DIGITAL LEARNING

PENULIS

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preface

Praise be to Allah SWT, who has given His grace and guidance so that we have completed the book entitled "Digital Learning". Lecturers across government and private campuses participated in this writing project. The presence of this book is the result of an extraordinary struggle of fellow lecturers who contributed to this writing project.

This book answers various issues regarding the use of digital media in learning. The understanding of digital media for the learning process will foster awareness of the importance of the current digital era. The discussion in this book is easy-to-read, straightforward, and wide-ranging.

We appreciate all parties supporting this writing project and hope that this book contributes valuable information. We are aware this book bears many limitations; therefore, suggestions and criticisms are very welcome. Have a good reading.

Author team

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CHAPTER 1.

E-Pedagogy

Wiputra Cendana, B.Sc., M.Pd.,
Ben Schmidt

Face to face classroom learning design will become a history in the human civilization. It is almost one year, since Covid-19 attacked the worldwide and becomes a global pandemic. Truly, the educators are facing great challenges in preparing 100% full online learning that makes them think critically and strategically. Online learning education makes a lot of adjustment for all the educators around the world in order to deliver the 'meat' of learning. Immediately, the webinars from the third parties happened in order to equip all the educators around the world.

Looking back at the journey of the online learning demands the critical thinking and creativity from the educators in preparing the lesson that they teach. The digital literacy becomes one of the skills that they need to update in order to be more skilful to meet with the students in a virtual setting. There are some learning management system which offered from educational technology expert in presenting the classroom digital platforms.

Starting the new academic year in 2021/2022 and beyond, there is a plan to make the school setting in a blended learning processes. It is a slice between the face to face learning and the online learning. Since, there are some online learning issues which is happened as the problem variable occurred in the most particular places in Indonesia, the minister of education asked the school leader to open the classroom again with high protocols and small number of the student in one class.

The idea to put together between the traditional classroom and online learning will blend together in delivering the content, assessment,

and evaluation of the teaching and learning activities. Traditional classroom helps the student's learning processes by facilitating them in a personalized experiences, giving some of the class based instruction, having the personal learning community, tutorials, and seminars. In the other hand, the online learning strategy that the teacher could design in the framework of building the student's independent, flexibility, timely, virtual instruction, forums, webinars, online learning communities, and video tutorial recording.

Furthermore, the activities in the blended learning should accommodate between *before, during,* and *after* class. In the traditional classroom will be in *during* period that the teacher could give the time for students to interact directly with the teacher in order to discuss some of the given material before the class starts. It is same like the concept of the flipped classroom.

The flipped classroom characteristics challenged the instructor to record and share the content of learning outside of the class. The student will watch or listen to the lecturer's video content shared before coming to the class. The class time will devote to apply the learning activities and more higher order thinking skills. The student will receive the support from the instructor.

There will be a traditional classroom paradigm shift and setting differentiated design that makes the instructor will prepare the material which will be delivered in the class. The student will listen to the lecturer content teaching and learning material and other guided instruction in the class. Most of the time the student will take notes from the classroom interaction. The homework will be assigned to demonstrate the students' understanding too.

Based on the survey which encapsulate about the online learning, the issue that happened such as overloaded task from the teacher, short time to execute the task given, low teacher's skill to do online learning. The teaching and learning that is not attractive, the digital media used by teacher is limited. Veteran teachers prefer to use social media such as WhatsApp, Line, Facebook, and Instagram. Teacher is just teaching in order to achieve the curriculum learning outcomes.

In the other hand, the internet access for the society in

Indonesia is not the main user especially in the remote places. The student's internet quota is not enough to support the learning process. In the technology side, the students does not have laptop, computer, or even mobile phone. There is small number of teacher's ratio that does not understand the technology for the online learning.

Looking at the issue that we have above, it is very important for the teachers to equip themselves with the intentional support from the school administration in facilitating them using the technology product. Furthermore, the parents are needed to be more equipped also as they will guide their children at home to use the chosen technology platform for education.

Based on the taxonomy bloom, we could understand that there are some of the learning activities that can engage the student's level from the minimum state into the maximum state until 90%. The reading activity for the example, it will give the students only 10% to remember the concept exposed. When they are listening to the content of teaching, they can remember 20% of the content shared. When the students start to see the picture/ graph/ video/ movie/ teacher's demonstration, it will give them 30% of the material that they will remember.

Continuing to the explanation above, the activity such as discussion that allowed the students to articulate their thought makes them to remember 50% of the learning content. The percentage more till 70% that the students can boost their learning material remembrance when they are doing a presentation in a particular topic given which related with the learning content. The peak of the enduring understanding is when the students do some of the simulation or workshop. Additionally, when the students can relate the topic learned with something that they can do in the real world problem, it boost the level of knowing the material until 90%.

The author suggested that the teacher should be aware in designing the synchronous and asynchronous activity in the upcoming new academic semester. The activities such as reading the text, listening to the teaching video recording, looking at the visual slide, and watching the animation/demonstration could be placed before the

class. During the class, the teacher can give a room for the students active participation in the workshop design, do a role play in the class in order to engage the students more. Furthermore, the way of the teacher to give the students to make a model or simulation based on the real world experiences will be beneficial too. Finally, the teacher who give the students a room to do and feel the real life experiences of learning would be reach 90% of involvement and the enduring understanding absorption processes. The description above could be shown from the figure below.

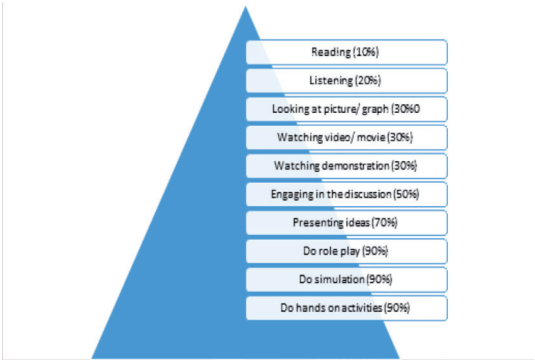

Figure 1: Enduring Understanding Percentage

The educators around the world should understand about when they should prepare for the synchronous and asynchronous lesson. The figure below will help us to see the connectivity among the lesson mode.

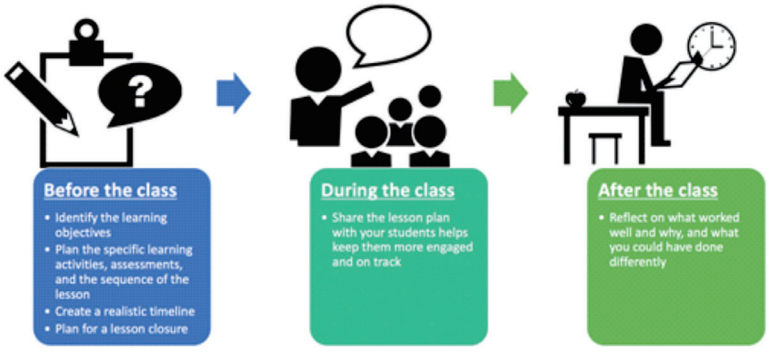

Figure 2: Learning mode strategy (Resources: https://cte.smu.edu.sg/approach-teaching/integrated- design/lesson-planning)

The activity that the teacher can place before the class such as: reading, listening, looking at the picture, watching video, and watching presentation (recording). During the class, the teacher could open the forum so the students can enrich their understanding or doing some hands on activity with the teacher supervision (usually at the laboratory). After the class, the teacher can give the students further follow up activity such as collaborative plan for solving problem based learning and presentation preparation. This design will be a meaningful moment for the students rather than only doing a lecturer.

The hybrid class model that we will plan for the next academic year will be shown as following figure.

Figure 3: Hybrid Class Model

Hybrid learning process will give a 50/50 ratio between instructor leading through clear and structured instruction and the independent work. The student will be able to have 24/7 access to the courses content. Synchronous lesson will be placed in a very strict scheduled classroom meetings and some of the virtual meetings. The asynchronous model will enhance 24/7 access in a weekly plan (Learning Management System) added with the course library and forums room.

The other strategy to make a very limited number of student who can come at the class will be arranged in the group based. The student who will come at school will always be the same and the students who will study at the virtual setting will set in the same group. The teacher will use camera or presentation screen sharing so that the students who stay at home will be able to follow the synchronous learning at school. There will be the activation for chat room or video teleconference

which activate the audio and camera in order to facilitate the in-class students and remote students at the same time. The teacher will be the instructor designer for this mechanism.

The key word for the upcoming hybrid model is.

1. Face to Face
2. Remote learning tools
3. Flexible schedules
4. Health and safety
5. Social Distancing
6 Adaptive Learning Tool
7. Blended Learning (Face to face and online learning)
8. Personalization

The teacher is expected to meet the student where they are and looking at the possible situational factor and variable context that the students may face later. Furthermore the stake holder and school decision maker should be aware regarding to the curriculum, multimedia content and platform, face to face and online learning guide book, formative assessment design, evaluation, and feedback. Having all in a web design will be beneficial for all parties. Yet, for the primary student level, they are strongly encouraged to build their psychomotor through hands on activities. The role of their parents are strongly needed to this student's range.

The school approach toward this is holding the strategic planning which looking the need analysis, budgeting strategies, policy/rules/handbook, and training program for teacher, parents, and students. At least the digital learning through e-pedagogy will be seen through asynchronous and synchronous; before, during, and after class; open forum; Learning Management System consistency and availability; Cloud resources pool; High flexibility, but firm in the principle.

The teacher who passionate in making the differentiated instruction to the students will bring them into the inspiring to love the learning process, increase the student's self-awareness and class engagement, improve the learning outcomes, and help the students to learn more efficiently and with deeper understanding.

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CHAPTER 2.

WhatsApp Goes to Campus: Mobile Instant Messaging Implementation at Mochammad Sroedji University of Jember

Moh.Ardani

In several countries around the world, modern information technology nowadays has become a component of the education system. This concept can be seen in the works of many scientists whose scientific interests lie within the scope of education information and communication technologies: the value of incorporation into the learning process of computer technologies (Agarwal, 2020). Information and communication technology in modern universities tend to dominate teaching and learning processes. They are used extensively to teach different topics. E-learning, currently implemented in the teaching process, is one of the forms of information used on communication technologies. E-learning alone, however, cannot meet all the needs of the educational process participants. Therefore, the desired results can only be achieved with the integration of traditional teaching methods and e-learning.

The learning experiences gained by the learner vary from one person to another in an e-learning environment. Students gain experience in an e-learning environment from three main aspects of the study process. These three aspects are learning, engagement and interaction. The e-learning activities include the study of learning materials, training, completion of assignments and examination sitting. For the student in an e-learning environment, having a computer with Internet access is essential. Participating in online platform forum

discussions and participating in tutorial sessions. The interaction with tutors or facilitators, colleagues and educative materials also contributes to the learning experience (Hascher, 2010).

Learners can virtually communicate with their tutors and colleagues in various ways, such as on-line forums, e-mails and text messages. Mobile devices, especially cellular telephones, have quickly been incorporated into teaching and learning. The television rate is 73.32 percent, and 875.48 million cellular phone subscribers, as per the information published by the International Telecommunications Union. Several mobile communications & learning applications can be downloaded for free into mobile telephones and the number of users has grown rapidly. The learning process has changed a lot over the last 15 years. The world has both become digital and educational. We cannot imagine a classroom that can be used during the learning process without interactive whiteboards, lecturers, students and various applications. New technologies change our world and instructors must be ready to integrate these technologies into classroom as students have grown up to play computer games, watch YouTube video and read digital books. New media were developed and we must study how these new technologies can be used at universities in the teaching and study of foreign languages.

WhatsApp Messenger is a mobile message cross-platform application for messages exchange. The devices can be accessed by iPhone, Android, Blackberry, Windows Phone or Nokia. Users of WhatsApp can create groups; send image, video and audio media messages without limits. It works via the web. Up to now, WhatsApp has added many additional features to enhance user experience since its launch in 2009. Now, you can even call or send documents through it. WhatsApp offers many features and no features extra, works only via the Internet and uses mobile or Wi-Fi data. WhatsApp reported 1 billion active monthly users worldwide in February 2016. WhatsApp is primarily a mobile user communication application. The subjects of communication cover a variety of subjects. WhatsApp provides numerous types of messages such as witches, comments, news, any news clip, videos or audios, etc. The current investigation aims at understanding how the WhatsApp cycle communicates or spreads

news. In this research, news communication means that contents of current issues or events are communicated on WhatsApp.

WhatsApp is an app for smartphones that works on almost all current types of devices and systems. The app has been on the market since 2010; developers declared it their intention to replace the existing SMS platform for an ad-free system. WhatsApp provides a number of functions, such as text messages, attached images, audio files, video files, and links to web addresses, for sending and receiving messages to and by individuals or groups. The application has become popular over the last two years, gaining more than 350 million average messages of 31 billion. WhatsApp can technically be seen as a social network, enabling individuals to quickly access a large amount of information. The easy operation system allows a variety of individuals and backgrounds to access the program. WhatsApp enables communication with anyone with a smartphone, an active web connection and the application installed. The application's overall cost is very low, up to one dollar a year.

This app contains many features that make it versatile. The option to create groups is one of its characteristics. Lecturers can create "Simple social networks" for their students to use. This helps to engage a certain group of people in discussions. The person creating the group will become the manager and he or she may also join the group manager. It can only be added or removed by administrators. All members of the group have the same privileges as regards usability. The amount of data that can be shared or communicated is another unique feature of this app. There's no word limit for messages, unlike other mobile apps like SMS.

There are many benefits to use when using mobile telephone systems to support lecturing activity. One of these is that WhatsApp instant messages are generally used in lectures used by lecturers and students in the teaching system:

- Instant message from WhatsApp facilitates online collaboration and collaboration between students who are connected to the campus and home in online courses via mobile telephone.
- WhatsApp is more or less free of charge.

- WhatsApp related groups can easily share learning objects with WhatsApp massagers via comments, text messages and messages. Discussions concerning content of courses are taught 100% in a classroom.
- WhatsApp enables students to create and publish class publications in groups.
- The short message WhatsApp makes information and knowledge easy to construct and share.
- The option to set up groups and communicate within its borders is one of the unique features of the app. The creator of the group becomes the organizer, who has the privilege to add and remove participants without the approval of group members. Moreover, the same rights are accorded to everyone in the group. This app gives participants the ability to get warnings for every message they send or to disable incoming warnings for a whole of 8 hours, a day, or a week.
- Security is another major problem in social networks. WhatsApp is safer in comparison with all common social networking sites and applications. Given the widespread monitoring of the Internet, users need to worry about how secure their cell phones and computers are. Many companies offer products for 'secure messaging' – but are these systems secure? In its evaluation of the strength of encryption and the privacy they provide, the US Electronic Frontier Foundation analyzes several mobile messaging apps.

Over the past decade, digital communication between student groups and between students and lecturers has been popular on different channels: email, SMS, Facebook groups, Twitter, and recently WhatsApp. Each of these tools has different features which influence their learning suitability (Calvo et al., 2014)nowadays some students still usually face accessibility barriers when using Chats and, as a result, they cannot learn in the same way as their classmates. Thus, some of the equality principles of education are not accomplished. This paper shows a study of chat's characteristics and analyzes if commercial

Chats with general purposes can be used for learning environments in an accessible way. This study has been carried out from the point of view of the Universal Design for Learning (UDL. Different Instant Messaging (IM) services were examined previously. Students who communicate during and after their learning through the internally developed SMS system of the university found in research conducted by (Scornavacca et al., 2009) to be inclined to ask more questions and to take part in the system of IM. In an analysis of previous research on social network integration and instant massaging in education, it is clear that many features that contribute to the learning process are common in every platform, including encouraging collaborative learning, active class participation, whenever possible learning and informal communication. However, research shows that these instruments are not widely used.

The high-smartphone market infiltration had begun to be used by WhatsApp in the period of the Covid-19 epidemic which began to hit educational groups in Indonesia as a communication platform for different student groups, as did recently groups of lecturers and students. Professors can create groups for their students, it's a sort of "common social network" (Westwood, 2008). A number of reasons why WhatsApp is adopted by people instead of as an alternative (such as SMS or other social networks) by (Church & De Oliveira, 2013): Low cost of application combined with the ability to send unlimited number of messages, mediation, the will to feel part of a trend because of their application, the capacity to talk simultaneously with many friends or family and their sense of confidentiality relative to other social networks. Nevertheless, users have also noted several disadvantages, like the flood of irrelevant or absurd messages and the impression that the request is not a formal communication channel. These disadvantages lead people to regular SMS when they feel they need to pass on a significant or unidirectional message.

In addition to some emoticons and images with less video file use, most of the study groups used by students and lecturers when they study together on a forum for discussion with WhatsApp are verbal. Almost no use of audio and location information. Students however

benefit from the option of changing the group name and group topics on a number of occasions. The group is named as: "Most successful class ever" or Genius class "or" (to remind the class that the lecturer are from the group). Lecturers and students often use cameras to picture and reply to their notebooks and sketches. Not a few lecturers often share the learning material URL link. Both students and lecturers use emoticons widely, while lecturers and children often add one or two emoticons and girls often add entire lines.

One of the main advantages of WhatsApp is its simplicity. Respondents identified various advantages of technology. In previous attempts to incorporate various technologies into their educational process, all participants were disappointed. WhatsApp's simplicity, low cost privacy (where applicable), and wide use among lecturers and students in their personal lives make it a top choice (compared to other social networks, such as Twitter or Facebook). WhatsApp groups have a positive social atmosphere, are seen from the class and are a source of fun for students. The homeroom lecturers usually starts talking to the students while the subject lecturers starts with the hope that the group will be used as a learning platform. Most lecturers do not plan and develop dialogue and sharing among students as groups develop.

We have not shown a pattern of WhatsApp group formation related to gender, school location, socioeconomic level of students, or group management. but not a few people still use email, but they do not comply because many students do not monitor email every day so that communication becomes less efficient. Some participants also use SMS to communicate with students interpersonal but it is more expensive and does not facilitate group communication. "In the past, I used to send SMS messages of happy birthdays and holidays to students," said one student. Each student receives his or her own welcome, but I work on it, and it's just communication between me and the students. Everything is different now. "WhatsApp makes it easy and fast to transfer connections, unlike other technologies, to the study material that do not work often or other communication forms that students don't use after hours on campus. WhatsApp ensures that all studying materials are sent to everybody, whether it's a class video or

a copy of a solution for exercising after school.

Of all the things that are positive and negative, it is the lack of communication between one lecturers and the other that makes it easier to use WhatsApp during learning and that which is negative. The lecturer will work on its own internet classes without considering the things that are needed to prepare for an innovative and efficient way WhatsApp will work. The authors therefore suggest that it is useful to find ways to enter into dialogue, to exchange ideas and suggestions on how to tackle challenges and broaden their understanding of how the educational and pedagogical goals of the school can be implemented. These lecturers are encouraged to participate in WhatsApp groups which we are specifically opening to this end.

