

Students' Attitudes Regarding Online Learning During Covid-19 Pandemic

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Abstract: Investigation of students' attitudes about online learning during the Covid19 pandemic was the main focus of this paper. The research was conducted at Faculty of Technical Sciences in Čačak and it involved 136 students from three study programs: Information Technologies, Engineering Management and Electrical and Computer Engineering. Students gave relatively low marks for general attitudes towards online teaching, especially its efficiency compared to the traditional one. Additionally, students gave relatively low marks for statements which refer to cheating in exams in e-learning context. When it comes to teamwork in the e-environment, students gave relatively high marks for statements which refer to the satisfaction of working in a team, turning an assignment in on time, coping skills etc. The majority of students points out at least one benefit of online teaching, where by most of them considers that this sort of teaching saves time, and their cognitive load was not too increased due to this type of learning. On the other hand, more than half of students stated that they had at least one issue during their attendance in class, and that Internet disconnection was the most common one.

I. INTRODUCTION

During the state of emergency caused by the COVID-19 pandemic, pupils and students in Serbia took online classes from home. Apart from daily video lessons aired on national television, teachers used a multitude of other technologies and platforms which made the classes quite diverse. At the Faculty of Technical Sciences in Čačak which has multidisciplinary departments and fields studied, with the state of emergency having been declared, students have had the opportunity to switch to taking online classes, with the support of The Moodle Learning Management System (LMS) for uploading course materials, assignments, projects, tests and video recordings of classes. The synchronous teaching was done via Zoom, Office 365, Google Meet and Webex. Considering the uncertainty of the current pandemic there arose a need for determining students' attitudes on online teaching with the aim of improving this type of teaching. In order to have a clear view of the students' attitudes, a survey has been conducted

which include students from different departments and different years of studies.

During the pandemic, many an author carried out research on teaching in extraordinary circumstances. Muhammad and Kainat [1] dealt with students' perspectives in Pakistan during the Covid-19 pandemic. The conclusion was that online teaching cannot provide appropriate results since a significant number of students does not have appropriate equipment, as well as Internet access. Wadood et al. [2] surveyed students in Bangladesh regarding knowledge, attitudes, practice and perceptions about COVID-19. They found that general knowledge, attitude, practice and perception of university students regarding COVID-19 were not satisfactory. Over one third of students had a negative attitude on avoiding public transport and public gatherings. Furthermore, over a third of students avoided staying at home so as to avoid places with a large number of people. Bao [3] conducted a study about COVID-19 and online teaching in higher education at Peking University. Five quite significant principles for online education were established: „(a) high relevance between online instructional design and student learning, (b) effective delivery of online instructional information, (c) adequate support provided by the faculty and teaching assistants to students; (d) high- quality participation to improve the breadth and depth of students' learning, and (e) contingency plan to deal with unexpected incidents of online education platforms.“ Shahzad et al. [4] conducted a study to determine the impact of virtual teaching on students behaviour. Results showed that students have a positive attitude towards the new way of teaching. Research on online teaching during the pandemic proposed by Ali [5] points to the most significant aspects of that sort of teaching (resources, teacher readiness, confidence, as well as students' motivation and the possibility of attending e-classes). Muflih et al. [6] highlighted one of the

research' results on students' attitudes towards online teaching during the pandemic, which is the positive attitude students have of online courses as an aid for working on assignments.

Main barriers to online education identified by students were "the geographic locations and lack of past experience with using online tools".

II. METHODOLOGY

The subject of this research is students' attitudes towards e-classes during the COVID-19 pandemic. Consequently, the main goal of the research is to examine the level of presence of certain categories which refer to the evaluation of attitudes toward e-learning. Nevertheless, the goal is to do a pilot study of the developed questionnaire.

The research hypothesis refers to the assumption that students give positive evaluation marks to e-teaching activities which were implemented during the pandemic, i.e. during the state of emergency.

The data was collected through a questionnaire which was developed for the purposes of research. The first part of the questionnaire consists of four categories of attitudes and 21 statements which are evaluated on a five-level Likert scale (1-does not apply to me at all; 2-it partially applies to me; 3-I am not sure; 4-it mostly applies to me; 5-it completely applies to me). The Cronbach's alpha reliability coefficient is 0.88. This scale includes the following subscales: the quality of e-teaching, cheating on tests in the e-environment, engaging in teamwork and cognitive load. The Cronbach's alpha reliability coefficient for the subscales are:

- Quality of e-teaching: 0.84;
- Cheating on tests in e-environment: 0.68
- Engaging in teamwork: 0.79
- Cognitive load: 0.63

In the second part of the questionnaire, students were asked to single out the advantages of e-teaching compared to the traditional one, as well as the difficulties they encountered. The third part of the questionnaire implied ranking of material formats used according to the frequency of use.

