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# Analysis of the Use of Online Teaching Tools in Specific Circumstances

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## Abstract

*E-learning can be viewed from a technical and pedagogical aspect, so the application of e-learning in teaching requires ICT knowledge and skills and pedagogical competencies for the use of ICT in teaching. Work on the topic: "Analysis of the use of online teaching tools in specific circumstances" consists of two parts. The first part of the paper, which uses a scientific method of content analysis, presents types of online teaching tools in specific circumstances and explanations of online teaching tools in specific circumstances. Also, the advantages and disadvantages of the online learning tools (as well as the advantages and disadvantages of the LMS, i.e. learning management system) are described. The second part of the paper presents the research results obtained by the scientific method of interviewing. Based on the surveys, answers (results) were obtained to the nine questions asked. Hypotheses were set in the paper:  $H_{t1}$  and  $H_{o1}$  and  $H_{t2}$  and  $H_{o2}$ . Based on the results obtained by interviewing the respondents (analysis of answers), the paper confirmed the basic hypotheses ( $H_{t1}$  and  $H_{t2}$ ), while the alternative hypotheses ( $H_{o1}$  and  $H_{o2}$ ) have been rejected.*

**Keywords:** *online teaching; online tools; tool options; online assessment; LMS.*

## 1. Introduction

Work on the topic: "Analysis of the use of tools for online classes in specific circumstances" consists of two parts. In the first part of the paper where the scientific method of content analysis is used are presented explanations of online teaching tools in specific circumstances and the advantages and disadvantages of online learning tools (and the advantages and disadvantages of the LMS system). The Learning Management System, or popularly known as LMS in the community of higher institutions, is online, i.e. a portal that connects lecturers and students. Provides a path for classroom materials or activities that should be shared easily. It

is also a portal that allows teachers and students to communicate outside the classroom, conversations through forums that might otherwise take up too much time to spend learning in the classroom (Nor Azura, Lee Hwei, 2013). The second part of the paper presents the research results obtained by the scientific method of interviewing. Web survey was used in this paper.

## 2. Research Methodology

Web survey is a specific research in which data are collected without an interviewer and without any control of a statistician over the probabilities of

selection for respondents. Based on the surveys, answers (results) were obtained to the questions asked: (1) which tools are the most practical for the respondents and the best to use for the purpose of conducting a video conference for online teaching (respondents could choose up to three tools), (2) which of the following code-writing tools are the most practical for the respondents and best for use for the purpose of creating web pages (online) in code view (respondents could choose the two most practical and the best tools), (3) which LMS learning management systems (i.e., online learning) are the most practical and the best for the examiners (the respondents could select the most practical and the best three tools).

Also, the survey included respondents' statements about: (4) whether (a) online teaching will give students more knowledge (i.e., will they learn more and learn during the hour and after the hour of that class) than at the time of classical instruction in the classical classroom and / or classroom or (b) students will not gain more knowledge online (i.e. they will no longer learn and learn during the class and after the class) and during the class time in the classical classroom and / or classroom, (5) whether (a) online attendance, activity, collaboration, and attention of students and students will be easier to detect and record than during classical classroom and / or classroom teaching, or (b) online attendance, activity, collaboration, and attention it is easier to identify and record students and students than at the time of classical instruction in a classical classroom and / or classroom, (6) whether (a) it will be easier and more objective to evaluate the activities of students in the process of distance learning (online teaching), or (b) whether it will be easier and more objective to evaluate the activities of students during the classical classroom and / or classroom. (7) whether (a) it is easier for students (transcripts) to transcribe (solutions) to online proficiency testing during the distance learning process compared to the classical proficiency test in a classical classroom and / or classroom (which is not online (not virtual)) or (b) it is more difficult for students (illicit) to transcribe (solutions) to online proficiency testing at the time of the distance learning process compared to the classical proficiency test in a classical classroom and / or classroom (which is not online (not virtual)), whether (8) is better than the application groups (listed) of the tools (in the opinion of the tester) Google Drive (Google Apps) or Office365-OneDrive (Office365 Apps). Also, the respondents stated which device (computer) made it easier and easier for students and students to participate in online classes and monitor online classes, and in response to the

