



APPLICATION OF MODERN TEACHING TECHNOLOGY IN COVID-19 CRISIS CONDITIONS

Ivana Marinović Matović^{a,1}, Nedžad Azemović^{b,2}, Lidija Kodrin^{c,3}

^a PUC Parking Service Nis, Nis, Serbia

^b University Novi Pazar, Novi Pazar, Serbia

^c Faculty of Commercial and Business Sciences Lava, Celje, Slovenia

ARTICLE INFO

Received 03/29/2021
Sent to revision 09/01/2021
Accepted 09/06/2021
Available online 11/05/2021

Keywords:

teaching technology
educational process
covid-19
online education

ABSTRACT

Modern technology enables a more creative organization of online educational processes, monitoring of all its stages and a special rhythm of learning adapted to the abilities of each student. Modern teaching technology is imperative today and a challenge for every teacher. Especially in the crisis conditions caused by the Covid-19 pandemic, it is important to achieve the best result with the digitalization of the teaching process. The paper analyses advantages and disadvantages in the application of modern teaching technology in general, as well as during Covid-19 crisis. The paper reveals the importance of new modern teaching technology models for improving online education, obtained by digital education tools, in Covid-19 crisis conditions.

Introduction

Under the influence of modern information technology, traditional educational methods are gradually being abandoned; digital transformation takes over all levels of the educational process (Valverde-Berrocoso et al., 2020). The role of the digital environment is becoming increasingly important and significant. Modern society requires the introduction of innovations in educational activities that are aimed at engaging the students in a productive and meaningful way (Papaleontiou- Louca et al., 2014). With the introduction of modern technologies, the role of the teacher changes, that is, the teacher is no longer exclusively a lecturer, but a teaching organizer and a partner in direct communication.

The time in which we live is characterized by the rapid development of science, engineering, and technology, as well as a sharp increase in knowledge. The explosion and expansion of scientific knowledge have also contributed to the digitization of educational activities. Numerous results of scientific research are increasingly applied in production, engineering, and technology. The development of scientific and technical progress leads to technological advancement and digitalization in the field of education, as one of the fundamental factors of overall national economy development (Ozturk, 2001). Innovation and digitalization of modern education require changes in the traditional education system, methods, forms, and principles.

The outbreak of Covid-19 pandemic during 2020 affected school closures and the transition to distance learning, thus impacting more than 94% of the world's student population (Pokhrel & Chhetri, 2021). In order to ensure the continuity of learning, several digital teaching models have been introduced for the realization of distance learning. Distance learning measures included a whole range of mechanisms for teaching: television and radio shows, resources posted on websites, online classes, and communication with students via mobile phones (World Bank Group, 2020; Milicevic et al., 2020). The outbreak of Covid-

¹ ivana.m.matovic@gmail.com

² n.azemovic@yahoo.com

³ lidija.kodrin@guest.arnes.si

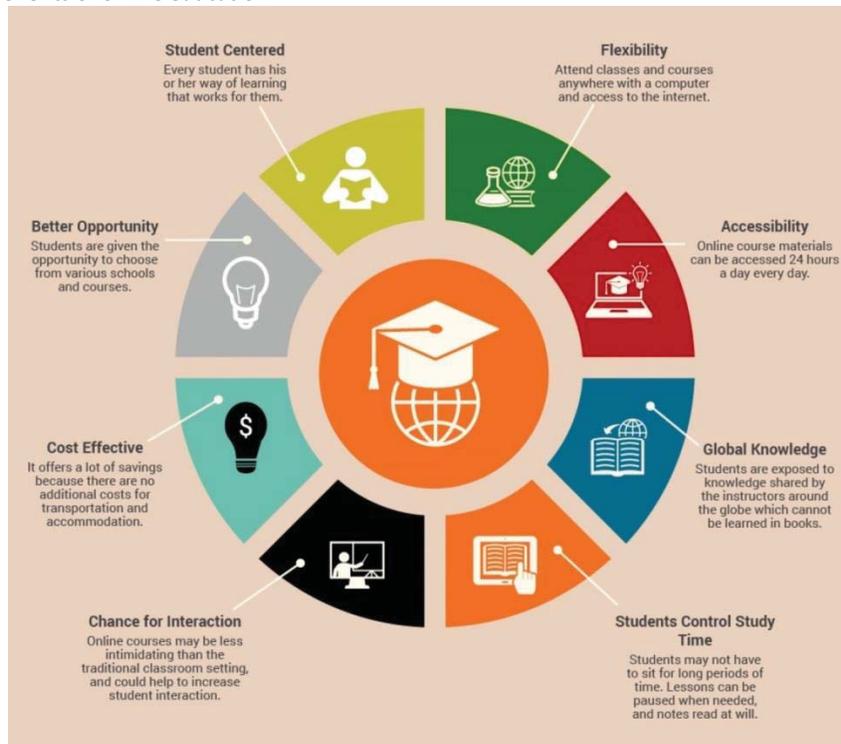
19 pandemic has led to numerous challenges in the education sector, in the form of insufficient preparedness for rapid digitalization of the teaching process, depending on the "expertise and exposure to information and communications technology (ICT) for both educators and the learners" (Pokhrel & Chhetri, 2021, p.135).

