

# Perceived constraints and impacts of online learning experiences by Indonesian university students during COVID-19

Restricciones e impactos percibidos de las experiencias de aprendizaje en línea de los estudiantes universitarios de Indonesia durante el COVID-19

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## SUMMARY

**Introduction:** Many educational institutions introduced online learning during COVID-19 to cope with the social distancing and lockdown policies. The students face challenges in adapting to new circumstances and the unprecedented use of technology. This study aimed to identify the constraints and impacts experienced by students during online learning.

**Methods:** This study used a cross-sectional design approach for 407 students who participated in online learning. Sampling used a non-probability technique, namely the snowball sampling technique. The constraints and impacts of online learning were measured using a questionnaire. The statistical test used the Pearson correlation test.

**Results:** The results indicated a strong correlation between constraints and the impacts of online learning ( $p$ -value = 0.0001). Furthermore, a correlation test of constraints and each domain of online learning impacts was carried out. The statistical test results showed a correlation between constraints and impact caused by online learning, including with psychological ( $p$ -value = 0.0001,  $r$  = 0.67), physical ( $p$ -value = 0.0001,  $r$  = 0.51) and social ( $p$ -value = 0.0001,  $r$  = 0.62).

**Conclusion:** Despite the constraints of online learning, it has helped students continue their education. Moreover, identifying constraints is essential in ensuring there is the utilization of various strategies that will help in the optimization of online learning and reduce its impacts of it.

**Keywords:** Constraints online learning, COVID-19, impacts online learning,

## RESUMEN

**Introducción:** Muchas instituciones educativas introdujeron el aprendizaje en línea durante el COVID-19 para hacer frente a las políticas de distanciamiento social y confinamiento. Los estudiantes enfrentan desafíos para adaptarse a las nuevas circunstancias y al uso sin precedentes de la tecnología. Este estudio tuvo como objetivo identificar las limitaciones y los impactos experimentados por los estudiantes durante el aprendizaje en línea.

**Métodos:** Este estudio utilizó un enfoque de diseño transversal para 407 estudiantes que participaron en el aprendizaje en línea. El muestreo utilizó una técnica no probabilística, a saber, la técnica de muestreo

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*de bola de nieve. Las limitaciones y los impactos del aprendizaje en línea se midieron mediante un cuestionario. La prueba estadística utilizó la prueba de correlación de Pearson.*

**Resultados:** *Los resultados indicaron una fuerte correlación entre las limitaciones y los impactos del aprendizaje en línea (valor  $p = 0,0001$ ). Además, se llevó a cabo una prueba de correlación de las limitaciones y cada dominio de los impactos del aprendizaje en línea. Los resultados de las pruebas estadísticas mostraron una correlación entre las limitaciones y el impacto causado por el aprendizaje en línea, incluido el psicológico (valor de  $p = 0,0001$ ,  $r = 0,67$ ), físico (valor de  $p = 0,0001$ ,  $r = 0,51$ ) y social (valor de  $p = 0,0001$ ,  $r = 0,62$ ).*

**Conclusión:** *Apesar de las limitaciones del aprendizaje en línea, ha ayudado a los estudiantes a continuar con su educación. Además, identificar las restricciones es esencial para garantizar que se utilicen diversas estrategias que ayudarán a optimizar el aprendizaje en línea y reducir sus impactos.*

**Palabras clave:** *Restricciones del aprendizaje en línea, COVID-19, Impactos del aprendizaje en línea.*

## INTRODUCTION

Since it was declared a global pandemic, various countries have tried to suppress and reduce the spread of COVID-19. Due to suppress and reduce the transmission of COVID-19, several countries have established infection prevention and control measures by limiting human contact (1-3). Lockdown is one of the government's efforts to restrict human contact to reduce the spread of COVID-19. The Indonesian government established a lockdown and social distancing policy during the COVID-19 pandemic. The existence of policies to reduce the spread of COVID-19 carried out by many countries has caused various changes in various aspects of life, such as the learning system. The policy resulted in conditions that the world of education must be able to adapt, through an online learning system (4,5).

COVID-19 has made various educational institutions switch from face-to-face to online learning (6-8). Online or distance learning is carried out separately between students and teachers and requires a particular delivery method (9,10). Online learning uses the internet and several other important technologies

to develop materials to achieve educational goals, instructional delivery, and program management (11).

During the COVID-19 pandemic, many universities worldwide digitized the learning process to fulfill the necessity of urgent learning (6,12). As the result, online learning has been observed as a possible alternative to face-to-face learning. Based on the meta-analysis conducted by Cook (2009) (13), it has been noted that online learning is effective and similar to the conventional learning method. Furthermore, according to the assessment of students' performance and the knowledge gained through online learning, it can be concluded that this method is equivalent to face-to-face learning (14).

