Online Learning in the Time of Crisis

Technologization of Higher Education During Covid-19 Pandemic

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Abstract. The spread of the Covid-19 Pandemic, which has moved educational spaces from campus to home, has forced the reorientation of the teaching and learning process from lecturer-oriented to technology-oriented. Educational technologization is becoming a new chapter in the relationship between lecturers and students due to physical and social distancing policies. This paper aims to show the effect of using technology on the relationship between lecturers and students, besides testing whether educational transformation, as shown by various studies, is successfully placing students as active and independent learners. The study used a qualitative method, which was conducted at a university in the city of Malang, Indonesia. Respondents who were involved in collecting interview data included lecturers and students. Data collection used google forms and online interviews via WA and Zoom. Research findings show that online learning policies have given birth to psychological stress for lecturers and students, not by accessibility and technological literacy factors, but by the mental barrier for lecturers and students. Technology has been perceived as a process that takes the rights and authority of lecturers in transferring knowledge to students. At the same time, students do not have the awareness and mental readiness to take an active position and be independent in the learning process. Technology has not been a possible possibility for the convenience and advancement of education.

Keywords: Online Learning · Higher Education · Technologization in Education · Mental Barrier · Lecturer–Student Relations

1 Introduction

The COVID-19 pandemic has shifted the learning process in universities from personal to instrumental. The learning process conducted in a face-to-face meeting between lecturers and students is now done online, and the distance between students and lecturers is in their respective places of residence. The COVID-19 pandemic has plagued various parts of the world, including Indonesia. Social policy Distancing and locking are a must for plagued countries with COVID-19, along with the closure of several companies, airports, ports, and education institutions. Universities, as educational institutions, must continue the process of learning. However, they must follow and obey the government

policies on social distancing to suppress the spread of COVID-19 and break the chain of transmission. Online learning with technology media is the only way to respond to the learning process's pace continuously. Obstacles and difficulties are inevitable for lecturers and students in this online learning process. Constraints from the aspect of technology, media, material content, evaluations, signals, and others have been experienced by them. In other words, being technologically literate and connected to the internet has become necessary in learning during the COVID-19 pandemic.

Existing research so far views that information and communication technology has rapidly changed various aspects of human life; one of them is emerging online businesses [1–3]. Technology is also seen as a medium that provides many conveniences, as indicated that technology is used as a medium of learning that can facilitate students in understanding subjects [4–6]. Other studies say that in the era of the industrial revolution 4.0, there are challenges for the world of education to develop technology-based learning methods and strategies [7]. In line with that, Yaumi emphasized the importance of applying information technology in learning can cover various aspects, including the development of visual teaching materials, ICT integration, social media integration, blended learning, or combining learning resources traditional and online, and ICT-based distance learning [8]. Riyana added that learning could be done flexibly and without any bounds using technology at any time and place [9].

This paper intends to show that online learning with technology, media, information, and communication has caused many problems experienced by lecturers and students, including hardware and software problems, conditions, and readiness. To answer this problem, three statements are formulated: a) technology used in online learning; b) Internet accessibility by students in online learning; c) obstacles experienced during online learning.

This research is based on the argument that the COVID-19 pandemic has required learning to be done online. So far, e-learning has brought many conveniences, especially in the era of industry 4.0. On the other hand, learning through information technology raises not a few difficulties and obstacles experienced by lecturers and students. Along with that, the change in learning practices from personal to instrumental has demanded the proficiency of the lecturers and students to master technology and apply it so that learning is more creative and maximum.

2 Literature Review

2.1 Online Learning

Online learning is one of the learning methods supported by advanced technology that is ever-evolving over time. According to Marbun [10], the designations of working from home, teaching from home, and studying at home are often heard by the community because of the new provisions from the government to carry out all online teaching and learning activities from home [10]. At the beginning of its development, online learning experienced many problems with its users. There are various factors that obstacle online learning in learning for children with special needs, including 1) School unpreparedness, especially teachers in the continuity of online learning, 2) Many parents who have not mastered technology well, 3) An unsupportive environment in an online learning system

for children with special needs [11]. In line with that, Nurdin & Anhusadar revealed in the results of their research on Early Child Education Programs (PAUD) that many teachers have not mastered the applications used in online learning well, and not all parents have media for learning, such as laptops and cellphones that make learning less effective [12]. Therefore, Irawati & Jonathan said that the things that need to be improved and redeveloped in general are related to the integrity of the teacher or lecturer in creating a teaching-learning space virtual well, understanding the use of platforms/media used in the system learning, providing motivation to increase enthusiasm for learning, and understanding the various difficulties experienced by students during the online learning process [13].