1. Advantages of modern teaching technologies and online education

One of the characteristics of modern teaching technology is its revolutionary development in the field of education (Raja & Nagasubramani, 2018). Distance learning spread relatively quickly and penetrated teaching practice. In traditional education, all activities are organized and executed by the teacher. Its basic task is to present the knowledge and to check how the students have adopted it. Modern technology enables the teacher to organize the educational process more creatively, to follow all its segments, and to provide each student with a rhythm of learning, adapted to his abilities (Suresh et al., 2018).

Modern teaching technology in the form of online education has many advantages. E-learning is a very broad term, encompassing all methods and techniques of computer-assisted education. The main goal of online education is to innovate this process, raise its quality and achieve the best possible learning outcomes (Aparacio et al., 2016). Online education provides students with the opportunity to acquire all educational levels, as well as to improve skills. One of the goals of online education is to provide students with the opportunity to learn at lower costs, to make education widely available (Techdiary, 2018). Figure 1 sublimates the benefits of online education:

Figure 1: Benefits of online education



Source: Techdiary, 2018.

Successful online education requires careful planning and a full understanding of the program requirements, effective communication, technology, learning, and feedback (Roddy et al., 2017). The appropriate technology can be chosen only after these elements have been considered. Successful online education programs should not be created spontaneously; they should be designed based on the effort of many individuals and organizations. Successful online education programs are based on the systematic and

joint efforts of all participants in this process. However, the success of any distance education depends largely on the teacher. In traditional education, the teacher's responsibility includes planning the program content and understanding the students' needs. Distance teachers are faced with special challenges, that could be described as three sub-presences (Rapanta et al., 2020). The teacher must understand the characteristics of student preparedness to participate in distance learning; the style of teaching should be adjusted taking into account the social presence of teachers, i.e. social communication channels; but they should remain focused on their teaching role and strengthen their facilitatory presence, and function successfully as a skilled lecturer and mentor (Rapanta et al., 2020).

Online education, in addition to the listed advantages, also has its disadvantages (O'Donoghue et al., 2004). Learning independence can be a problem for students who are not accustomed to this way of learning. The absence of a teacher, who more closely monitors the work process, and regular learning dynamics, can be a problem for these students and represent an inefficient way of learning. Online teaching can create a feeling of isolation in students, or even relaxed behavior during classes. Interaction is reduced, so online education methods can result in less learning motivation. Another disadvantage is the lack of skills of teachers in the use of online tools and applications, teachers have to have training that leads to them assimilating the pedagogical uses of technology (Espino-Diaz et al., 2020), creating accounts, accessing online classes, or creating learning materials. Another problem is the fact that students use several different applications in the teaching process, because teachers are allowed to choose the application independently. Table 1 shows the most significant concerns related to online education, examples of concerns, as well as real practical implications (Table 1).

Table 1: Online education concerns and practical implications

Online education concerns	Example	Practical experience
Reducing costs	<ul style="list-style-type: none"> • Online education is less expensive than traditional education • Online education is associated with high earnings • Savings are achieved on printed material • The teaching materials are already available online and are free 	<ul style="list-style-type: none"> • Significant startup costs • Ongoing investments in training/support are required, both for students and staff
Reducing the number of teachers	<ul style="list-style-type: none"> • Technology makes teaching more efficient, with fewer teachers • Online education is performed through recorded classes 	<ul style="list-style-type: none"> • Successful online courses demand much more time and involvement on the part of the teacher • Support needs of distance learners in terms of 'teacher presence', motivation, pacing, and individually targeted feedback are all vital for retention and completion
Reducing education quality	<ul style="list-style-type: none"> • Online education is very depersonalized • Online students don't get as much personal tuition as face-to-face students • Technology de-humanizes learning 	<ul style="list-style-type: none"> • No significant difference between online and traditional formats • Evolving evidence suggests better results from well-designed online courses • Online education of high quality can be highly regarded by students
Benefiting from technology	<ul style="list-style-type: none"> • Technology always enhances learning • Online learning materials (video, interactivity, etc.) are superior means of learning • Using technology will make students more engaged and/or raise standards 	<ul style="list-style-type: none"> • Technology itself does not bring any noticeable pedagogical benefits to the learning and teaching process • If used badly, technology could hinder learning, generally as a result of poor pedagogical strategy and design
Insignificance of technology	<ul style="list-style-type: none"> • A good face-to-face teacher is just as good online 	<ul style="list-style-type: none"> • Effective online learning requires a different approach to teaching and learning design