Some lecturers say that this application isn't temporarily accessible to all students because every day there are increasing numbers of students with Smartphones. The majority of participating lecturers are university students from low socioeconomic status areas. However, even among these students, the use of smartphones is widespread. The study of WhatsApp's educational aspects has shown various advantages. Open discussions allow professors to get a deep understanding of their students and create a positive atmosphere and a sense of belonging. Many lecturers feel that their group presence influences students positively. Whether the lecturer dominates or the listener is quiet, the students know how they are, how they treat one another, and how they express one another with regard to the content studied. Further research is invaluable in order to test the views of students about how their lecturers speak.

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CHAPTER 3.

Basics of Zoom Cloud Meeting and Google Meet

Bayu Rianto, Mulono Apriyanto,
Samsul Amri, Melda Yeni

Zoom Cloud Meeting Application

1. Zoom Cloud Meeting History

The Zoom Meeting application, founded in 2011 by Eric Yuan, has become a video communication-based company and has become a line of high-end companies. This is not surprising because it is currently a favorite of many people, especially for online meetings. The founder of Zoom himself is a billionaire who is on the Forbes list of the wealthiest people in the world. Eric Yuan has founded Zoom for nine years with a value of US $ 35 billion. (Pintar, 2021)

The Zoom has begun widely used by workers during the pandemic; Eric Yuan's wealth has risen by 112% to around US $ 7.57 billion. The founder of Zoom is born in China, in Shandong, 49 years ago, to be precise. His educational history is applied mathematics and engineering. Moreover, his initial creation of Zoom was inspired by his story with his girlfriend, who is currently his wife (Pintar, 2021).

2. The advantages of Zoom Cloud Meeting

2.1 Large space capacity

A virtual meeting application must certainly enable to accommodate many participants in one conference session. Also, it usually has a large number of participants.

2.2 Best video and sound quality

One of the Zoom Cloud Meeting advantages is that it enables a presentation of clear video and voice quality. Consequently, it makes easier when communicating.

2.3 Having various interesting features

The Zoom Cloud Meeting application provides a variety of exciting features. Users can record and save videos during the meeting, brighten their facial skin tone, change the background as desired, and schedule online meetings.

2.4 Supports presentations

By using the Zoom Cloud Meeting application, the users can present material files to other participants. Both participants and presenters can scribble on the presentation to make it easier to deepen the material.

2.5 Video on/off feature

If the users no longer need their appearance and voice, they can set video and audio to turn off. This advantage, of course, will maintain their privacy without disrupting the system of a meeting.

2.6 Available on a wide variety of devices

The Zoom Cloud Meeting application can be run on various devices, including Android phones, iPhones, PCs, or laptops.(Pulsa Seluler, 2021)

3. Disadvantages of Zoom Cloud Meeting

3.1 The Indonesian language is not available.

The Zoom Cloud Meeting application uses English to be pretty tricky for those who do not understand English. But it is not a severe problem because the users can realize English sentences well by utilizing Google Translate.

3.2 Wasteful quota

Usually, applications that display videos will consume more quotas. Likewise, at Zoom Cloud Meeting, it is not surprising if the internet package will decrease significantly after holding a video conference session.

3.3 Less safe

Recently, the Zoom Cloud Meeting application has become the centre of attention due to the leaking of user data to the public. Instead of storing its users' personal details, this application even disseminates sensitive data such as faces, user locations, and user login hours. (Pulsa Seluler, 2021).

4. How to Register for Zoom Meeting

The first step in using the Zoom application is to register for the Zoom application for free. Registration can be done via your cell phone or through the website.

a. How to Register for Zoom Meetings through the Website

Visit the https://zoom.us/ site, then click sign up and enter the date, month, and year of birth.

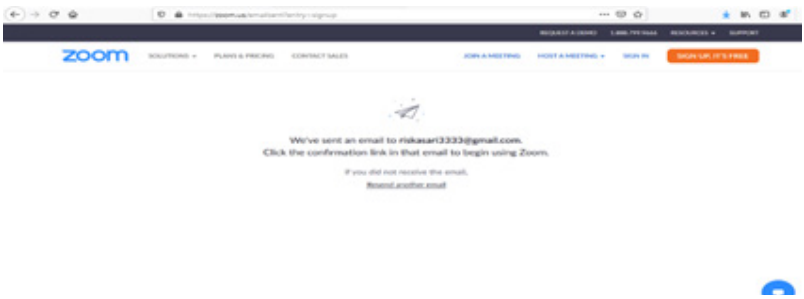

Figure 1. Initial Display

Then, the users register by giving active email in the email column, then check the notification email from Zoom.

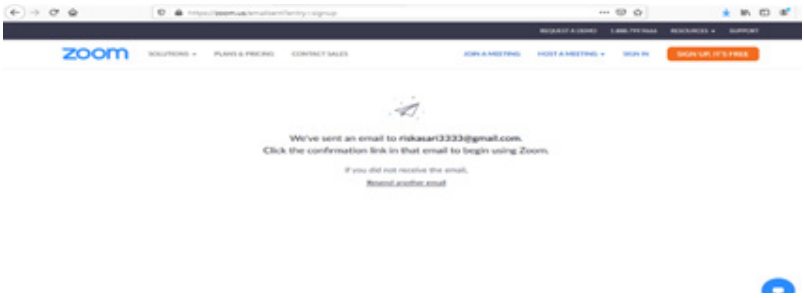

Figure 2. Registration Display

- Then click "Activate account." Then they will be directed to the browser to create a new password or password.
- Finally, the Zoom account can be used by selecting sign in then entering the email address and password you registered.

b. How to Register for Zoom Meeting via Cell phone / Mobile

It is almost similar to the registration through the website. Here is how to register Zoom via cell phone.

- First, download this application on the Google play store
- After the application is installed, open the application, then click sign up
- Then enter the email address, first name, and last name you want to display to other users.

Figure 3. Zoom Display in Smart Phone

- Check the terms of service agreement if it appears. Then click sign up.
- Open the notification email sent by Zoom to email registered.

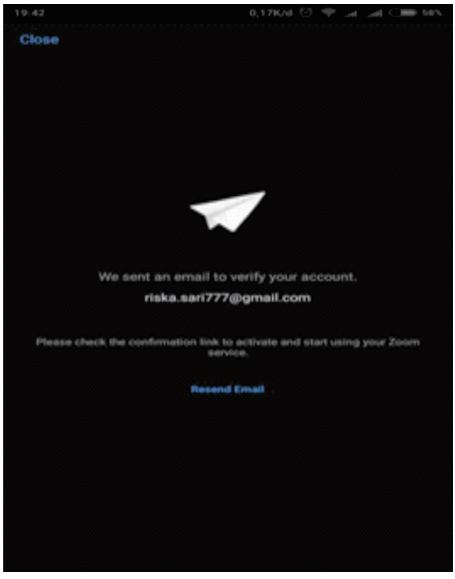

Figure 4. Registration Display in di Smart Phone

- Then click "activate account" on the email.
- In the next step, the users will be asked to create a password for your account.
- Finally, the Zoom account is already active. It can be used by selecting sign in then entering the email address and password that you registered.

5. How to Start an Online Meeting Using the Zoom Meeting Application

It is a tutorial on using the Zoom application to hold online meetings.

- After the Zoom application has been installed on laptop, PC, or mobile phone, log in to Zoom account.
- After logging in, the users will find three options: schedule, join and host the meeting in Zoom at the top of the screen.

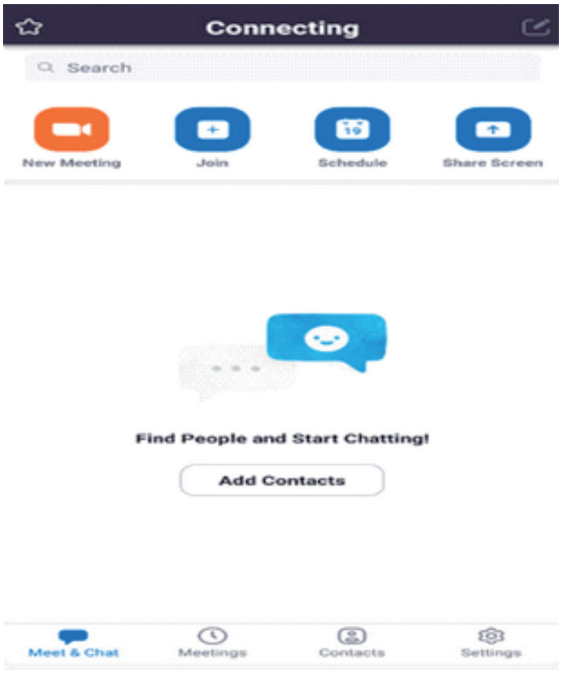

Figure 5. Display of Home Zoom on Smart Phone

- Choose according to the needs if they want to hold a meeting at that time select schedule. If they wish to join the meeting, click join.
- If they choose to join, they must have a "meeting ID" or include their name to join the meeting.
- If they choose the host, they must make a meeting room first because they can participate in the meeting.
- Done

6. How to Set a Zoom Meeting Schedule

The users can organize meetings more flexibly by using this application. It is how to schedule a meeting:

- Open the zoom application and sign in
- Then click the calendar icon

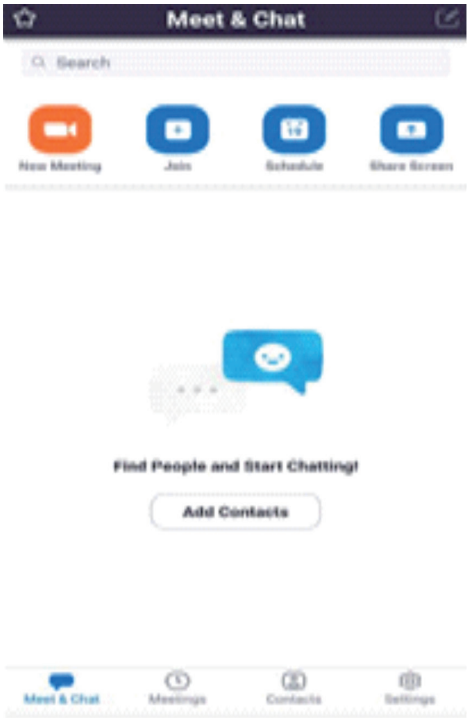

Figure 6. Display of Meeting Schedule Settings

Then select the meeting settings.

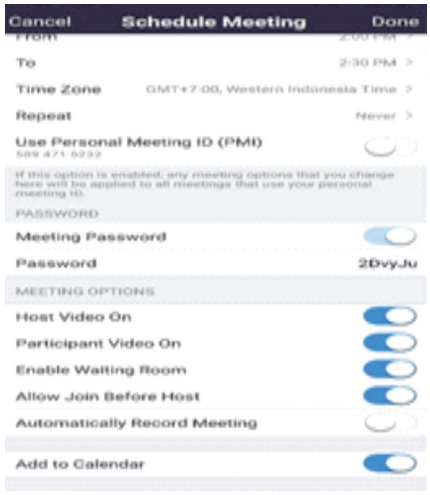

Figure 7. Display of Meeting Schedule Settings (Continue)

The meeting schedule settings will appear, such as meeting topics, starting at what date and time the video can be seen by everyone and others

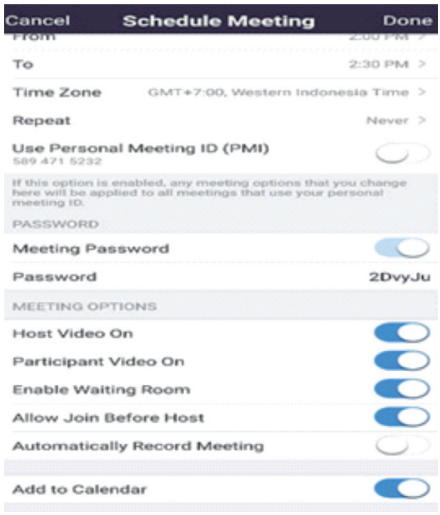

Figure 8. Display of Meeting Schedule Settings (Continue)

- If the meeting settings are in accordance, then click schedule.
- Done (Bambang Winarso, 2020).

Google Meet

1. Google Meet History

Google Meet is a product of Google, which is a video communication service developed by Google. This application is one of two applications: a new version of the previous version; Google Hangouts and Google Chat. Google itself discontinued the classic version of Google Hangouts in October 2019.

Without being known by the public, Google Meet was released for iOS users only. But in February 2017, Google officially launched Google Meet. This application was established as a video-conferencing application that up to 30 participants could watch. The meet is a more robust version than its predecessor Hangouts because it can be displayed on the web, Android, and iOS applications (Serba Serbi, 2020).

2. Google Meet features

Google Meet offers many features that can help individual and corporate use even on a large scale. Here are the parts you can rely on from Google Meet:

a. It can invite up to 100 participants per call for G Basic Suite users, 150 people for G Suite Business users, and 260 people per meeting for users who purchased a G Suite Enterprise plan.

b. It can join meetings from the web or via applications installed by Android and iOS smartphone users.

c. It enables to conduct online meetings with dial-in numbers.

d. If a G Suite Enterprise edition user uses a dial-in number, the user's password will be protected.

e. It Integrates with Google Calendar to make one-click meeting calls.

f. It can share the screen to present documents, spreadsheets, or presentations.

g. Encrypted calls among all its users.

h. Closed text generated by AI. (Serba Serbi, 2020; Subiantoro & Sardiarinto, 2018)

3. Advantages of Google Meet

The creation and updating of Google Meet, which is much more exciting and offers the best features than its predecessor, the classic Google Hangouts, here are the advantages that Google Meet offers (Rianto, 2019):

- It assists workers and employees to hold meetings wherever they are by using video calls.
- It has a unique and functional interface with a light and fast size, prioritizing efficient management, easy to use (user friendly) that can be followed by all participants.
- The users can invite meeting participants and share features. (Serba Serbi, 2020)

4. Disadvantages of Google Meet

a. No data saving feature

- Conducting online meetings on the Google Meet application has drawbacks, which there are no data saving features.
- Indeed, features to save data will reduce data that will be wasted or even wasteful.
- The users have to be ready if the internet data is drained a lot while doing video conferencing or online using the Google Meet application.

b. Need a Stable Internet Network

- In video conferencing applications, the internet network is the primary key that makes it works smoothly as it should.
- It is possible and often happens when conducting video conferences with unstable internet, then the video often delays or pauses.

- However, this is not only felt when conducting online meetings in the Google Meet application, but also it may occur in other video conferencing applications.

c. Not All Features Are Free

- Google Meet is available for free, but not entirely facilities.
- To conduct a full-service video conference or online meeting on Google Meet, the users have to pay more.
- To use certain features, the users must pay and subscribe to or buy a Google Suite package with a fee determined by Google.
- After knowing the advantages and disadvantages of online meetings in the Google Meet application, the users should be wiser in choosing any application installed on their devices.
- Before installing any applications, the users should be selective of various aspects and features, especially security aspects, because personal data will be accessible. (Dianti Rahayu, 2020).

5. How to use Google Meet

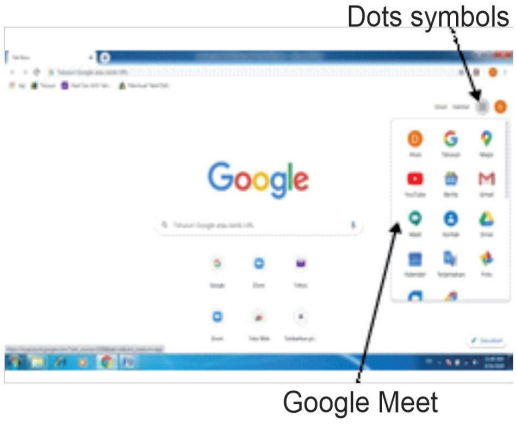

Figure 9 Google Meet Application Display

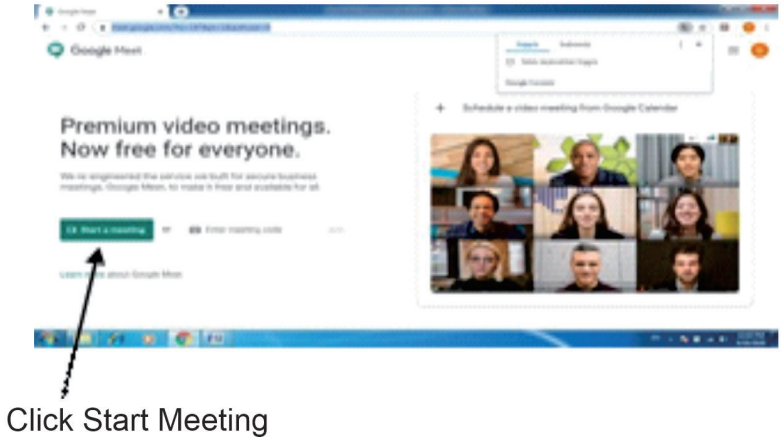

Figure 10. Start a Meeting Display

To join the video conference

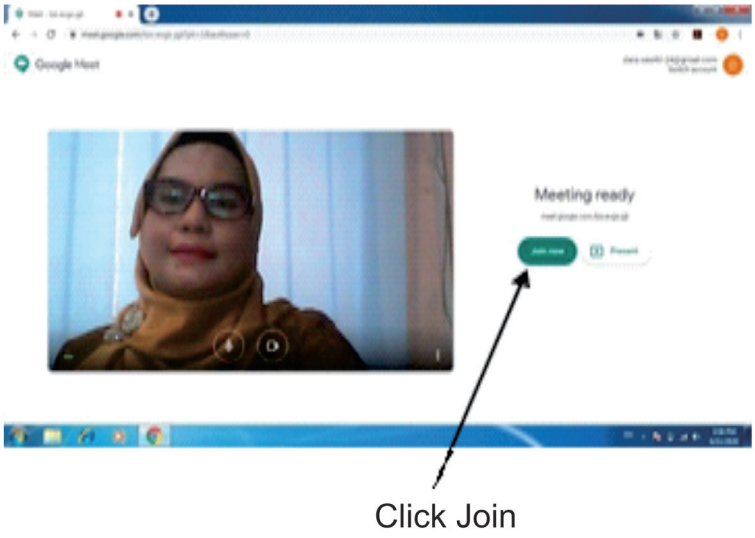

Figure 11 Joint Video Conference Display

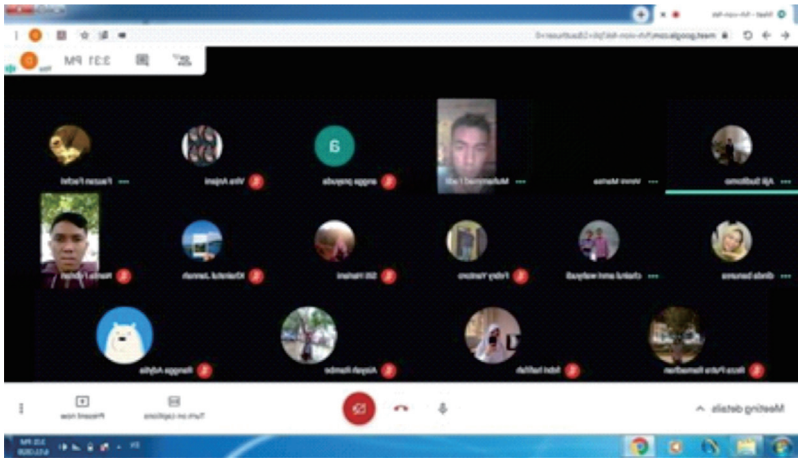

Figure 12. Display of Students after Joining the Video Conference

a) To mute the sound, press the microphone mark.
b) To turn off the speaker image display, turn off the camera mark.
c) To display the file to be presented, you can press the sign Present Now. (Sawitri, 2020)

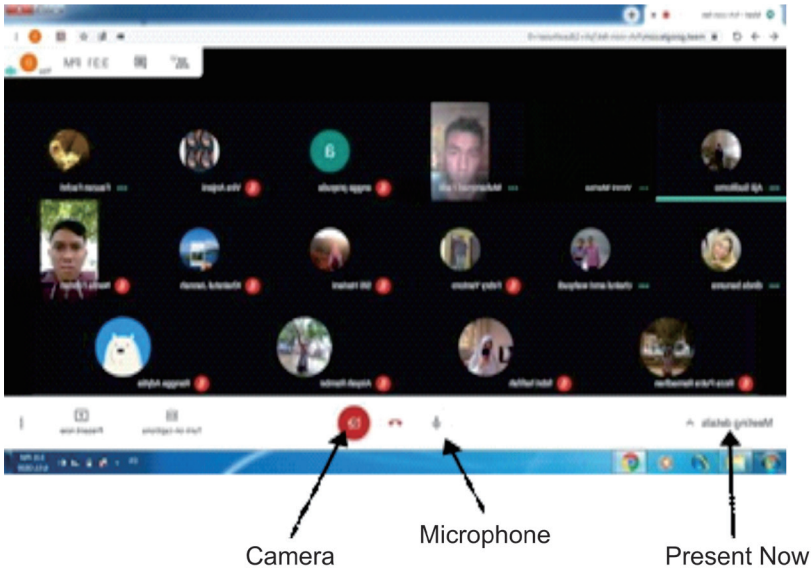

Figure 13. Display of Microphone, Camera, and Present

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CHAPTER 4.