At the beginning of its development, the online learning system was divided into two kinds: asynchronous and synchronous learning. Susanti & Estherina said that asynchronous learning is a flexible learning system, without limitations of space and time, with guidance material given by the teacher by using several media such as google classroom or email [14]. At the same time, synchronous learning is a learning system that is implemented in real-time and at the same time. It can be done with offline learning or through media such as zoom and video conferencing [15]. As time goes by, the learning system grows, and a new learning system is called blended learning. It is a learning system that collaborates synchronous learning and asynchronous learning. Mamahit revealed in his research that the results of distance learning with a blended learning system could achieve better learning outcomes in Digital Electronics classes [15]. In line with this, Susanti also revealed in their research that learning with the blended learning system in 5th-grade elementary school students significantly impacts its results [14]. Purnama emphasized that the blended learning system will be more effective and efficient, with four stages to achieve optimal learning, including 1) Asynchronous presentation of material in the form of a file before learning begins, 2) Asynchronous discussion and consultation such as discussion forums, 3) Procurement of elaboration or practice processes, 4) Learning evaluation processes in the form of quizzes, written or oral tests, mid-term and final exams to find out the quality of students' understanding toward the material that has been given and available in the media learning used [16].

2.2 Online Learning During the COVID-19 Pandemic

With the spread of the covid-19 outbreak around the world and government regulations to stay at home as long as the situation has not improved, online learning is the solution for continuing teaching and learning activities, even from their respective homes. According to Irawati, this online learning solution is one way to reduce the spread of Covid-19, especially in Indonesia, as in schools and colleges [13]. In line with that, Prasetya & Harjanto mentioned that online learning could substitute for the previous offline system because students can open learning information anywhere and anytime without space and time limits [17]. Students can access as many learning resources as they need to support the learning materials. However, learning style is also one thing that affects learning outcomes. In his research, Anggrawan revealed that students who excel in online learning are students with auditory and visual learning and kinesthetic learning styles; they have no difference between online and offline learning [18].

Learning media during the pandemic has also developed over time. A number of these applications are Zoom, Google Classroom, and Discard. According to Ismawati [19], learning through the Zoom application can make it easier for educators to effectively channel learning materials to students. Learning through Zoom is also more effective because it provides a place for interaction between fellow students and lecturers [20]. Besides the zoom application, Munasti also confirmed that the use of PowerPoint in online learning is also practical because 1) the use of PowerPoint can improve student learning motivation, 2) Reduce boredom of students, 3) Increase enthusiasm for student learning, 4) Make it easier for students to remember the material that has been given[19]. Another alternative application that can be used is discord, which is enjoyable, relaxing, and fun, with present features that encourage users to be more active and communicative [20]. Therefore, Purnama said that the applications above are the medium for the source of learning materials, discussion, and consultation with teachers by utilizing the features available in the application [16].

2.3 Learning Technologies

In an era that is increasingly advanced over time, it is not only information that we can get electronically, but learning resources are almost entirely accessible through the hand too. According to Marbun, a learning system based on technology information and communication existed before the Covid-19 outbreak, and several institutions performed well. In addition, there are several things to support learning with this system, including 1) Adequate infrastructure, 2) A good support system from the school or campus, 3) the ability of teachers to understand and use ICT, 4) Improvement of appropriate content, 5) Willingness to pay for ICT [10]. Information technology and today's communication also function as a medium to communicate and disseminate knowledge information in higher education institutions [21]. Correspondingly, Kozlova & Pikhart suggest that the emergence of ICT brings influence and significant changes in aspects of human life, the meeting, communication, and interaction, to create a community [22].

There are many distributions in learning technology in its development, one of which is e-learning. E-learning emerged as one of the innovations in learning technology by virtualizing teaching materials as attractive as possible so that students can research, replicate, and project existing assignments comfortably [23]. In line with that, [22] Kozlava said that e-learning is a learning system that is integrated by technology, which is divided into 4: 1) Elearning 1.0 is technology-integrated learning with transfer features information between teachers and students in a unidirectional manner, 2) Elearning 2.0 is learning with a creative transfer of knowledge through blogs or podcasts, 3) Elearning 3.0 seen by exploring various information formats (image, text, audio) and providing feedback and recommendations for user-friendly educational content, 4) Elearning 4.0 is the collaboration of various technologies in the learning infrastructure. Prasetya [17] also emphasized that e-learning provides features for students to control the content, systems learning, and the learning rate to achieve learning objectives. Besides e-learning, there is another technology called e-journal, a management system and publication of scientific papers electronically/online, which functions to replace the previous system, which is printed [24]. Moreover, another technology currently developing is mobile learning, a learning application that can be downloaded on a smartphone and learned more easily

and freely. One of the existing applications is applications for foreign language learning [25].

