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Research Article

Virtual Learning During The COVID-19 Pandemic, A Disruptive Technology In Higher Education In Indonesia

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ABSTRACT

Purpose. This study aims to determine the problems faced by universities in Indonesia, during the COVID-19 pandemic. And also, to identify the most widely used learning platforms, the constraints and to prefer solutions to them.

Methodology. The qualitative-descriptive methodology used was NVivo 12 software. Furthermore, the purposive sampling technique was utilized, consisting of 40 universities in Indonesia with 200 participants. The data were collected through Focus Group Discussions, conducted virtually on Zoom and Google Meet. The questions ranged from the experiences of the lecturers while using the online teaching programs, to the types of platform used, the challenges faced, and the solutions provided.

Results. The data were obtained from 16 online learning media platforms, namely Whatsapp, Zoom, Google Meets, Edmodo, Google Classroom, Video Call, Email, E-learning, Webex, Facebook, Schoology, Padlet, Microsoft Team, Moodle, Blog, and Youtube. The most used platform was WhatsApp with 51 users, i.e., 25.5%, followed by Zoom meeting 44 (22.0%), Google Classroom 29 (1.5%), Google Meets 28 (14.0%), Email 18 (9.0%), E-learning 12 (6.0%), Youtube 4 (2.0%), Microsoft Teams 3 (1.5%), Facebook, Voice / Video Call, Webex with 1.0% each, and Blog, Edmodo, Moodle Padlet had 0.5% each. The problems encountered were an unstable signal, limited data quota, and weak internet connection.

Conclusion: The biggest online learning platform during the pandemic was Whatsapp because it was the easiest to access and operate. The problem most faced was an unstable signal, especially in mountainous areas. The solution to this, is that the government needs to ensure that students have access to the best teaching and learning, fast internet, and increase the network to villages. Moreover, they should also establish good cooperation between the central and local government, and provide human resources for virtual learning.

Keywords: Virtual learning, COVID-19 Pandemic, E-learning platform, Disruptive technology, Higher education

INTRODUCTION

The Novel Coronavirus 2019 disease also known as COVID-19, is a new and mysterious infection, which originated from Wuhan, China. Initially, it was considered as pneumonia with unknown etiology, however after much studies, the cause was announced by the Chinese Disease Control and Prevention (China CDC) on January 8, 2020. Subsequently, the virus became more widespread, and, on January 31, 2020, the World Health Organization (WHO) announced it, as a public health emergency and is at high risk of international attention. Globally, this disease has a rapid spread rate, to the extent that, on March 11, 2020, WHO declared it a pandemic after spreading to 114 countries. (C. Pramana et al., 2020; WHO, 2020a, 2020b)

In Indonesia, the first case was discovered on March 2, 2020, which continuously increase daily, and presently (14 December 2020) there have been 623,309 confirmed cases and 18,956 morbidities (Worldometer, 2020). With these increasing number, it has created new problems in all sectors of life, including health, economy, socio-culture, and education.

Moreover, considering that a vaccine has not been found, the only effort, therefore, is to curb further spread through preventive measures. One of the effective methods to achieve this is by observing social and physical distancing. (Nanotkar et al., 2020; Wiersinga et al., 2020) Physically closing educational institutions (schools and universities) has proven to be an efficient method in minimizing the spread, although it poses many challenges for students, teachers, families, and communities (Aristovnik et al., 2020; Owusu-Fordjour et al., 2020).

Social and physical distancing policies are non-pharmacological interventions, which require a virtual learning process in all parts of the world including Indonesia. This is to support and play an active role in breaking the chain of COVID-19 spread. Moreover, social distancing is a method of minimizing crowd interactions, prevent the spread of the disease (Nanotkar et al., 2020; Prem et al., 2020).

Based on the Circular, i.e., Number 4 of 2020, from the Minister of Education and Culture of the Republic of Indonesia, concerning the Implementation of Education in the Emergency Period of COVID-19, contains policies in the form of requests to learn from home via the internet. The call for the implementation of the online learning process, during the COVID-19 pandemic, is the beginning of a change in the teaching of all schools and colleges in Indonesia.

This governmental policy has an impact on the curriculum that is applied during a pandemic. (Mendikbud, 2020) Sadikin's research (2020) showed that online learning has flexibility in its implementation, and can encourage the emergence of social distancing behaviour and minimize the gathering of students. Therefore, it is expected to reduce the potential spread of COVID 19 on campus (Sadikin & Hamidah, 2020).

