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## The Impact of Online Learning on NDUM Students During COVID-19

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**Abstract**—One of the impacts of the COVID-19 outbreak was the closure of numerous education facilities, including schools and universities. Due to the closing of these institutions, the method used for teaching and learning changed from physical face-to-face lecturing to online contactless learning. This helps curb the spread of infections while ensuring that teaching and learning continue as usually as possible. However, questions arise not only about the effectiveness of online learning but also about the impact of online learning on education stakeholders, namely students and educators. This study aims to assess the effects of the lockdown during COVID-19 on National Defense University of Malaysia (NDUM) students. A link pointing to a custom-built questionnaire was forwarded to students through email and WhatsApp. At the end of the survey period, 445 students responded to the questionnaire. The simple percentage distribution was employed to evaluate the student's learning status and their expectations. Based on the analysis, during the lockdown, students faced issues involving technical, time management, social interactions, and surrounding (home-related) issues. In contrast, during the lockdown, students were also keen to learn new technological skills and favorable towards the ability to replay lectures and class materials. These valuable insights on the impact of online learning on students are essential due to the advancement of technology in education, not only in Malaysia but in other nations as well.

**Keywords**—Online learning; barriers; COVID-19.

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### I. INTRODUCTION

Investigating other countries' educational systems and experiences with similar situations may be helpful. Reviews and projections on the potential COVID-19 effect on higher education have already been released [1], [2], [3]. QS, Educations.com, and Study portals [4] are conducting three international surveys of university staff and students, as well as prospective students, to assess the effect of COVID-19 on their research or mobility plans [5]. The survey findings are summarized in online talks and blogs.

However, relatively few analytical academic studies have been published on this topic to understand how online learning performed during the COVID-19 lockdown and how this has influenced higher education institutions' (HEI) educational activities. For this study, it is essential to investigate the significant challenges and opportunities online learning platforms provide to higher education students during the COVID-19 pandemic. This will give us a better idea of how people are affected by online learning.

Some of the challenges identified in previous studies include communication, digital literacy, and instructional delivery methods. The expected outcomes from this investigation would assist the HEI top management in exploring the most effective learning environments that encourage students to learn.

This study aims to bridge the gap of existing literature on the effects of online learning on students' learning experiences and identify the critical challenges facing - students' learning from home during post-COVID-19. In this study, the research questions derived from the previous research are as follows:

- What is the student's perception of online learning platforms?
- What are the effects of online learning on students' learning experience?
- What are the critical challenges facing students' learning through the online platform at home during the COVID-19 pandemic?

Section II of this paper highlights the challenges and benefits of online learning platforms compiled from previous

studies as well as the data and methodology used for this study. Section III shows the findings of this study, taken from the analysis of the research survey. Finally, the conclusion and future works will be presented in Section IV.

## II. MATERIAL AND METHOD

Prior research on the challenges and benefits of online learning can be classified into four (4) main challenges: health-related issues, internet access and technology infrastructure, adaptation to the online learning platform, and communication. Based on previous studies, a conceptual framework is proposed.

### A. Health-related Issues

Several research was done in previous years to investigate the reality behind the effect of online learning on students' perspectives. Based on our findings through a detailed literature survey, one of the main factors which affected the student's online learning experiences is their well-being or health related. In 2021, [6] research found that a lack of self-motivation is also an issue for students. According to [7], students could not finish the online assignments assigned by the lecturer. This increases students' anxiety, leading to worry about attaining the best possible result for the enrolled course. [8] captured equivalent results, showing that social interaction is necessary for learning and development and may make students feel anxious and mentally exhausted throughout their studies.

Mustafa et al. [9] stated that the constant use of Information and Communication Technology (ICT), especially on smart campus projects, has been shown to affect students' health throughout the learning process. For example, research focusing on the impacts on lecturers found that exposure to virtual education might have unintended repercussions for students [10]. Physical symptoms of mental stress include shoulder and neck pain, postural damage, eye strain and headaches, skin problems, and sleep disorders. Furthermore, technical equipment exposure causes weariness in pupils and teachers [11].

### B. Internet Access and Technology Infrastructure

Based on the research conducted by Aung and Khaing [12], [13] and Mayoka [14], most college students cannot afford internet access due to its high cost. In addition, students need to have a high-speed and stable internet connection and computer-based skills to participate in online courses. The students must have basic knowledge of computers, software, programs, and online learning tools [15].

