









Online Learning during the COVID-19 Pandemic

Silva Kostić¹ 
Nada Ratković Kovačević² 
Marija Zajeganović³ 
Đorđe Dihovični⁴ 
Ivana Krulj⁵ 
Dragan Kreculj⁶ 

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Abstract: *In the 21st century almost every higher education course includes some type of digital learning. Many universities provide blended, online or e-learning courses. Many LMS platforms are used for online learning and testing students in various fields. Several virtual meeting platforms are used for online learning and communication. The use of these platforms at universities skyrocketed during the Covid-19 pandemic. This paper focuses on teachers' experience and satisfaction with different tools for online learning in comparison with traditional, face-to-face teaching methods. The authors surveyed three academies of applied studies in Serbia. According to the survey, most teachers used online learning platforms as well as virtual meetings during the Covid-19 pandemic and they were satisfied. The results of the survey imply that the majority of teachers find blended learning to be the optimal method of teaching in the future.*

1. INTRODUCTION

E-learning made learning possible anytime and anywhere as a result of technological advancement, particularly the development of computer networks and end devices. Many universities worldwide have accredited distance learning study programs and provide blended or online courses. Numerous LMS platforms are used for online learning and testing students. Different virtual meeting platforms are widely used for communication and collaboration. The use of both types of platforms in the teaching process soared during the Covid-19 pandemic since it was the only possible method of teaching during the lockdown when there was an urgent need to overcome the problem of mandatory social distancing. After two years of online learning, the digital competence of teachers and students has increased and e-learning has advanced in many settings.

This paper gives an overview of the basic terms regarding e-learning, learning management systems and virtual meeting platforms followed by the results of a survey on teachers' experience, and satisfaction with online learning and the conclusion of the research.

¹ Academy of Technical and Art Applied Studies Belgrade, Department School of Information and Communication Technologies, Zdravka Čelara 16, Belgrade, 11000, Serbia

² Academy of Applied Technical Studies Belgrade, Department of Computer-Mechanical Engineering, Blv. Zorana Djindjića 152 a, Belgrade, 11070, Serbia

³ Academy of Technical and Art Applied Studies Belgrade, Department School of Information and Communication Technologies, Zdravka Čelara 16, Belgrade, 11000, Serbia

⁴ Academy of Applied Technical Studies Belgrade, Department of Computer-Mechanical Engineering, Blv. Zorana Djindjića 152 a, Belgrade, 11070, Serbia

⁵ Academy of Applied Technical and Preschool Studies, Department Vranje, Filipa Filipovica 20, Vranje, 17500, Serbia

⁶ Academy of Applied Technical Studies Belgrade, Department of Computer-Mechanical Engineering, Blv. Zorana Djindjića 152 a, Belgrade, 11070, Serbia

2. E-LEARNING, ONLINE, BLENDED, SYNCHRONOUS AND ASYNCHRONOUS LEARNING

The term eLearning was coined by Elliot Masie in 1999. E-learning or electronic learning implies *training, learning, or education delivered online through a computer or any other digital device* such as tablets or mobile phones connected to the internet which makes it easy for users to learn anytime and anywhere (Lawless, 2018). It appeared in the 2000s with the development of internet technologies and it occurs remotely and online via information and communication technologies (Rise up, 2022). However, it can successfully be offered offline as well (Lawless, 2018).

There are various models of e-learning, the most common of which are: (a) enhanced or adjunct model – acts as an assistant in classroom face-to-face learning, providing relative independence to students; (b) blended e-learning model – integration of classroom face-to-face learning experiences with online learning; and (c) pure online or fully-online model – without traditional face-to-face learning, providing maximum independence to students (Garrison & Kanuka, 2004). The fully online model is further divided into individual and collaborative learning, with the collaborative learning model being subdivided into asynchronous and synchronous learning models (Regmi & Jones, 2020). Synchronous (face-to-face) learning refers to a method of teaching which enables students to interact with teachers via the Internet in real-time, similar to in-person learning (Khan, 2006). The asynchronous (text-based internet) teaching method implies that students and teachers do not have to meet on the web in real-time. It allows students to learn *anytime and anywhere* (Khan, 2005).

Blended learning (hybrid learning) combines the benefits of e-learning (it is time-saving, cost-effective and flexible) with the benefits of face-to-face learning (human interactions, sharing ideas, and motivation). It can involve a combination of e-learning modules, virtual classes, in-person training, collaborative exercises via web chats or forums, etc. It makes training courses more flexible and adaptable as well. For instance, theory can be taught via e-learning modules, while practical exercises can be done at face-to-face sessions (Rise up, 2022).