Online learning is one of several features of the digital transformation of education institutions. Online learning is an educational use of technological devices, equipment, and the internet (15). Utilizing the internet and several other important technologies to develop materials for educational purposes, instructional delivery, and program management (11). Although online learning relies on technological devices and the internet, teachers, and students with poor internet connections can hinder online learning. The dependence of online learning on technological tools and the provision of such tools is a major challenge for institutions, faculty, and students.

Online learning results from carefully designed instructional planning have been investigated for decades (16). However, for online learning to be effectively operational, it requires adopting content, methodology, pedagogy, and technology (17). Nowadays, about 61.9 % of students worldwide have felt the impact of higher learning institutions' closure by local governments due to the COVID-19 pandemic (18). This shows the unpreparedness exhibited by most learning institutions towards adjusting their teaching methods in case of emergencies (19).

Major and dramatic changes in learning occurred during the COVID-19 pandemic, resulting in some learning being disoriented. Students have lost the way of learning that they used before. Furthermore, the students are also faced with challenges in adapting to new circumstances, the unprecedented use

of technology in learning (20), the necessity for independent learning, and the lack of a learning structure (19). The continuing spread of COVID-19 and the closure of educational institutions in various countries have significantly impacted the students' education, social life, and mental health (21).

Online learning is still being carried out in Indonesia today. Even though the public university is usually located in the capital city, students come from various regions with different economic backgrounds and regional conditions, affecting access to online learning. Various studies have shown online learning to have an impact on students. Many studies have explored the impacts of online learning on students' psychology. However, this study identified the impacts caused by online learning, not only the psychological impact. Furthermore, this study explores how constraints impact students' participation in online learning. This study also aimed to investigate the correlation between constraints and the psychological, physical, and social impacts of online learning on students.

## METHODS

### Study Design and Samples

This study used quantitative research with a cross-sectional design. This study used a survey questionnaire and hypotheses to explain the relationship between the constraints and impacts of online learning. The sample was taken from one public university student aged between 18 to 24 years using a non-probability technique with snowball sampling. The number of samples in this study was 407 respondents who conducted online learning for at least one semester. Data collection was carried out in July-August 2021 using a questionnaire through an online survey. The method used questionnaires containing students' demographic data, constraints, and impacts of online learning.

### Variables

The independent variable was the constraints of online learning, while the dependent variable

was the impacts of online learning during the pandemic COVID-19 measured by questionnaire. The students who meet the inclusion criteria and fulfilled informed consent will be selected and followed in this study.

### Instrument and Data Analysis

The questionnaire was adopted from studies by Haider and Al-Salman (2020) (22) Jordanian universities switched to the online learning model as an alternative to traditional face-to-face education. The researchers designed a questionnaire that consists of two main sections; the first section included demographic information including gender, level/year, age, and cumulative average (GPA and Elmer et al. (2020) (23). Furthermore, it was modified that the validity and reliability tests were carried out. The questionnaire consisted of 16 questions including psychological, physical, and social impacts. The validity test results for each question on the impact questionnaire were regarded as valid, where each had a value of results  $> r$ -table (0.273). The Cronbach's alpha value was 0.922, making the reliability test result declared reliable. The answers to the questions always included often, sometimes, and never. The constraints students faced during online learning had 12 questions, which were answered using a Likert scale of 1-4. The validity test indicated that each question on the constraints questionnaire could be declared valid with a value of results  $> r$ -table (0.273). The reliability test results showed Cronbach's alpha value of 0.900, which increased its validity, and each question was rated with answers: always, often, sometimes, and never with the Likert scale of 1-4. The statistical test used Pearson correlation test.

### Ethical Approval

Respondents who participated completed the informed consent form before completing the online questionnaire. The research permit was obtained from the Health Research Ethics Commission of Padang Hospital with 215/KEPK/2021.

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**RESULTS**

Most respondents were between 19 and 20 years old, representing 236 people (58 %).

Furthermore, female participants were 333 people (81.8 %), while the remaining percentage was male. The other statistics involved 117 third-semester students (28.7 %) and the other 159 (39.1 %) with a GPA range of 3.51 - 37.5.