Hussin et al. [16] stated that more than half of students lacked adequate internet access, which was identified as the primary impediment to open and distance learning (ODL) adoption. According to their findings, 53% of individuals with poor internet connections reside in cities. As stated in the previous studies, technological inadequacies, a lack of essential equipment, an unstable internet connection, conflicting demands, and a lack of an acceptable, distraction-free workplace are all hurdles to online training [17], [18], [19], [20], [21], [22].

### Adaptation to the online learning platform

According to O'Doherty et al. [23], the primary challenges to online learning include insufficient technical skills, time

restrictions, a lack of institutional strategies and support, inadequate infrastructure, and unfavorable attitudes. Hjelsvold et al. [24] also examine instructors' perceptions of distance learning during the COVID-19 shutdown. It was discovered that a lack of time and readily available materials were significant hurdles to a fast change to distance learning.

Aldulaimi [25] observed that students' workloads have significantly increased due to being required to complete study activities and upload them to the internet, which increases overall stress and takes a long time due to the intricacies of technology. In recent research, Sugilar [26] highlighted four hurdles to students engaging in online tutorial classes: (1) a lack of awareness of online tutorials, (2) a lack of student motivation, (3) technological difficulties, and (4) a lack of student support services. On the other hand, [27] reviewed articles on e-learning in health sciences education and identified four categories of hurdles: low motivation and expectations, resource-intensiveness, inadequacy for specific disciplines or topics, and a lack of information technology skills.

### C. Communication

Previous research has also found that communication is one factor affecting students' online learning experience. In their research paper, Allam et al. [28] mentioned that the absence of physical social interaction promotes dread, low self-confidence in completing online activities, and the likelihood of procrastination. Students sometimes feel alienated during online learning since there is no physical or social touch with the lecturer or classmates, which influences their level of preparedness.

Furthermore, in the article "The Effect of Communication Barriers on Distance Learners' Achievements," Abu et al. [29] hypothesized that communication barriers such as social barriers, cultural barriers, temporal barriers, technological barriers, psychological barriers, contextual barriers, and collaborative barriers are significant challenges in distance education, negatively affecting distance learners' success and achievements. These issues also overlap and add to the complexity and concern of distance learners, impairing their performance and accomplishment.

In this study, a questionnaire developed by Abramenska [30] in 2015 was used as a starting point for this study to determine which online learning modules students find challenging or ambiguous and thus provide a barrier to their successful online learning. In his thesis, Abramenska has compiled a list of challenges and advantages to determine which categories students are most likely to struggle with. The research was carried out in 2015, long before the COVID-19 pandemic. As a result, it would be worthwhile to investigate and compare the results of this study with the research conducted by Abramenska.

Based on previous studies and feedback from Abramenska's research, Figure 1 shows the proposed conceptual framework for the effect of online learning experiences and the critical challenges and benefits of online learning platforms on students.

**Conceptual Framework on the Effects of Online Learning Experiences and, the Critical Challenges and Benefits of Online Learning Platform**

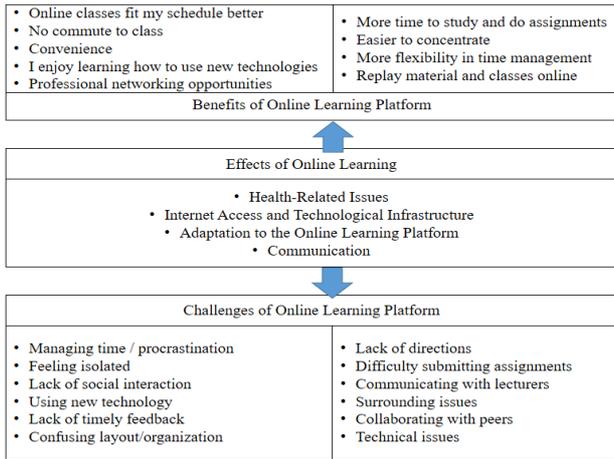


Fig. 1 Proposed Conceptual Framework

This section covers an in-depth explanation and description of the strategy and method used for this study and data collection. The research design process used in this study is depicted in Figure 2.