3. LMS PLATFORMS AND VIRTUAL MEETING PLATFORMS

A learning management system (LMS) is a software application or web-based technology used to plan, implement and assess a specific learning process. The primary use of a learning management system is for knowledge management. Some popular LMSs used by educational institutions include Moodle, Blackboard Learn and Schoology (Brush, n.d.). Learning Management Systems are platforms that include learning systems, course management systems, content management systems, portals, and instructional management systems (Coates et al., 2005). LMS platforms allow students to upload assignments and download grades, interact with each other, their teachers, or learning tools, share knowledge and take online exams and quizzes (Jurubescu, 2008).

LMS platforms are used to create teaching materials, digital textbooks, various activities, tests, etc. Digital textbooks can contain videos, movies, animations, 3D models, tests and quizzes. They are better adapted to student needs than traditional textbooks and provide multimedia and special-purpose tools. They are cheap, always available and occupy little space (Kreculj et al., 2019).

LMS platforms are used to keep a record of student activities and progress and communicate with students on forums as well. The most common Learning Management Systems (LMS)

used in the teaching and learning processes in higher education institutions are: Moodle, ATutor, Blackboard and SuccessFactors (Kasim & Khalid, 2016). Most higher education institutions in Serbia use Moodle platform, which is an open-source, customizable LMS, developed in 2001 (Moodle, 2022). It is user-friendly, accessible and flexible.

A virtual meeting is a form of communication that enables people in different physical locations to use their mobile or internet-connected devices to meet in the same virtual room. There are different types of virtual meetings such as: video conferences (face-to-face interaction, high-quality video and audio, best suited for team building), web conferences (brainstorming sessions and collaboration on projects by using sharing and whiteboarding), webinars (a one-way seminar with hosts or panelists presenting to attendees), teleconferences (the simplest, audio-only meetings, best suited for quick and informal calls) (Webex, 2022).

Virtual meeting platforms are used in online learning as well. They enable communication and collaboration in real-time. The most common ones are Google Meet, Zoom, MS Teams, and Cisco Webex.

Apart from video chat, virtual meeting applications offer interactive tools such as digital whiteboards or even VR (virtual reality), newer and emerging technologies that allow meeting participants to create an avatar that sits in virtual space alongside colleagues' avatars, which might be a very fun and creative experience. Presenters can also share YouTube videos and create polls. Most video and web conferencing software include additional features such as a built-in messaging system, *hand raise* (a non-interrupting way to inform the speaker you wish to ask a question), the ability to mute, turn the video on/off, and control these options for participants, etc. (Tovuti, 2022).

The benefits of using a virtual meeting platform in online learning are infinite, from increased productivity and interaction with students and instructors to technical conveniences such as the possibility of recording meetings and facilitated collaboration with features such as breakout rooms, messaging and sharing documents and computer screens (Tovuti, 2022).

The main drawbacks of virtual meetings are technical problems, learning curve issues for new participants and the impression of being less personal than in-person meetings (Webex, 2022).

4. SURVEY

The authors surveyed three academies of applied studies, two in Belgrade and one in Niš. All three academies are technical and their predominant scientific field is engineering and technology. The focus of our research was teachers' experience and satisfaction with e-learning platforms and virtual meetings. The research aimed to determine the teaching model with the best outcome in a state of emergency and under normal circumstances. 85 teachers participated in the survey which had 8 questions. All the teachers who took part in the survey had a chance to use the platforms during the pandemic, therefore the results of the survey can be considered valid.

5. RESULTS

The first question in the survey referred to the use of e-learning platforms in the teaching process during the pandemic. Most teachers used Moodle, 10% of them used Google Classroom, whereas 20% used various virtual meeting platforms. Only 13% of the teachers did not use any e-learning platforms.

The second question addressed the complexity of using LMS platforms. 54.1% of the participants used them before the pandemic and they find that tool easy to use. The participants of the survey work at technical academies and such a result is expected. Most of the teachers without previous experience with e-learning platforms (31.8%) find them easy to use as well. A small percentage of the participants, 5.9%, find them complicated to use and 8.2% of them do not use e-learning platforms in the teaching process, as shown in Figure 1.