3   Method

This study uses a qualitative descriptive approach based on the research location at universities in Malang, East Java, Indonesia. The forced online learning system has resulted in many educational failures and the unpreparedness of the perpetrators in learning from managers, lecturers, and students. Online-based learning is already widely practiced at the university level. However, it is still limited as a medium and strategy of learning, as a companion to the learning process, not as a paradigm yet. So far, learning at the university level is still face-to-face in delivering the material.

The interview was conducted through technological media through zoom and video applications. Sources of data that were interviewed consisted of 7 lecturers and 50 students. Lecturers from different faculties were interviewed regarding using applications in the teaching process and conducting evaluations and final assignment guidance related to the obstacles it faces. Students from various faculties were interviewed to obtain information related to the obstacles experienced by students in their online learning experience from their respective regions and homes.

The data from the interviews were analyzed descriptively and interpretively. Data was described by going through the stages of qualitative research: data reduction, display data, and drawing conclusions or data verification. Data reduction is made by sharpening the collected field data, which is then classified according to sub-discussions by discarding irrelevant data. Data display is done by presenting data through tables accompanied by brief descriptions so that the presentation of data is more precise and easy to understand, which is the final stage of concluding. Interpretive analysis,

4   Results

4.1   Technology Used in Online Learning

Besides providing many benefits, using technology in online learning also slips some obstacles experienced by lecturers and students. Learning carried out through distance requires technology media as an online learning medium. The media used in the learning process, internal media conduct evaluations, and media for assignments and provide the final project guidance.

Technology or social media were previously only used for social groups and is now transforming their usefulness into online learning media in the COVID-19 pandemic. Technology media offers many facilities such as voice, note, send files, photos, videos, and others as a communication tool and convey material, discussion and questions, and answers sessions. The technology media used by lecturers for the online learning process can be shown in Fig. 1 .

Figure 1 has provided an overview that the most widely used technological media by lecturers in providing distance learning materials is through the WA Group, as much as 47%. No less than 17% of the lecturers use the E-Learning application, utilization on
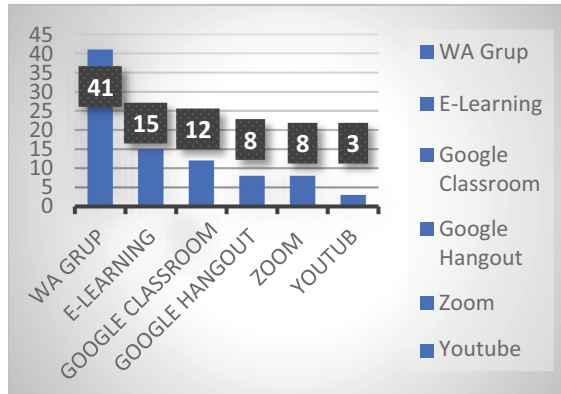
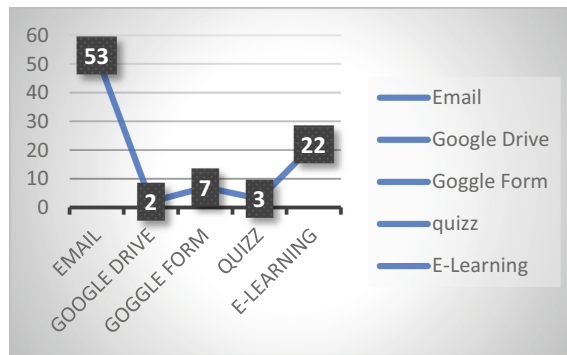**Fig. 1.** Learning technology used in online learning

Fig. 2. Technology media to evaluate the material achievement and understanding.

the google application classroom as many as 14% of lecturers and 9% of lecturers teach online using Google Hangouts and the Zoom app. At the same time, 4% of lecturers used Youtube indicating that this application is rarely used.

Online learning has shifted the form of process evaluation. Previously the lecturer gave questions or assignments that must be responded to directly by students orally, becoming a form of assignment primarily done in writing. It is meant to know the level of the student's understanding after being given an explanation or after they have been given the task of reading books or modules that have been determined. The data in Table 2 shows various information and communication technology media that lecturers access to evaluate the materials that have been submitted.

