APPLICATION OF DIGITAL TECHNOLOGIES FOR DISTANCE LEARNING IN HIGHER EDUCATION – PROBLEMS & PROSPECTS

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Abstract: In the context of the global COVID-19 pandemic around the world, higher education institutions were faced with the need to carry out an educational transformation by providing educational services in an electronic environment and conducting an active form of distance learning. New models of intensive digital communication, e-learning and distance learning and professional engagement have emerged, both for the teaching staff at the university and for students, including applicants who had to participate in mass online student admission campaigns and exams. In this sense, universities around the world have been forced to transform many traditional educational activities into electronic ones using various types of information and communication tools and web technologies, including different types of communication software applications and electronic learning platforms and/or (cloud) platforms for remote classroom management (Microsoft Teams, Skype, Zoom, G Suite, Viber, Facebook & Messenger, Google Classroom, Blackboard, Moodle, Dropbox, OneDrive, etc.) so as to carry out active communication and distance learning. The purpose of this paper is to perform a SWOT analysis of the readiness of lecturers and students at the University of Forestry to conduct distance learning and reveal the existing advantages, strengths and strategic opportunities of digital learning, as well as emerging weaknesses, risks and threats.
Keywords: information and communication technologies, digitalization, digital education, distance learning, e-learning.

1. INTRODUCTION

In recent years, innovative educational methods for higher education have been actively developed and implemented both in Europe and around the world, with the aim of expanding the scope of university activities by creating an electronic information and educational environment. The digitalization of the modern world has strongly influenced the introduction of information and communication technologies (ICT) in education, as they were even more strongly sought after and implemented during the global COVID-19 pandemic. In this sense, ICTs are a necessary tool for dealing with the difficult situation in all areas of social development and have facilitated the accelerated transformation of the way of learning in educational structures. Thus, the electronic information and educational environment at the university had to provide intensive interaction between the participants in the educational process, including synchronous and/or asynchronous communication via the Internet throughout the study period. Such type of digital learning required the active participation of both lecturers and students in the process of implementing e-education and led to the need to increase the knowledge and skills necessary to handle digital technologies, including the Internet.

A combination of public web services and educational resources created as a result of the intellectual work of the pedagogical community has been used as an effective mechanism in the development of an e-learning environment. In this sense, the use of digital technologies in teaching is considered by researchers in the field of higher education pedagogy as one of the opportunities to increase the effectiveness of the formation of professional competence of students pursuing bachelor's, master's and doctoral degrees in the relevant scientific fields (Sunders & Werner, 2002; Swan, 2009; Shamova, 2019; Goncharuk & Khromova, 2019; Levina, 2019, Trifunović & Petrašević, 2021). The interaction of e-learning environments and the Internet provides an opportunity of organizing learning activities productively and creating a positive correlation between the intensity of the use of social networks and students' perceptions of the use of social networks for educational purposes (Lim & Richardson, 2016). Meanwhile, the Internet provides access to sufficient open educational resources and social software tools widely used in the academic activities of the university (Manca & Ranieri, 2016, Seaman & Tinti-Kane, 2013). The web space has become an integral part of the learner's preparation, and no one can deny, for example, that Wikipedia plays a major role in the collection and research of information by students (Selwyn & Gorard, 2016). On the other hand, social media is widely used by students in the e-learning process in order to expand the learning experience beyond the limited learning time (Lee & Bonk, 2016).

However, despite the arguments set out above, distance learning has become a real stress test not only for the students, but also a challenge both for the lecturers and for the Ministry of Education and Science in Bulgaria. Therefore, despite the fact that distance learning is quite a well studied and researched topic, unfortunately, many conclusions and recommendations have not been adapted to the unexpected COVID-19 pandemic (Reimers &

Schleicher, 2020). For this reason, this paper aims to analyze the readiness of lecturers and students at the University of Forestry regarding distance learning and the discovery of existing problems, prerequisites and prospects.

2. GOALS AND RESEARCH METHODOLOGY

The purpose of this paper is to perform a SWOT analysis of the readiness of lecturers and students at the University of Forestry to conduct distance learning, and to study the emotional state of the respondents, as well as the availability and quality of technical equipment during distance learning and self-isolation. According to the adopted methodological recommendations, the training at the University of Forestry in the 2020/2021 academic year was organized by using distance and mixed forms of training and by using offline and online mode of work and training, observing all imposed health measures in the country. All academic policies as well as requirements for compliance with sanitary standards, social distancing rules, library resources, technical support services, academic and non-academic support services for students and applicants were posted on the university's website.