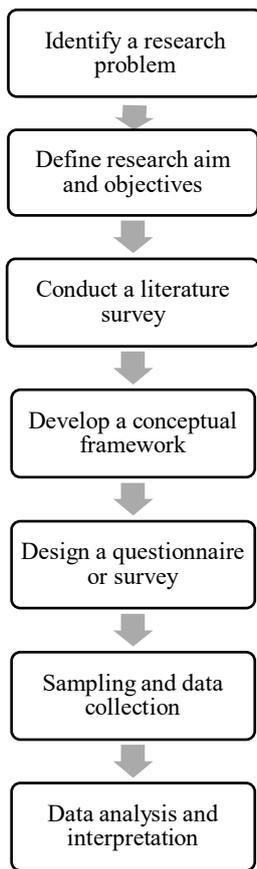


Fig. 2 Research Design

The first step begins with searching for recent issues. The research problem and objective were identified from an overview of the literature in the research area. The effects of online learning and the critical challenges facing the student towards the learning experience through online platforms were defined from a thorough literature review. The

conceptual framework has been developed, as shown in Figure 1.

Using the findings from the literature review, a set of questionnaires was developed. The information collected from a complete questionnaire would satisfy our research questions. The questionnaires are distributed mainly through mass email to students and WhatsApp messages. This quantitative technique was the most effective method for exploring this issue during the epidemic period.

This research's respondents were 445 students from the National Defense University of Malaysia (NDUM). Descriptive statistics were used to describe study participants. Simple percentage distributions were used to assess students' learning status and expectations of online learning due to the lockdown. The Statistical Package for the Social Sciences (SPSS) was used to analyze and evaluate all the data obtained throughout the survey.

III. RESULTS AND DISCUSSION

This section presents the data analysis and the research findings. To start the descriptive analysis, we present a frequency table and charts that summarize the sample's characteristics (Gender, age, education, and respondent's location during the pandemic). Next, we measured the challenges and benefits of online learning for students. The final finding is validating the issues related to the students' comments.

A. Respondents Gender

Table I demonstrates the gender identity of the respondent. Of 445 students, 258 respondents (58%) were male, and the others were female.

TABLE I  
RESPONDENT'S GENDER

Gender	N	Percentage (%)
Male	258	58
Female	187	42
Total	445	100

B. Respondent's age range

Table II shows the age of the respondents. As can be seen, the majority of the students were between the ages of 18 and 25, accounting for 97.3 percent of the total, while the smallest percentages of students were between the ages of 26 and 35 and 36 and 45, accounting for 1.3 percent of the total for each of these age ranges.

TABLE II  
RESPONDENT'S AGE

Age	N	Percentage (%)
18-25	433	97.3
26-35	6	1.3
36-45	6	1.3
Total	445	100

C. Respondent's Location Stayed during the Time of Pandemic (between May 2020 – May 2021)

As shown in Table III, the majority of respondents were from Selangor, with 20.4%, followed by Kuala Lumpur, with 17.3%, during the first wave of the pandemic. The fewest respondents were from Labuan, with only a single respondent from that state.

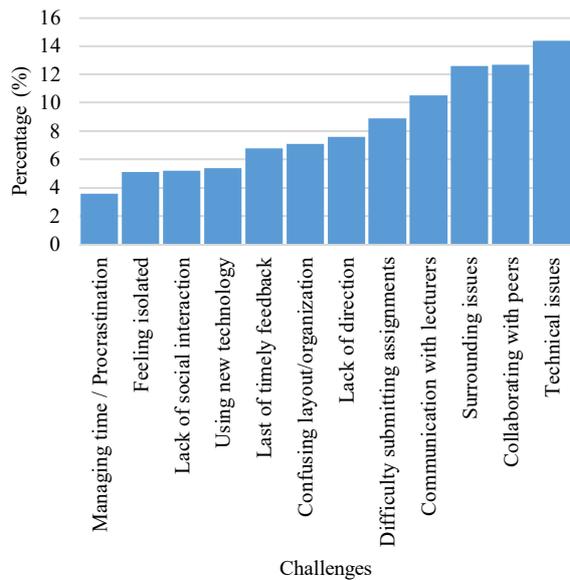


Fig. 3 Student's Online Learning Challenges

TABLE III  
RESPONDENT'S LOCATION

States	Responses	
	Frequency	Percentage (%)
Johor	44	9.9
Kedah	35	7.9
Kelantan	22	4.9
Kuala Lumpur	77	17.3
Labuan	1	0.2
Melaka	16	3.6
Negeri Sembilan	42	9.4
Pahang	20	4.5
Penang	12	2.7
Perak	42	9.4
Putrajaya	7	1.6
Sabah	12	2.7
Sarawak	11	2.5
Selangor	91	20.4
Terengganu	13	2.9
Total	445	100