	<ul style="list-style-type: none"> • There is nothing that can be learned from previous experience of technology in education or educational research • All lecturers do with technology is put lecture notes online • Teachers don't want technology 	<ul style="list-style-type: none"> • Teachers are engaging with technology, and there is a growing appetite for it
Approaching revolution	<ul style="list-style-type: none"> • Online education will change forever the way we teach and learn • The virtual learning environment is dead 	<ul style="list-style-type: none"> • It is more evolution than revolution: educators generally have been cautious with technology in the teaching and learning space • At the institutional level, educational leaders have been slow to impose directives regarding technology use • Educators are deciding how they want to engage with technology rather than having technology imposed upon them

Source: Authors, based on National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015.

Creating an open and stimulating environment as a prerequisite for the successful implementation of the educational process in an online environment is the primary goal, to overcome the listed disadvantages, and encourage the benefits. In that process, the key role is owned by the teacher, who should be skilled to encourage students to achieve defined goals, i.e. to acquire new knowledge.

2. Challenges of modern teaching technologies during Covid-19 pandemic

The Covid-19 virus pandemic has significantly affected people's awareness of the digitalization of society; and has resulted in increased digital transformation (Klein & Todesco, 2021). After the outbreak of Covid-19 pandemic, the question was no longer whether modern information technologies should be applied, but the main task was to reach appropriate solutions, to apply new technologies in crisis-affected areas, including the education sector. First of all, the goal was to maintain the continuity of the education process, and online education has been implemented as the best alternative, regardless of its limits and limitations (Mishra et al., 2020). The use of modern teaching technology in the education sector has suddenly become much needed, because many aspects of the crisis conception of online education could not be achieved without it, or would be very difficult to achieve.

Educational system in most countries has adapted very quickly to pandemic conditions, teaching activities continued through various emergency policy initiatives (Zhang et al., 2020). Focusing on new learning models, using the benefits of e-platforms, national economies have moved in the direction of remedying the consequences caused by Covid-19 pandemic. Due to Covid-19 pandemic, the concept of online education has gained special importance. Online education has become an important part of every country's education policy, one of the ways out of the crisis in the educational sector, as well as other sectors.

Covid-19 pandemic created the largest disruption of education systems in human history, and the teaching system inevitably had to adapt to the new changes (Pokhrel & Chhetri, 2021). The online education process that was applied in crisis conditions brought numerous advantages, but also numerous obstacles (Coman et al., 2020). One of the main advantages was great flexibility in terms of location and time. One of the basic obstacles of online education was decreased motivation in students, delayed feedback, and feelings of isolation (Yusuf & Al-Banawi, 2013). In crisis conditions, however, where social distance was recommended as a form of pandemic control, this weakness of online education was an advantage, from an epidemiological point of view. In any case, the current crisis situation required this way of teaching, which was made possible by modern teaching technology.

In order for online education to function as well as possible in the Republic of Serbia, UNICEF has provided over 50 different digital educational tools for interactive teaching and learning over the Internet; online resources for coding and programming; educational video channels; and a selection of useful Youtube channels (UNICEF, 2020).

Institute for Improvement of Education of the Republic of Serbia has introduced the Learning Management System, launched the platform "My School", on which materials related to classes broadcast

via television communication channels, have been posted. During the crisis period, Microsoft enabled the use of Teams application adapted for education. The platform enabled remote teaching via Internet through a group video call, with the option of sharing a screen, as well as recording the entire class, which would later be available to students (ZUOV, 2020a).

Institute for Improvement of Education, with the support of UNICEF, provided mentoring support to schools and teachers in planning and implementing the teaching process using modern teaching technology. Mentoring support includes the process of learning management, the use of digital tools in teaching, hardware, software, etc. Digital mentors are a group of teachers, prominent in various areas of pedagogical use of digital technologies (ZUOV, 2020b).