Inter-Organizational Networks as a Solution in Forest and Land Fire Control

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Abstract

Forest and land fires (karhutla) are still a routine problem in Riau Province. One of the districts that routinely contributes to forest and land fire hotspots is Pelalawan Regency. So far, the control of forest and land fires that has been carried out tends to be incidental and only focuses on the aspects of firefighting. The network practice that takes place is more of an exchange of information and direction of assistance with resources (limited according to their respective capacities) when the forest and land fires occur, whether they are siblings between two agencies or multi-agency. The engagement is relatively loose and formal. However, the level of coordination between agencies is quite good, so that the forest and land fires that occur can still be handled. In a hierarchical bureaucracy, the forest and land and forest fires problem holders already exist, such as the regional forest and forestry center at the provincial level and satlakdakarhutla at the district level, as well as the satgaskarhutla at the sub-district level. However, these agencies are not fully functional due to a number of "ex-officio" constraints. An alternative solution to this bureaucratic obstacle is needed, namely by analyzing related

policies. With the alternative solutions offered, it is hoped that the bureaucracy can work together and work optimally according to their main duties. The bureaucracy can use an institutional model for inter-organizational networks of forest and land fire control. With this, the forest and land fires which are a problem are expected to be prevented and tackled together.

Keyword: Inter-Organizational Networks, Forest and Land Fire Control

Public policies are described in Appendix 1 of the Regulation of the Minister for Administrative Reform Number PER / 04 / M.PAN / 4/2004, namely public policies are decisions made by the government or government agencies to solve certain problems, to carry out certain activities or to achieve certain objectives concerning with the interests and benefits of the crowd. The policy analysis approach is an effort to produce information and arguments, policy analysis can use several approaches, namely: Empirical, Evaluative, and Normative approaches (DUNN, 1988).

Pelalawan Regency is one of the areas with the highest number of hotspots besides Meranti Islands Regency, Bengkalis, Dumai Rokan Hilir. Even until 2019 the frequency of land and forest fires is still high in Pelalawan Regency. Based on data released by BMKG Pekanbaru station (2019), the most hotspots or hotspots are in Pelalawan district. This is one of the reasons the authors chose Pelalawan as the research location. The number of hotspots can be shown in Figure below:

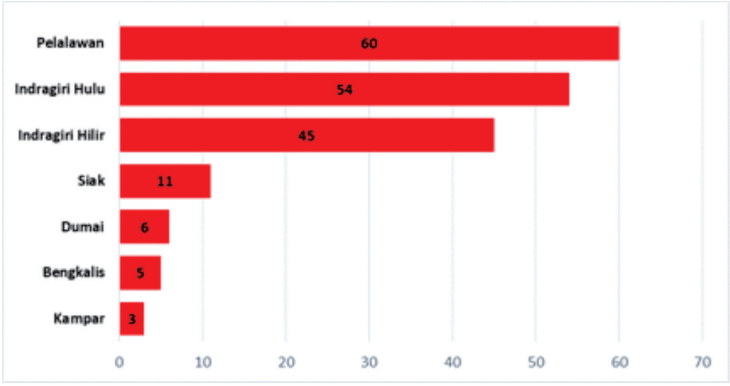

Figure 1.1 Number of Hotspots in Riau Province in 2019

Source *: BMKG Pekanbaru, 2019*

The negative impacts caused by forest and land fires are complex. The negative impact of forest and land fires (karhutla) is very real in the health aspect. Haze can cause allergic reactions, inflammation, and acute respiratory infections (ARI). In practice, forest and forest fires control cannot be carried out entirely by one party or the government alone. It requires the involvement of many parties, both individuals and groups or organizations. This requires the government to involve many parties or other agencies in controlling forest and land fires. There are several problems identified in the control of forest and land fires that have been carried out in Pelalawan Regency, namely:

1) Control of forest and land fires cannot be handled by one party or actor alone, but requires complex collective action (collaboration and synergy / network) of many parties who actually have their respective capabilities specifications,
2) Networks in forest and land fire control involve a number of actors / parties who are interdependent, both in terms of expertise and resources.
3) Interdependency or interdependence requires complex strategic governance in interactions between organizations and in operations.
4) The fact is that each of the organizations involved in forest and land fire control (in this case government and private

and public agencies) is actually an organization that has a level of autonomy according to their respective fields of work (sectoral) with perceptions and strategies based on their perspective. respective fields,

5) Collaborative collaboration between these actors is bound by the same challenges (karhutla in one area) for a period of time (in this case during the forest and land fire control period, alert status / emergency response status).

Based on the identification of the above problems, the government must of course find alternative solutions to solve the above problems so that the output of preventing forest and land fires is realized. Forest and forest fires problems that occur in Pelalawan Regency can use a network or organization network approach. At the initial stage, forest fire control should be the target program for all organizations involved, thus, all agencies and organizations are interrelated and interdependent. Therefore, there will be information networks where the exchange of information between organizations can take place. The exchange of information makes interactions more intensive, thus a more solid network is built at this stage of development networks. After the network was built and became more solid, an outreach network took place where there was adjustment and adoption of strategic programs between organizations. Furthermore, in the final stage there is a network action where action programs are planned and executed together. This form is the most solid form of inter-organizational network compliance.

Forest and land fire control in Indonesia involves many organizations, both government and non-government organizations. The involvement of many organizations requires an understanding of the organization as a whole and that organizing is part of the management function so this also requires an understanding of inter-organizational networks. Humans always play an active and dominant role in every organizational activity, because humans become planners, actors, and determining the realization of organizational goals (Melayu, 2010). Inter-organizational relations can take the form of cooperation,

collaboration and coordination. In various literatures these terms are often used and sometimes the meanings are interchanged.

Inter-organizational relations can take the form of cooperation, collaboration and coordination. If the relationship already involves three or more parties, it is said to be a network. The initiative to establish an inter-organizational network of forest and land fire control organizations as stated by Wehmeyer in the Provan (2007) term "network as a form of governance" is one of the variables considered appropriate for the bureaucratic organizations that control forest and land fires in Pelalawan. The advantages of a network organization are as follows:

- Encourage the exchange of information. Network structure design is usually supported by sophisticated IT tools,
- Make it easier to make decisions. Decision-making mechanisms can take place in a fragmentary way. This means that you don't have to hold meetings, brainstorms, or other coordination methods. Each unit manages its own decisions, with reference to the basis of the contractual relationship that has been agreed upon,
- Spur innovation, the exchange of ideas among elements of network structures is usually much richer and more diverse than traditional organizations. This encourages creativity and various innovations, based on combining or modifying existing ideas,
- Very flexible to keep up with changing trends or fashions. Organizations that require speed in adjusting to trends or fashions usually benefit more from network structure design.
- Can respond to local consumer needs or preferences (Kusnadi, 2009).
- Forest / land fire control organizations involve many government agencies or organizations, at the national, provincial, and district / city levels.

Involvement between these parties requires an organizational model that works integratively and harmoniously in order to be effective and efficient (Siswanto, 2009). In general bureaucracy, the agencies that play a role in the problem of forest and land fires in the regions are as follows:

1. Badan Penanggulangan Bencana Daerah (BPBD) sebagai koordinator pengendalian kebakaran hutan dan lahan di daerah.
2. Satpol PP dan Damkar
3. Dinas Kehutanan dan Lingkungan Hidup sebagai koordinator penyusunan kebijakan/peraturan daerah yang berhubungan dengan pencegahan dan penanggulangan kebakaran hutan.
4. Dinas Perkebunan (Disbun) sesuai dengan tupoksi dalam Pusdalkarhutla mempunyai tanggung jawab pencegahan karhutla.
5. Badan Lingkungan Hidup (BLH) berperan dalam pengendalian dampak lingkungan.

Apart from the aforementioned government organizations/ agencies, other organizations are often involved in extinguishing and controlling forest and land fires at the Damkar, TNI, Polri and many other agencies. So far, the collaboration between organizations (agencies) taking place in Pelalawan is still primarily oriented towards operational activities for the prevention and extinguishing of fires and fires. This - as obtained from an interview with Mr. Suparno from BPBD Pelalawan Regency, can be seen from the type of fire status that is the target of the operation, namely (1) monitoring and overcoming hot spots defined as the presence of smoke, but fire status has not yet spread; not yet a spreading fire, and (2) extinguishing the fire spots as soon as possible. A fire spot is defined as a hotspot that has the potential to become a massive scale of forest and land fires.

Cooperation procedures between organizations to control forest / land fires at the provincial and district / city levels actually already exist in Riau as stipulated in the Riau Governor Regulation (Pergub)

No. 91/2009. The problem is, the Pergub does not explain the funding mechanism for this cooperation, so the cooperation remains difficult to implement. In order to manage cooperative relations between agencies in the work of handling and controlling forest and land fires, the government agencies involved hold joint coordination and evaluation meetings at least once a year. Meanwhile, coordination meetings for certain cases were held flexibly according to the demands of the situation and conditions. There is no definitive structure and functional role division (systematic work plan / program) for each agency involved. So far, BPBD has been the leader and command center for firefighting activities. The status of regional satlakkarhutla tends to be ex officio in accordance with the Regent's Decree which is renewed every six (6) months. Communication or inter-agency meetings are usually responsive in nature and become intense, especially when there is a forest / land fire emergency situation.

Therefore, the inter-organizational network model can be applied by local governments with the hope of being an initiative that allows a policy window (entrance / possibility; entry door) for the discourse on the work model of inter-organizational networks in forest area governance. and is directly related to the improvement of operational performance in handling and controlling forest and land fires. So that the output of forest and land fire control can be achieved together.

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CHAPTER 5.

Conducting Flipped Classroom using Google Classroom and Google Meet

Noorhapizah

Introduction

Covid-19 pandemic forces teachers around the globe to shift their instructional method from face-to-face instruction to online learning. The governments closed the schools to prevent coronavirus spread (Madhesh, 2021; Takaku & Yokoyama, 2021). Thus, all students from the elementary level to the tertiary level have to study from home. In Indonesia, the regulation has been implemented since March 2020 (Djalante et al., 2020). The minister of education of the Republic of Indonesia issued circular number 4 of 2020 concerning the Implementation of Education in a Coronavirus Disease Emergency, which obliges schools to carry out distance learning. This new regulation has changed the education system of a sudden.

This sudden disruption caused by the Covid-19 pandemic brings many challenges for both the teachers and the students (Oyedotun, 2020). Those challenges include the school readiness for the new system (Hanafi et al., 2021; Syamsuddin et al., 2021). The schools here cover the students, teachers, and the infrastructure that the schools have. Many teachers were not accustomed to teaching using a video conference facility. The same thing was also true for the students. Many teachers still had problems in conducting online teaching and learning (Scherer et al., 2021). Many of them felt that online teaching and learning processes bring more challenges than face-to-face instruction (Mishra et al., 2020). Many teachers felt that face-to-face instruction is more

effective than online learning (Radu et al., 2020). In addition, many students also prefer to have face-to-face instruction (Muthuprasad et al., 2021).

However, if we see the previous studies on e-learning, many studies have proven that e-learning brings various benefits. The implementation of e-learning is more flexible since it can be done anywhere and anytime (Jamalpur et al., 2021). Online learning can be designed to accommodate students with various learning styles (Van Waes et al., 2014). Moreover, online learning creates independent and active learners (Park, 2016). Nevertheless, online teaching and learning should be conducted properly using the appropriate teaching strategy to get those benefits. It is because teaching strategy plays a crucial role in the success of an instructional process. The teaching strategy used by teachers may influence the students' academic achievement (Cordero & Gil-Izquierdo, 2018; Tulbure, 2012). Therefore, teachers should know the appropriate teaching strategy for the online teaching and learning process. Besides teaching strategy, the application used by the teachers to conduct the online teaching and learning process is also a crucial thing (Abdulrahaman et al., 2020; Rubin et al., 2013). Hence, teachers should also know about good software to be used for conducting online teaching and learning.

Some researchers have already proven that Flipped Classroom is an effective teaching strategy (Goh & Ong, 2019; Gómez-Tejedor et al., 2020; Özbay & Çınar, 2021; van Alten et al., 2019). Besides, some studies also found that the use of google classroom and google meet positively affects instruction and students' achievement (Mishra et al., 2020; Swaminathan et al., 2021). Thus, this paper tries to provide information about how to use google classroom and google meet for conducting flipped learning to create an effective online teaching and learning process.

Flipped Learning

Flipped Classroom is a learning method that reverses traditional methods. Where the teacher will usually provide explanations in class and students, do assignments at home. However, in this method, the

teacher will provide material that the students will read at home (Van Alten et al., 2019). Then the class learning session will then be used for a joint discussion regarding the material given (Halasa et al., 2020). Flipped Classroom is a learning model or method that minimizes direct teaching from the teacher, wherein the learning process students learn the subject matter first at home, while teaching and learning activities in class are only in the form of assignments, discussing material or problems that have not been understood while studying at home. The flipped classroom learning model concept is basically what is done in class in conventional learning done at home, while homework in conventional learning is done in class (Murillo-Zamorano et al., 2019). The flipped classroom model has several types (Soliman, 2016). Those types are:

a. Traditional flipped

   Traditional Flipped is the simplest flipped classroom learning model. The students have to watch learning videos at home before they have face-to-face instruction in the Classroom. Then, during the face-to-face instruction at schools, they do the tasks or the assignments given in groups. Then at the end of the lesson, quizzes are carried out individually or in pairs.

b. Mastery flipped

   Mastery Flipped is a development from Traditional Flipped. The learning stages are almost the same as Traditional Flipped, except that material repetition is given at the previous meeting at the beginning of the lesson.

c. Peer Instruction flipped

   Peer Instruction Flipped is a learning model where students learn basic material at home via video before they have face-to-face instruction. During the face-to-face instruction, the students answer conceptual questions individually, and students are allowed to argue with each other on the questions given to ensure the answer to their friends. At the end of the lesson, an individual understanding test is given.

d. Problem-based flipped learning

Problem-Based Flipped Learning is a learning model in which students are given videos that provide instructions for solving problems that will arise in class. While during the face-to-face instruction, the students do experimentation and evaluation with the guidance given by the teachers.

The advantages of using Flipped Classroom (van Alten et al., 2019):

- The Flipping Model answers the challenges of today's students
- Flipping helps students who have many activities outside of school
- Flipping helps students who want to make an effort to understand the learning material
- Flipping helps all students to be the best
- Flipping allows educators to understand students better
- Flipping increases interaction between students
- Flipping educates parents

There are many reasons why flipped classrooms are currently an important choice in our learning model. The following are some of the advantages that are the reasons why we need to use this flipped classroom learning model. According to Soliman (2016), those reasons are:

For student:

- Students (forced) have time to study the subject matter at home before the teacher delivers it in class. Thus, students are more independent and no longer just wait for the teacher to deliver their subject matter in class.
- Students can study subject matter in comfortable conditions and atmosphere according to their ability to receive the material. Smart students can learn quickly, whereas less able students can repeat the course material (video) until they understand.

- Every student can get the teacher's full attention when they have difficulty understanding concepts and assignments/exercises/quizzes. In the Classroom, the teacher only discusses (reviews) the material that students think is difficult (only). Or, the teacher can ask students who already understand the material to help their friends who don't understand. Thus, it can be ascertained that every student has understood the material well.
- Students can learn from various types of learning content, either through videos, websites, mobile applications, or other types of content. This makes it easier for students to understand the subject matter, rather than only learning from the blackboard or books.

For teachers:

- It is more effective because the material is presented in the form of a video to be used repeatedly in other classes.
- Save time because the teacher does not have to explain all the subject matter, but only certain parts are considered difficult.
- Teachers are motivated to prepare subject matter in various types of content, whether in the form of videos, websites, mobile applications, or other types of content. So that the implementation of learning is more well planned and organized.
- Teachers are increasingly creative in making learning modules that utilize information technology that makes it easier for students to understand concepts.
- There is active communication between teachers and students because learning is mostly done by discussing (question and answer) between them.

Google Classroom

Google Classroom is an online learning application that can be used for free. Educators can create their class and share the class code or invite students. Google Classroom is intended to help all spheres of education help students find or overcome learning difficulties,

share lessons, and create assignments without attending class. Google Classroom's main goal is to streamline the process of sharing files between teachers and students. Google Classroom combines Google Drive for assignment creation and distribution, Google Docs, Sheets, Slides for writing, Gmail for communication, and Google Calendar for scheduling. Students can be invited to join classes via a personal code or be automatically imported from the school domain. Each class creates a separate folder in each user's Drive, where students can submit work for the teacher to grade. This application is available for mobile users of iOS and Android devices, allowing users to take photos and attach assignments, share files from other applications, and access information offline. The teacher can monitor progress for each student, and once assessed, the teacher can return to work together with comments.