above question they had: smartphone, tablet, laptop (laptop) or desktop computer. In the paper, hypotheses were made:  $H_{t1}$  and  $H_{a1}$  and  $H_{t2}$  and  $H_{a2}$ .  $H_{t1}$  reads: "Students will not acquire more knowledge online (i.e. they will no longer learn and learn during the class and after the class and lecture), but there will be no attendance, activities, cooperation and attention of students and students is easier to detect and record than during the classical classroom and / or classroom, while it is easier and more objective to evaluate the student activities during the classical classroom and / or classroom."  $H_{a1}$  states: "Online teaching will give students more knowledge (i.e., they will learn more and learn during online hours and after online lessons and lectures) than during the classical classroom and / or classroom and online classes are the presence, activities, cooperation and attention of students and students are easier to detect and record than at the time of classical teaching in a classical classroom and / or classroom, while it is easier and more objective to evaluate student activities in the distance learning process." The  $H_{t2}$  hypothesis reads: "It is easier for students to transcribe (solutions) to online proficiency testing during distance learning in comparison to classical proficiency testing in a classical classroom and / or classroom (which is not online).", while the alternative hypothesis of  $H_{a2}$  is: "It is more difficult for students (illicit) to transcribe (solutions) during online assessment at the time of the distance learning process compared to the classical assessment in a classical classroom and / or classroom (which is not online).

### 3. Online Teaching Tools - Advantages and Disadvantages

Online teaching facilitates the process of "lifelong learning" and information can be brought to any corner of the world. However, despite the undoubtedly large number of advantages over classical teaching, this type of teaching has its disadvantages as well, which should certainly be taken into account when implementing it into the education system. These deficiencies on the one hand are related to the characteristics of online learning, while on the other hand, some of them are related to the characteristics of potential participants in such programs. Numerous foreign authors show that in the field of online teaching, many important problems have not been sufficiently studied or have not been studied at all. Various indicators show that online training reduces staffing and drastically lowers costs while enriching the teaching process and ensuring better quality of service (Vasilj, Zovko,

Vukobratović, 2017). Online teaching tools include: (1) LMS systems (learning management systems), (2) LCMS systems (learning and content management systems) and (3) real-time online teaching tools (i.e., tools that allow live streaming of the teaching process directly such as Skype, Zoom, Viber, Google Hangouts Meet, Google Duo, etc.).

Distance learning, and especially e-learning, represents a desirable and necessary form of help with learning at engineering faculties. It enables students to learn independently of time and space, but it also offers better communication between students and teachers and students' team work. On the other hand, it mitigates the problem of irregular learning and encourages students' independent work. Furthermore, e-learning creates a possibility of supplementing the teaching material via the LMS or a web application, as well as a possibility of distance learning cooperation between scientific and educational institutions and exchange of teaching materials. This might increase not only the level of quality, but also the level of students' independent work due to activities pertaining to developing their own projects, programs and web applications (Crnjac, Milić, Martinović, Fercec, 2009).

Learning management systems (LMS) have been adopted by the majority of higher education institutions and research that explores the factors that influence the success of LMS is needed. Involvement was found to be important to LMS success. Student involvement was shown to have a significant effect on the benefits to students of LMS use. The more involved a student is with the LMS site for a course offering, the stronger the benefits they report obtaining from use (Klobas, McGill, 2010). An LMS provides the virtual platform for the e-learning by enabling the management, monitoring student, delivery, tracking of learning, testing, communication, registration process and scheduling (Cavus, 2015). LMSs are essentially standardized products (Black, Beck, Dawson, Jinks, DiPietro, 2007).

This makes the LMS selection process relatively straight forward and focuses attention on "other side of the LMS" or issues of adoption and implementation. A primary challenge for change agents rolling out an LMS is to convince potential users to adopt the LMS and support them as they implement it (Black, Beck, Dawson, Jinks, DiPietro, 2007). On the Internet there are many open and commercially available learning management systems (LMS), and one of the important problems in this field is how to select an LMS that will be most

effective and to meet the requirements (Cavus, 2010).

#### 4. Research results of online teaching in specific circumstances

Chapter (3) presents the results of research on online teaching and the application of tools in the teaching process during specific circumstances (a measure of protection related to nCoV diseases (i.e. COVID-19)). The survey method was applied. The sample consists of competent respondents and teachers of schools and colleges (target population) with ICT competencies, which in the whole designates the sample as representative. The sample of competent respondents from the target population with ICT competencies is  $N = 47$ . Some respondents did not answer all the questions.