Although the Cronbach's alpha reliability coefficient for the whole scale is acceptable (over 0.8), lower values were obtained for certain subscales. The reason for this could be a small number of statements for certain scales [8].

Dependent variables in this research were grouped according to the abovementioned attitude categories.

For data processing, procedures of descriptive statistics were implemented with the use of the SPSS software package. To determine the variance in prominence level which refer to the presence of certain theories of study, descriptive statistical techniques were used, such as arithmetic means and standard deviation.

The sample consisted of a total of 136 students from The Faculty of Technical Sciences in Čačak, University in Kragujevac. The research involved students from three study programs: Informational Technology (73 students), Electrical and software engineering (32 students) and Engineering management (31 student).

III. RESULTS AND DISCUSSION

In order to gain a more detailed insight into the representativeness of certain attitude categories, below are means shown for each individual statement.

Table 1 shows average values for statements which refer to the quality of teaching.

In Table 1, it is visible that students give the highest evaluation mark for the statement which refers to the utility of recorded materials for subsequent studying ($M = 4.39$). Additionally, the students assess that the access to e-learning was clear ($M = 4.30$). On the other hand, the lowest evaluation marks were given for the statement of how much online teaching contributed to the material comprehension ($M = 2.71$) and the statement which refers to how much online teaching could replace the traditional one ($M = 2.87$). Such a finding implies that general attitudes towards e-teaching were relatively low evaluation marks (under the average mean of 3).

TABLE I AVERAGE MEANS FOR THE E-TEACHING QUALITY EVALUATION SCALE

The quality of e-teaching	M	S.D
The application of modern technology in teaching and learning has advantages compared to traditional teaching	3.32	1.258
It was difficult to understand the teacher's e-lesson	3.02	1.256
E-teaching affected your achievements	3.19	1.112
E-teaching contributed to better understanding of the subject compared to traditional teaching.	2.71	1.143
The approach to e-learning was clear.	4.30	0.855
The overall engagement of professors who taught online was satisfactory.	3.67	1.011
E-learning can replace the traditional approach.	2.87	1.216

Recording the lessons and uploading the video recordings on the e-learning system was useful for subsequent studying.	4.39	1.012
Students' self-evaluation has a positive effect on learning.	3.22	0.994
I am satisfied with the online colloquium.	3.60	1.142

Other authors find that e-teaching did not meet the expected effects due to lack of equipment and internet access [1], as well as that attitudes towards this sort of teaching are not satisfactory [2]. On the other hand, there are statements which point to the positive effect of virtual environment towards this approach to studying [4].

In Table 2, average means are shown for statements which refer to cheating on tests in e-environment. In Table 2, students' lowest evaluated statement was the one which refers to the individual evaluation of the use of illicit means in these learning conditions (M = 2.11). Yet, most students assess that other students cheat (M = 3.33). Of course, something that must be taken into consideration is subjective evaluation, and that, when it came to this particular ethical issue, students were not completely honest. And other research show that students give low evaluation marks for all types of cheating during examination [7].

Table 3 shows average means for statements which refer to engaging in teamwork. When it comes to teamwork, Table 3 shows that students give high evaluation marks for turning an assignment in on time (M = 3.69), while they are unlikely to think that teamwork in an e-environment is any more difficult compared to traditional teaching (M = 3.14). Still, it should be noted that the evaluation marks for all the statements given in this group are below 4. This finding shows that students are likely to need further support in the realization of activities in this manner.

Table 4 shows average means for statements which refer to the cognitive load and fatigue during e-learning.

TABLE II AVERAGE MEANS FOR THE CHEATING IN EXAMS SCALE

Cheating during e-testing	M	S.D
Students cheated during e-testing.	3.33	1.211
Students are responsible and conscientious not to use illicit means without the professor's supervision.	2.89	1.165
You used the chance to manipulate illicit means so as to achieve better results.	2.11	1.209

TABLE III AVERAGE MEANS FOR THE ENGAGING IN TEAMWORK SCALE

Engaging in teamwork	M	S.D
Students follow the deadlines for assignments in teams.	3.69	0.984
Students cope well with the realization of distance teamwork.	3.54	1.242

Students were satisfied with the involvement of the rest of the team during the preparation of seminar papers.	3.49	1.162
Teamwork is more difficult in distant learning and the inability for students to meet as with traditional teaching.	3.14	1.462

TABLE IV AVERAGE MEANS FOR THE COGNITIVE LOAD AND FATIGUE SCALE

Cognitive load and fatigue	M	S.D
A higher cognitive load in students was present in distant than in regular teaching.	3.59	1.330
You had the will to study at home.	3.00	1.339
You felt more tired after e-teaching compared to standard teaching	3.08	1.361
Household chores interfered with completing obligations regarding classes.	2.87	1.216

Based on the average means shown in Table 4, relatively low evaluation marks are noticed (below and above the 3 mark), which refer to the cognitive load during e-learning. In this group of statements, most of the students stated that the cognitive load during e-learning was increased compared to regular conditions (M = 3.59). Students consider that the least of their distractions were chores (M = 2.87), which means that students were able to balance between faculty and private responsibilities.