Table 1  
Frequency Distribution of Impacts and Constraints on Online Learning

No	Statements Impact Of Online Learning	Always	Often	Sometimes	Never
<b>Psychological Impact</b>					
1	Online learning at home makes me uncomfortable	51 (12.5 %)	155 (38.1 %)	169 (41.5 %)	32 (7.9 %)
2	The online learning method that is currently being applied makes me experience a decrease in learning motivation	81 (19.9 %)	175 (43 %)	126 (31 %)	25 (6.1 %)
3	I feel confused following the online learning method as it is currently being used	65 (16 %)	163 (40 %)	144 (35.4 %)	35 (8.6 %)
4	I feel like I don't have time to rest during online learning	30 (7.4 %)	104 (24.6 %)	186 (45.7 %)	87 (21.4 %)
5	The use of electronic tools to support online learning makes me bored	123 (30.2 %)	169 (41.5 %)	93 (22.9 %)	22 (5.4 %)
6	I feel that online learning has limited the emotional support I should get from those closest to me, such as family and friends	48 (11.8 %)	145 (35.6 %)	147 (36.1 %)	67 (16.5 %)
7	The use of gadgets/ laptops/mobiles during online learning makes it easy for me to divert my attention to other things outside of learning	111 (27.3 %)	177 (43.5 %)	101 (24.8 %)	18 (4.4 %)
8	I feel bored with the online learning method used today	120 (29.5 %)	152 (37.3 %)	108 (26.5 %)	27 (6.6 %)
<b>Social Impact</b>					
1	During online learning, I find it difficult to relax	28 (6.9 %)	113 (27.8 %)	197 (48.4 %)	69 (17 %)
2	During online learning, I feel socially isolated	70 (17.2 %)	146 (35.9 %)	141 (34.6 %)	50 (12.3 %)
3	Online learning makes me feel isolated from friendship	73 (17.9 %)	135 (33.2 %)	143 (35.1 %)	56 (13.8 %)
4	Current online learning has limited my interaction with the environment	87 (21.4 %)	168 (41.3 %)	105 (25.8 %)	47 (11.5 %)
<b>Physical Impact</b>					
1	I feel tired of following the online learning used during the COVID-19 pandemic	92 (22.6 %)	156 (38.3 %)	130 (31.9 %)	29 (7.1 %)
2	Online learning complicates me to concentrate on following lessons	111 (27.3 %)	179 (44 %)	95 (23.3 %)	22 (6.4 %)

*Continued on page S961...*

...continuation Table 1.

No	Statements	Always	Often	Sometimes	Never
<b>Impact Of Online Learning</b>					
<b>Psychological Impact</b>					
3	I feel that online learning that is currently being carried out is not physically healthy because it makes me experience physical complaints (for example, headaches, sore eyes, and others)	132 (32.4 %)	155 (38.1 %)	94 (23.1 %)	26 (6.4 %)
4	Online learning has made me difficult to sleep	55 (13.5 %)	117 (28.7 %)	157 (38.6 %)	78 (19.2 %)
<b>Learning Constraints</b>					
1	I am having financial problems (fulfilling internet quota) in participating in online learning	103 (25.3 %)	127 (31.2 %)	116 (28.5 %)	61 (15 %)
2	I have problems with internet access in participating in online learning	70 (17.2 %)	144 (35.4 %)	145 (35.6 %)	48 (11.8 %)
3	Lack of opportunity to ask and discuss during online learning	44 (10.8 %)	125 (30.7 %)	186 (45.7 %)	52 (12.8 %)
4	There is communication that is not smooth during the learning process with online learning methods	57 (14 %)	192 (47.2 %)	140 (34.4 %)	18 (4.4 %)
5	Difficulty understanding the lessons given during online learning	81 (19.9 %)	196 (48.2 %)	140 (34.4 %)	18 (4.4 %)
6	Lack of study time due to assignments piling up during online learning	91 (22.4 %)	172 (42.3 %)	108 (26.5 %)	36 (8.8 %)
7	I have problems with skills in using gadgets/laptops/mobiles that are used to support the online learning process	21 (5.2 %)	68 (16.7 %)	162 (39.8 %)	156 (38.3 %)
8	I have problems using online learning applications	13 (3.3 %)	56 (13.8 %)	182 (44.7 %)	156 (38.3 %)
9	I do not focus on participating in online learning	62 (15.2 %)	188 (46.2 %)	140 (34.4 %)	17 (14.2 %)
10	Environmental conditions interfere with me in doing online learning	62 (15.2 %)	134 (32.9 %)	164 (40.3 %)	47 (11.5 %)