Google Meet

Google Meet is a video-conferencing application that is very useful to support online meeting activities. This application is part of Google Hangouts, which is specifically designed for the purpose of use by a company or institution, or organization. The Google Meet application is easy to use because it can be applied through various devices. This application can be used via desktop or PC with a web application, Android, and iOS. In addition, this application can also be used via mobile or cellular telephone, making it possible to use it anytime and anywhere. So its use is arguably flexible and following needs. The application is provided free of charge or free of charge and with a very simple operational process making it easy to use.

Features included in Google Meet

- Two-way and multi-way audio and video calls with resolutions up to 720p
- Call encryption between all users
- Noise cancellation audio filter
- Low light mode for videos
- join a meeting via a web browser or via the Android or iOS app

- Integration with Google Calendar and Google Contacts for one-click meeting calls
- Screen sharing for presenting documents, spreadsheets, presentations.
- The host can deny entry and delete users during the call

Panning Flipped Classroom using Google Classroom and Google Meet

In designing a flipped classroom using google classroom and google meet, several steps must be taken. These stages include:

1. Create a google account and set up google classroom and google meet

   The first thing that needs to be prepared by the teacher in designing a flipped classroom using google classroom and google meet is creating a Google account. For teachers who already have a Gmail account, the teacher automatically already has a Google account. However, if you don't have a Gmail account, the first thing to do is create a Gmail account. After having a Gmail account, all the teacher needs to do is to log into his Google account using a Gmail account. Then, just select the google classroom application on the google menu. Next, the teacher needs to create a class on the selected google classroom application. If it is successful, the class will be available along with a link for the google meet application specifically for that class because the latest google classroom facilities are directly integrated with google meet (see Figure 1). In other words, teachers no longer need to create special links through the Google Meet application.

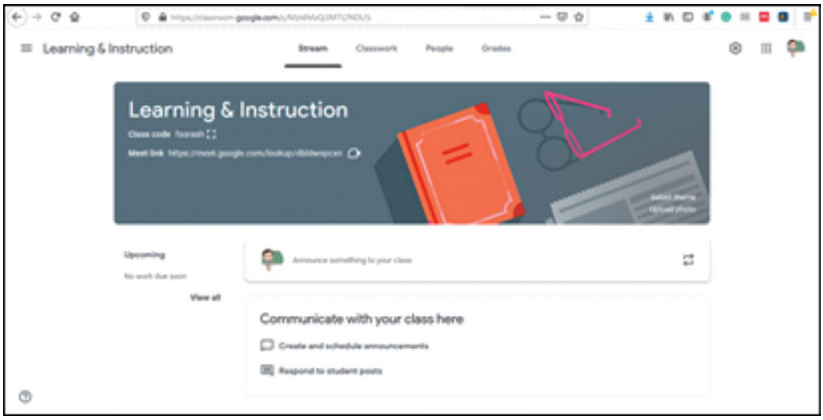

Figure 1. A Class in Google Classroom that Provides Link for Google Meet

2. Preparing Learning Materials and Tasks

In arranging the material to be distributed to students, the teacher should consider some important points. First, the materials should use language that is easy to understand. This is important because students must study this material without the help of the teacher first. Second, provide a reference source for students to access if they want to explore the material further. Third, include several questions that aim to check students' understanding of the material and then also provide the answer key at the end of the question. Fourth, ask students to make a kind of effective and efficient summary (at other times, an educational essay will discuss this in more depth and detail) to be discussed at the meeting. Those materials and tasks should be placed in the Google classroom. Besides, teachers should also make a slide for further explanation and tasks for the students during the virtual meeting session using Google meet. In preparing the materials and tasks, the teachers also need to decide the type of flipped Classroom they want to implement. The type of the flipped Classroom can be adjusted with the learning objectives and learning materials.

3. Preparing Students and Parents

Since most schools in Indonesia generally do not use the flipped classroom method, teachers need to socialize this method.

Teachers should also explain that they will use Google classroom and Google meet in delivering the instruction. Thus, teachers should make sure that the students already have Google accounts and know the link or code to access the Google classroom and Google meet. Furthermore, students must understand that in this method, they are obliged to study the learning material before the class starts through Google classroom. This means they have to study independently from the materials available in the Google classroom without the presence of the teachers first. Students should also be given directions on maximizing this method, such as doing independent research using the internet. The teacher is also obliged to provide further reading material for students to further explore the material. The school can also ask parents to monitor and assist the student's independent learning process before the class begins.

Implementing Flipped Learning using Google Classroom and Google Meet

In implementing flipped classrooms using google classroom and google meet, what needs to be considered is the distribution of learning activities carried out. In general, Google Classroom will be used to deliver material that must be studied independently by students before implementing face-to-face learning. In contrast, Google meet is used to replace face-to-face learning with learning through online meetings. The sample of the activities for the independent learning using google classroom and the activities during the virtual meeting sessions using google meet can be seen in Table 1 and Table 2 below.

Table 1. Students Independent Learning Activities using Google Classroom

Students' Activities	Media	Google Classroom Facilities
Reading the given materials	• File (.pdf or .doc)	• Material (google drive, link, file)

Students' Activities	Media	Google Classroom Facilities
Watching a video(s)	• Video (.mp4 of YouTube link)	• Material (google drive, link, file)
Making summary	• File (.pdf or .doc) • Video (.mp4 of YouTube link)	• Assignment (google drive, link, file) • Create (docs, slides, sheets, drawings)
Making questions	• File (.pdf or .doc) • Video (.mp4 of YouTube link)	• Assignment (google drive, link, file) • Create (docs, slides, sheets, drawings)
Answering a quiz	• Quiz	• Quiz (google form)

From Table 1 above, it can be seen that there are various activities that students can do to learn independently through google classroom. Students can do reading activities, watch videos, make summaries, make questions, and answer quizzes. Making summaries, questions, and answering quizzes must be preceded by reading activities or video mentions. Likewise, reading and watching videos should also be followed by summarizing activities, making questions, or answering quizzes. This is important to do to ensure that students have learned something from their independent learning process. In addition, by carrying out independent learning, students are expected to identify their understanding. So they know what to ask or discuss with the teacher during online meetings.

When students learn independently through google classroom, the teacher still has to monitor student activities and analyze student activities primarily to identify problems experienced by students in understanding the material provided. This identification can be made by analyzing questions, summaries, and the results of quizzes that students have worked on. It is important to identify this problem so that the teacher can prepare the explanations or solutions needed by students to be delivered in online meeting sessions. Thus, the discussions that

occur during online meetings are effective. In addition, information about students' level of understanding during independent learning will also help teachers determine further tasks that students must do during online meeting sessions.

Table 2. Activities during Online Meeting using Google Meet

Classroom Activities	**Media**	**Google Classroom Facilities**
Small-Group Discussion	-	Video Conference (Breakout room, chat)
Class Discussion	-	Video Conference (raise hand, chat)
Teacher Explanation	Slide	Video Conference (present now)
Further Assignment	Slide	Video Conference (present now)

Table 2 shows that several activities can be done using google meet during online meeting sessions. Considering that the purpose of conducting online meetings is to confirm students' understanding of what they have learned independently, the activity carried out is to provide further explanation or deepen the material through discussion or further assignments. Occasionally, the teacher can also explain to students if students still feel they do not understand or need additional explanations.

In the online meeting session, the teacher will take the position of a facilitator who accompanies discussions conducted by students. If additional explanations are needed, the teacher must provide explanations for students so that they have a complete understanding. Furthermore, the teacher can provide follow-up assignments while still supervising and providing assistance for students in carrying out these advanced assignments.

Conclusion

From the explanation above, it can be concluded that online learning, which was imposed suddenly due to the Covid-19 pandemic, caused teachers and students to experience various obstacles. One of the main obstacles faced by teachers is making online learning effective. One of the efforts teachers can make is implementing flipped classrooms because various studies have proven that the flipped classroom learning model has succeeded in making learning more effective. In addition, the use of suitable applications is also important in the implementation of online learning. To support the implementation of flipped classrooms, google classrooms and google meet can be an alternative. Besides being easy to use and suitable for flipped classrooms, the two applications can be used free of charge. Teachers can carry out various types of activities in implementing flipped classrooms using google classroom and google meet. However, to produce optimal results, the implementation of Flipped Classrooms using google classroom and google meet must be well planned. In addition, teacher creativity will also greatly determine the success of flipped classrooms using google classroom and google meet.

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CHAPTER 6.

Learn Fun with Some Simple Digital Application

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Introduction

The use of digital in the world of education and learning basically has been done for a long time, especially in developed countries. Ming-Hung et.al. (2017), citing a statement by Yoon et.al. (2012), stated that; learning using digital (E-Learning) was first proposed by Jay Cross in 1999. The growth and development of these technology tools led to various terms, such as web-based training, internet-based training, online learning, network-based learning, remote learning, and so on.

In contrast to countries that are somewhat behind in technological development. They use technology, not as the maker of the technology. They are also able to use internet-based technology. However, it is still limited to communicating, playing games, enjoying entertainment, and so on. Its use has not led to the learning process. Although some have used it, it is still in a limited circle.

In contrast to countries that are somewhat behind in technological development. People only become consumers of the products of developed countries. Even so, they can use internet-based technology well, but it is still limited to communicating, playing games, enjoying entertainment, and so on. Not yet leading to the learning process. Although some have used it for learning, it is still in a limited circle.

Currently, education and learning are developing massively towards the era of digitalization. This is due to the existence of

regulations related to maintaining the distance required by the world health institution, namely the WHO, as a result of the massive spread of Covid-19, which is almost unstoppable and haunts humans around the world. Therefore, like it or not, like it or not, all educators must switch from offline learning to online learning.

Facing this direction of education, educators in Indonesia initially experienced a bit of panic, especially lecturers who were born in the baby boom era. Because people born in that era were not digital natives, so they were not familiar with existing digital applications. Moreover, so far, the use of digital applications in the learning process is still relatively foreign. Meanwhile, the digital world has explored most Indonesians, but its utilization is still at the level of communication and entertainment needs (music, films, and games), including the digital native generation. Meanwhile, the utilization for the development of education and learning is still very minimal.

Given this inevitable need, educational institutions make policies that require lecturers or teachers who teach at their educational institutions to switch from face-to-face learning to learning using digital applications in the learning process.

The use of digital applications is a solution to the limited space and time for educators and students to meet face to face in one room. Putri (2011) said that with E-learning teachers, and students do not have to be in one dimension of space, and time and the learning process can run effectively.

Over time, it does not feel that this condition has been going on for a year and four months. For teachers or lecturers who feel obliged to follow these changes, try to find out and learn how to operationalize the various forms of learning applications available on the Internet, even though they are simple so that students are not constrained by the learning process. However, lecturers or teachers who do not care about these changes, they will find it difficult or even unable to carry out their function as professional educators.

Not as bad as imagined, it turns out that many digital applications can be used in the learning process and are easy to operate. Even though they are still novice users, if they are intensively engaged, these

simple applications can bring their own fun in carrying out the learning process.

Types of Simple Digital Applications

There are several types of applications that can be used for learning purposes, from very simple to complex. Please note that even though the type of application used is simple, it will be difficult to use it if you do not know how to operate it. Conversely, no matter how complex an application is, if you know how to operate it, it will make it easy for its users and can lighten one's work, including for teachers.

Online learning regulations require educators to take advantage of various existing digital applications to carry out their obligations as educators. Among the digital applications that are simple, and can be used for learning are; WhatsApp, Zoom Meeting, Google Meet, Google Class Room, Google Docs, and so on.

This paper will not discuss all types of learning applications available today but only discuss some simple digital applications that have been widely used by educators born in the baby boom era. Even though the application is simple, it can carry out the learning process according to predetermined competencies.

1. WhatsApp (WA)

WhatsApp is an application for sending messages on a smartphone. WhatsApp Messenger is a messaging application that operates across platforms, so there is no need to use credit when we send messages, it is enough to use internet data. The internet connection used is 3G, 4G or Wi-fi. With WhatsApp, anyone can communicate online, share files, photos, etc. (Hartanto, 2010).

Rosarians et al. (2020), Harususilo (2020), and Daheri et al. (2020) argue that the WhatsApp application is very widely used in learning in Elementary Schools (SD). The results showed that 100% of online learning conducted by elementary teachers only made use of the WhatsApp application. In their research, Daheri

et al. (2020) found that online learning using the WhatsApp application in SD was less effective.

Meanwhile, the results of Iskandar's research (2020) prove that teachers and students are greatly helped in learning using the WhatsApp application. However, it still needs to make improvements to some of the shortcomings and obstacles that have occurred.

2. Zoom Meeting (ZM)

Zoom Meeting is an application that is used as a learning medium. The initiator, Eric Yuan, formalized its use in 2011 in San Diego, California. Although initially used for office purposes, now it is used as a learning medium. This application is free if used for forty minutes only, but it is paid if used more than that time limit (Haqien and Rahman, 2020). The Zoom Meeting application facilitates anyone to communicate directly via video. Therefore, very many people use it as a learning medium.

The Zoom application is classified as audio-visual media, which can immediately see and talk with other people in one room (Zoom) as if they were in an offline class. Therefore, very many people use it as a learning medium. However, using Zoom Meeting has a weakness, which is that it is often constrained when the internet network is weak.

The use of Zoom Meeting in learning seems to have a positive impact because it is considered quite effective. As the results of research conducted by Monica and Fitriawati (2020) show that the use of the Zoom application in learning has been effective, the implementation of learning is more flexible and encourages students to be more independent.

3. Google Meet (GM)

Google Meet is a digital application that can be used as a learning medium. Similar to Zoom Meeting, this application can also facilitate people to communicate face-to-face via video. This application is very easy to use because people who want to

join the forum do not need to register. Simply click on the link provided, they can immediately join.

For lecturers/teachers who want to facilitate student learning through Google Meet, they don't need to download the application first but can open it directly from Google Chrome, log in with email then Google Meet can be used.

Wiratama (2020) states that the 97.14 students he studied stated that it was easy to access Google Meet in following the learning process. However, due to frequent bad weather, students said the learning was less effective. Overcoming this, the lecturer sends lecture materials to students before learning takes place.

4. Google Docs (GD)

Google Docs is an application for storing files, especially office applications. This Google Docs application can be used to process words, create worksheets, presentations, save data, edit manuscripts online, and so on. Dharmawan et al. (2016) cite Weier's (2010) opinion that Google Docs has many advantages, including easy to use, free, can store data well, complete support, using a simple: What You See Is What You Get (WYSIWYG) editor, can format documents, check to spell, and so on. As a data processor, Google Docs has special advantages, such as: can create word documents, OpenOffice, RTF, HTML, or text, upload documents, share with others, or view documents and spreadsheets, edit documents, and others. The explanation above proves that Google Docs can be used as a learning medium, especially in making work scripts.

Great experience using WA, ZM, GM and GD

1. Questions and Answers Via WA

Maybe some people will sneer if a lecturer today uses the WA application in the learning process. Although, WhatsApp (WA) is a digital application that is commonly used as a communication tool, however, for certain student conditions it, can be used as a

learning medium. And no one can expect that WA can be used as an effective learning medium to increase student questioning activities and present a pleasant atmosphere.

At the beginning of the policy to switch offline to online learning, I used WhatsApp Group (WAG) in teaching. Even though I know that it is permissible to use Google Classroom or Google Meet to carry out the learning process, I still fail to focus on using them (because I have never used these applications at all), especially in the learning process. From the first week to the third meeting, I really used WA as a campus LMS-based e-learning support. Even using an LMS, I'm not very good at it. Therefore, I maximized the use of the WA Group to carry out the learning process. Actually, there is a sense of shame, but you must still use it so that the learning process continues.

In the third week, I can see differences in asking questions in face-to-face learning with learning using WhatsApp. In face-to-face learning, students are generally reluctant to ask questions that have not been understood. This may be because many students are not able to ask questions well, so they are worried that their friends will laugh at them. However, after learning to use the WhatsApp application, many students were enthusiastic about asking questions. This means that the use of the WhatsApp application is more effective in increasing questioning activity among students.

They write questions via chat on the WA Group. There was a student who asked questions several times there were even students who wanted to give answers to their friends' questions before the lecturer gave answers to these questions. Students asked each other, occasionally interspersed with fresh jokes. So that the learning process, which is expected to be passive, turns out to be active and fun.

The increase in student questioning activities using WhatsApp is predicted because the questions asked in learning are not face-to-face, even if the questions are of less quality, they will not be ashamed because no one will laugh at them.

2. Experience using Zoom Meeting

I started planning that the fourth week of learning and beyond would change the WA learning media to other applications. I'm trying to learn with my daughter how to use Zoom Meeting. Armed with simple knowledge, I started teaching using the Zoom Meeting media. Longing for students who have not met for a long time can be relieved face-to-face through the Zoom Meeting.

Learning to use Zoom Meeting has its own experience. Even though the Zoom Meeting application can give a different color than using the WhatsApp application, it does not mean that learning runs smoothly. Zoom Meeting provides free access for only forty minutes. Meanwhile, in the free duration the learning has not been completed, the lecturers and students agreed to use the strategy of using the Zoom Meeting in a chain, namely if the Zoom Meeting provided by the lecturer is about to expire, then a student registers for the Zoom Meeting with his account. This can connect the learning process that is almost interrupted.

The domicile of students who are in villages or mountainous areas, the internet network is almost nil, so they cannot access learning properly. They are always in and out of the zoom room. This results in the emergence of an apathetic attitude to participate in learning. Question and answer activities are often hampered because the voices of students or lecturers are often intermittent. Finally, the learning process cannot be carried out properly. This is another obstacle in using Zoom Meeting.

There is an interesting story from a student. He is present in Zoom's Meeting room but only shows a picture of a mocking Angora Cat. I greeted the student, he did not answer. I greeted him again, still no answer. Suddenly I heard a sound from a distance and saw a pair of legs wagging the zoom screen. He replied aloud that he was up in the big tree listening to the lesson. My heart was touched to hear that, so much struggle and motivation to participate in the learning process by having to risk extra energy to get an internet signal from the top of the tree.

3. Go to the Google Dogs application

Apart from using the WhatsApp application and Zoom Meeting, I have also used the Google Docs application in carrying out lessons. As previously explained, Google Docs is an effective application for storing data in document form. Therefore, the use of Google Docs in learning is only for classes studying Book Compilation and Teaching Materials courses. I invite students to study using this Google Docs application. At first, we had a little trouble. Understandably, because this is the first time using it.

Students are assigned to make textbooks on Islamic Religious Education and Character. In face-to-face learning teaching, these subjects are not so difficult because they can directly discuss and provide input for improving the written script. However, online-based learning is rather difficult to achieve the desired learning outcomes, namely students produce textbooks of Islamic Religious Education and Character.

Armed with the Google Docs application, students work on textbook texts that have been determined in their respective groups. As long as the student is working on writing textbook manuscripts, I can monitor it and can immediately provide input to perfect the text that is being worked on. I can also know which students are really active, less active, even those who are not actively carrying out their duties.

