/fi13020052

[32] T. Konaklı and R. Akdeniz, The Emergence, Reasons and Results of Resistance to Change in Teachers. International Journal on Lifelong Education & Leadership, 8(1), 2022. 10.25233/ijlel.1107137.

[33] T. Jensen, Higher Education in the Digital Era The current state of transformation around the world. IUA 2019, pp. 626–633.

[34] K. Valdés, S. Alpera, L. Suárez, An institutional perspective for evaluating digital transformation in higher education: Insights from the chilean case. Sustainability, 13, 9850, 2021.

[35] M. A. Mohamed Hashim, I. Tlemsani, R. Duncan Matthews, A sustainable University: Digital Transformation and Beyond. Educ. Inf. Technol., 27, pp. 8961–8996, 2022.

[36] M. M. Gobble, Digital strategy and digital transformation. Res. Manag. 61, 2018, pp. 66–71.