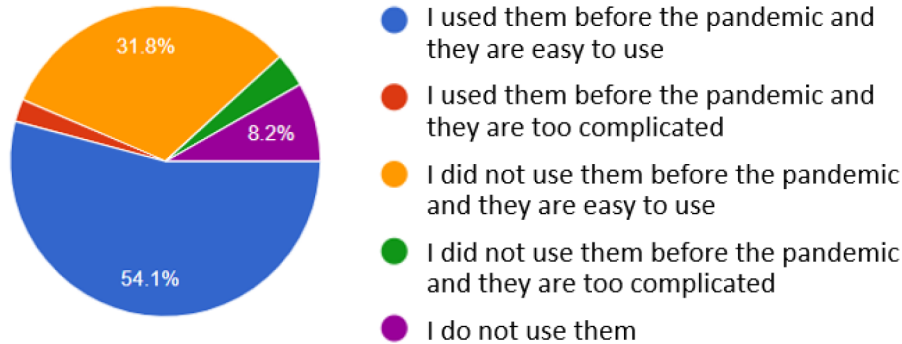


Figure 1. Complexity of using e-learning platforms

Source: Own research

The third question dealt with teachers' satisfaction with the features of e-learning platforms. The participants mostly used the platforms to create lectures (83.5%). 36.5% of the teachers used them for testing students and 40% of them to keep a record of student activities. The majority of the participants were satisfied with the features they used. Only 10.6% of the participants did not use any e-learning platforms in the teaching process, as shown in Figure 2.

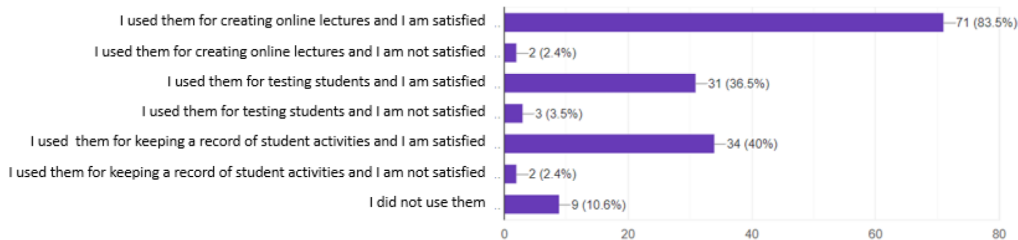


Figure 2. Features of e-learning platforms

Source: Own research

The fourth question of the survey focused on the use of virtual meeting platforms in the teaching process. The participants mostly used Google Meet (47.1%), Zoom (45.9%), MS Teams (25.9%) and Cisco Webex (16.5%). Only 9.4% of them did not use any virtual meeting platforms for teaching, as shown in Figure 3.

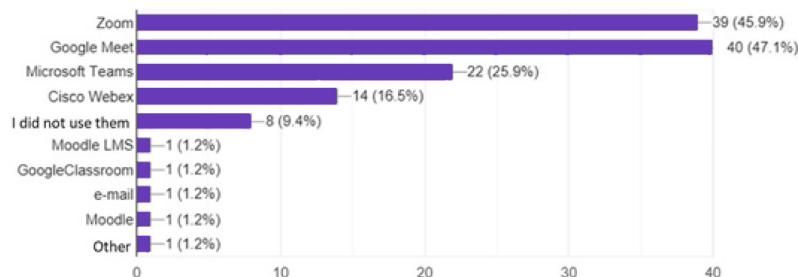


Figure 3. Virtual meeting platforms

Source: Own research

The answers to the fifth question show that the participants mostly used virtual meeting platforms for giving synchronous online lectures (71.8%). 22.4% of the teachers who took part in the survey used the platforms to give synchronous online lectures and record them (22.4%). 11.8% of them used virtual meeting platforms to record lectures offline. A small number of the participants (14.1%) do not use any virtual meeting platforms in the teaching process, as shown in Figure 4.

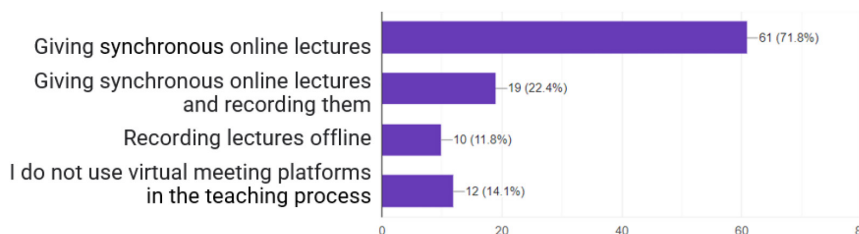


Figure 4. Different uses of virtual meeting platforms in the teaching process

Source: Own research

The sixth question referred to the complexity of the use of virtual meeting platforms in the teaching process. The results are as expected. Whether the participants used them before the pandemic or not, they find them easy to use (84.7%). 11.8% of the participants do not use them in the teaching process and only 3.6% of them find them too complicated to use, no matter if they used them before or not, as shown in Figure 5.