At the end of the semester, all groups of students who were assigned to compile Islamic Education and Character Education textbooks submitted the manuscripts they had written during the lecture period. They send the manuscripts via the Google Docs application as well. The manuscripts they wrote were not as perfect as they wanted, but they had enthusiastically made efforts to compile the textbooks and needed to be appreciated with satisfying scores.

4. Linger using Google Meet

After trying to use the three types of simple learning applications above, I tried switching to other applications. Now

I'm used to using the Google Meet app for a long time. The reasons are as follows: 1) Using Google Meet is unlimited, 2) relatively easy to use, 3) The campus LMS team has integrated the Google Meet application into a face-to-face application other than using an LMS.

Stakeholders in the campus where I teach require all lecturers to use LMS in the learning process. Therefore lecturers must import all teaching materials into the LMS. They come in various forms, in the form of modules, videos, PowerPoint, whether with sound or not.

Closing

All the simple digital applications that have been used above each have advantages and disadvantages. However, I conclude that the WhatsApp application has special advantages, which the other three applications do not have. Because in practice, to use the other four applications, educators generally first send messages to their students via the WhatsApp application.

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CHAPTER 7.

The Use of Cabri II Plus and Cabri 3D to Develop Students' Problem Solving Skills in Mathematics

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Abstract

The development of technology, information, and communication in the era of the industrial revolution 4.0 is undergoing extraordinary changes. The development of ICT affects changing the use of ICT in the classroom. One of them is the use of Cabri II Plus and Cabri 3D software in learning geometry. This paper describes the use of Cabri II Plus and Cabri 3D in developing students' problem-solving abilities at school. Cabri II Plus software can help students to construct and explore geometric shapes accurately and precisely while Cabri 3D can help students build three-dimensional structures. These two Dynamic Geometric Software (DGS) software, if utilized to the maximum. Both of these Dynamic Geometric Software (DGS), if maximally utilized, will help students develop their mathematical problem-solving skills. The teacher can make Cabri II Plus and Cabri 3D as alternative software that can be used in the classroom to teach material related to geometry.

Keywords: Cabri II Plus, 3D Cabri, Geometry, Problem Solving

Introduction

The development of information and communication technology in the 4.0 industrial revolution era is now experiencing extraordinary changes. In its journey, the development of information and communication technology that is unstoppable also affects the development of technology in the world of education. Efforts to improve the quality of education by utilizing information and communication technology continue to be carried out to produce optimal learning. One of them is mathematics learning, which must change in the context of improving the quality of education. Continuous improvement must always be made in learning mathematics to realize innovative learning and by the times and technology. The development of technology should be an instrument in developing mathematics learning. The integration of the use of technology in mathematics learning is a necessity in building teacher pedagogical trust and teacher professional development (Bozkurt & Ruthven, 2017; Hegedus et al., 2018; Tondeur et al., 2017; Trgalová et al., 2018)

According to research conducted by (Teo et al., 2017; Young et al., 2018), mathematics teachers must use computers in both traditional and innovative teaching. Correspondingly, (Bray & Tangney, 2017) recommends optimizing the potential of technology in improving mathematics learning. Teachers using technology in the classroom are not only used in public schools but are also used to teach in special education classes. Teachers who teach in special education are competent in using technology in teaching mathematics (Baglama et al., 2017).

Optimizing the use of computer technology is also carried out by (Orcos et al., 2019)) in the form of application development that enables secondary education teachers to assess students' mathematical competence. (Stankova et al., 2016) state that the use of computer technology can improve the efficiency of teaching in the classroom. Technology infrastructure can provide equal access to all students to teach and learn subject matter more efficiently. Also, the use of computer technology can increase the creativity of teaching mathematics teachers in the classroom (Madden, 2018).

(Joshi, 2017) states that the use of information and communication technology (ICT) will help mathematics teachers perform their pedagogical tasks. The utilization of ICT will have an effect on teaching efficiency, professional skills, content knowledge, and teaching skills, communication skills, adjustment skills, and other related skills from teachers. Besides, students' abilities will increase, including increased knowledge, skills, abilities, performance, achievement, independent learning abilities, communication skills, developing problem-solving skills, motivating to learn, promoting understanding of mathematics, engaging learning, and engaging with mathematical problem-solving.

One form of the use of computer technology in learning mathematics is in learning geometry (Njiku et al., 2019). The use of computer technology in the class in question is the use of Dynamic Geometric Software (DGS) in mathematics learning, especially geometry topics. (Schumann, 2019) states that the use of 3D dynamic geometry systems (D3DGS) opens up new issues in spatial geometry. This system provides opportunities for discovery (enrichment) and supports the application of heuristic methods for theorem discovery (reinforcement). (İlhan & Aslaner, 2017) states that the investigation of the influence of the use of Dynamic Geometry Software (DGS) on the teaching of geometry subjects to the level of visual mathematics literacy perception of prospective elementary mathematics teachers.

The concept of geometry is one of the mathematical material that aims to invite students to analyze the characteristics of geometric shapes, as well as using visualization, spatial reasoning, and geometric modelling to solve problems (National Council of Teachers of Mathematics, 2000). Geometry material consists of 4 main categories, namely (1) shapes and properties which include learning the features of two and three-dimensional shapes and their relationship to these properties, (2) transformations which include translation, reflection, rotation, symmetry and similarity concepts, (3) location that refers to the geometry of coordinates or other ways of determining how objects are in a plane or space, (4) visualization that includes an introduction to the forms of the surrounding environment, the development of a relationship between two objects dimensions with three dimensions

and the ability to describe and recognize shapes from various points of view (Van de Walle, 2007).

In practice, learning geometry experiences many obstacles. Students have difficulty understanding concepts and problem-solving geometries. Another obstacle faced by students is not being able to construct knowledge of geometry in the form of axioms or theorems they have then connected to the problems they face. As a result, students experience confusion to start were to solve a problem. The use of geometry software is useful as a tool for exploration to minimize these obstacles.

The teacher can use geometry learning software, namely Cabri II Plus and Cabri 3D. Geometry teaching with Cabri II Plus software has a positive effect on learning the transformation of student learning geometry and student understanding (Yazlik & Ardahan, 2012). In this context, the use of Cabri II Plus when teaching geometry transformation can increase the success of student learning outcomes. (Şandır & Aztekin, 2016) stated the same opinion, which noted that the use of Cabri II Plus software would provide the development of positive student attitudes in learning high-level geometry. (İbili, 2019) stated that Cabri II Plus and Cabri 3D are the Dynamic Geometric Software (DGS) packages most widely used by mathematics teachers. In other words, Cabri II Plus and Cabri 3D software are examples of geometry software used to develop mathematical problem-solving abilities.

Cabri II Plus

According to (Maarif, 2014), Cabri II Plus is a type of Dynamic Geometric Software (DGS). Cabri II Plus to help users construct and explore geometric shapes carefully and precisely. Geometry construction with Cabri II Plus can be manipulated and driven to make it easier for users to explore without reconstructing the same building. Besides, the use of an interface, structured and interactive with users, the Cabri II Plus can be used to examine the properties of flat shapes with careful and accurate calculations. Geometry construction that is difficult to obtain by constructing manually using manual drawing tools that are

often used, such as pencils, rulers, etc. can be quickly and precisely if done with Cabri II Plus. Thus, the effectiveness and efficiency in exploring and constructing the data building are more secure.

Although Cabri II Plus looks simple, but to construct a triangular structure, it turns out the user must use the ability to think to interpret every step of construction with geometrical concepts. Thus, the combination of geometry concepts in visualizing a building with Cabri II Plus will add to the user's insights to create a deep understanding of geometry.

As for some of the advantages possessed by Cabri II Plus compared to similar software and previous versions are:

a. The interface is easier to understand and use, and more uncomplicated. Cabri II plus has a similar appearance to Microsoft's office software, where there is a menu of interface structures such as a file, edit, options, window, help, etc.
b. The icons are better and bright, so it's easy to use.
c. Enhancements are provided to give names to each object with a complete font type and size. Besides, numbers and equations can be inserted between text and worksheets.
d. Able to add images to points, segments, triangles, and squares
e. The picture is made more explicit by eliminating some sketch lines forming the image.
f. Images can be taken to and from other files of the same type.

(Maarif et al., 2018) stated the effectiveness of geometry exploration using Cabri II Plus's Dynamic Geometry Software (DGS) in constructing proof of student geometry. The use of Cabri II Plus allows students to present a verification problem diagram appropriately, determine valid allegations, and make a statement of written evidence. More importantly, students can participate in geometric exploration activities using Cabri II Plus, which provides opportunities to explore alternative evidence related to geometry (Maarif et al., 2018; Mackrell, 2011; Mackrell et al., 2013; Yazlik & Ardahan, 2012).

Cabri 3D

Cabri 3D is software that presents mathematical geometry by creating shapes that resemble the authenticity of various models. This software makes it easy for students and teachers to explore multiple geometric shapes and models. Students can be more active in learning by exploring under the guidance of the teacher. This software also makes it easy for students to be better able to prove theories and concepts independently by using a little calculation and simple manipulation.

Research conducted by (Hartatiana et al., 2017) states that implementing 3D Cabri-aided learning can make it easier for students to understand geometric concepts. (Akkus, 2016; Kepceoğlu, 2018) recommend the use of 3D Cabri to make it easier to manipulate the construction of three-dimensional space from the shape of two-dimensional objects. By using Cabri 3D software, students can draw accurately and interpret images correctly.

The use of Cabri 3D has a significant influence on the performance and ability of students' mathematical containment (Marlena & Nugrheni, 2019; Olagunju et al., 2015). Cabri II Plus and Cabri 3D software have the potential to make students learn geometry well (Mackrell et al., 2013; Selman & Tapan-Broutin, 2018) if utilized to the maximum. The Cabri II Plus and Cabri 3D software can help make it easier for students to solve mathematical problems.

Mathematical Problem Solving

Problem-solving is a high-level thought process and has an essential role in learning mathematics. Problem-solving is an integral part of all mathematics learning (National Council of Teachers of Mathematics, 2000) and the basis of all mathematical activities (Reys et al., 2001). Problems solving mathematical problems can be in the form of the presentation of real problems in everyday life related to mathematical content. Students must be able to make appropriate mathematical models so that existing problems can be solved using mathematical concepts related to the problem. In general, mathematical problem solving is solving mathematical problems that are not routine and are high-level thinking skills.

(Polya, 1973) outlines four main steps in mathematical problem solving, namely, 1) understanding the problem, 2) preparing a plan/ choosing a strategy, 3) implementing the plan / solving the problem, and 4) re-examining the answers that have been obtained. By using Cabri II Plus, a student can construct a problem by describing it in a precise geometric form. Next, students explore the problem by using Cabri II Plus to give questions that lead students to the solution. After students get a completion plan in the form of guesses, students can associate with algebraic calculations or axiomatically so that a solution is found. An understanding of theorems is needed to link the conjectures that have been constructed. Thus, an understanding of theories is required to carry out plans to find a solution. Most students get solutions or answers to mathematical problems feeling satisfied with the response regardless of whether the solution has been made right or wrong. Therefore, the stage of re-checking the results of the solutions obtained is essential. By re-examining the results that have been received, reconsidering and re-examining the results, and the path that leads there, they can strengthen their knowledge and develop their ability to solve problems.

The problem-solving abilities of students in learning mathematics are still in the low category (Septiany et al., 2015; Wulandari & Jailani, 2015). One way that can be done to improve mathematical problem-solving skills is to use media in mathematics learning, such as the use of Cabri II Plus and Cabri 3D learning software when learning geometry.

Discussion

Example of Using Cabri II Plus to Develop Mathematical Problem Solving Capabilities

Students are given problem solving problems in learning geometry by using Cabri II Plus. if known points D, E, and F are located respectively in each ΔABC, namely point D on the AB side, point E on the BC side, and point F on the AC side with a ratio of BE: EC = 2: 3 and AF: FC = 8: 9. If side length AB = 28 cm, and lines AE, BF, CD intersect at one point, then determine AD length? To solve this problem in accordance with the stages of problem solving that

have been revealed by Polya using Cabri II Plus, pay attention to the following steps:

Stage 1. Understanding the Problem

a. Students first construct the problem using Cabri II Plus.

b. Start by using the define grid and then create three segments by using the segment button on the toolbar.

c. Segment 1 is 17 cm in length because of AF: FC = 8: 9. Segment 2 is 5 cm in length because BE: EC = 2: 3, and the last segment is made up of 14 cm, which is ½ of the actual length of the AB segment, to match the other segments.

d. Next, remove the define grid and name the segment (figure 1).

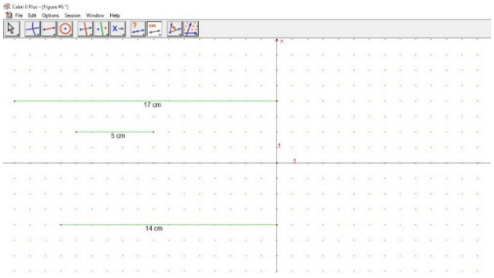

Figure 1.

Stage 2. Arrange the Plan

a. Combine each point in each segment by pulling the point in the direction it is headed to form a triangle (figure 2).

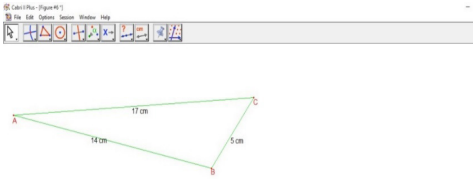

Figure 2.

b. Delete the value of each length in each segment on ΔABC.

c. Next, create a new segment with a starting point at point A and endpoint at the AC segment.

d. Next, adjust the length of the segment by using a distance or length of 8 cm.

e. Also, create a new segment with the starting point at point B and the final point on the BC segment.

f. Next, adjust the length of the segment by using a distance or length of 2 cm (figure 3).

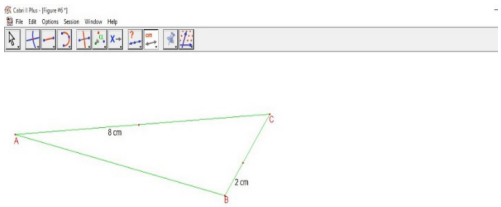

Figure 3

g. Next, create a segment from point A to point in BC and also segment from point B to point in AC (figure 4).

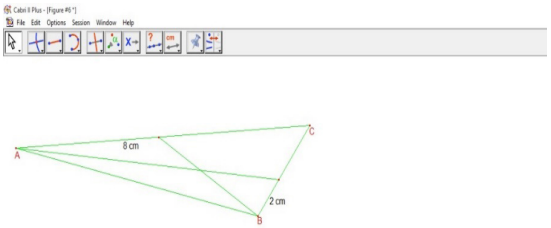

Figure 4.

h. Make the intersection points using the intersection points between the two segments and name the points with E and F (figure 5).

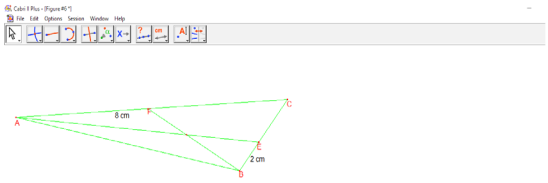

Figure 5.

i. Name the intersection of the segment with O.

j. Draw a line from point C and through point O using ray (figure 6).

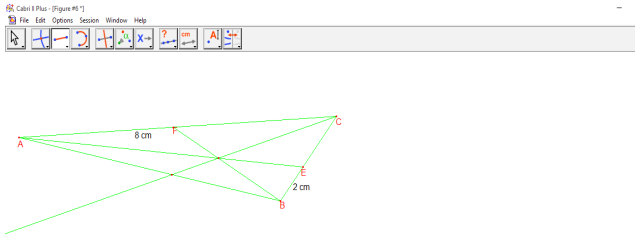

Figure 6.

k. Make a name on the intersection between the ray line with the AB segment, point D.

l. Create a segment from point C to point D (figure 7).

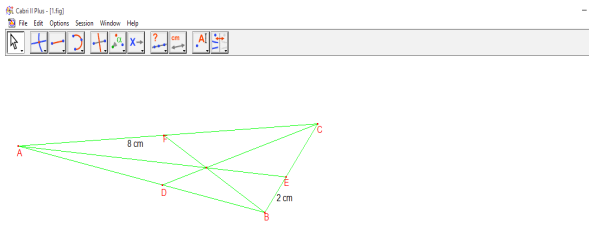

Figure 7.

m. Remove the number value from Distance or Lenght (figure 8).

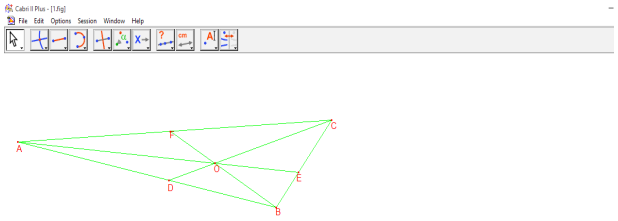

Figure 8.

Stage 3. Implement the Plan

a. Determine length AB = 28 cm (figure 9). In figure 9, the length of AB is only 14 cm, so that the triangle view is not too large.

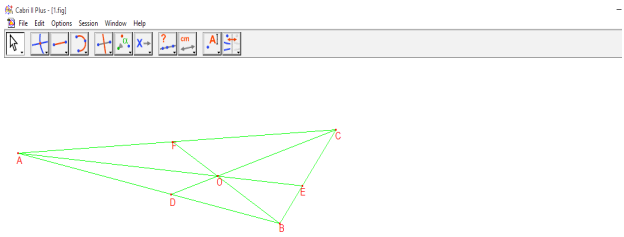

Figure 9.

b. Determine the ratio BE: EC = 2: 3, and AF: FC = 8: 9 (figure 10).

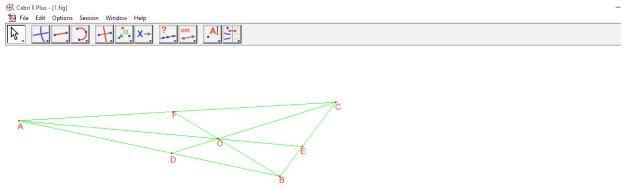

Figure 10.

By using the Ceva argument:

$$\frac{AD}{DB} \cdot \frac{BE}{EC} \cdot \frac{CF}{FA} = 1$$
$$\frac{AD}{DB} \cdot \frac{2}{3} \cdot \frac{9}{8} = 1$$
$$\frac{AD}{DB} \cdot \frac{3}{4} = 1$$
$$\frac{AD}{DB} = \frac{4}{3}$$

Then the ratio AD: DB = 4: 3, so that AD: AB = 4: 7

Determine the length of AD

AD = AD / AB × length AB

AD = 4/7 × 28

AD = 16 cm

So, AD length = 16 cm.

Step 4. Re-examine the solution obtained

Students at this stage re-check by using distance or length on the toolbar (figure 11).