The data in Fig. 2 shows that lecturers rarely use online media when giving an assessment or evaluation in online learning google drive, no more than 2%. Media quiz also not used by many lecturers; only about 4% of them are using them. Google the form is used by some lecturers as much as 8%. Quiz and google forms have similar characters, which are very suitable for multiple-choice items and not suitable for using
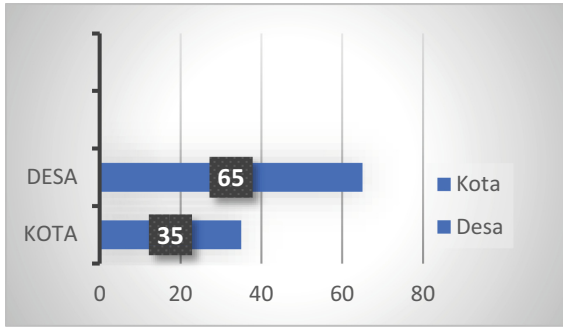
Fig. 3. Learning technology used in online learning

essay questions or explaining each student's opinion. Many college lecturers utilize E-Learning applications, 25% of which are made by the IT team of the college. Google Drive and E-Learning have similarities in their use. They can access, save files, and re-share. This application is suitable for use to evaluate in the form of essay assignments or articles. In comparison, the technology media in the form of email is the most dominant media used by lecturers, as much as 61%. An email has a broader use as a tool for correspondence, is more familiar to the wider community, especially in Indonesia, and is relatively simple.

Email is the only technology media that is used as a solution for supervising the students' final assignments. The COVID-19 pandemic has changed the process of supervising students' final assignments. In the past, it was done face-to-face, and students met directly with lecturers. In line with that, the lecturer can provide feedback orally or in written form on their final assignment sheet. However, the lockdown and social distancing policies require mentoring to be done online, as is the learning process.

4.2 Internet Accessibility by Students in Online Learning

Lockdown and social distancing have made the migration of students' residences during their studies at college. Previously, students lived or resided in boarding houses, rented or boarding schools not far from the campus area; now, they had to return to each other's hometowns. The campus area is an area that has a strong signal (Internet connection), easy access to free wifi, and easy access to the library, and even a few students spend much time on campus to do some assignments from lecturers by accessing free campus wifi. Conversely, most students live with their families in rural areas, the outskirts, and remote islands. It is not easy to access the internet smoothly and powerfully. This can be shown in Fig. 3.

The range of students, as shown in Table 3, is that as many as 35% of students live in urban areas, while students live in rural areas 65%. The region greatly determines the smoothness or strength of the signal to access technology media in online learning, determined by each lecturer's scheduled course. The weak internet connection in online learning causes student's difficulty following the learning process optimally, both from quantity and quality aspects. In other words, internet accessibility determines the fluency of online learning.

In addition to software requirements, hardware is another tool for online learning. Software such as the internet (wifi, data quota) must be sufficient so that online learning for lecturers and students is not hampered. Hardware such as laptops, cellphones, computers, and tablets also contribute to launching online learning. Hardware must support the applications needed for the learning process.

4.3   Obstacles Experienced by Lecturers and Students in Online Learning

So far, online learning using technology media is considered to provide many conveniences, learning is more effective and efficient, but it turns out to cause many obstacles and difficulties experienced by educators and students. Universities in Indonesia have implemented a distance learning system with information technology, media, and communication, along with the COVID-19 pandemic, which requires social distancing. The closing of educational institutions at various levels makes us conduct online learning a must so that the teaching and learning process between lecturers and students continues unhindered by time and space. Some of the obstacles experienced by lecturers and students related to the use of technology media in online learning can be seen in Table 1.

Table 1 shows that online learning obstacles experienced by lecturers and students include: first, the internet network is not strong enough, so buffering often occurs when learning takes place. Second is a lack of student data packages, so a long time is needed to download and send files to and from the lecturers, or even fail. Third, the availability of devices such as laptops and cell phones is inadequate. Fourth, technology stuttering is the ability of lecturers to master information technology for learning media is minimal, so the provision of material is made through assignments.

5   Discussion

The change in the learning process from personal to instrumental requires careful preparation. Previous learning is determined by the presence of lecturers and students in class, but now shifting to distance learning through technology and communication media. Lecturers can use lots of information and communication technology media for learning online, as shown in Table 1. It is explained in Table 1 that, most dominantly, as many as 47% of lecturers use WA Group technology media in the process of learning from the other applications.

