

Benefits of online education or shortcomings of the traditional system?

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Abstract. The pandemic generated by the Coronavirus COVID-19 forced universities to shift from face-to-face to online education. This change has been a challenge for both teachers and students, as well as for the institution. Inherently, the new situation triggered a comparison with the traditional system and for many students, it seems to bring unforeseen benefits. A closer look at students' opinions reveals that apart from the contextual advantages, online teaching and learning are surpassing or fixing several limitations or shortcomings of the traditional system. The objective of this research is to analyze in more detail the students' positive perceptions of online teaching and learning from a new perspective. The analysis revealed several shortcomings of the pre-existing system: lack of a structured repository of educational materials, scarcity of learning support, poor access to information of interest, issues related to communication with teachers, and issues related to the quality of the learning environment.

Keywords: online education, pandemic, engineering education, benefits of online learning.

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1. Introduction

The pandemic generated by the Coronavirus COVID-19 forced universities to shift from face-to-face to online education. This change challenged both teachers and students, as well as the institution. As extant literature shows, this sudden change had both advantages and disadvantages (Xie et al., 2020; Ismaili, 2020; Reznikova et al., 2020; Ionescu et al., 2020; Lamanauskas & Makaraskaite-Petkeviciene, 2021).

On the positive side, students appreciated the comfort of learning from home, the time flexibility, the development of new skills, and the benefits of

the online teaching and learning platforms (Landrum, 2020; Reznikova et al., 2020; Manea et al., 2021). On the negative side, students complained about the lack of interaction with students and teachers, lack of hands-on laboratory projects, attention and concentration difficulties, frustration, stress, and technical issues (Aristovnik et al., 2020; Clark et al., 2020; Radu et al., 2020; Asgari et al., 2021; Johnson & Barr, 2021).

The analysis of students' perceptions during the pandemic is difficult since home confinement had major consequences on people's behavior. The home, a place for personal life and individual study, has been invaded by academic activities (Manea et al., 2020; Gherhes et al., 2021; Haggdorn et al., 2021). While participation in lectures and seminars from home was perceived as appealing to many students due to time and money saving it has been negatively perceived by others, because of the threats to privacy, lack of socialization, and lack of face-to-face interaction.

The shift to online teaching and learning triggered a comparison with the traditional system. For many students, learning from home seems to bring unforeseen benefits. In a previous work (Manea et al., 2021), the analysis of students' opinions revealed that apart from the contextual advantages, online teaching and learning are surpassing or fixing several limitations or shortcomings of the traditional system. In this respect, the present work aims to analyze students' opinions from a new perspective.

This research has two objectives. The first is to analyze in more detail the students' positive perceptions of online teaching and learning from this new perspective. The second objective is to analyze how things changed after one year. The analysis has been done on a sample of 181 university students from a Romanian university of civil engineering.

The rest of this paper is structured as follows. Related work is discussed in the next section. The method and sample are presented in section 3. Section 4 presents and discusses the results of the study. The paper ends with a conclusion in section 5.

2. Related work

The work of Rashid & Yadav (2020) analyzed the impact of the pandemic on higher education and research. They noticed that the pandemic brought in front the vulnerabilities and shortcomings of the existing system and highlighted the transformative impact that raised the digital technology for e-

learning. The sudden change forced universities to close the gaps in terms of equipment and training of the teaching staff and created opportunities to develop future partnerships with technology providers. Overall, the education crisis generated by the pandemic provides valuable insights into the improvement of the education system (Rashid & Yadav, 2020).

Reznikova et al. (2020) analyzed the problems of higher education during the pandemic and noticed that the change to distance education triggered the development of new technical skills and teaching methods as well as databases with lectures, test blocks, and presentations. The main advantages of distance learning that have been mentioned by students are time management, low cost of study, and permission not to attend university daily. They considered education during the pandemic as a preparatory stage toward a better education system able to combine traditional and distance teaching methods.