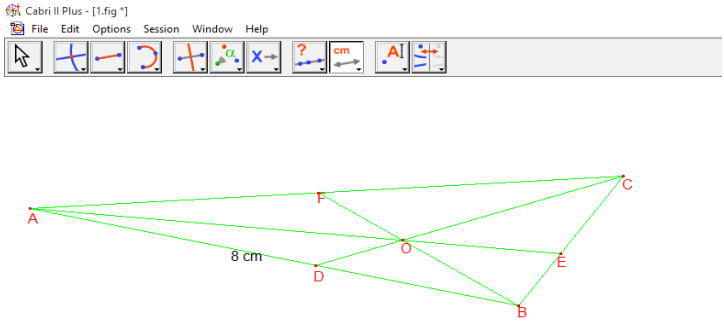

Figure 11.

From the picture, it is seen that the length of AD is 8 cm because AB in the picture is 14 cm, then the actual length of AD = 2 x 8 cm = 16 cm.

Examples of Using 3D Cabri To Develop Mathematical Problem Solving Capabilities

The teacher challenges students about problem solving about the ball. A ball has a radius of 4.1 cm long. Calculate the volume of ½ ball and surface area of the ball! To solve this problem following the stages of problem-solving that have been revealed by Polya using Cabri 3D.

Stage 1. Understanding the problem

a. To make a ball, you must have a circle. To make a circle, click the line, then select the circle (figure 12).

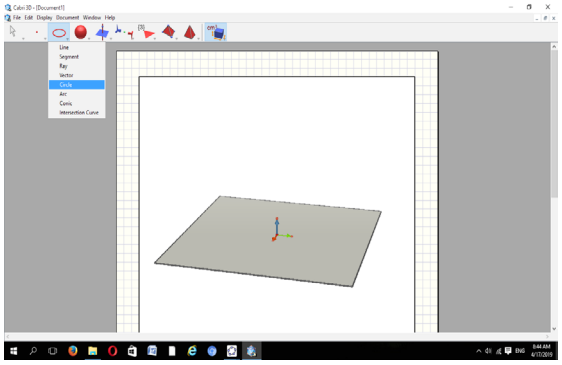

Figure 12.

b. Click anywhere and then drag and form a circle (figure 13).

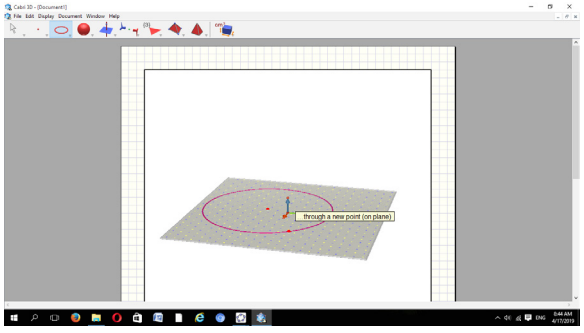

Figure 13.

Stage 2. Arrange the Plan

a. Then to find out the radius of the circle, click the distance menu, then click the point in the center of the circle to the endpoint of the circle (figure 14 and figure 15).

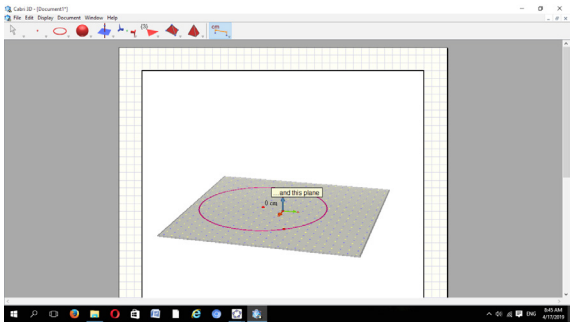

Figure 14.

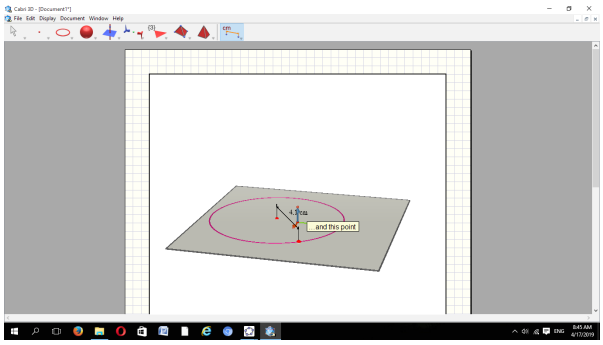

Figure 15.

b. Next, make the ball, click the plane menu and select sphere, click the point in the center of the circle to the end of the circle so that the ball is the same size as the circle (Figure 16 and Figure 17).

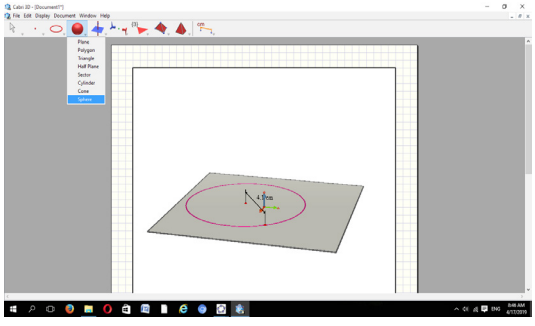

Figure 16.

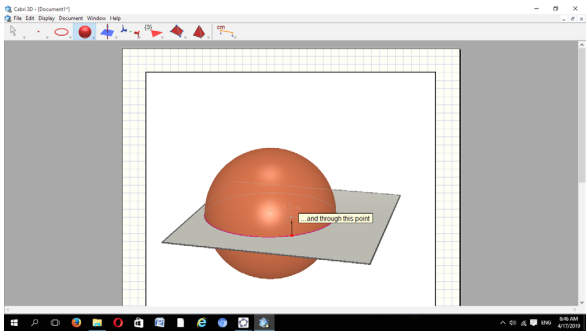

Figure 17.

Stage 3. Implement the Plan

Students begin to determine the ball volume and surface area of the ball (figure 18)

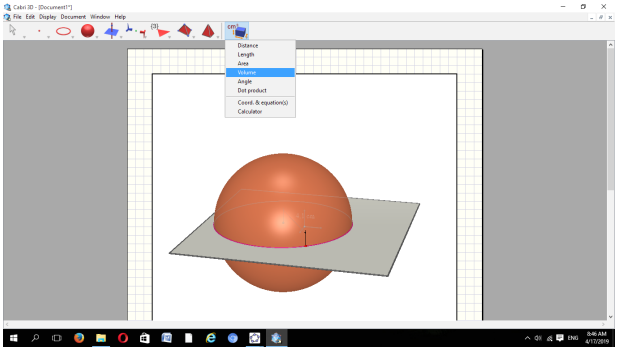

Figure 18.

Using the ball volume formula (figure 18) and surface area of the ball, students find that:

a. Looking for the volume of the ball

Volume = 4/3 x π x r^3

Volume = 4/3 x (3.14) x (4.1 cm)^3

Volume = 4/3 x (3.14) x 68,921

Volume = 293.6 cm^3

Volume of ½ ball = ½ x 293.6 cm^3 = 106, 8 cm^3

b. Finding the Surface Area of the Ball

Surface Area = 4 x π x r^2
Surface Area = 4 x (3.14) x (4.1cm) ^{2}
Surface Area = 4 x (3.14) x 16.81
Surface Area = 213,6 cm^2

Step 4. Re-examine the Solution Obtained

a. To re-check whether the volume of the ball and the surface area of the ball that students have calculated in stage 3, the teacher can ask students the volume of the ball, click the distance menu, and then select the volume then click the ball area (figure 19).

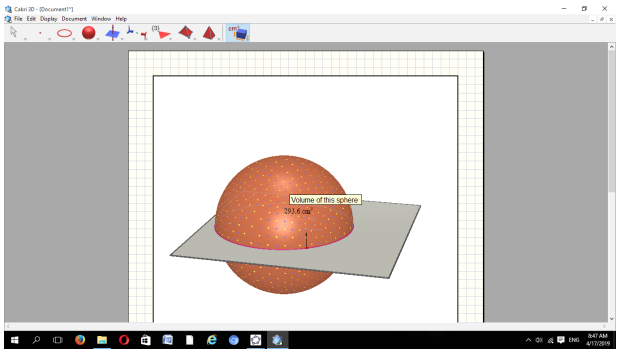

Figure 19.

b. To find the surface area of the ball, click the distance menu then select the area after that click on the area of the ball and get the surface area of the ball (figure 20 and figure 21).

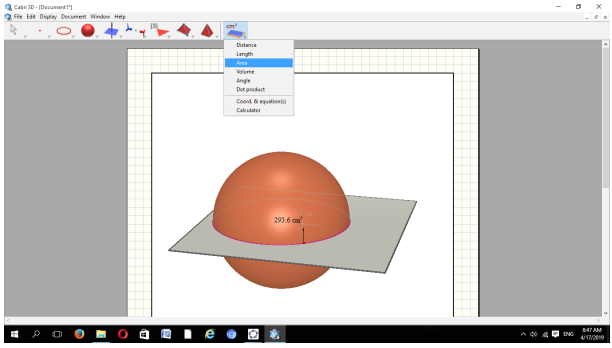

Figure 20.

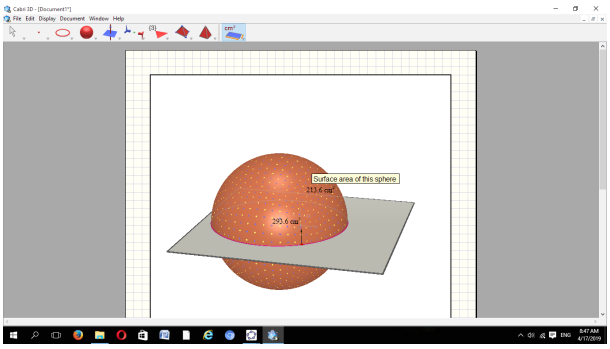

Figure 21.

Thus, the volume of the ball is 293.6 cm³, the volume of ½ ball is 106.8 cm3, and the surface area of the ball is 213.6 cm.

Conclusion

Cabri II Plus and Cabri 3D are software included in the type of Dynamic Geometric Software (DGS). Cabri II Plus helps students to accurately and precisely construct two-dimensional geometry structures. Cabri 3D helps students build three-dimensional structures. These two DGS software, if utilized to the maximum, will help students develop their mathematical problem-solving skills. The teacher can make Cabri II Plus and Cabri 3D as alternative software that can be used in the classroom to teach material related to geometry.

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CHAPTER 8.

Integrating Zoom Cloud Meetings and WhatsApp Group as Digital Learning Technology

Roudlotun Nurul Laili

In this evolving digital era almost all aspects including economic, business, programming, engineering, and education are moving towards the digital technology and all information we want can be simply accessed particularly in the field of education. The rapid development of technology makes views of learning change too. At the past time, learning process was carried out face to face in the classroom only with printed media presented by educators, but currently with the development of internet technology, educators can hold learning anytime and anywhere they want. Hence this digital learning may assist educators to arrange dynamic learning and they can still supervise students' learning even though outside the class. Educators have to keep pace with the newest quick changes and incredible developments of information technology and how these expansions have affected various aspects of life including aspect of education. Currently, the teaching learning process urges the use of technology (Singh et al., 2020).

In fact, digital learning has been implemented by several universities and schools since long time ago as a form of awareness in Industrial Revolution 4.0, an era that has brought changes to the way humans work, transact, and interact. They have tried to integrate technology in their courses as a learning adaptation form. Moreover the current Covid-19 pandemic situation forced all educational elements

such as educators, staffs, and students to transform from conventional to digital learning immediately in order to reduce learning disorder and break the chain of corona virus spread. It can be our chance to design learning model that can respond to industrial revolution challenges which is characterized by the increase of connectivity, the development of artificial intelligence, virtual and digital systems. The success of industrial revolution is established by the quality of teachers, they are encouraged to have proficiency in adapting to global challenge and new information technology (Lase, 2019). Managing learners in distance learning using digital technology forces the educators to develop alternative teaching methods and strategies from those used in conventional class. Digital learning can increase the educators' and students' variety and creativity in finding learning resources and solving problems in their learning.

Digital learning encourages teachers and learners to converse fully interactive by applying information and communication technology (ICT) like computers or laptop, mobile phones with internet and various applications, videos, telephones, video call and others. In this technology era, it is necessary to implement digital learning that can increase the effectiveness of teaching learning activities by utilizing e-learning. In line with the need for digital-based learning facilities, a number of communication service providers are developing digital class features and services such as WhatsApp, Telegram, Edmodo, Schoology, Quipper School, Google Classroom, Google Meet, Zoom Cloud Meetings, Skype, and other learning platforms as a bridge to support digital learning. In this occasion the writer is interested to discuss about the integration of using Zoom Cloud Meetings and WhatsApp Group for digital learning because based on our research the platforms most used by English teachers in online teaching were WhatsApp Group (78%) and Zoom Cloud Meetings (38%) (Nashir & Laili, 2021).

Two applications that are familiar to our daily lives and commonly used are Zoom Cloud Meetings and WhatsApp Group. You can download WhatsApp application via Playstore on your cell phone or you can access it on your laptop/computer through WhatsApp web. WhatsApp concept and function is the same as Short Message Service

(SMS) application, it does not use pulses but internet quota with much more complete features which makes it possible to support digital learning. Then for Zoom Cloud Meetings application, you can also download it in your mobile phone. You can use a laptop and computer as well by visiting the Zoom Cloud Meetings site. We can just join the meeting room without having a zoom account. If the invitee or host shares the meeting room link, you just need to click the link, join the meeting, and fill in the Meeting ID so you can join immediately. However, if you want to have a Zoom account, you can sign up first using email or Facebook. As reported by id.cloudhost.com active Zoom users have increased rapidly for about 2.22 million per month since Covid-19 pandemic broke out globally on March 2020. This paid application can be accessed freely with a maximum user capacity of 100 people and conference duration limit of around 40 minutes.

Those two applications do not have access restrictions so that learning can be carried out in a longer time based on the learning needs. The use of Zoom Cloud Meetings and WhatsApp Group are complementing each other in relation to its implementation in learning process. Both of these applications offer their major features such as Zoom allows students to get real experiences, have face to face learning in virtual classroom like in real meeting and offers discussion forum feature. Meanwhile WhatsApp Group to support learning activities offers features to download material and learning sources, give comments and feedback, ask questions, open discussion session, and collect the assignments in various forms such as images, audio, and video. It is in line with what is stated by (Wahyuni, N. R., Nurpahmi, S. & Awaliah, 2020) WhatsApp has main features to send text messages, photos, audio, and office files of various forms; word, pdf, ppt which offers cheap in budget with lower internet data consumption. Furthermore WhatsApp gives spaces to upload learning material and share learning resources which are limited by Zoom Cloud Meetings application.

Zoom and WhatsApp Group offer convenience and flexibility in which teachers and students are not stuck in one space and time to carry out learning activities; they do not have to come to class at a certain time. Both of these applications provide online classroom that

seem to replace the functions of learning process in real class such as material providers, list of attendance, two ways communication between teachers and students, and evaluation process. Zoom is one of applications which provide face-to-face interaction facilities for educators and students virtually via video conference through computer, laptop or smart phone. This application is used as a medium for long distance communication by combining video conference, chat, online meetings and mobile collaboration. Meetings through this application can accommodate 100 to 1000 participants together in one meeting virtually.

The use of video conference like Zoom Cloud Meetings application in distance learning will greatly assist students because they can interact with educators and fellow friends even in different places. By using these two applications, the teacher centered learning process paradigm can be transformed into student-centered learning. The advantages offered by Zoom are it can record all learning activities between educators and students for long time, while WhatsApp Group enables educators to share material or video link, learning sources and allows students to send assignments in the form of files or videos. These applications let the educator only act as a facilitator and learning activities are more dominated by students. So that it forms students to be independent learning indirectly. Zoom and WhatsApp Group applications can also be accessed on all platforms both mobile phone and desktop.

Even though Covid-19 pandemic has been over and has entered to the new normal era, Zoom and WhatsApp Group can be used in blended learning (integration online and face to face learning). Both of these platforms facilitate asynchronous and synchronous learning settings. Asynchronous learning allows learners to access e-learning any time and downloads documents or sends messages to the educators and their peers. Students study the same material at different times and locations, it is more flexible. Asynchronous learning generally use email or chat media, it can be in the form of independent and collaborative asynchronous. The asynchronous online learning method involves self-learning modules, streaming video content, virtual library, adequate learning resources and references, posting lecture notes, and

exchanging across discussion boards or social media platforms.

While synchronous learning occur at the same time, activities, and place where the educators and learners meet face-to-face such as attending classroom, lectures or laboratories. They can get direct learning experience and real-time. Teachers and students can have hands-on question and answer and live discussion which makes participants feel fully engaged rather than isolated. There are some advantages of synchronous learning such as direct feedback and input, greater support, and a responsibility to attend and participate in learning (Redmond et al., 2007). Furthermore, in conducting teamwork courses which involve interaction among communities, synchronous online conference can be extremely fruitful and beneficial for learners when they solve constraints on space, scope and time limit (Tabak & Rampal, 2014).

In order that learning objectives can be achieved as expected, planning must be neatly arranged before starting teaching such as formulating learning outcomes, mapping learning materials, determining learning activity models, identifying media needs, distributing tasks, giving feedback until the evaluation stage. The selection of learning settings is adjusted to its objectives. If the learning requires group discussions and both teachers and students want flexible learning time, they can determine asynchronous learning settings through WhatsApp Group. Meanwhile, if the teachers want to meet online and carry out control and supervision at the same time, they can choose virtual synchronous learning setting by video conferencing through Zoom. However, tutors' skills are needed in packaging materials and finding learning resources as well as designing learning so that they can carry out learning effectively. Combining synchronous and asynchronous methods based on students' needs can produce maximum outcomes. It is in accordance with (Ene & Upton, 2018) if the integration between synchronous and asynchronous learning media affect the learning effectiveness. So the integration between the use of Zoom and WhatsApp Group represent both of these two types of learning.

Integrating various technologies in teaching allows educators to use varied media in delivering material with more flexible place and

time. This way can be an answer of the current situation about how the education system must adapt to new conditions in the digital era, one of which can use Zoom and WhatsApp applications. Practical tutorials on learning using both Zoom and WhatsApp Group applications are also very widely available on the internet so that if the teachers and students encounter problems in using these applications, they can learn independently without fear of getting difficulty in finding learning resources. This would be in accordance with the educational hope to form capable, innovative, creative and competitive generation by maximizing technology as learning aids to produce capable output and increase graduate's quality based on the work needs and digital technology demands. Here are the displays of digital learning by using Zoom Cloud Meetings and WhatsApp Group:

Picture 1. Digital Learning by using Zoom

Picture 2. Digital Learning by using WhatsApp Group

Zoom application offers better video conference which can accommodate 100 - 1000 users than WhatsApp video call which is restricted for several users only. Zoom Cloud Meetings is face to face media which can be used to meet and communicate directly like in conventional face to face class. It facilitates students to join class by clicking the shared link or by typing meeting ID and pass code given. Zoom offers many conveniences such as time savings, more flexible can be implemented everywhere and every time, allow teachers to give direct comment and feedback and enable educators and learners to discuss freely. This application is also equipped with the sharing screen feature which is able to facilitate the needs of teachers in presenting teaching materials to students like face-to-face meetings in conventional classrooms.