WA is a social media used by all community levels, from children, adolescents, adults, and the elderly, including lecturers and students familiar with WhatsApp. WA is a communication tool used daily between lecturers and students, lecturers with lecturers, students with lecturers, family, school friends, and others. Lecturers with a pile of activities do not have enough time to study technology media use. Correspondingly, online learning must be immediate and direct implemented suddenly of the lockdown and social distancing policies so that WA is a practical choice of technology media in learning during the COVID-19 pandemic. Dependence on technology is unavoidable. It must master how to apply technology media is mandatory so that variations of technological media are utilized optimally following the demands of the learning process.

Table 1. Media constraints in online learning

Media	For Teachers	For Students
WhatsApp Group	Cannot monitor students' seriousness, whether they follow the learning activity, and cannot do an evaluation objectively	Need a considerable amount of internet quota to download files, lack of understanding through the writing and audio explanation
E-learning	Errors frequently occur if an excessive amount of students are logging in together at the same time	Errors frequently occur during the submission. As a result, the class is canceled. It takes a long time to be fixed
Zoom	Spend lots of internet quota. Lecturers must stay in front of the screen and be active in learning activities. Must use headset	It requires lots of data packages and a strong internet connection. Otherwise, it will catch buffering many times, not even connected. Must use headset
Google classroom	Never used it before, must learn how to use it, which takes time and seriousness.	Need a strong internet connection
YouTube	Requires enough internet quotas and a strong internet connection. This application drains more internet quota	Requires enough internet quotas and a strong internet connection. This application drains more internet quota
Google hangout meet	Never used it before, so the lecturers must study the content and how to use it, which takes time and seriousness	Never used it before

The strength of the internet connection is also a determinant of efficient learning that uses internet information and communication technology. Unfortunately, not all students live in accessible areas for smooth internet connection. Many are in remote areas with difficulty obtaining an internet connection, as in table 3, where 65% of students live in villages, and 35% live in cities. This causes many of them must wait for the night to get a signal; some have to go up a hill and walk for kilometers to the city to find a location with a solid signal to access learning online. The social distancing policy that requires everyone to stay home cannot be realized.

On the other hand, the demands of the learning process are carried out online, which are not accompanied by an online learning connection or free wifi, and the family economy does not support being able to buy sufficient internet quota. Most of them come from middle-to-middle-income families below, as shown in Table 5. It is illustrated in Table 5 that the income of parents in one month by 3–4 million reached 39%, while per month less than 2 million reached 27%, and 14% reflected parental income of 4–5

million, 11% showed monthly income <1 million, as well as student's parents whose economy is well off with monthly income of 5 million and above, is not more than 9%.

Learning so far has been more of a meeting in a physical space limited by space and time, but now learning is more flexible in cyberspace; it can be done anywhere and anytime. This flexible learning has a less favorable impact on students, and at the same time, they sometimes have to follow more than the courses taught by different lecturers. In line with that, students complain about the severity of assignments given by lecturers that must be completed in a short time. Simultaneously other lecturers also give assignments, which causes students to be unable to complete them. Students are also constrained by references that cannot be accessed directly in the library. In comparison, the media capability (HP) is insufficient to download the relevant book or journal. On the other hand, the lack of good internet channels accessible and a place to live in the interior of an area that is difficult to get a signal.

Distance learning makes students lose concentration and lack focus on learning. On the one hand, they have to divide their time to study (following online learning and doing the assignments from the lecturer); on the other hand, they have to help their parents finish homework. Not a few students have to help with work to strengthen the family's economy, which began to weaken. In other words, distance learning distance has created a less conducive learning situation.

6   Conclusion

This study has shown a shift in the education system from offline to online, which requires many changes in the world of education, especially at the tertiary level. Students and lecturers began to adapt to various aspects of learning tools and cultural aspects. They must carry out the learning process instrumentally through technology without interacting directly. This is causing several obstacles. In addition, they are not ready to face a new culture of learning and have not been used as a precedent in carrying out transformations in the world of education. The various media used by lecturers in the learning process continue to run well, both synchronous and asynchronous media. Such as e-learning, email, Google classroom, zoom, email, etc. Each application media has varied characteristics. This requires adaptation and skills in media literacy quickly. In line with that, this paper recommends that lecturers continue to upgrade and update themselves regarding information and technology, which is currently very much needed as something essential in the learning process.

This paper has limitations on the object of research conducted at one university. So the findings in this study still do not represent all the obstacles experienced by the world of education in higher education. Therefore, this paper suggests further research comparing the object of research, namely between Islamic universities (under the auspices of the Ministry of Religion) and national universities (under the auspices of the Ministry of Education and Culture). Thus, the resulting data is more comprehensive and can be used as a reference for structuring the education system in this new normal.

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