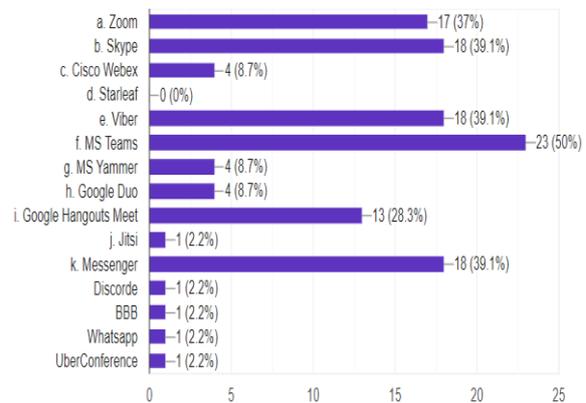


Figure 1. Showing the tools that are most practical and best used for conducting a video conference for online teaching

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 1 shows the tools that are most practical for the respondents and best used for the purpose of conducting a video conference for online teaching. According to the respondents, the best and most practical tools for using video conferencing for online teaching and online teaching are: (1) MS Teams (50%) and (2) Messenger (39.1%), (2) Skype (39.1%), (2) Viber (39.1%) and (3) Zoom (37%). Interestingly, 28.3% of respondents think Google Hangouts Meet is the most practical and best to use, ranking sixth overall, although most respondents (based on respondents' answer to survey question 8) stated that Google Drive is a better option than MS Office365.

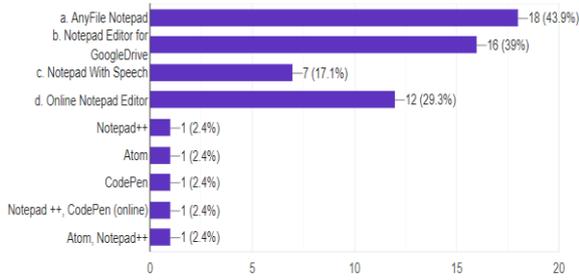


Figure 2. Display of the code-writing tool that is most practical for the respondents and best used for the purpose of creating web pages (online) in code view

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 2 shows the code writing tools that are most practical for the respondents and best used for the purpose of creating web pages (online) in code view. Most respondents chose Any File Notepad (43.9%) and Notepad Editor for Google Drive (39%), Online Notepad Editor (29.3%), Notepad with Speech (17.1%). Respondents also chose other tools they personally use, such as: Notepad ++ (online), Atom, Code Pen, and a combination of Notepad ++ and Code Pen, and Atom and Notepad ++.

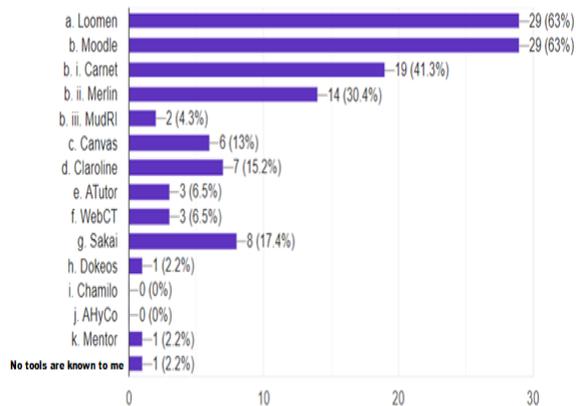


Figure 3. View the LMS learning management systems (i.e. online learning) that are most practical and best for the respondents

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 3 shows the LMS learning management systems (i.e. online learning) that are the most practical and the best for the respondents. According to the respondents, the most practical and best LMS tools are Loomen (63%), Moodle (63%) and Sakai (17.4%). Claroline chose (as the most practical and best option) 15.2% of respondents.

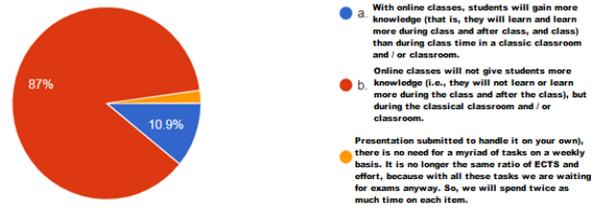


Figure 4. Respondents' views on whether or not online students will gain more knowledge

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 4 shows the opinion of the respondents about whether or not online students will gain more knowledge. The graph in Figure 4 shows the research result which is one of the arguments (as seen) for accepting the  $H_{t1}$  hypothesis, i.e. rejecting the  $H_{a1}$  hypothesis.