While WhatsApp Group can accommodate 256 members that can be used for communication with many features such as photos gallery, camera, voice note, chat group, video call with limited users, contact persons, sharing or downloading documents and videos. WhatsApp is also equipped by emoticons and various stickers that can make chats more interactive and interesting and the learning atmosphere more

fun, the starred message feature keeps the learning material stored properly, easily send learning-supporting videos, photos, and office files which allows the use of a variety of study materials starting from eBooks, PPTs, documents and so on. Seeing the large number of WhatsApp users, it is fair if it becomes a favorite application during digital learning. WhatsApp application is quite familiar and widely used in all circles from young to old generation due to its simple use. WhatsApp Group facilitates educator and learners to submit tasks, give comments, conduct discussion, and distribute the announcement and new information easier. It is practical, time and energy saving. The features available on WhatsApp can equip the features which are not provided by Zoom and vice versa. These two applications complete each other to form virtual class atmosphere which is more similar to real traditional class.

In addition to the various advantages which are presented, several obstacles have been found during the use of the Zoom and WhatsApp Group applications during the learning period including the unstable internet network, quite expensive internet quota prices, limited capacity smart phone storage memory, educators and students lack of knowledge in using Zoom application, and they are still used to conventional learning. Data quota is a crucial issue that must be responded wisely because of the heterogeneous economic conditions of students so that the learning process can take place fairly. Apart from data quotas that they feel burdensome, online learning through Zoom sometimes is constrained by an unstable signal especially for those who are in rural area, so that the Zoom they access sometimes disconnects, produce intermittent voice and suddenly come out from Zoom class. This factor can be considered as the most crucial aspect because if learning through Zoom is still forced, not all students can get benefit from the material presented.

Fortunately Zoom Cloud Meetings is completed by recording feature, so when teachers deliver the material and the process of learning activities from beginning to end can be recorded and it can be shared through WhatsApp Group, so that the students who are constrained by the signal do not lose the moment and opportunity to heed the material if they are already on a conducive signal. Besides, the

participants can send text while the lecture/class is in progress through chat feature and can raise hand if they want to ask questions or giving opinion. In order to get around the imbalance of interaction between teachers and learners through Zoom, WhatsApp Group is created and integrated in learning to complement the existing shortcomings of the Zoom. Otherwise Zoom becomes an alternative direct learning through video conference which cannot be provided by WhatsApp Group. Many students stated that using Zoom and WhatsApp Group makes them more confident when delivering questions and discussion session through chat room feature, they do not feel as awkward as when asking questions directly as in real class.

Considering that Zoom is a live streaming application with quota-wasteful, the duration of video conference through Zoom can be shortened per meeting, so that interactions between teachers and learners can be maintained like learning in a conventional classroom although it is not as long as real face to face meeting on the grounds of quota savings. Furthermore, the delivery of additional material and submission of assignments can be done through WhatsApp Group so the teachers can monitor intensively and in real time. With those two platforms, students can not only engage in synchronously online learning in real time, but also they can be active in virtual classrooms asynchronously without being obstructed by place, time, and other conditions. It is in line with the research conducted by (Suadi, 2021) online learning platforms are solutions to sustain the English Language Teaching (ELT who stated that students' perception on the use of WhatsApp and Zoom in English Language Teaching (ELT) virtual class during Covid19 pandemic is positive, it is more effective and efficient in terms of charge, place, and time despite the availability of network and slow internet connection become the main problems. In addition, the students admitted that both these online platforms can support them in improving language skill and narrow the shame during interaction in class virtually.

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CHAPTER 9.

Synchronous and Asynchronous

Setiawati

Developing technology and information runs rapidly bringing the world into a new era that is far more advanced than imagined before. The term information technology is proof that the new era brings life to a more advanced level. The digital era makes human activities to be easier and fast. People can access information regardless of space and time. The digital era is a trend in the development of the world from various aspects of life including education. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers who have a high level of personal contact with learners. The use of ICT in education is suitable for learning regulation that has been central to learners. Meanwhile, developing ICT be fast and the role of ICT in education to be more important. It will grow and developing in the 21st century. In the 21st century based learning ICT is recommended educator expected to use the device technology in learning, both offline and online. Education has learned form by using electrical media, educator use technology in the teaching-learning process. By including technology in the learning process it is called digital learning. P.Harger in Jose and Rocha (2018) said digital learning use several types of technological devices like smartphones, tablets, computers, and others.

Digital Learning requires changes in teaching and learning methods to match the expectations, abilities, and mind-set of a new generation who lives accompanied by digital technology. Digital learning refers to the embedded digital technologies inside learning, teaching, and evaluation practices in a school. The list of digital technologies

is continuously evolving, and they have the capacity to aid a range of activities throughout the school. Digital learning is digital processing system that encourages active learning, knowledge construction, inquiry, and exploration in learners, as well as allows remote communication and data sharing that occurs between educators and learners. Digital learning includes the strong internet to support the process of learning.

The digital learning process occurs when the learning process prepared and described, but it usually are mixed with other automatic classroom processes, like the finding of information, watching relevant videos, or other, in order to understand the topics of the subject or to acquire the knowledge about it (Jose and Rocha, 2018). The digital learning process is a bold step towards change. This bold move requires innovation, creativity, tenacity, and the courage to accept that the nature of knowledge has evolved in the digital sphere. Various innovations in digital media based-learning support the learning process. The learning process allows learners involved in the real learning experiences and they can interact with other individuals without the need to meet face to face. The existence of digital media demands the ability of educators or educators competence to integrate the media into the learning process. Competence in using digital is a set of knowledge, skills, attitudes needed to use ICT and digital media to perform tasks, manage information, collaborate, and build knowledge effectively, efficiently, critically, creatively, and independently. Educators invariably need guidance and support as to how to use a digital environment productively, effectively, and efficiently to achieve the range of educational purposes they are pursuing. Learners may also need help with adjusting to the different monitoring and assessment processes that online learning enables (Zadja and Donna, 2009).

In the Pandemic era, all schools in Indonesia use digital media as a tool in the learning process. Duri, Riau area is also used digital tool in the course. The situation makes distance each other. The learning process is done at home. Here, the educators' competence uses the technology needed. Many tools or platforms are used in the learning process. Interaction is used in the learning process by digital tools. The course in the pandemic era is designed by synchronous and asynchronous interactions. Online tool by synchronous; web conference

(eg; go to meeting), voice- over- IP (eg; skype, google talk), chat, instant messaging and asynchronous; email, wiki. Mixing concept synchronous and asynchronous interactions in the learning process, planning for learning time, in cooperating the right technologies is called Blended course design (Stein and Charles, 2014). The synchronous platform had been used by writer; zoom and google meet and asynchronous tools such as Edmodo, Padlet, and Google Classroom.

Synchronous

Synchronous online training allows for careful preparation and structuring of learning; for example, an educator may prepare a PowerPoint presentation to present during a live synchronous session. The technology is adaptable enough to enable instructors to respond to students' needs and adjust their teaching plans as needed. The aim of this structure's versatility is to reduce the amount of time it takes to complete a task (McBrien,j., Cheng,R.& Jones,P., 2019). Stephens & Mottet in Ann, Ashley Skylar (2009) said that synchronous online sessions are often called web-based training, webinar, virtual meeting, and web conferencing. This type of environment requires a set date and time for meeting and contradicts the promise of "anytime, anywhere learning that online courses have traditionally promoted. Some recommendation to prepare the learners for synchronous learning are list below: (Jeong, Yun Park & Bonk, Curtis.J, 2007)

1. Clarify technology requirement, require learners to have the appropriate software and facilities (example: a headset for voice chat), as well as a secure internet connection, until beginning any synchronous activities instruction. A more rich and immersive learning experience is facilitated by thorough planning, which includes quality group interactions and performances.
2. Explain the purpose, clearly state what learning outcomes and behaviors the synchronous activity is supposed to produce. To assist learners' comprehension and preparation of the synchronous challenge, course tools and materials, synchronous interaction guidelines and ground rules, and team meeting planning aids and worksheets should be given.

3. Set up a meeting time, hold practice matches in the same environment as real-time meetings (tool practices, events, and procedures). During these practice sessions, learners can become familiar with the processes and activities involved in synchronous operation, as well as the roles and features of the communication tools.
4. Be adaptable, the instructional plan should be adaptable enough to handle a wide range of sessions, with the number of sessions changed as the learners' needs change and the instructional situation changes. The duration and number of synchronous sessions, as well as the number of participants per session and meeting times, must all be calculated to meet the needs of various circumstances.

Using zoom and google meet are categories of the synchronous platform. Reginald, H.C.D., Asmarani.D,&Puspa U.D. (2017, 267-273) said that zoom is online media application which is usually for video conference. It is accessible from various gadgets from PC, laptop, android phone, iPhone, and tablet. Learning with video conference can replace learning that usually done face-to-face virtually through the help of applications connected to the internet network. The use of video conferences in remote learning can help learners and educators to continue to interact face-to-face even though they are not close together. Video conference is included in synchronous learning, which activity is carried out jointly by educators and students. Synchronous is real-time knowledge sharing, for questions or comments, you will have immediate access to the lecturer. The educator is a primary moderator who oversees the teaching process in a synchronous interconnected environment (Kuo,Y.C, Walker, A. Belland, B., Schroder, K. & Kuo, Y-T., 2014). Based on the writer's experience this application provides face-to-face interaction facilities for educators and learners virtually via video conference with a PC, laptop, and smartphone is the Zoom cloud meeting. This application uses long-distance communication media by combining video conference, chat, online meeting, and mobile collaboration. The use of meetings in this application can accommodate participants together in a virtual meeting.

Zoom can be achieved by using learning media that is in accordance with the situation and condition, both from material content or the circumstances of the learner's environment. Delivery of concept to learners will be conveyed well if the concept requires students to be directly involved in it to learners using the internet media. Zoom can be categorized as an online learning media which can be interpreted as a type of teaching and learning that allows teaching materials to be delivered to learners using internet media. Online learning media as an alternative to learning based on electronics provide many benefits, especially for education carried out by distance.

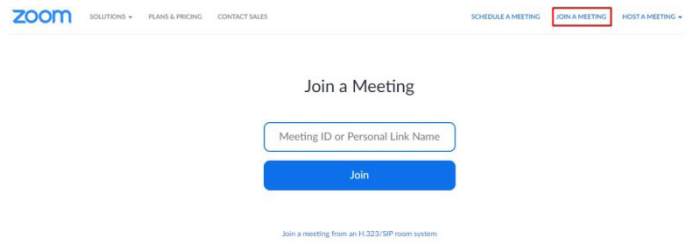
Steps to use zoom application during learning:

1. Educator invite learners to download the zoom application at https://zoom.us . Zoom can be used via a smartphone or laptop.

Source: https://images.app.goo.gl/pmQHXNhaUMAXbhJ28

2. After downloading, the learners will be given an ID to enter the meeting. After being given an ID, students can be joined immadiatelly by choosing the option join or join meeting.

Source:https://images.app.goo.gl/EBFDSRwkngxENTUo7



Source: https://images.app.goo.gl/9KovTgQSzssQKNhd7

Another platform had been done in synchronous learning like google meet.

Source: https://images.app.goo.gl/aHumBhxepRD-dZngH9

Google Meet is a Google product that is a video chat service that was created by Google. Google Meet was launched, encouraging users to participate in video calls with up to 25 other people in the same day. To put it another way, Google Meet can be used to integrate new learning and teaching methods (Purnawati, W.,Vicenovia, I.O.S,& Fatonah,S., 2021). The advantages of using the google meet application; (1). Unlimited use of online classes; (2), automatic texts during meetings; (3). Compatible with various traps; (4). Video and audio preview screen layouts and settings; (6). Controls for online class organizers; (7). Sharing screen

with participants; (8). Exchanging messages with participants; (9). Integration with google ad Microsoft office applications. The benefit of using google meet compared to other services is simplicity just by having a google account, you can immediately start video calls with friends, and educators. The weaknesses of the google meet application are; (1). The absence of data –saving feature so requires a lot of data when using google meet; (2). Requires a stable internet network, in order to operate properly and work properly.

Starting a video conference or synchronous learning on google meet in various ways; (1). start class from a meet, (2). Start class from Gmail, (3). Start class from google calendar, (4). The schedule video meetings on scheduling system. So, google meet is one google application that can support distance learning. By this medium, lots of learning interactions can be done.

Asynchronous

Asynchronous is a learning activity carried out by educators with learners at the same time, where teaching materials that have been distributed by the educator can be accessed by learners whenever and wherever they are. Asynchronous distance education refers to the physical and temporal distance of the educator and the learner (Beldarrain at all in Gunes, 2018). Asynchronous is also a learning process that takes place indirectly between students and their learning resources, where learners can carry out learning activities whenever and wherever they want without having to wait directly for the presence of learning sources. Learners can access course content using a variety of resources such as CD-ROMs, streamed pre-recorded audio/video web recordings, and audio podcasts in asynchronous courses, which include a flexible, self-paced setting. Asynchronous conversation improves coordination and teamwork. Learners have more flexibility to plan an answer to a collection of instructions or questions because they are not limited to a specific day or time for communication. Discussion groups (e.g., via discussion boards via WebCT/Blackboard or other learning management system), blogs, and e-mail are examples (Ann,

Ashley Skylar, 2009). Another discussion board had been done by writer's experience by using the platform; Edmodo, Padlet and Google classroom.

Edmodo is one of the results of development in information technology in 21st-century education to support online learning systems for education activists, such as teachers, students, undergraduate students, and lecturers. Based on the writers' experience used Edmodo platform gives many features which help educators in digital learning.

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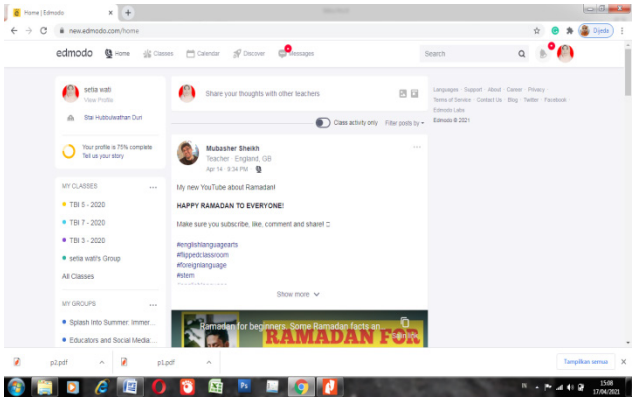

Writer's edmodo class

In the Edmodo platform, both educators and learners can interact with each other easily. The facilities will be offered in learning activities such as giving assignments, taking exams, quizzes, and more. For educators and learners, Edmodo offers activities such as microblogging discussions, managing and responding to polls, managing and submitting tasks, and managing and submitting quizzes (Cankaya, S., Durak, G., Yunkul, E., 2013). Since Edmodo is a closed

platform, no one can access its content. As a result, in order to access the course, learners must enter an access code created automatically and provided by the instructor. Educators are the only ones who can build an account in Edmodo. It's also worth noting that the creators of Edmodo were influenced by Facebook and designed the Edmodo interface to look like Facebook. Angelo (2013) also said that Edmodo is called the 'Facebook for Education'. Edmodo is a free service that does not require the installation of any software. Edmodo platform can be used on tablets, smartphones, and laptops. All learners and educators can access Edmodo easier by their smartphones, tablet, and laptop.

Next, Padlet is an asynchronous platform that it had been used in online learning. A padlet platform is used by writer in the online learning process.

padlet

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Padlet is an online class where educators and learners can do collaborative learning, reflection, sharing of links and pictures. It is also called online whiteboards by facilitating students to enter notes in a public place. This allows learners to share notes with others in the form of links, pictures, videos, and different documents. The educators can share some videos, PPT, documents related to the materials on the wall of Padlet. The educators can also give marks to the learners directly. Fuchs (2014) states Padlet (www.padlet.com) is a downloadable, multimedia-friendly wall that can be used to promote whole-class engagement and evaluation in real-time. If you've ever led an in-class activity in which you asked students to write ideas on sticky notes and then put them on a large piece of paper or a wall to gather ideas from the entire class, you make a good point.

The padlet platform includes the following features:

1. Write a message event

   Teachers and students can communicate with each other through text or message using this function.

2. Discussion event

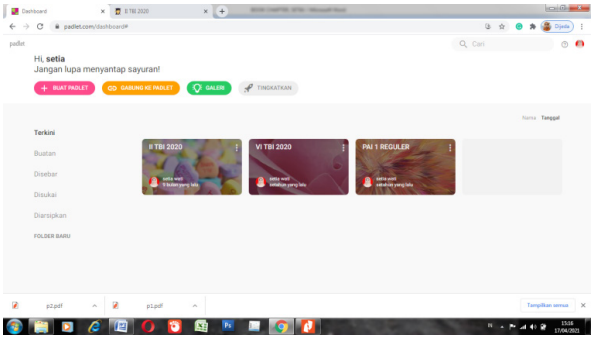
   This feature can be used to encourage dialogue in virtual classrooms. This conversation may occur between teachers and students, between students, or as a group discussion.

3. Talking event

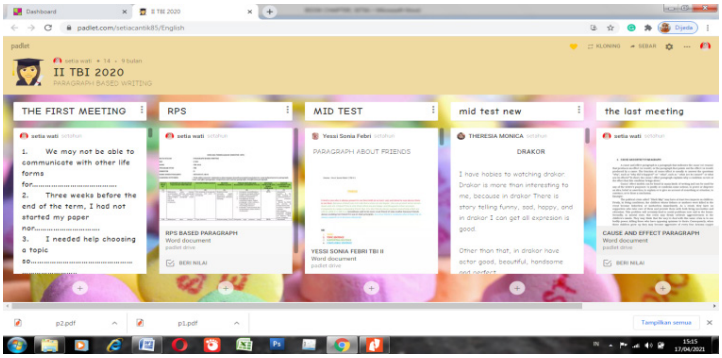
   Students who take to express themselves verbally can benefit from this function, which allows them to communicate in writing. This activity could include talking about a picture or video, drawing, or writing about the subject.

4. Recording learning event

   Padlet has the advantage of allowing students to copy or import discussion results in a number of ways, making it easier for them to monitor learning outcomes.



Writer's padlet dashboard



Writer's padlet online class

At the last platform, Google Classroom is an online learning application that has been used by writer. Educators can create their own class and share the class code or invite learners. Google Classroom is intended to help all spheres of education that help the students to find or overcome learning difficulties, share lessons and create assignments without having to attend class. The main purpose of Google Classroom is to share files between educators and learners. Google Classroom combines google drive for assignment creation and distribution, google docs, sheets, slides for writing, Gmail for communication, and google calendar for scheduling. Learners can be invited to join classes via a personal code. Each class creates a separate folder in each user's drive, where learners can submit work for the educator to grade.