The presented research is based on an independent survey conducted over the period of distance learning in the 2020/2021 academic year while observing the measures imposed by the Ministry of Health in the Republic of Bulgaria. The conducted research includes a compilation of a SWOT-matrix based on the systematization of the results of a survey of the opinion of lecturers and students from different specialties at the university. Performing a SWOT analysis allows the identification of key elements such as: Strengths (S); Weakness (W); Opportunities (O); Threats (T), which are analysed in order to guide organizations to more effectively determinate internal and external influences (Duxbury, 2012; Eastwood et al., 2016) which affect the activity and development of the company. SWOT analysis is considered by many researchers (Akman, 2019; Namugenyia, et al., 2019; Woźniak, 2018) as an element of security analysis, including strategic analysis, whose tasks are to generate information about patterns of change in the external and internal environment of the organization, to assess the level of risks and dangers in order to support the formation of a system for effective decision-making and identification of threats in the overall activity and development.

3. RESEARCH RESULTS AND DISCUSSION

The results of the conducted study showed that the teaching staff at the university was psychologically and technically ready for the transition to distance learning in the 2020/2021 academic year, as the majority (70% of the surveyed lecturers) had already used online educational platforms before the Covid pandemic, and also very actively during the first wave in the 2019/2020 academic year. At the same time, 100% of the lecturers conducted their lectures and seminars with students online in the 2020/2021 academic year, where Microsoft Teams was used as a priority platform for communication and training (90%) together with the e-learning platform Blackboard, which had been implemented at the university. At the same time, the survey shows that the vast majority (90%) of lecturers and students were online almost throughout all working week days and had access to various software applications such as Skype, Zoom, G Suite, Viber, Facebook & Messenger, etc., which facilitated the communication between lecturers and students. However, 50% of respondents admitted that they missed the live communication with colleagues/fellow students, as well as the university environment. Also, unfortunately, 10% of the respondents indicated that it was impossible for them to conduct distance learning at home due to lacking, damaged or outdated computer technologies, as well as network communication issues.

In the end, the conclusion can be drawn that during the period of distance learning, lecturers and students managed to build skills for digital teaching and learning, and more than half of them found advantages and additional opportunities in such a form of learning. Moreover, the majority (80%) of the surveyed students encouraged lecturers to create e-learning resources on a given topic and actively used e-mail services and cloud resources to access or distribute educational materials in order to prepare and develop independent assignments. As a result, it can be said that the introduction of such an approach to e-learning has led to the transformation of the traditional understanding of research, teaching and learning at the University of Forestry.

In this sense, based on the results of the theoretical analysis, as well as on the survey conducted among lecurers and students, a SWOT analysis matrix was elaborated, systematizing the strengths and weaknesses of distance learning in an electronic environment, as well as the opportunities and threats as a basis for reflection and consideration by the strategic management of the university during a pandemic so as to develop e-learning systems and services, as well as further optimize them in the future.The performed analysis is not final, as there are a number of issues that require further study and there may be a need for further consultation and study of the process according to its dynamic development in relation to the pandemic. The compiled matrix of the SWOT analysis is presented in Table 1.

Table 1. Matrix of the SWOT analysis

Strengths (S)	*Weaknesses (W)*
S1. Possibility for rational distribution of daily time, without the need to travel. S2. Saving financial resources spent on transport/travel, food, etc. during traditional training. S3. Expanding the possibility to conduct training regardless of the place of residence (in the country or abroad), health status and other factors that could otherwise obstruct or impede access to traditional university education. S4. Flexibility in the process of giving and receiving knowledge, according to the time and location of the lecturer/student. S5. Variety of uses and applications of digital learning technologies. Ability to combine digitized tools (images, audio and video, graphics, animation, simulations) to enrich and illustrate the teaching material, which would otherwise be more difficult to master only from textbooks S6. Expanding the competencies for working in a digital environment of both students and lecturers. S7. Increasing the level of motivation of teachers and students with good digital skills when dealing with the situation during a pandemic. S8. Openness and accessibility of the educational resources of universities. S9. Improving the demographic situation in the regions by avoiding mass movement of the population to the cities. S10. Creative approach and increased independence in the preparation and implementation of educational materials and tasks to perform.	W1. Risk of poor time and activity management during isolation. W2. Unexpected IT costs for each of the parties in this type of communication. W3. Direct dependence of the classes on the availability of information and communication network equipment, Internet and the availability of electricity. W4. Poorly developed information and communication infrastructure and Internet access in some urban and rural areas. W5. Lack of direct contact between lecturers and students. W6. Difficulties in controlling the independence and acquisition of knowledge by students. W7. Presence of students who have difficulties acquiring the study material in a digitized format. W8. Lack of sufficient digitized teaching materials in the studied disciplines. W9. Distance learning is not suitable for mastering professions that require a lot of practice. W10. Difficulties in adopting and imposing a unified approach to distance learning. W11. The optimal combination of traditional and digital learning technologies has not been developed.
Opportunities (O)	*Threats (T)*
O1. Possibility for unlimited access to databases with training materials and resources. O2. Opportunity for online application and admission to leading universities, both in the country and abroad. O3. Opportunity for online training and obtaining a diploma of higher education from prestigious universities, regardless of the student's location. O4. Possibility to receive several qualifications and degrees at the same time without compromising any of them. O5. Increasing the level of education of the population based on the accessibility of the educational system. O6. Increasing the level of computer literacy of the population. O7. Greater opportunity for higher education for people with disabilities and limited opportunities. O8. Opportunity to increase the number of prospective students (Bulgarian and foreign) at the university. O9. Greater opportunity for students to combine higher education with an additional job. O10. Greater opportunity to obtain a higher education	T1. Increased competition with foreign institutions that offer distance learning. T2. Risk of misrepresentation and cheating on the part of the learners when submitting their results. T3. Increased risk of programme disruptions, information and communication breakdowns, poor Internet connection speed, cyber attacks, etc. T4. Need for the implementation of new ICTs and distance learning solutions. T5. Need for continuous information and communication support, both at university premises and at the place of residence of each lecturer and student. T6. Lack of a sufficient number of qualified IT specialists. T7. Risk of health deterioration due to the excessive use of digital technologies. T8. Reduced motivation and worse distance learning results due to insufficient digital skills. T9. Increased risk of plagiarising or stealing intellectual property. T10. Increased difficulty in doing lab work in digital