Furthermore, the change of curriculum for online teaching and learning activities were made quickly without prior preparation. The applications and platforms used during the pandemic ranged from learning management systems to additional resources, for carrying out online teaching (Atmojo & Nugroho, 2020). This certainly creates many challenges, especially for students and lecturers in various universities in the country. The preparation of a revised curriculum with various online learning innovations for each educational institution, while maintaining the quality of learning is paramount. Furthermore, different challenges and problems arise due to the diverse geographical conditions of the Republic of Indonesia. This includes limitations in accessing the internet network, according to the demands of learning during the COVID-19 pandemic.

This manuscript was written to convey various distance learning methods between lecturers and students with all the encountered challenges. Therefore, this article is considered as a solution to the various problems of information technology.

METHODOLOGY

The purposive sampling technique was used, consisting of 40 universities in Indonesia with 200 participants. The data were collected through Focus Group Discussions, conducted virtually via Zoom and Google Meet, to obtain the necessary information, the form of opinions and learning experiences during the COVID-19 pandemic. This included, the experiences by lecturers using online learning process, as well as the type of platform used, the obstacles faced, and the solutions provided. The survey data were analyzed descriptively and qualitatively using NVivo 12 software.

RESULTS

The results of the virtual learning (due to the COVID-19 Pandemic) survey, conducted in 40 universities in Indonesia is shown in the table below:

Table 1. Types of Online Learning Platforms in Indonesian Universities

No	Institution	Virtual learning categories			
		Virtual meeting	Online class	Media Sharing Networks	Messenger
1	University State of Surabaya	3	1		1
2	STAI Kupang. NTT				2
3	STFT GKI IS Kijne Jayapura				1
4	Musi Rawas University, Palembang	1	1	1	2
5	University PGRI Semarang	2	2		3
6	Polytechnic Indonusa Surakarta	3	2	1	3
7	STIKES Guna Bangsa Yogyakarta	1			1
8	Tadulako University, Palu	3	1		1
9	Immanuel Christian University Yogyakarta	2			2
10	University. Prof. DR. Hazairin, SH Bengkulu.	1	2	1	2
11	IAIN Metro Lampung	3	2		2
12	Sultan Agung Islamic University Semarang	2			1
13	Trisakti University Jakarta	1			1
14	Tarumanagara University Jakarta	1			1
15	Bogor Agricultural Institute	2	1		1
16	Halu Oleo Kendari University	1	3		2
17	Serambi Mekkah University, Aceh	2	1		1
18	Tompotika Luwuk Banggai University	1	1		1
19	Muhammadiyah University of Palu	2			1
20	Lambung Mangkurat University Banjarmasin		2		1
21	Ngudi Waluyo Ungaran University Semarang	2	2		1
22	Diponegoro University Semarang	3	5		2
23	UIN Sunan Ampel Surabaya	2			2
24	Respati University Yogyakarta	2	2		2
25	STIKES Mitra Ria Husaha Jakarta	2	1		2
26	STIKES Mataram Lombok	1	1		2
27	YARSI University Jakarta	2	1		2
28	STIKES Medistra Indonesia Bekasi	3	1		2
29	STT BNKP Sundermann Pulau Nias	1	1		1
30	Cirebon Maritime Academy	1			1
31	Muhammadiyah University. Prof. Dr. Hamka Jakarta	2	3		2
32	Sebelas Maret University Surakarta	2	1	1	4
33	Maharaswati University Bali	2	1	1	1
34	Metro Lampung University	3	1		2
35	Dian Nuswantoro University Semarang	3	1		2
36	IKIP PGRI Pontianak	3			1
37	Islamic State University Surakarta	2	1		2
38	State University of Jakarta	2	1		3
39	Jakarta College of Statistics	2	3		2
40	Duta Bangsa University Surakarta	2	3		2
Total		73	48	5	68
Percentage (%)		36.5	24.0	2.5	34.0

There are four categories of virtual learning in the 40 universities in Indonesia, namely virtual meetings, online classes, media sharing networks and messengers. The most widely used was virtual meetings at 36.5%.

Table 2. Percentage of virtual learning platform usage

Virtual learning categories	Platform Type	Frequency	Percentage (%)
Virtual meeting	Zoom meeting	44	22.0
	Google Meets	28	14.0
	Video Call	2	1.0
	Webex	2	1.0
Online Class	Edmodo	1	0.5
	Google Classroom	29	14.5
	E-learning	12	6.0
	Schoology	1	0.5
	Moodle	1	0.5
	Microsoft Teams	3	1.5
Media Sharing Networks	Youtube	4	2.0
	Padlet	1	0.5
	Blog	1	0.5
Messenger	WhatsApp	51	25.5
	Email	18	9.0
	Facebook group	2	1.0
Total		200	100.0

Based on a questionnaire distributed using google form with feedback from 200 lecturers as sampling respondents, data was obtained on the use of online learning media platforms using 16 types. The WhatsApp platform ranked the most used by lecturers and students, with 51 users, i.e., 25.5% of respondents sampled data.