In order to support teachers, Institute for Improvement of Education has created a digital support service to help plan and implement online teaching processes, using modern teaching technologies. The support is organized through a "ticketing" system, with a question on some of the topics related to the use of modern teaching technologies, Learning Management System, pedagogical aspects of the use of digital technologies in teaching and learning, etc. (ZUOV, 2020c).

However, online education in the Republic of Serbia is realized only in exceptional situations. Improving digital competencies is an important factor for the development of online education and improvement of the educational system in the future. Creative use of modern teaching technologies can give a new quality to the realization of teaching activities, and help in the development of various competencies of students and teachers.

Conclusion

Covid-19 undoubtedly influenced all segments of human life, and thus education. In the structure of the online education process, the teacher and the student were given new roles. The teacher is no longer just a transmitter of information and assessor of student knowledge, but also becomes a manager and regulator of information flow, organizer and leader of the entire process of learning, and the student becomes an active participant, teacher's associate, and sometimes the creator of teaching and learning.

When in a state of emergency, caused by Covid-19 virus pandemic, distance learning had to be organized, the use of all the above modern teaching technologies enabled fast organization and continuity of teaching in the form of online education methods. With the involvement of teachers and students, the use of modern teaching technologies has gained its full significance and opened new opportunities for improving online education. After the outbreak of the pandemic, the Republic of Serbia ensured the continuity of education as soon as possible, by switching from traditional to online education. The current pandemic has accelerated the need for educational change and has designed more online methods for distance learning. This way of thinking is an excellent basis for the further development of modern teaching technologies and online education in the future.

The sudden and urgent need for online education highlighted as a current problem the fact that the Republic of Serbia still does not have a defined educational strategy that would respond to the challenges of crisis of these dimensions. Additional efforts are needed to create flexible digital educational programs, to strengthen the key skills of the teaching staff, with special emphasis on digital competencies.

References

1. Aparicio, M., Bacao, F., & Oliveira, T. (2016). An e-Learning Theoretical Framework, *Educational Technology & Society*, 19(1), 292–307.
2. Coman, C., Tiru, L.G., Mesesan-Schmitz, L., Stanciu, C., & Bularca, M.C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective, *Sustainability*, 12(24), 1-24.
3. Espino-Diaz, L., Fernandez-Caminero, G., Hernandez-Lloret, C.M., Gonzalez-Gonzalez, H., & Alvarez-Castillo, J.L. (2020). Analyzing the Impact of COVID-19 on Education Professionals. Toward a Paradigm Shift: ICT and Neuroeducation as a Binomial of Action, *Sustainability*, 12(14), 5646.

4. Klein, V.B., & Todesco, J.L. (2021). COVID-19 crisis and SMEs responses: The role of digital transformation, *Knowledge and Process Management, Special Issue*, 1-17.
5. Milicevic, J., Sremcevic, N., Cosic, I., Ralevic, N., & Lazarevic, M. (2020). Online Learning Pros and Cons During Covid Pandemic: A Case Results Students in a Higher Education Institution, Chapter 12 in *DAAAM International Scientific Book 2020*, pp.151-170, B. Katalinic (Ed.), Vienna: DAAAM International.
6. Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic, *International Journal of Educational Research Open*, 1(1), 1-8.
7. National Forum for the Enhancement of Teaching and Learning in Higher Education. (2015). *Teaching and Learning in Irish Higher Education: A Roadmap for Enhancement in a Digital World 2015-2017*, in *teachingandlearning.ie*, Published September 8, 2015, <https://www.teachingandlearning.ie/publication/teaching-and-learning-in-irish-higher-education-a-roadmap-for-enhancement-in-a-digital-world-2015-2017/>
8. O'Donoghue, J., Singh, G., & Green, C. (2004). A comparison of the advantages and disadvantages of IT based education and the implications upon students, *Interactive Educational Multimedia*, 9(1), 63-76.
9. Ozturk, I. (2001). The Role of Education in Economic Development: A Theoretical Perspective, *MPRA Paper 9023*, University Library of Munich, Germany.
10. Papaleontiou- Louca, E., Varnava-Marouchou, D., Mihai, S., & Konis, E. (2014). Teaching for Creativity in Universities, *Journal of Education and Human Development*, 3(4), 131-154.
11. Pokhrel, S., & Chhetri, R. (2021). A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning, *Higher Education for the Future*, 8(1), 133-141.