

Mathematical Economics Online Learning in the Pandemic Time of Covid-19

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Abstract. The purpose of this study is to describe the situation and conditions of online learning for the Accounting study program as an effort to reduce the chain of COVID-19 spread in the UKI Paulus which shows the feasibility of this distance learning system through online media. This online learning uses learning media that can be accessed using internet services. This research uses a case study approach. This type of research is a qualitative research that seeks to find meaning, investigate processes and obtain deep understanding and understanding of individuals, groups, or situations. Data collection techniques through observation, interviews and documentation. Interviews are intended to gather information about online learning through e-learning applications, zoom meetings and whatsapp and documentation is carried out to print documents in the form of photos or distance learning results during the COVID-19 pandemic. For data validation using data validity testing techniques through the method triangulation. The data analysis technique in this study uses an analysis model according to consisting of data reduction, data display and conclusion drawing/verification. The impact of using online media through the use of Information Technology in Mathematics and Economics learning for students is as follows: (1) The results of the interview show that the application of e-learning learning media, zoom meetings, videoscribe, whatsapp by utilizing information technology in the learning process has an impact on thinking, ability to analyze and understanding using language that is easily understood by students; (2) The application of learning media is one of the new innovations among students, which initially face-to-face learning in class by lecturers, turned into a learning process using online learning media; (3) The learning process outside the classroom as well as in the classroom allows students to adapt to the situation, making it an interesting thing because there can be online discussions and collaboration between other students in solving a problem.

Keywords: online learning; reduce; COVID-19 spread

1 Introduction

The beginning of change / transition in human life in all aspects, be it in work, social, economic, health, education, and so on, was caused by a corona virus or better known as

COVID-19 (Corona Virus Disease). This case originated in the city of Wuhan, China [1] which is a type of pneumonia whose origin is unknown and the cause of how it spreads so quickly and the suspect rate is so high that many questions have not been answered either scientifically or theoretically either. From the world organization, namely WHO, as well as researchers from all countries in the world competing to find drugs as a fast treatment step to overcome the breaking of the chain. In the case of this epidemic, the handling is different in each country as is done by the Indonesian government, to minimize the level of spread and break the chain of COVID-19, the Indonesian government has taken various ways by issuing policies such as crowd restrictions, social restrictions (social distancing, physical distancing). Until the enactment of the PSBB (large-scale social restrictions) in several cities / regions, one of the local government regulations for each citizen with the 3M slogan (keeping distance, wearing masks and washing hands) and its implementation until now is known as the 3T slogan (Tracing, Testing and Treatment) so that tracing affected by the COVID-19 case can be handled quickly. The policies for handling COVID-19 issued by the government have had a huge impact on the world of education in Indonesia, one of which is higher education.

The Covid-19 pandemic presents challenges or problems to the implementation of the learning process in the world of education. The learning process is a public policy as a way of increasing knowledge and skills [2]. The Government's policy to massively limit or reduce contact with people or communities who have been exposed to Covid-19 has made many colleges or universities close all face-to-face learning activities for an indefinite period of time. The article [3] illustrates that teenage students in Sweden have a different number of days to prepare for the test. These students increase their study time by ten school days and the result they get is an increased score on their knowledge test. This is the same as [4], explaining that attending school will increase memory capacity. Furthermore [5], explains in more detail that if the knowledge test, it is assumed that not carrying out learning in school (not attending school) for 10 days means that they experience a deficiency of 1% of the standard deviation, and if within 12 weeks or for 60 days these students are unable to attend school lessons for some time so their school loses 6% standard deviation. The fact or phenomenon like this will cause a problem that causes students to experience a decrease in knowledge for the future and this knowledge problem will become more complex.