Fatoni et al. (2020) explored the advantages and disadvantages of online education in Indonesia during the pandemic on a sample of 100 students. They found that the main advantages perceived by students were the comfortable educational environment (32%), time-saving and time flexibility (30%), and smooth interaction (22%). Another study has been carried on by Nuflic et al. (2020) in Jordan. They analyzed the perceptions of 1210 undergraduates and found that online education favors better time management and active communication with instructors and classmates.

The study by Radu et al. (2020) analyzed the perceptions of students from a Romanian university as regards the shift to online education during the pandemic. They found both advantages and disadvantages, but more importantly, they found a positive perception of combining traditional with online education. Students showed interest in more flexible and self-paced learning and opportunities to support students from disadvantaged groups.

Ionescu et al. (2020) carried out a sustainability analysis of e-learning in Romania during the pandemic. The study targeted three levels of study (middle school, high school, and higher education) and three types of actors (teacher, student, and parent). For the teachers, the main difficulty was adapting the course to the new conditions. For students, the main shortcomings were the lack of interaction with the teacher and the lack of socialization with colleagues. The majority of participants in each category expressed a negative attitude towards the continuation of the online system.

A study by Xie et al. (2020) analyzed the online education system during

the pandemic and advocated for a more important role for online and hybrid education in the future. They argued that online education has many advantages: time and space flexibility, increased information accessibility, global reach, equity, innovation, and efficiency.

In previous work, Manea et al. (2021) analyzed the benefits of online learning as perceived by students from a civil engineering university. They identified two kinds of benefits: educational and personal. The main educational benefits were the possibility to review recorded lectures, better access to educational resources, and better participation in classes. The main personal benefits were the time saving (no travel, time for other activities), the comfort of learning from home, and the money savings.

3. Method and sample

3.1 Sample

The participants in the study are students from the Technical University of Building Engineering in Bucharest.

216 students answered the questionnaire. After screening for incomplete data, 35 questionnaires have been eliminated thus resulting in a working sample of 181 observations (119 male / 62 female). 164 students are undergraduates (91%) and 17 are master students (9%). As regards the study program, they are enrolled in civil engineering (61%), engineering and management (16%), project management (8%), railways and bridges (7%), and others (8%).

There was no LMS used in the university before the pandemic crisis. Therefore, the university purchased a Microsoft Teams platform that served both as an LMS and a platform for online teaching.

3.2 Method

This research is a qualitative study that is based on the analysis of opinions. Students have been asked to answer the question “Please mention the most important things you like in using Microsoft Teams”.

The answers have been analyzed to identify keywords related to the perceived advantages. Only 20 students did not answer the question and more than 45% mentioned two or three advantages. A total of 391 advantages have

been identified. Table 1 shows the distribution of positive aspects mentioned by students.

Table 1. Advantages (N=181)

Advantages	None	1	2	3	4	5 and over	Total
Students	20	49	48	35	16	13	181
%	11.05	27.07	26.52	19.34	8.84	7.18	1.47

Then the answers have been analyzed to group keywords on categories and topics.

4. Results

4.1 Overview

The analysis of data revealed two broad categories of answers: advantages of using the platform and advantages of distance education. The advantages in the first category point to educational aspects and could be further grouped into topics: quality of the platform, ease of access, learning materials, communication & group work, and better learning. The advantages in the second category point to personal aspects. The perceived advantages are summarized in Table 2.

Table 2. Perceived advantages (N=181)

Category / Advantage	No	%
Advantages of using the platform (Educational)	291	74.42
Availability of the learning materials	96	24.55
Platform quality	72	18.41
Ease of access to information and activities	67	17.14
Communication & group work	30	7.67
Better learning	26	6.65
Advantages of distance education (personal)	100	25.58
Time & money saving	29	7.42
Being in different places, having a job	23	5.88
Quality of the learning environment	17	4.35
Comfort and commodity	15	3.84
Health and other	16	4.09
Total	391	100.00

The main advantage in the first category is the availability of learning materials that account for almost 25% of the total: recorded lectures and

seminars, videos, exercises, and other teaching materials uploaded by teachers. As could be noticed, the advantages in the second category account for only 25% of the total.