Table 3. Constraints in virtual learning

No.	Constraints in Virtual Learning
1	Unstable signal
2	limited data quota
3	Passive student
4	Lack support on-campus servers
5	Low internet connection
6	The application does not support
7	Lecturers are less updated about IT
8	Time sync difficulty
9	The electricity turns off suddenly
10	Low student literacy

According to the data, there were 10 challenges faced in the online learning process, which originated from students, lecturers, and other supporting facilities and infrastructure. Unstable signals and weak internet connections in several regions in Indonesia made it difficult for students and lecturers to access designated platforms.

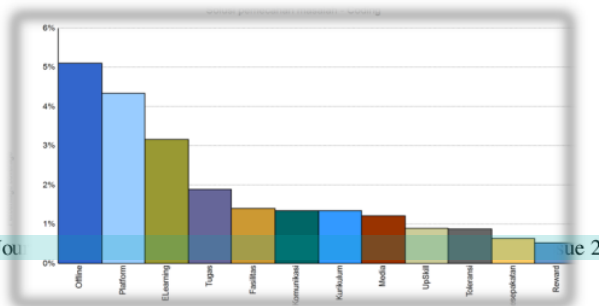


Fig. 1: Coding problem-solving solutions
Table 4. Description of problem-solving solutions

No	Solution	Description	Percentage
1	Offline	Conducting face-to-face (offline) learning, while adhering to health protocols.	5.10%
2	Platform	Using a platform that is economical and easy to access	4.34%
3	eLearning	Each institution has a Learning Management System (LMS)	3.16%
4	Task	Do not overload students with assignments, while tasks are replaceable with literature reviews.	1.88%
5	Facilities	Collaboration with internet quota providers. The institution facilitates the quota requirements for lecturers and students.	1.40%
6	Communication	Conducting a more intense discussion with students, and always reminding students of class schedules.	1.35%
7	Curriculum	Revising the curriculum with an online assessment system, and making it simpler.	1.34%
8	Media	Creating interesting learning media (in the form of videos, ppt, etc.).	1.22%
9	Upskill	Attend learning technology training and online learning assistance. The lecturer made online media for practicum.	0.89%
10	Tolerance	Taking into account the condition of students by maximizing the value of B, and minimizing the that of C or E.	0.89%
11	Agreement	Agree with teaching and learning time. Performing a time contract before the guidance process.	0.63%
12	Reward	Giving appreciation to students that have successfully overcome challenges in each meeting. As well as good marks to those that are actively learning online.	0.53%

There were several solutions obtained from the results of the FGD, most of the lecturers suggested returning to physical lectures, while still paying attention to the health protocols.

DISCUSSION

During the Covid-19 pandemic, almost all human activities including the educational sector were restricted to prevent infection transmission. Physical and social distancing are effective ways to reduce transmission. Due to the increasingly advanced information and communication technology, the implementation of the teaching and learning process was not hampered, especially in universities in Indonesia. Many learning platforms were utilized, depending on the available resources. Remote learning was

performed by using the internet for effective and efficient teaching and learning activities. The huge and sudden change in education due to the spread of COVID-19 has transformed the global learning model to online teaching and learning methods, therefore, many e-learning platforms that exist are relevant and more futuristic. They are adapted to the technology that needs to be used in each institution to support the learning process in higher education. (Giorgi Basilaia, Marine Dgebuadze, Mikheil Kantaria, 2020; Nanotkar et al., 2020; Cipta Pramana, 2020; Prem et al., 2020)

Unlike Indonesia, before the emergence of the COVID-19 pandemic, many new devices were always in use in education and training in California, United States. Group chat applications

such as WhatsApp and Facebook are mainly used ⁹ by many trainees for medical knowledge sharing and collaboration. (Almarzooq et al., 2020; Kochar et al., 2018) In the COVID-19 pandemic, innovative solutions were an urgent need to optimize education efforts, therefore many e-learning platforms with new technologies such as Zoom (Zoom, San Jose, California) and Slack (Slack Technologies, San Francisco, CA) were developed. (Vela, 2018)

Based on this study's results, the WhatsApp Platform ranked the highest application used by lecturers and students for virtual learning, namely, 51 users or 25.5% of respondents that were taken as data samples. This supports the research conducted by Sahidi ¹⁵ and Prarasto (2019) which explained that WhatsApp has a feature to save documents in the form of PDF, Microsoft Word, Excel, and PowerPoint, therefore, sharing documents in the formats above is easier. Furthermore, WhatsApp also forwards messages, facilitating the students to share with other friends. An example of its application is when a student has a material that has been summarized or recorded during learning, it is shared easily with other students that need these notes by using the forward feature. The research by (Sahidillah & Miftahurrisq, 2019) was conducted in Ghana on social media platform preferences among 467 students, listing the platforms used for online learning during the Covid-19 pandemic. The majority chose WhatsApp (n = 236; 50.5%), Google meetings (n = 85; 18.2%) and Zoom (n = 82; 17.6%) and some others use YouTube and Facebook. (Agormedah et al., 2020) however, studies in Italy, Japan, the United States, and China had shown that the most used e-learning platform was Zoom meetings. (Mola, 2020)

The constraints in the ability to learn with various platforms are different for each campus. Although, technology advances the community, using it on different learning platforms in various campuses in Indonesia faces several challenges.