Figure 5. View of the respondents' opinion on whether online teaching of attendance, activities, cooperation and attention of students will be easier to detect and record than at the time of classical teaching in the classical classroom and / or classroom

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 5 shows the respondents' opinions about whether online teaching of attendance, activities, collaboration and attention of students will be easier to detect and record than at the time of classical teaching in a classical classroom and / or classroom. During the research, 71.7% of the respondents stated that online teaching of attendance, activities, cooperation and attention of students would not be easier to detect and record than during the classical classroom and / or classroom, while 28.3% said the opposite, that online teaching of attendance, activities, collaboration and attention of students will be easier to detect and record than at the time of classical teaching in a classical classroom and / or classroom. Graph in Figure 5 shows the result of research, which is also one of the three arguments (as shown) for accepting the hypothesis  $H_{t1}$ , i.e. rejecting the  $H_{a1}$  hypothesis.

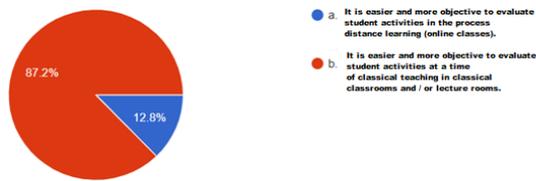


Figure 6. Examination of respondents' opinions on whether it is easier and more objective to evaluate student activities in the process of distance learning (online teaching) or whether it is easier and more objective to evaluate student activity during the classical classroom and / or classroom

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 6 shows that it is easier and more objective to evaluate the activities of students in the classroom in the classroom and / or classroom according to the opinion of 87.2% of respondents, while 12.8% of respondents think the opposite is easier and more objective to evaluate the activities of students in the process distance learning (online classes). The graph in Figure 6 shows the research result, which is also one of three arguments (as seen) for accepting the  $H_{t1}$  hypothesis, viz. rejecting the  $H_{a1}$  hypothesis.

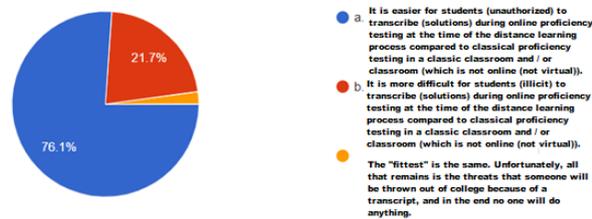


Figure 7. Respondents' view on whether it is easier for students to transcribe (solutions) during online assessment at the time of distance learning in comparison to the classical classroom and / or non-online classroom (not virtual))

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 7 shows the respondents' opinions about whether it is easier for students to transcribe (solutions) during online assessment at the time of the distance learning process compared to the classical assessment in a classical classroom and / or classroom (which is not online (not virtual)). 76.1% of respondents chose the option to make it easier for students (unauthorized) to transcribe (solutions) during online proficiency testing during distance learning compared to classical proficiency testing in a classic classroom and / or classroom (not online (not virtual)) , while 21.7% of respondents opted for the second option. One respondent wrote in the "something else" option: "To those" fittest "it is the same because, unfortunately, everything remains solely on the threat that someone will be thrown out of college for rewriting and in the end no one

will do anything." The graph in Figure 7 shows the research result that is an argument (as seen) for accepting the  $H_{t2}$  hypothesis, i.e. rejection of the  $H_{a2}$  hypothesis.

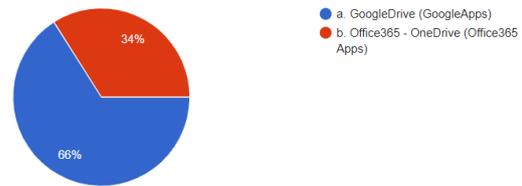


Figure 8. Respondents' views on which group of online tools are better for them

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 8 shows that 66% of respondents decided that a better group of online tools was Google Drive, while 34% of respondents chose Office365, i.e. OneDrive, as a better option.

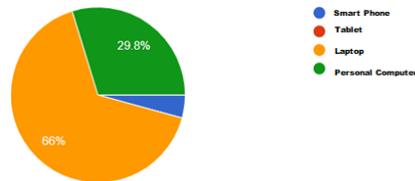


Figure 9. Display of the device (computer) that makes it easier and easier for students to participate in online teaching and to monitor online teaching according to the opinion of the respondents

Source image: Creating an author using the tools Google Forms ("GoogleForms anketa," 2020).

Figure 9 shows the opinion of the respondents by which device (computer) is the easiest and easiest way for students to participate in online teaching and to monitor online instruction. The majority of respondents (66%) chose option (c), i.e. participating in classes and monitoring online teaching using a laptop (laptop), while the second option (29.8%) chose desktops. Two respondents think that it is easiest and easiest to participate in online classes and monitor online classes using a smartphone (4.3%).