Likewise, according to [6] explaining that the impact on the learning process is due to differences in teaching time in all countries in the world. Assuming that total weekly teaching hours in math, language and science are 55% higher in Denmark than in Austria. This difference is important and very significant in the results of the test scores obtained by about 6% of the standard deviation formulated above. So Indonesian students or students by looking at the changes in the learning process that are happening nowadays, it is very clear that whatever standard deviation they accept is caused by the loss of study time in tertiary institutions which in turn has an impact on students' loss of their knowledge.

With the emergence of the Covid-19 pandemic globally, the world of education in Indonesia will automatically change the learning and teaching process system. Thus the Covid-19 pandemic based on the pandemic period, time, location and distance is a major problem or challenge for all educational units currently occurring [7], so that currently we are directed to the era of the industrial revolution, namely online with the use of information and communication technology. In order to keep the education process going in today's emergency, the right step or solution without adequate preparation is to hold a distance learning process online. This distance learning has never been done globally and simultaneously for all education stakeholders, namely educators, students and parents [8]. This online learning is an innovation in education to provide a variety of learning resources. Online

learning is a breakthrough to carry out the teaching and learning process effectively and efficiently to serve the needs of students in terms of education [9].

The current phenomenon or reality shows the use of information and communication technology (digital) devices, namely computers, laptops and smartphones, as is the case within the UKI Paulus, especially the accounting study program in mathematics subject to a change in learning methods that were initially face-to-face directly become a method of distance learning known as in the network (online / online). Online learning is an interaction between lecturers and students to be able to access electronic documents to broaden their knowledge [10]. Learning through networks has potentials, including meaningful learning, easy access and improvement of learning outcomes [11]. Obstacles or problems that occur at UKI Paulus which have an impact on the effectiveness of learning with online media, include:

1.1 The Problem of the Limited Mastery of Information Technology by Lecturers and Students

The situation shows that lecturers who were born before the 1970s, not all of them can understand the use of this information technology. This obstacle causes them to be very limited in using online media and students have problems or are hampered by limited applications that can be used due to the old version of the information technology used so that it does not support online media such as: e-learning, zoom, google classroom, videoscribe; etc. Applications / software that can be used by lecturers for the learning process or assign assignments to students, namely by using e-learning applications, zoom, whatsapp, google classroom, videoscribe, and so on. One of the online learning media that is owned by each campus is e-learning. The use of e-learning media provides a new experience for students in accessing information technology so that students are interested in learning [12]. Apart from e-learning, other media used within the UKI Paulus campus are zoom meetings.

1.2 Limited Internet Network Access

The network or internet signal is not evenly distributed throughout Indonesia. There is an internet signal but the situation is very limited by looking for a range that is a little higher so that it can be accessed and even then cannot be used properly online media because the signal is not maximally reached. The density of internet access usage and the duration of its use continues to increase, so that often the network is long (loading) or the signal is suddenly lost. Wearesocial reports that the world's average uses the internet for six hours per day through various devices [13]. Network access or signal in areas that are not reached by students who live in remote areas (depending on the telephone operator and area coverage), the online learning process provides opportunities for students but problems often occur, namely the internet network from the data quota operator experiences poor signal (connection) good (unstable) due to geographic location, so that sometimes students cannot attend lectures on that day but they can see and study the material that has been discussed through e-learning.

1.3 Inadequate Budget Availability

The use of internet quota to access online media is very expensive and quite a lot of quota is used to find, create and input material. Also experiencing economic limitations in buying data pulses due to large quota usage. In addition to learning through zoom meetings, Google Meet consumes a lot of quota in a few hours. So that usage in a month requires a large budget

in purchasing data quotas from both lecturers and students. The use of very large internet quota, and to make content that is interesting and quickly understood by students requires a large capacity so that uploading a file takes a long time (loading), and so on.

1.4 Facilities and Infrastructure

Technological support devices require expensive costs with economic conditions that are not met significantly so that lecturers and students are very limited in enjoying the information technology facilities and infrastructure that are needed in the presence of the COVID-19 pandemic, such as UKIP lecturers who do not have new laptops with RAM memory and technology supporting applications, while not all students have laptops, only rely on smartphones and sometimes students have difficulty accessing / downloading material or videos because RAM or internal memory is not enough to download large files that require capacity, factors like this are examples of cases obstruction of the continuity of online learning.