#### D. Challenges of Student Learning through the Online Platform at Home during the COVID-19 Pandemic

According to Table IV, 14.3% of respondents chose technical issues as the major obstacle they experienced in online classes during COVID-19. Managing time or procrastination comes in at a close second (12.7%), followed by maintaining positive social interactions in third place (12.6%). The surrounding difficulties challenge was the fourth topic that respondents struggled with during the COVID-19 survey (10.5%).

The remaining challenges that they faced during COVID-19, such as feeling isolated, utilizing new technology, not receiving timely feedback, having a confusing layout/organization, lack of direction, difficulty submitting assignments, communicating with lecturers, and collaborating with peers, can be considered not to be critical challenges for them because less than 10% of respondents selected these issues as major barriers.

TABLE IV  
STUDENTS' ONLINE LEARNING CHALLENGES

Challenges	Responses	
	N	Percentage (%)
Using new technology	70	3.6
Last of timely feedback	99	5.1
Collaborating with peers	102	5.2
Difficulty submitting assignments	106	5.4
Confusing layout/organization	132	6.8
Feeling isolated	139	7.1
Lack of direction	149	7.6
Communication with lecturers	174	8.9
Surrounding issues	205	10.5
Lack of social interaction	246	12.6
Managing time/procrastination	248	12.7
Technical issues	279	14.3
Total	1949	100

#### E. Benefits for Students' Learning through the Online Platform at Home during the COVID-19 Pandemic

Table V reveals that 17 percent of respondents identified learning new technologies as the major advantage of online classes during COVID-19. Next, about 16.9 percent of respondents said it was easier to review materials and lessons online, and the difference between the first and second benefits was very small, less than 0.01 percent. Respondents chose more time management flexibility as the third most important benefit (12.2%).

About 10% of the respondents chose the following three benefits: online classes fit better with their schedule (10.6%), they have more time to study and do assignments (10.3%), and they can meet other professionals (10.2%). The other two benefits, less than 10%, are convenience (9.7%) and not having to travel to class (8.7%). Lastly, only 4.5% of people who took online courses during COVID-19 said that it helped them focus better.

TABLE V  
BENEFITS OF ONLINE LEARNING FOR STUDENTS

Benefits	Responses	
	N	Percentage (%)
Easier to concentrate	63	4.5
No commute to class	122	8.7
Convenience	135	9.7
Professional networking opportunities	143	10.2
More time to study and do assignments	144	10.3
Online classes fit my schedule better	148	10.6
More flexibility in time management	170	12.2
Replay material and classes online	236	16.9
I enjoy learning new technology	237	17.0
Total	1398	100

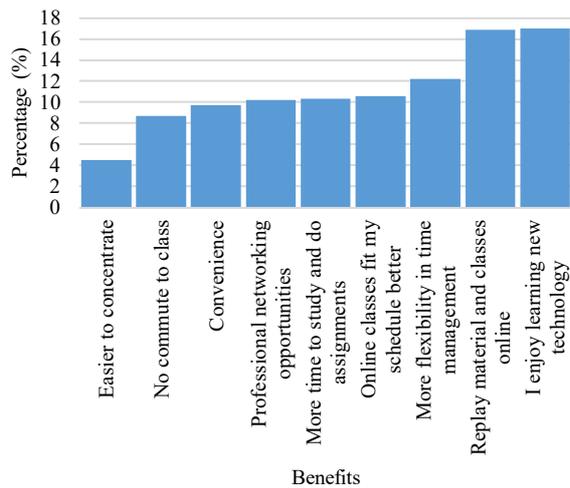


Fig. 4 Benefits of Online Learning for Students

#### F. Students' Views on the Effects of Online Learning Platforms at Home during the COVID-19 Pandemic

Table VI shows a few comments from the respondents regarding the barriers to online learning during COVID-19. From the feedback, it can be concluded that all of the issues discussed in Table VI illustrate our study's validity. The primary issues addressed by students were health-related issues, a lack of student engagement and motivation, technical issues, surrounding issues, and a lack of social interaction between students and lecturers.