## 5. Conclusion

In this paper, the hybrid form of teaching is especially emphasized as one of the best solutions for learning and teaching. The best way to learn is to apply a hybrid model of teaching and learning that involves the combination of teaching and learning in the classroom in the classical classroom process, and

which involves the process of distance learning (online teaching). Online tools should be more recommended for solving tasks and tasks after the topic has been covered in a classic classroom, i.e. live. It is more difficult for professors and students to start working in the teaching process (especially in IT subjects) immediately with new tools and / or new teaching topics (online) without the students / students having previously been shown the (new) application tool and / or made oral introduction to a new teaching topic.

In connection with the second part of the paper, the basic hypotheses ( $H_{t1}$  and  $H_{t2}$ ) were confirmed, while alternative ( $H_{a1}$  and  $H_{a2}$ ) were selected based on the results of the research obtained by interviewing the respondents (response analysis). The hypothesis  $H_{t1}$  is accepted which reads as follows: "Online classes will not give students more knowledge (i.e. they will not learn or learn more during class and after class and lecture) than during class teaching and / or in the classroom and online classes will not be attended, attended, collaborated and students' attention is easier to perceive and record than during classical classroom and / or classroom, while it is easier and more objective to evaluate student activity during classical classroom and / or classroom 'and the  $H_{t2}$  hypothesis:' It is easier for students (impermissible) transcripts (solutions) during online proficiency testing at the time of distance learning in relation to classical proficiency testing in a classical classroom and / or classroom (other than online).".

A web survey is the best research method for this issue which is research. The best and most practical tools for respondents to use for conducting video conferencing for online teaching and online teaching are: (1) MS Teams (50%) and (2) Messenger (39.1%), (2) Skype (39.1%), (2) Viber (39.1%) and (3) Zoom (37%). The most practical and the best online tools to use for website design (online) in code view according to respondents are: Any File Notepad (43.9%) and options: Notepad Editor for Google Drive (39%), Online Notepad Editor (29.3%), Notepad With Speech (17.1%). Also, respondents selected other online tools that they personally use, such as: Notepad ++ (online), Atom, Code Pen, and a combination of Notepad ++ and Code Pen, and Atom and Notepad ++. According to the respondents, the most practical and best LMS tools are Loomen (63%), Moodle (63%) and Sakai (17.4%), while Claroline chose (as the most practical and best option) 15.2% of the respondents. Also, it is worth mentioning with proven hypotheses: (1) a result showing in the respondents' opinion that 66% of the respondents decided that a better online tool

group was from the Google Drive application tool group, while 34% chose a better Office365 i.e. OneDrive option and a suite of tools from Office 365's suite of application tools, and (2) a score indicating that the majority of respondents (66%) chose the option: taking classes and monitoring online classes using a laptop (i.e. laptop) as the type of computer that makes it easiest and easiest for students and students to use and participate in online classes and monitor online classes, with the majority of respondents answering nine questions (29.8%) chose desktops. Two respondents think that it is the easiest and easiest way to participate in online classes and monitor online classes using a smartphone (4.3%).

## References

- Black, E. W., Beck, D., Dawson, K., Jinks, S., & DiPietro, M. (2007). The other side of the LMS: Considering implementation and use in the adoption of an LMS in online and blended learning environments. *TechTrends*, 51(2), 35–53.
- Cavus, N. (2015). Distance Learning and Learning Management Systems. *Procedia - Social and Behavioral Sciences*, 191(1), 872-877.
- Cavus, N. (2010). The evaluation of Learning Management Systems using an artificial intelligence fuzzy logic algorithm. *Procedia - Social and Behavioral Sciences*, 41(2), 248-254.
- Crnjac, Milić, D., Martinović, G., Fercec, I. (2009). E-Learning: Situation and Perspectives. *Technical Gazette*, 16(2), 31-36.
- GoogleForms anketa. (2020). Retrieved from <https://drive.google.com/drive/my-drive>
- Klobas, J.E., McGill, T.J. (2010). The role of involvement in learning management system success. *J Comput High Educ*, 22(2), 114–134.
- Nor Azura, A., Lee Hwei, L. (2013). Learning Management System (LMS) among University Students: Does It Work? *IJEEEE*, 3(3), 248-252.
- Vasilj, M., Zovko, A., Vukobratović, J. (2017). Potencijali e-učenja za unapređenje modela poučavanja odraslih. *Inovacije u nastavi (Teaching Innovations)*, 30(2), 82-97.