1.5 Student Losses in the Assessment Process

Higher education institutions that use traditional assessments are replaced by online causes the situation to change because lecturers' assessments for students may have measurement errors, unlike what is usually done. So in the implementation of the learning process of economic mathematics, it is necessary to study the appropriate media so that the provision of material can be effectively accepted and understood by students and the time used can be efficient. In implementing economic mathematics learning, students are required to be able to learn independently, think critically and creatively in understanding the material that has been discussed and develop it themselves in completing the given assignments.

Mathematics Economic learning that can be carried out during the current pandemic by the teaching staff (dosem) at UKI Paulus College is through online learning, using several applications, namely the e-learning application provided by the campus, zoom meetings and whatsapp. The e-learning application is used to upload teaching material files before learning is carried out, assignments, quiz questions, midterm exam question files (UTS) and semester exam question files (UAS). The zoom meeting application is used for each mathematics learning lecture meeting and each meeting is taken to mark the attendance of students or student interactivity in the meeting, besides the whatsapp application is used as a two-way communication tool from lecturers to students and vice versa to notify / remind lecturers that the meeting will be carried out according to the class schedule and students inform their attendance and other friends. However, the problems that occur during the implementation of lecturer learning cannot measure or clearly assess that:

- a. the limited time spent teaching whether students can understand the material provided online, unless they are looking for material or literature from other media. This is very much felt in the implementation of economic mathematics learning which requires a level of understanding, analysis in calculations to provide an explanation of the material through examples of how to calculate it.
- b. The level of knowledge, understanding, and reasoning (cognitive) of students in receiving the discussion of different material is that there are those who are quick to understand and analyze, some are moderate, and some are slow, besides that there are students who are active, quiet and shy. -shame so that the time of the assessment greatly affects the end result (achievement value).

- c. In this online learning too, the presence of students taking part in lectures can be seen by activating the camera so that it can be seen that students are taking part in learning and students turn off the audio when the lecturer provides material and students can only listen, understand and analyze, when given the opportunity for new questions and answers. they activate the audio, but when they activate the audio there will be many voices from where they are so it will be interrupted in the learning process. In addition, students who do not attend online learning because they are constrained by signals or data quota that have run out, they can view or access material in e-learning.

2 Methodology

This research uses a case study approach. This type of research is a qualitative research that seeks to find meaning, investigate processes and obtain deep understanding and understanding of individuals, groups, or situations [14]. The research method used in this research is descriptive qualitative research. Qualitative research is a research procedure that produces descriptive data in the form of words or writings and behaviors that can be observed from the people themselves [15]. Meanwhile, descriptive research is research that attempts to describe a symptom, event, event that is happening now [16]. The purpose of this research is to describe the situation and conditions of online learning for the Accounting study program as an effort to reduce the chain of COVID-19 spread in the UKI Paulus College environment which shows the feasibility of this distance learning system through online media. This online learning uses learning media that can be accessed using internet services. Sources of data taken are from informants as many as 3 (three) lecturers and students of the UKI Paulus Accounting study program, places and events, as well as documents of the results of research conducted by purposive sampling technique.

Data collection techniques through observation, interviews and documentation. Interviews are intended to gather information about online learning through e-learning applications, zoom meetings and whatsapp and documentation is carried out to print documents in the form of photos or distance learning results during the COVID-19 pandemic. For data validation using data validity testing techniques through the method triangulation. The data analysis technique in this study uses an analysis model according to [17] consisting of data reduction, data display and conclusion drawing/ verification.