diploma for people already working in a given field, but not sufficiently qualified.	format for students pursuing degrees in natural sciences and technical subjects.

Source: Author's own research

The SWOT analysis presented above clearly systematizes the specific strengths and strategic opportunities of distance learning, which must be actively developed and implemented by the university management in order to overcome the analysed weaknesses, threats and risks that may critically affect the e-learning process. For example, it is recommended to take measures for the rational distribution of the curriculum so as to take into account the flexibility of online learning, to use innovative approaches and technologies for visualization and presentation of web materials, as well as to engage students in active participation in online conferences, which will provide an even greater opportunity to reduce the adverse effects caused by the lack of direct contact between lecturers and students and to overcome the psychological barrier due to self-isolation. At the same time, the creation of additional encouragements (competitions, awards for success, scientific achievements, etc.), both for lecturers and students, to obtain concrete results in the online learning activity will increase their motivation in the process of distance learning and will allow creative development of the process. The undertaking of such measures and the improvement of the e-learning environment will in turn lead to the generation of more digitized teaching materials in the studied disciplines by the lecturers. This of course will facilitate students' acquisition of the study material and will increase the quality of e-learning.

It is important to note that universities must invest resources and efforts in the continuous innovation and maintenance of ICT technologies and networks, both at university and faculty level. In this sense, it would be a useful practice for the funds saved from unconducted traditional activities at the university during a pandemic to be directed and spent on the development of the future ICT infrastructure at the University of Forestry, as well as on the recruitment of staff who will be responsible for the quality 24 hour IT support of the e-resources. This will also reduce the risk of program interference and information and communication failures. What will also be of particular importance is a continuous process of expanding the competencies for working in a digital environment of all participants in the process of digital learning as well as a continuous search for and application of an approach to perform a combination of traditional and digital methods of learning in the future. It is through the adoption of such an approach aimed at implementing innovative ICT and training methods that the University of Forestry will gain competitive advantage not only over Bulgarian educational institutions but also over foreign ones, which in turn will increase the number of applicants (Bulgarian or foreign).

Last but not least, there is the issue of the impact of ICT technologies and devices on human health and its deterioration with excessive use. A possible solution to the problem can again be a flexible curriculum by reducing classes by 10-15 minutes and extending rest time. A good practice can be to stimulate the teaching and student staff to be physically active at home, as well as to use additional techniques for relaxation and healthy eating, which can be introduced as a recommended part of the daily schedule.

4. CONCLUSION

Nowadays the digitization of the world around us and web resources have become an important tool for the learning activities of students and lecturers. The traditional organization of the educational process turned out to be insufficient and in the foreground there is a need to transform and complement it, if not, in some situations, replace it by digital learning technologies. This is exactly what we have witnessed thanks to the COVID-19 pandemic, which has proved to us that in a world of ever-evolving technologies, if they are properly mastered and targeted, we can not only deal with a difficult period for all of us, but also grow digitally, improve our educational system and develop key competencies at a professional level in accordance with the new generation of educational standards. In this sense, the conducted investigation of students' and lecturers' assessment of the strengths and weaknesses of digital learning, capabilities and shortcomings, allowed for the creation of more effective pedagogical strategies and guidelines for work that can be applied in the future digitalization of the educational process at the University of Forestry.

In conclusion it may be argued that, although distance learning will not completely replace traditional full-time education at university, during the course of the distance learning lecturers and students were definitely able to build skills for a digitized way of working and learning, and more than half of the respondents found advantages and additional opportunities in such a form of education. The introduction of such an approach to e-learning has led to the transformation of the traditional understanding of research, teaching and learning activities at the University of Forestry and will be key experience for its future development.

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