In this research, the emerging problem is an unstable signal and a weak internet connection in several regions in the country. This contributes to the challenges faced by students and lecturers in accessing predefined platforms. This is due to differences in geographic location and regional conditions. Adaptation to the use of online learning platforms is also one of the obstacles in determining the type of platform used. Because the type of application chosen is always based on the lecturer and student expertise in technology.

According to the research by Rita Ambarwati et al, the factors related to the use of the Online Platform are resource availability including supporting infrastructure (internet access, ability in

using mobile devices, and ¹¹ sizes that affect internet speed). User factors are closely related to the general condition of communities in Indonesia that are relatively unfamiliar with new technology. Therefore, ²³ is necessary to introduce and socialize the use of Information and Communication Technology in online learning (Ambarwati et al., 2020)

An inappropriate platform used as a learning medium for certain materials tends to cause the students to become passive, low literacy, and difficulty in synchronizing time. This supports the research conducted by Annur, that the students faced technical difficulties, adaptation issues, and lecturers' unpreparedness. Technical problems are also an obstacle in the learning process, these include limited data quota, unsupported campus servers and applications, as well as electricity that sometimes goes out suddenly. (Annur, 2020) Meanwhile, other studies ¹⁴ stated that a lack of preparation and planning also contributed to the problems in the online learning process. (Atmojo & Nugroho, 2020)

A research survey by Kenneth Wilson Adjei Budu of 237 respondents consisting of; the school's management members, faculty members, a staff of the Technology, Information and Communications department and students from five higher institutions in Ghana. It was concluded ³⁰ that individual behavior and motivation affect the use of the e-learning platform system (Budu et al., 2018)

Furthermore, the data quota for students and lecturers is limited and the applications used are not supported by several cellphones, and this affects the type of platform to be used. Moreover, the campus servers do not support the needs of all the courses and the electricity is unstable. (Annur, 2020)

Other previous studies have shown that the main problems in online learning are due to some learning contents that are incompatible with e-learning, which are students' weak independent learning abilities, and poor student habits in online learning. The ³ second category of the problem includes poor network speed and stability, imperfect functioning of the teaching platform, and poor classroom teaching sequences (such as unrelated group class problems, etc.)". Thirdly, these problems include Insufficient student participation, E-teaching resources for support courses, learning room environment and terminal equipment support for students. The fourth main problems include insufficient support for the environment and ³ teaching room equipment, inadequate support for online technical services, unskilled student teaching platforms and tools, teaching evaluation

methods, strategies, and methods ³ are not suitable for online instruction, teachers unskilled in teaching platforms and tools. The fifth challenge includes the no course assistants or insufficient quantity, insufficient school policy support for online instruction, and teacher's attitudes and enthusiasm in teaching. (Chang & Fang, 2020)

However, several solutions have been proffered from this research and most of them are the lecturers suggesting that they return to physical lectures in addition to the online learning platform to overcome the obstacles faced during online lectures, while still paying attention to health protocols during the pandemic. Furthermore, the solution offered to overcome quota constraints is choosing a learning platform that is quota-efficient and easily accessible to students. Each institution is also expected to have an e-learning platform to make it easier for lecturers to prepare an inventory on learning outcomes.

¹³
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The authors do not have any conflicts of interest.

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Ethical Approval
Not applicable

CONCLUSION

Social and physical distancing policies as preventive measures ¹⁴ against the COVID-19 pandemic require that the learning process in Indonesia be carried out online. The e-learning process has an impact on ¹² curriculum implementation during the pandemic. Based on the data analysis, it was observed that the most widely used platform was WhatsApp since it is easily used in sharing messages, learning, and studying documents. The obstacles faced during the virtual learning process include 1) internet connection problems, 2) adaptation to the use of online learning platforms and 3) technical problems. To solve these problems, a combination of online and physical learning is to be effected, while adhering to health protocols. Furthermore, the solution offered to overcome the constraints includes choosing a learning platform that is quota-efficient and easily accessible to students. Each institution is also expected to have an e-learning platform that is appropriate to the conditions of the school, to facilitate lecturers in the teaching process, as well as taking the inventory of learning outcomes.

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