3 Results and Discussion

Since the Indonesian Government with a policy issued in mid-March 2020 has temporarily eliminated face-to-face learning in order to reduce the spread of the Covid-19 virus outbreak, so that currently all learning activities are becoming distance learning using online media, in this case between working lecturers. or teach from home and students in their respective areas. Based on the results of interviews and documentation, online learning during the pandemic period for accounting students at UKI Paulus Makassar used several media such as e-learning applications, zoom meetings and whatshap, as follows:

The Effectiveness of Online Learning

At the time of the learning process using the application in its implementation was not optimal due to distance learning experiencing obstacles or obstacles during the continuity of online learning, especially the network (signal) of internet operators. students and blackouts cause signal loss as well, this can be caused by geographic location by each student residence location. In addition, when online learning has separate locations between students and lecturers, the lecturer cannot directly supervise student activities during the learning process and it cannot be known for sure that students really listen and understand the material presented by the lecturer.

However, this online learning prevents students from making time and place an obstacle, because they can attend / access lectures from home or where they are located anywhere and lecturers provide lectures through virtual classes that can be accessed anywhere and anytime. Even though they are not bound by time and space, this condition makes students flexible in collecting tasks that can be done first. One of the advantages of online learning is that it is able to foster self-regulated learning by using online applications to be able to learn independence [18]. Meanwhile [19] stated that online learning is more centered on students which makes them able to be responsible and autonomous in learning (learning autonomy).

The role of campus stake holders is very important in online learning, including the campus providing facilities:

- a. providing an e-learning link to make it easier for lecturers to work from home by uploading material files and online learning,
- b. a zoom meeting link is also provided to carry out the online learning process to attendance by taking pictures (photos) as printed evidence documents,
- c. providing data quota assistance to lecturers and students, this is very helpful even though the internet data quota is not sufficient, but only three months, namely April to June

Online learning can cut the level of the spread of covid-19 in tertiary institutions, especially in the UKI Paulus Makassar campus environment. The existence of lecturers and students in different places during learning means eliminating physical contact and creating social distancing behavior as one of the policies of the government to reduce / break the chain of covid-19 transmission. However, in remote areas that do not have good internet access, the implementation of online learning shows a different problem. To overcome such situations and conditions, students who live in areas with weak internet signal / network look for certain areas or locations such as hills and sub-districts so that they can be accessed by internet access.

The observation results show that students in the learning process have followed the learning process through the application of e-learning media by utilizing their technology to access the internet network, there are students who use laptops, computers or smartphones. The results of the interview showed that at the beginning of learning, students had difficulty learning, due to changes in the learning system so that there was an adaptation between lecturers and students, and after continuous use of online media, namely e-learning applications, zoom meetings, videoscribe, start excited and motivated in learning. The impact of using online media through the use of Information Technology in Mathematics Economics learning for students is as follows:

- a. The results of the interview show that the application of e-learning media, zoom meetings, videoscribe, whatsapp by utilizing information technology in the learning process has an impact on thinking, ability to analyze and understanding using language that is easily understood by students.
- b. The application of learning media is one of the new innovations among students, which initially face-to-face learning in class by lecturers, turned into a learning process using

online learning media. In e-learning applications, zoom meetings, videoscribe, whatshapp are planned learning and can be followed by all students. However, not all students have the same technology, some have laptops, or only have computers or smartphones, but some have two technologies, namely smartphones and laptops. This makes it easier for these students to learn.

- c. The learning process outside the classroom as well as in the classroom allows students to adapt to the situation or adapt to the learning system, which was initially difficult for students and students but carried out regularly, making it an interesting thing because there can be online discussions and collaboration between other students in solving a problem. problem.