Table 1 shows the impacts and constraints of online learning experienced by students during the COVID-19 pandemic. 169 respondents claimed that online learning at home makes them uncomfortable (41.5 %). The impacts of online learning consist of psychological, social, and physical impacts. It is known that 175 respondents (43 %) stated that they mainly experienced decreased motivation during online learning, and 163 respondents (40 %) claimed

that they experienced a lack of concentration while performing online learning. Also, 152 respondents (37.35) reported that they mostly felt bored with the new learning methods, while 145 respondents (35.6 %) felt having limited emotional support. The social impact of online learning had also been reported by students, where 168 respondents (41.3 %) stated that online learning often limited student interaction socially with the surrounding environment and 146

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respondents (35.9%) reported experiencing social isolation during online learning. Furthermore, from the physical impact of online learning, it is known that 156 respondents (38.3%) often felt tired from participating in online learning, 179 respondents (44%) often had difficulty concentrating in following lessons, and 155 respondents (38.1%) stated that online learning was currently being carried out usually caused physical complaints like headaches, sore eyes, etc.

Meanwhile, online learning obstacles that students often experienced included problems with internet access in participating in online learning, which was reported by 144 respondents (35.4%), 192 respondents (47.2%) complained of poor communication during the learning process, 196 respondents (48.2%) complained on the difficulty to understand the lessons given during online learning and 188 respondents (46.2%) did not focus on participating online learning.

Table 2  
Frequency Distribution of Constraints and Impacts on Online Learning

Variable	Min- Max	Mean	SD	95 % CI
Impact of Online Learning	16 - 64	37.5	9.6	36.56 - 38.44
Impact of Psychological Learning	8 - 32	18.63	4.9	18.15 - 9.11
Impact of Physical Learning	4 - 16	9.9	10	9.61 - 10.18
Impact of Social Learning	4 - 16	8.97	2.7	8.71 - 9.24
Constraints of Online Learning	11 - 40	25.1	5.3	24.57 - 25.61

Table 2 shows the frequency distribution of the constraints and impacts experienced by students during online learning. The mean value for learning impact is 37.5 (SD = 9.6),

with a minimum and maximum weight of 16-64. Meanwhile, the mean value for online learning constraints is 25.1 (SD = 5.3), with a minimum and maximum value of 11-40.

Table 3  
Analysis of Correlation Tests between Constraints and Impacts on Online Learning

	Total Impact	Psychological Learning	Physical Learning Impact	Social Learning Impact	Learning Obstacles Impact
Total Impact	1				
Impact of Psychological Learning	0.954	1			
Impact of Physical Learning	0.842	0.683	1		
Impact of Social Learning	0.915	0.840	0.673	1	
Learning Constraints	0.669	0.669	0.510	0.615	1

Note: All correlations were significant at  $p < 0.05$

Table 3 shows the correlation test between constraints and the impacts of online learning. The relationship between the constraints and impact of online learning was examined using the Pearson correlation test. Based on the results of statistical tests, it is known that there was a

correlation between the constraints and impacts of online learning with a  $p$ -value = 0.0001, and there is a strong positive correlation between the obstacles and impacts of online learning with  $r = 0.67$ . This means that the greater the learning constraints, the greater the impact of online

learning. Furthermore, the Pearson correlation test was carried out on the constraints with each domain of the impact of online learning. The statistical test results showed a correlation between the constraints and psychological impact of online learning ( $p$ -value = 0.0001,  $r$  = 0.67), the physical constraints and impacts of online learning ( $p$ -value = 0.0001,  $r$  = 0.51) and the constraints and social impacts of online learning ( $p$ -value = 0.0001,  $r$  = 0.62).

## DISCUSSION

As a result of the COVID-19 pandemic, most institutions worldwide were forced to switch from conventional to online learning (9,10). The sudden change from face-to-face to online created a complex constraint for students accustomed to physical learning (24). The constraints caused by online learning have affected the performance of students. The results showed a correlation between limitations and the impact of online learning. Furthermore, the correlation test conducted on each domain regarding implications for online learning also shows significant psychological, social, and physical impacts on students who participated in online learning.

In this study, online learning constraints were associated with access to the internet, difficulty understanding material, poor communication, decreased focus during learning, and a lack of support for online learning. Moreover, it was found that 35.4 % of respondents often experienced problems with internet access while participating in online learning. Access to the internet is one of the problems most reported by students during learning. It is known that studies on online learning in developing countries have shown that online learning problems are concentrated on limited access to devices and the internet (25). Indonesia is one of the developing countries with internet connections that are not evenly distributed in various regions, and complaints about internet access are often reported in online learning.

In this study, the environment is also one of the problems in online learning. A total of 163 respondents (40.3 %) complained that the environment sometimes interfered with online

learning. In several studies, students reported that their home was an environment that could interfere the online learning and was vulnerable to being disturbed by roommates or family members (26-28). In a study conducted by Realyvásquez-Vargas et al. (2020) (29), it was found that environmental factors contributed significantly to student academic achievement during online learning amid the COVID-19 pandemic situation.