This research also tested which benefits of e-learning students pointed out compared to traditional teaching. Table 5 shows the results of this part of research. Students were able to choose multiple answers.

Results show that 10.29% of students think that there are not any advantages of e-learning compared to the traditional one. Still, the largest percentage of students thinks that this type of teaching saves time (74.3%).

About a third of those students who acknowledge those benefits think that e-learning makes learning easier and improves the connection between students. As a special advantage, students stated the fact that they were able to stay at home during studies.

Table 6 shows results which refer to the difficulties students have had during e-teaching.

TABLE V BENEFITS OF LEARNING IN E-ENVIRONMENT

	Yes (%)	No (%)
Saving time	74.3	25.7
Studying is easier	32.4	67.6
Increased interest	19.9	80.1
Improved quality of learning material	20.6	79.4
Improved communication between students and teacher	32.4	67.6
Other benefits	1.5	98.5

TABLE VI ISSUES WITH ATTENDING E-CLASSES

	Yes (%)	No (%)
Internet disconnection	74.3	25.7
Computer issues	32.4	67.6
Increase of interest	19.9	80.1
No internet access	1.5	98.5
Other issues	10.3	89.7

Results show that 46% of students did not have an issue with taking classes online. Table 6 shows that the largest percentage of students (out of those who singled out at least one difficulty) had issues with Internet disconnection (74.3%). Other difficulties students have pointed out were power outage, lesson schedule, technical difficulties with video conference platforms, delay of emails with online meeting dates, and that one of their inmates had e-classes at the same time. Other authors find the main obstacle to be lack of skills for the use of technology for studying [6]. Unlike other students in this study, students in Pakistan had difficulties with following classes in pandemic conditions due to the lack of technical equipment [1].

Table 7 shows the consistency of using materials in different formats in percentages. Looking at Table 7, one could conclude that teachers usually taught via video conferences, and that they relatively often provided materials in pdf form. E-testing was also used. This finding in accordance with findings of other research which point to the presence of online platforms and tools for video conferences [6]. As it was already mentioned, at the Faculty of Technical Sciences, where the research had been carried out, a system for e-learning Moodle as well as other platforms for video conferences were used during the pandemic, which gives an additional explanation for the more frequent use of certain types of material and activities.

IV. CONCLUSION

The results of the research show that the hypothesis set on the positive attitudes towards online teaching during the pandemic is partially confirmed. Namely, students have given relatively low evaluation marks for the general attitudes towards e-teaching, especially for its efficiency compared to the traditional one. Nevertheless, they consider that recording the video material and its later use can be useful.

Students give relatively low evaluation marks for statements which refer to cheating on exams in the e-learning context.

TABLE VII FREQUENCY OF MATERIAL USE IN DIFFERENT FORMATS RANK (%)

	1	2	3	4	5
Power Point	10.3	17.6	39	16.2	16.9
Pdf materials	5.1	10.3	36	18.4	30.1
Tests	2.9	25.7	26.5	27.9	16.9
Regular textbooks	8.1	36.8	27.9	19.9	7.4
Video conferences	7	8.1	25.7	33.8	31.6

However, due to subjective evaluation and the possible insincerity of the students, this result should be taken with a grain of salt.

When it comes to teamwork in the e-environment, students give relatively high evaluations for statements which refer to the satisfaction of working in a team, turning an assignment in on time etc.

Furthermore, students' evaluation point to the fact that their cognitive load was not too increased for having to study in this manner. Most students singled out at least one benefit of e-teaching, whereby most of them think that this teaching method saves time. On the other hand, more than half of students said that they had had at least one issue during class, and that the most frequent one was Internet disconnection.

Video conferences, materials in pdf format and e-testing proved to be the most frequently used ones during the pandemic. Still, it should be taken into consideration that this new approach to studying was probably a novelty for most teachers, as well as students, where adjustments are yet to be made.

Further research implies the scrutiny of teachers' attitudes towards teaching under extraordinary circumstances and comparing the evaluations. Additionally, it would be useful to determine the objective differences in students' achievement during traditional teaching and teaching in e-environment.

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