The results of the analysis showed that the use of information technology through online learning media, namely e-learning media, whatshapp, zoom meetings in mathematics learning from each student's area can access them, can follow the principles and considerations of one of the appropriate learning media currently used in accordance with ACTION Access, Cost, Technology, Interactivity, Organization, Novelety) (Indonesia, nd). Some constraints or factors in its implementation have not been maximally achieved but their use has been resolved, although it still requires improvement from various aspects. The principles and considerations of ACTION (*Access, Cost, Technology, Interactivity, Organization, Novelety*) are as follows:

- a. Access factor means that the ease of accessing the internet network from the location of each student is a reason or basis for consideration from the results of observations or interviews, even though the signal or network coverage is not maximized in their location so that they are looking for a location with signal range or the opportunity to be able to access the material contained in files on e-Learning.
- b. Cost factor means the cost consideration in choosing the right learning media. Online media that require low cost and good utilization aspects are e-Learning and WhatsApp media, while zoom meeting media require a slightly higher cost because data quota is used up a lot.
- c. Technology factor means the availability of technological equipment and ease of use. However, the current conditions of technology that can be used are not all the same for students, this can happen because their computer, laptop and smartphone technology has not been updated so that the online learning process has not been maximally achieved.
- d. Interactivity factor means online media that can be used for two-way communication between lecturers and students. The use of online media to date can be used for two-way communication and is quite effective, namely e-Learning and WhatsApp media, while the zoom meeting media is very effective as well because two-way communication can occur virtually directly but requires a large data quota to access this and time also limited to its use.
- e. Organization factor means the support from the organization. The Indonesian government issued a policy through a circular regarding online learning and working from home (WFH) to break the chain of the spread of COVID-19, regarding activities both administrative work and learning carried out online by all Indonesian citizens, both teachers and lecturers. as well as students and students and private and public employees according to (Indonesia, nd) so that the organizational factor has been achieved.
- f. The novelty factor means the novelty of the selected media into consideration, such as the current conditions that occur as a result of the Work from Home (WFH) which is based on the National Education System Law Number 20 of 2003 which reads "Every citizen entitled to the opportunity to improve lifelong education must continue. "[20]. So

that online learning media are appropriate and appropriate as well as changes towards digital in utilizing information and communication technology in the era of the Industrial Revolution.

The current learning media has a positive influence on students' critical and creative thinking in solving problems in learning, is independent and has enthusiasm for discussion. In addition, students are also trained to find information via the internet or other literature by utilizing technology to increase student knowledge or insight and students can also provide positive things for themselves with time management, where students can train themselves by managing their time independently to carry out their activities. online classes in every lesson.

In addition, online media has a negative impact on student behavior such as being lazy to open physical handbooks, smartphones are more widely used by playing games, listening to music, and watching videos, so students experience internet addiction [21].

4 Conclusion

Breaking the chain of the spread of covid-19 in higher education, as well as UKI Paulus Makassar in the accounting study program implementing online learning as a solution to continue carrying out lectures so that learning can continue. The results showed that students had the facilities and infrastructure to be able to take part in online learning. Online learning is one of the options for government policies to overcome the implementation of learning so that there is a relationship between lecturers and students in virtual classes and can be accessed anywhere and anytime.

This online learning enables students to study independently with motivation and enthusiasm to continue their education. But the condition of the network/signal that is weak/not strong is a challenge for online learning and the large amount of internet quota costs incurred apart from assistance from the campus, besides that students cannot be known for sure their sincerity in understanding the material well or lacking during the online learning process this. However, they can contact the lecturer and ask if they are not understood at any time they can do it because not all can access it quickly so that the lecturer gives time for students so that they can access the material that has been input into e-learning and when the zoom meeting is held there are students. those who go in and out due to the signal or network coverage are very unstable can be given the flexibility of time to also contact their lecturers to ask questions or just to confirm their situation and condition where the student is, so that evaluation can also be carried out in this online learning process.

The learning process based on online media (online) by utilizing technology to form knowledge, skills and character in accordance with the skills in the era of the digital revolution, students can have 4C skills, namely (1) creativity (creativity); (2) ability to think critically (critical thinking); (3) communicate (communication); and (4) collaborating (collaboration). This 4C skill is very important for students to support their knowledge and skills and independently in solving the problems they face. Apart from that, students can also train themselves to have a positive influence in the use of technology and keep away from the negative impact of technology they have.

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