Furthermore, 43.5 % of respondents mentioned that several technologies such as gadgets, laptops, and mobile phones often turn students' attention to other things outside of learning. In addition, the use of media such as gadgets and laptops make students experience a decrease in focus during online learning. Such problems are associated with difficulties in students' focus and concentration while studying (14,28). The difficulty of focusing during online learning was also reported to be one of the constraints in this study. It was known that 46.2 % of respondents often experienced a decrease in focus during online learning. The decreased focus during learning can be a barrier to gaining knowledge by participating in online learning (30). It can be seen in this study that as many as 196 respondents (48.2 %) often had difficulty understanding lessons during online learning, thereby becoming a constraint in optimizing the learning method.

This current study found that communication in online learning becomes a constraint during online learning. A total number of 47.2 % of respondents often complained of poor communication during the online learning process. The purpose of communication in online learning is the same as face-to-face learning, to form bonds and exchange information between lecturers and students. When lecturers communicate with students, either in face-to-face or online classes, they are communicating to provide knowledge or information so that the students gain understanding. However, communication was indicated as a constraint in distance learning, which should be addressed to exchange information between students and lecturers effectively (31).

Physical distancing was imposed to reduce the spread of the COVID-19 pandemic. However, it has exposed students to academic stress, leading

to mental illnesses among students (32,33). This research showed that students had been affected psychologically, physically, and socially. The results indicated about 41.5 % of respondents sometimes feel uncomfortable with online learning. According to respondents, online learning creates uncomfortable conditions, leading to high anxiety levels such as confusion and frustration (6). It also showed that 163 respondents (40 %) often felt confused following the online learning methods. Therefore, a good match between technological design and student psychology components is required in online learning. A lack of solid policies in the learning process can be a constraint in the education sector (6).

During online learning about 43 % of respondents often experienced decreased learning motivation. Research conducted by Tan in 2021 also showed that online learning during the COVID-19 pandemic made it difficult for students to concentrate and experienced a decrease in learning motivation (34). Several other studies stated that most students experienced a decrease in learning motivation during online learning. Harandi in 2015 showed a correlation between online learning and motivation. It is known that learning motivation is influenced by how the class takes place, whether physically or virtually (35).

Using electronic devices to support online learning for such a long time causes boredom. It can be seen that 41.5 % of respondents often experienced boredom while learning online. Boredom is considered an emotion that is perceived in the academic environment. According to Finkielstein, in 2020 (36), 40 % to 59 % of students feel bored while online classes. Academic boredom is a condition related to an educational context (specifically during the classroom or learning-related activities), usually described as a transient psychophysiological response to a less meaningful educational situation (37,38).

The impact of learning from the social aspect can be seen in 35.9 % of respondents who felt socially isolated during online learning. This study also showed that 38.3 % of respondents reported that online learning that was currently being carried out had limited student interaction with the surrounding environment. Furthermore,

students felt less connected with their lecturers and friends during online learning than during face-to-face learning. Boling et al., in 2012 observed that most students describe online learning as a unique teaching method with limited interaction (39). Previous research has highlighted the lack of social contact and feelings of isolation during lockdown (40-42). The previous study has highlighted the lack of social contact and feelings of isolation during lockdown (40-42). This showed that students would feel less connected to the academic community than when involved in classroom learning (28,40,41). Social theory strongly emphasizes the importance of peer interaction and the interaction between students and lecturers at learning centers (43). This finding confirmed the significance of social interactions and communication mechanisms necessary for an effective online learning system (44,45).

The impact of learning from the physical dimension was seen in as many as 38.3 % of respondents who felt tired of taking part in online learning during the COVID-19 pandemic. Moreover, 38.1 % of respondents complained that online learning is not carried out healthily, resulting in headaches, sore eyes, and others. It is known that online learning has caused health problems for students due to the many tasks that must be done and the use of laptops/computers or cell phones for a prolonged period.

## CONCLUSION

This study provides an overview of the constraints and impacts of online learning. The constraints and impacts of online learning due to online learning itself must be a concern. Due to the uncertainty caused by the COVID-19 pandemic, it is essential to ensure the design of appropriate teaching methods that best fit the current situation. Conclusively, online learning has been excessively effective despite constraints brought about by the COVID-19 pandemic. During this pandemic, the education sector has heavily invested in technological advancement to avoid the changing academic schedule. This research has clearly outlined the correlation between constraints and impacts caused by online



learning. Therefore, there is a need to employ education strategies to overcome constraints and optimize online learning.

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