TABLE VI  
STUDENTS' VIEWS ON THE EFFECTS OF ONLINE LEARNING

Student's views	Effects
Online classes are making me more lazy than physical classes. I think it is because of the radiation from my gadget's screen, which causes my eyes and brain to be tired.	Health-related issues
Less exercise is done, and the communication between students and lecturers lacks a lot.	- Health-related issues - Lack of engagement and motivation
The problem is mostly at my own house like the distraction from the family to do some chores and to deal with some slow internet.	- Surrounding issues - Technical issues
It is difficult to communicate with students to discuss questions, and I get extra shy when answering the lecturer's questions.	Lack of engagement and motivation
<ul style="list-style-type: none"> <li>Technical issues, especially regarding the unstable network when submitting the work, especially during the test and final exams.</li> <li>Effect on my lifestyle.</li> <li>Cope with the practical subject that teaches the theory instead of we need to do it practically.</li> <li>Understanding the learning took a long time, and we could not catch up during the learning session.</li> </ul>	- Technical issues - Lack of engagement and motivation
I want to take a physics class since my course desperately needs many physical demonstrations, physical touch, and an	Lack of social interaction

Student's views	Effects
effective way to understand when the lecturer and student face each other. Theory learning only makes my brain not work, and I feel dumb.	
For many students struggling with family stresses, in-person schooling was an escape. It was a safe space. In remote learning, however, students do not have that escape. Instead, they are now trying to deal with school stresses while surrounded by all the stresses at home. These conditions are not ideal for academic success or behavior management.	Health-related issues
It was pretty challenging for me when I was only a girl and the youngest in my family. I will do all the house chores before and after the class starts. It makes me exhausted, in addition to lecturers' many overlapping assignment deadlines.	- Surrounding issues - Health-related issues
I lack motivation, but there is a way to get my online learning involved and actively engaged in the process. Badges, certificates, points, and leaderboards motivate online learners to achieve the desired outcomes.	Lack of engagement and motivation
Difficulty in understanding the info conveyed by the teacher. There are also difficulties in doing group work when group members have internet problems and cannot provide good cooperation.	- Lack of engagement and motivation - Lack of social interaction - Technical issues

#### IV. CONCLUSION

From the respondents' feedback, it can be concluded that there are four significant challenges of online learning platforms during the COVID-19 pandemic: technical issues, managing time or procrastination, social interaction, and surrounding issues. These issues were selected based on the highest percentage of respondents, with more than 10%. Moreover, these issues were also stated in the previous literature review. Furthermore, it was also found that six significant benefits of the online platform selected by the respondents are enjoying learning new technology, replay material and classes online, time management, online courses fit their schedule better, having more time to study and do assignments, and professional networking opportunities.

According to the findings, 14.3% of respondents identified technological concerns as the most significant barrier to online learning. The COVID-19 pandemic's technical issues affect Malaysia and the world. As the pandemic is so abrupt, a lot of IT infrastructures must be upgraded quickly; however, it requires a significant expense to support online learning platforms. New technology is the least important challenge, with only 3.6% choosing it. This shows that most respondents are IT literate and can use online learning systems.

Regarding the benefits of online learning, most respondents (17%) enjoyed learning new technology. As an online class has replaced the physical face-to-face class, students and lecturers must adjust their teaching and learning methods to accommodate the new environment. This advantage of online learning was supported by the respondent's responses to the preceding question on the

challenges associated with online learning, where respondents identified new technology as the least challenging of online learning. In addition, the respondents stated that they had no problem commuting (8.7%). This shows that travel to the physical class is not an issue for the student.

For future works, this study can also expand during the COVID-19 pandemic and in measuring the current online learning scenario. Considering the rapid pace at which technology is advancing in the country, it is essential to do so. In addition, future research may employ this methodology to evaluate schools, colleges, and private institutions.

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