A comparison with the data from 2021 shows an increase in the first category. In the previous study (Manea et al., 2021), educational advantages accounted for 55.42% of the total. This may be explained by the experience gained in using the educational platform which revealed the benefits of fast access, at any time and from anywhere, to educational materials.

A second difference is the lower weight of the benefits of learning from home which decreased from 13.25% to 3.84%. This may be explained by the fact that learning from home has been also perceived as a restriction and after two years of isolation, the comfort is no longer so important.

4.2 Advantages of using the educational platform

4.2.1 Availability of the learning materials

Advantages refer to the structured database with various teaching materials uploaded by teachers (16.62%) and the possibility to record lectures and seminars (7.93%).

Students liked the possibilities provided by the MS Teams platform: “we can record the lectures and seminars and we have the Files section where we find didactic materials”; “... the main advantage is that we can receive the materials from teachers through the Files section”; “the didactic materials are available anytime, I can take the notes from the course from Files if I couldn't attend the lecture”.

Another positive aspect was the possibility to record lectures and seminars: “the great advantage is that classes could be recorded”; “the fact that lectures could be recorded and accessed later if needed”; “I consider an advantage the fact that we can record lectures and seminars so it makes it easier to learn after classes”.

4.2.2 Quality of the online platform

Advantages refer to the ease of use, functionality, usefulness, and speed of access: “The platform is easy to use and satisfy any need of a student”; “it is easy to use”; “easy to use, practical”; “it is fast, easy to use, and accessible”; “easy to use, simple, helpful”, “everything is easy to use and organize”; “the efficient organization of teams and sections... the chat is also very useful”;

“the interface is simple and easy to use, the platform is stable”; “flexibility, no bugs”; “easy to use, intuitive”; “it is easy to use and has many useful applications, good video, and audio quality”.

4.2.3 Ease of access to information and educational activities

Advantages refer to the easy and ubiquitous access to courses, seminars, and other activities: “always with you”; “accessibility on different devices”; “you can access lectures, seminars, and laboratories from anywhere”; “We can connect at any time from anywhere”; presenting the homework and projects is more practical”; enable students to be present to lectures anywhere they are”; “you are up to date with everything”.

4.2.4 Communication and group work

Advantages refer to the interaction with the teacher (6.39%) and group work (1.28%).

Students found it easier the communication with the teacher: “Easier and faster communication with the didactic staff”; “it favors the communication student-teacher and student-student”; “an easier way to discuss with teachers”; “the relationship with the teacher is closer also after classes”; “I can consult the teacher without going to faculty”; “we can contact any time the teachers”; easy to transfer materials to and from students”; “easy to upload assignments”.

They also mentioned that is easier to work in teams: “I can see how colleagues work”; “helps students to work in a team; we can work in groups better than at school”.

4.2.5 Better learning

Advantages refer to better learning (3.84%) and better understanding by using the online platform.

Students mentioned that learning is easier and more effective: “recorded lectures”, “from my point of view learning on this platform brings advantages for students that don’t get it everything during classes”; “recording classes help me to get better results in learning”; “very useful for learning”; “accessible materials, I can learn in advance”.

They also found that the recordings and learning materials posted by teachers lead to a better understanding: “recorded lectures, if there is something I didn’t understand I can read again”, “some lessons could be

better explained online”; “ if there is something you didn’t understand, you enter the record” is more difficult without face-to-face interaction”).

4.3 Advantages of distance education

4.3.1 Time and money saving

Advantages refer to the time and money saving when learning from home and to the time flexibility: “The advantage is that we have more time for us”; “I can better organize my time”; “the time saved on the way to faculty”; “no time lost for faculty travel”; “the main advantage is the time saving which would be 3 hours per day”; “we don’t waste time and money for transport and food”; “wake up at 8 instead of 6 in the morning”; “the working time is more productive”; “efficiency and time saving”.