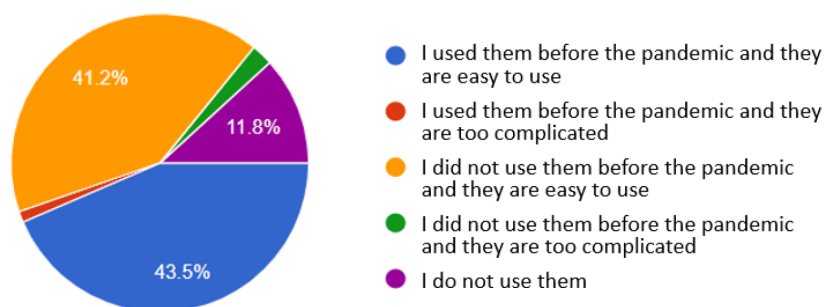


Figure 5. Complexity of using virtual meeting platforms

Source: Own research

The last two questions addressed the best teaching method in a state of emergency and under normal circumstances. 74.1% of the participants find synchronous online learning with the use of e-learning platforms to be the best method of teaching when classroom teaching is not possible. 15.3% of them opted for online learning without using e-learning platforms while 10.6% of the teachers prefer distance, i.e. asynchronous learning, as shown in Figure 6.

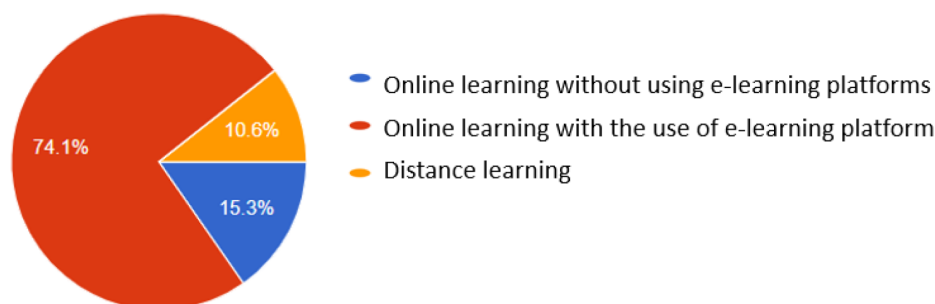


Figure 6. Model of teaching with the best outcome (when classroom teaching is not possible)

Source: Own research

Most teachers (68.2%) find face-to-face learning with the use of e-learning platforms to be the best method of teaching under normal circumstances. 21.2% of the teachers who took part in the survey would give in-person lectures without using e-learning platforms. 5.9% of the participants would choose the same method of teaching as the one considered best during the pandemic, i.e. online learning with the use of e-learning platforms. Only 1.2% find distance learning, i.e. asynchronous learning to be the best model of teaching even under normal circumstances. For 3.5% of the teachers online learning without using e-learning platforms would give the best outcome, as shown in Figure 7.

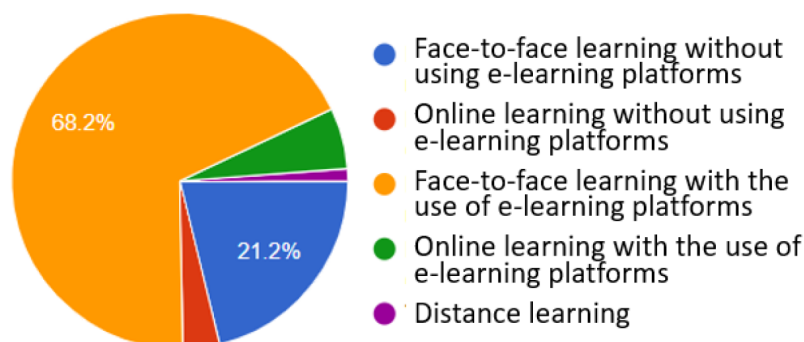


Figure 7. Model of teaching with the best outcome (when classroom teaching is possible)

Source: Own research

6. CONCLUSION

Most of the participants in the survey find e-learning platforms and virtual meeting ones easy to use no matter if they previously used them or not. The majority of them believe that LMS platforms should be used not only in a state of emergency but also under normal circumstances. A great number of the teachers who took part in the survey find online learning with the use of e-learning platforms to be the best method of teaching in a state of emergency. According to the majority of participants in the survey, blended learning is the best method of teaching under normal circumstances. During the Covid-19 pandemic, teachers were faced with a challenge that they managed to overcome.

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