4.3.2 Being in different places, having a job

Advantages refer to the situation when students are from other counties (or even countries) and students that have a job in parallel: “is useful from people from other counties (far away) or other countries”; “advantages for students that are living far from the faculty and students that are working”; “it is an advantage for people going to work”.

4.3.3 Quality of the learning environment

Advantages refer to the lack of noise and the possibility of seeing everything: “lectures could be given without the noise in the traditional classroom”; “The blackboard is accessible to everybody, there is no background noise during classes”; “you are not distracted by the noise in the classroom”; “it is better than in the classroom where you might not see on the blackboard or you might not hear all words”; “online is better than in the classroom where you may not understand what is written on the blackboard”.

4.3.4 Comfort and commodity

Advantages refer to the comfort and commodity of learning from home: “commodity, information in a single place”; “I stay home”; “you learn from the comfort of your home”; “ the advantage is the commodity”; “I am more relaxed online”; “we have everything at hand, we don’t need to carry books to faculty”.

4.3.5 Health and other advantages

Advantages refer to health issues (1.53%) and other aspects related to distance education (2.56%).

Students mentioned that online education is safer during the pandemic: “I don’t risk my life during the pandemic”, “from a pandemic point of view online learning is safer for me and my family”; “we reduce the risk of getting ill during the pandemic”.

4.4 Discussion

A closer look at students’ positive perceptions of the educational platform is revealing several shortcomings of the existing system.

The lack of a structured repository for educational materials is a chronic issue: distance education forced all teachers to upload the didactic materials on the platform and enabled students to record the lectures and seminars. This brings several advantages to education since the transparency of the teachers’ work creates a sense of competition and stimulates them to enrich the learning materials.

For students, having all learning materials at hand makes it possible to replay a recorded lecture to better understand, better manage the learning time, and learn for exams without needing to go to the university library. This points to a related issue: the scarcity of learning support. Inherently, students that are missing a lecture or a seminar should be able to fill in the gap in time.

Several students mentioned that the educational platform improved communication with teachers and enables better access to the learning activities. This advantage unveils some issues related to the relationship between student-teacher and the way the assignments and homework are handled. First of all, consulting the teacher is an important activity that is neglected in the existing system and suffers from a lack of flexibility. Second, assignments and homework are handled in various ways which depend on the teacher. The educational platform provides a structured repository where homework could be easily preserved and further used as well as deadlines and dedicated communication channels.

Another issue is access to information. In the existing system, there are several communication channels and information points: physical, at university and each faculty/department, via Facebook (page of the series, page of the group), or e-mail. The educational platform enables better access

to information, in a structured way, at any time and from anywhere.

The teaching environment is not always good: students liked the video and audio quality of lectures since they complained about the background noise in the class and about the difficulty to see or understand what is written on the blackboard. Although this issue might appear mainly in lectures given in large auditoriums, the students' feedback should challenge the teachers to provide written educational material that helps students to clarify what they did not understand.

This work has several limitations. First, the sample is relatively small and the students are from the same university. Second, online teaching and learning are working inherently better since both teachers and students had time to adapt after two years of the pandemic. Last but not least, this is a particular case of a university that did not have an LMS before the pandemic so fulfilling a need has been inherently positively perceived.

5. Conclusion

The mobility restrictions during the pandemic forced universities to shift from traditional to distance education. At first sight, distance education brought unforeseen benefits in terms of comfort, time, and money saving. A closer look at students' opinions revealed several limitations and shortcomings of the existing system. In this respect, the change challenged the university and created an opportunity to improve the educational system.

In this case, the main issue was the lack of an educational platform that enables the storage of educational materials as well as the storage of assignments and students' work. Another issue was the communication with the teacher and the teamwork on projects. The results of this study should challenge universities and teachers to better exploit the educational platform and encourage online learning where appropriate.

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