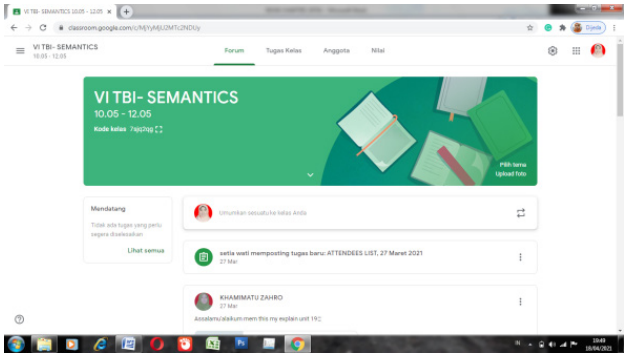
Every platform has good features to do digital learning. Google Classroom is a new tool in Google Apps for Education that was launched in 2014. This classroom allows teachers to easily build and coordinate tasks, provide timely feedback, and engage with their students (Nizal,I.M.S, Mohd.J.J, Syamimi,S.M.R, 2016). Google classroom presents features such as assignments, grading, smooth communication, learning archive, mobile application, and personal safety. The features help the educators to be effective and easier.

Assignment, each downloaded assignment will be saved and graded in this application. Grading, google classroom support many different grading methods. Teachers have the option to monitor each learner's progress on assignments where they can make comments

and edit. Altered assignments can be graded by the educator and returned with comments to allow learners to revise assignments and return. Once graded, assignments can only be edited by the educator unless the educator returns the assignment. Smooth communication, announcements can be posted by the educator to the class stream which can be commented on by learners. This way can be done two-way communication between teacher and learners. Then, learning archive, classrooms allow instructors to archive courses at the end of a semester or year. Mobile application, the application lets users take a photo and attach them to their tasks, share files from other apps, and supports offline access. At the last feature, personal safety is given by google classroom. Google classroom as part of G Suite for Education which not display any ads in the interface for learners, and educators, and user data is not used for advertising purposes.

Google Classroom

Source: https://images.app.goo.gl/URYBEXkcYkEop4hP8



Writer's google classroom

Summary

Digital learning can be done by mixing synchronous and asynchronous platforms. By combining it make the situation of the learning process to be effective, flexible, and easier. The educator and learners can give comments directly to make the situation of online class be life. The creativity of educators will develop because this platform is designed by own. Not only educators but the learners will also be involved directly with the digital platform. All materials are integrated by technology. The educator and learner can share information, documents, PPT, video, and link YouTube. All of the features of synchronous and asynchronous platforms help the educators in the teaching-learning process in digital learning.

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CHAPTER 10.

Google Meeting, a Synchronic Learning Alternative for Students

Wahyuni

Abstract

The COVID-19 pandemic has changed the habits of human life, including the world of education. Regulations to avoid social distancing means that we have to work from home and learn from home. Meanwhile, the learning process must continue so that the online learning process is chosen not to lose time to study. Many online learning applications can be used, one of which is Google meet. Google Meet is an application that is easy to do and access. Google Meet is not supported by saving data, so we have to serve data more than others.

Key words: COVID-19, online learning process, Google meet

Introduction

The Covid 19 pandemic has made changes to human life, including how to learn and also communicate. The provisions that cause a person to comply with health protocols cause people to try various ways to achieve goals and ideals. The learning method, which has so far been done face-to-face, must be changed into a distance learning method. Distance learning is strongly supported by technological developments in the era of the industrial revolution 4.0. The main characteristic of the 4.0 industrial revolution is the combination of information and communication technology in the industrial sector, which causes changes in various sectors. Industries that initially required a large

number of workers, now the functions of these many workers can be replaced by specialized machines.

Industrial Revolution has fundamentally changed the way of life and human work processes and integrated real life with digital to impacts scientific disciplines. The development of information technology is so fast that it represents a breakthrough in artificial intelligence, where computer technology gives birth to technology in the production process controlled automatically. The birth of this digital technology has an impact on human life around the world. Automation in the 4.0 industrial revolution has become a basis for the transaction process for all areas of life, education. In this era, people can communicate with other people without having to meet face to face. In the world of education, this technology is used for distance learning. The government has established a distance learning regulation based on Permendikbud and Permenristekdikti. These regulations include Permendikbud No. 24 of 2012 and no 109 of 2013, concerning Distance Education. One year ago, the latest regulation was issued, namely April 3, 2020, regarding education and distance learning that must continue online during the COVID-19 pandemic. The Ministry of Education and Culture issued circular No. 15 of 2020 concerning guidelines for organizing learning from home in the emergency period of the spread of COVID-19. This circular appeared because of the demands of studying from home and working from home.

Many virtual distance learning methods can be utilized during the COVID-19 pandemic. This method can be synchronous, and it can be unsynchronized. Synchronous Learning is carried out using an internet network and utilizing an application where teachers and students can communicate at the same time without pause. Some of the synchronous methods include zoom, google meet, Microsoft team, google classroom, or others. The asynchronous method is a learning method that does not require virtual meetings between teachers and students. Students can learn the same teaching material at different times and locations. The asynchronous learning method is also called location independent learning. This method does not require a meeting between teachers and students. In the asynchronous method, the teacher must provide teaching materials so that students can learn

independently. This method allows students to access and fulfil these requirements in a flexible time frame. The teaching materials required in asynchronous learning are self-study modules, streaming video content, virtual libraries, posting lecture notes, and exchanging across discussion boards or social media platforms. Unsynchronized learning includes email, WhatsApp, open learning, Schoology, and others.

One of the synchronous learning methods is google meet, whose application has been provided by Google with all the conveniences, although some things sometimes lack support with this method.

A. Understanding Google Meet

The Google Meet application is a meeting or video communication application developed by Google. Before this application, there were two previous versions of applications, namely Google Hangouts and Google Chat. Google itself discontinued the classic version of Google Hangouts in October 2019. Google Meet was first released for iOS users only in February 2017, but Google officially launched Google Meet the following month. This application was launched as a video-conferencing application that up to 30 participants can attend. Google Meet is a more potent version than its predecessor, Hangouts, because Meet can be displayed on web applications, Android, and iOS applications.

Google Meet is an alternative to learning from home when social distancing regulations prevent the spread of the COVID-19 virus. Google Meet has a unique and functional interface that is light and fast in size, prioritizes efficient management, is easy to use (user friendly), and can be followed by all participants. The use of google meet for distance learning that must be done from home provides everything from loud noises to accidentally passing people. The things that must be considered in using google meet are: 1) users must avoid their backward position on the window. The light from behind will interfere with the participants. It should also be understood that, if using a laptop, then the laptop must be placed in a stable place because

movement or shock from the laptop can cause distraction of focus. ; 2) The google meet application allows users to turn on automatic captions such as subtitles in movies. This feature can be found under the google meet window. 3) Google Meet is integrated with G Suite, which allows users to join directly from Calendar or an invitation sent via email; 4) Meeting invitations can be made from the application and can be accessed via the link and meeting code sent, as well as a telephone number if available. Users using Skype for Business or systems based on SIP and H.323 standards (Polycom and Cisco) can also easily join Google Meet meetings via the Pexip Infinity Platform. 5) Google can be enjoyed via mobile devices, be it iOS or Android. Users can also monitor meeting schedules with all the essential information from the Calendar, like the desktop version.

B. Easily Google meet

Google has several advantages that allow its users to feel comfortable when using this application. The first advantage is the Whiteboard feature which allows users to write words and words on the whiteboard. Writing on the whiteboard can explain the material that cannot be explained verbally, for example, an explanation of formulas, pictures, or numbers. The next advantage is, Google Meet is an application that is available for free without paying. This application can be downloaded via the Playstore or the app store for iOS users. Google Meet wants to prove that the services it provides are better than other video conferencing. The third advantage of Google Meet is the availability of a display that is HD (High Definition) and with the resolution found on a smartphone. This feature causes the display to become more apparent. Another advantage is that it is easy to use, the presence of video encryption services, an attractive appearance, and the capacity of participants can reach 100 people, and each participant can make a presentation without having to be a host or co-host, the recording of the meeting can be received instantly. Directly via email host.

Google is very easy to use by only having a Google account to sign up for the application. The existence of a video encryption service means that our data will not be misused. This service is provided to maintain users' data confidentiality so that users do not have to worry about data theft or buying and selling. An attractive appearance can be adjusted according to our wishes, and this is very necessary so that users feel at home and comfortable. The capacity of participants who attend google meet can reach 100 participants. Even by subscribing to the G-suite, the capacity of participants can reach 250 people. Each meeting participant can make presentations directly through the share screen feature, either with windows or full screen. If we want a recording of the meeting we are doing, Google Meet provides a recording feature sent directly to the host's email as soon as the event is over.

C. Google meet limitations

No matter how perfect an application is, there are some things to note so that the application does not support activities. The disadvantage of Google Meet is that there is no data saving feature in Google during a call. This deficiency causes us to spend excess data during Google Meet, or in other words, the amount of money we spend to buy data becomes more significant so that our calls are not interrupted. Another drawback of the Google Meet application is that not all facilities are free of charge. Google Meet users must purchase a package from Google Suite before using more and more exclusive features. With limited features, we cannot freely use Google Meet. To be able to run the google meet application, we need a stable internet network. A stable network greatly determines the continuity of the meeting using the Google Meet application.

D. How to use google meet

The use of Google Meet is divided into two parts, namely as a host and as a participant. As a host, the first thing we have to do is install Google Meet on our devices, either cell phones

or laptops, or directly access https://meet.google.com/. The second step is to enter the application using a Gmail account. The next step is to start the meeting by clicking Join or Start a Meeting to create a class and then the class's hostnames. Then click Continue, and we will see the video camera, then click Join Now to display the class URL link. Copy Joining Info to share the URL Link to Participants, and we can also invite participants by clicking Add People Select an email to invite and then click Send Invite.

The steps as a participant are as follows: 1) participants also install Google Meet on devices, cell phones, or laptops; 2) Login using our Gmail account to join a class or meeting. There are two ways to join the class, namely by copying and pasting the URL that was obtained from the admin/host into the Address Bar and by entering the identity (ID) into the Form Use the meeting code (https://meet.google.com/vxp-qmod-ded) Example of entering ID: vxp-qmod-ded, then click Continue; 3) Then click Request to join. After Participants Click Request to join, then on the Host or admin page, an approval form will appear, and the host must Click Admit to approve the participants joining; 4) after that, on the Admin page and the Participants will display a list of participants. To change the view, the participants or admin view, we can select the participant list image. On the dashboard page, there is a menu: Turn off Menu or Turn on Microphone Menu Leave Call (End Meeting) Menu Turn off or Turn on Camera; 5) Host and Participants can make a presentation by clicking presentation Now; 6) Meeting activities can also be recorded by clicking record. For the use of the Google Meet application via HP or Android. After installing the application, activate/open the application, then Input the Meeting Code and click Join meeting, then click Ask to Join. If the host has allowed us to enter, then we have joined.

There are several supporting features of Google Meet, namely: 1) Turn on or Turn off caption which is useful for displaying text or conversation captions; 2) Present Now Menu for Presentations, by clicking Present Now, then selecting one,

for example, a Window to select one of the active windows (for example, PPT slides). The next step is to click Share, and then the participant window will display a PowerPoint slide. If we want to stop the presentation, click Stop sharing. 3) To change the display layout, click Menu on the lower right corner, then click Change Layout. There are 3-page layout options; select one or click Auto; 4) There is a Chat Menu for communication via text between admin and participants, namely by clicking Chat in the upper right corner. Chat view will appear on the right sidebar.

(Center for Innovation in Teaching and Research, 2020)

E. Google meet mini-survey.

COVID-19 pandemic lasted more than a year. Many things have been done to try distance learning with the help of this application. The study was conducted on the feasibility and accessibility of using Google Meet.

1. Purpose

The purpose of this mini-survey is to find out how far the feasibility and accessibility of the Google meet use is for students of the Physiotherapy study program, Faculty of Health Sciences, UMS.

2. Methods

This research was conducted online using the google form application regarding the feasibility and accessibility of using google meet. The study design of this study was a quantitative cross-sectional study. Respondents were taken from the students of physiotherapy department, Muhammadiyah University of Surakarta. The cross-sectional study was conducted in March 2021. The study population consisted of the physiotherapy students of the Health Science Faculty of the Muhammadiyah University of Surakarta. The number of students is 318. The population will be selected using inclusion and exclusion criteria. The inclusion criteria were physiotherapy students of UMS

who actively attended online lectures using google meet, taken from semester II and IV. The exclusion criteria were respondents whose experiencing concentration problems with the online lecture. Samples were selected by purposive sampling. The number of samples were 96 respondents.

The study instrument used in this study was Technology Acceptance Model (TAM) adapted from Davis, 1989 in Priyanka, 2012. The data collection method was done by using google forms. The researcher will explain the study objectives, the study process, and the confidentiality of the data from the study. Then, prospective respondents were approved to express their desire to participate. Next, respondents were asked to fill out a questionnaire form. The following procedure was to collect questionnaires, editing, coding, test data quality, describe data, and test hypotheses. Data analysis was carried out using the SPSS program. The univariate analysis will only the feasibility and accessibility of google meet use.

3. Result and Discussion

From the study results, there were 96 respondents. The following are the characteristics of respondents based on age, sex, and semester of study.

Table 1. Respondent Characteristics

No	Characteristic	Frequency	Percentage
1	The age of respondents		
	18	18	18.8
	19	52	54.2
	20	26	27.1
2	Sex		
	Male	24	25.0
	Female	72	75.0

3	Semester		
	semester II	42	43.8
	semester IV	54	56.3
	Total	96	100

Source: primary data, 2021

Based on table 1, the highest number of the age was 19 years. The majority of sex were female, and more than 50% of respondents were from semester IV.

Table 2 The Technology Acceptance Model (TAM) of Google meet

No	Feasibility and accessibility	Frequency	Percentage
A	**ATTITUDE TO USE**		
1	Good idea using Google meet.		
	Disagree	2	2.1
	Neutral	36	37.5
	Agree	48	50.0
	Strongly agree	10	10.4
2	The thoughtful idea of using Google meet.		
	Disagree	2	2.1
	Neutral	41	42.7
	Agree	46	47.9
	Strongly agree	7	7.3
3	Ideas Using Google meet is fun		
	Totally disagree	1	1.0
	Disagree	4	4.2
	Neutral	49	51.0
	Agree	34	35.4
	Strongly agree	8	8.3

4	Using Google meet would be fun		
	Totally disagree	1	1.0
	Disagree	4	4.2
	Neutral	51	53.1
	Agree	32	33.3
	Strongly agree	8	8.3
B	**BEHAVIOR INTENTION**		
1	The choosing Google meet for routine.		
	Totally disagree	3	3.1
	Disagree	18	18.8
	Neutral	43	44.8
	Agree	27	28.1
	Strongly agree	5	5.2
2	The choosing Google meet to be regular		
	Totally disagree	3	3.1
	Disagree	12	12.5
	Neutral	47	49.0
	Agree	30	31.3
	Strongly agree	4	4.2
3	The choosing Google meet to study		
	Totally disagree	2	2.1
	Disagree	10	10.4
	Neutral	42	43.8
	Agree	36	37.5
	Strongly agree	6	6.3
4	choosing Google meet help study		
	Totally disagree	2	2.1
	Disagree	15	15.6
	Neutral	47	49.0

	Agree	28	29.2
	Strongly agree	4	4.2
C	**PERCEPTION OF USE**		
1	Google meet makes it quick to understand		
	Totally disagree	2	2.1
	Disagree	17	17.7
	Neutral	47	49.0
	Agree	28	29.2
	Strongly agree	2	2.1
2	Google meet is efficient		
	Totally disagree	3	3.1
	Disagree	17	17.7
	Neutral	36	37.5
	Agree	38	39.6
	Strongly agree	2	2.1
3	Google meet facilitates work		
	Totally disagree	2	2.1
	Disagree	7	7.3
	Neutral	47	49.0
	Agree	38	39.6
	Strongly agree	2	2.1
4	Google meet is useful		
	Disagree	3	3.1
	Neutral	33	34.4
	Agree	53	55.2
	Strongly agree	7	7.3
5	Google meet is cheap		
	Totally disagree	1	1.0
	Disagree	4	4.2

	Neutral	41	42.7
	Agree	39	40.6
	Strongly agree	11	11.5
D	**PERCEPTION OF EASE TO USE**		
1	Easy to use google meet		
	Disagree	3	3.1
	Neutral	20	20.8
	Agree	56	58.3
	Strongly agree	17	17.7
2	It is easy to become a Google meet expert		
	Disagree	2	2.1
	Neutral	44	45.8
	Agree	44	45.8
	Strongly agree	6	6.3
3	Google meet is very clear and easy to understand		
	Totally disagree	2	2.1
	Disagree	8	8.3
	Neutral	46	47.9
	Agree	36	37.5
	Strongly agree	4	4.2
4	Accessing the Google meeting is not difficult		
	Disagree	5	5.2
	Neutral	19	19.8
	Agree	47	49.0
	Strongly agree	25	26.0
	Total	96	100.0

Source: primary data, 2021

Based on table 2, almost all of the respondents choose neutral and agree. In the attitude to use Google Meet statement, most of the

respondents chose that using Google Meet is a good idea and wise. In behavior intention, almost all of the most significant numbers are neutral. In the perception of use, the majority agree that Google meet is efficient, useful, and cheap. Meanwhile, the perception of easy to use, accessible, easy to be skilled, and Google meet is not difficult, is do respondents choose the majority.

According to Lee (2013), when students think that learning technology is easy to use and accessible, they will think that technology is useful. It also raises the idea that perceived ease of use is a significant factor of perceived usefulness. Easy use also affects the intention to use; ease of use is also a substantial variable in behavioral intention. The utility of technology is also a significant stimulus to increase the intention to use it.

Another study was conducted by Martínez-Torres et al. (2008) regarding the factors affecting the intention to use e-learning among European students by implementing TAM. Martínez-Torres et al. find that if there is an assumption that learning technology is easy to use, they will think that technology is useful. The awareness that the technology is useful will influence them to consider using it. The convenience is also since the respondents in this study are Generation Z, who have formed a digital bond to the internet to identify their feelings of being emotionally attached to it. They are always connected to the virtual world and can do everything using the technology available. Even gadgets have been their hold since childhood. So automatically, the introduction of technology and cyberspace is so effected on the development of their lives and personalities. This bond with the internet makes it easy for them to use Google meet.

On the other hand, according to Yuen and Ma (2008), pressure and influence, or other people (subjective norms), significantly influence the way teachers perceive technology in e-learning as accessible and useful. Yuen and Ma (2008) also found that students' awareness of the ease of technology would cause them to think that technology was useful. Perceived ease will be a stimulus to use it.

Septantiningtyas et al. (2021) said that learning using the Google meet application greatly influences student interest in learning. Because

the learners are very easy to implement, time is more flexible and can be accessed. Dewantara et al. (2021) also said that practicum learning with the Google Meet Logic application was effective and got a very good response from students.

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CHAPTER 11.

Utilization of Campus Siakad as Digital Learning Means

Zaedun Na'im

STAI Ma'hadAly Al-Hikam Malang

Introduction

This 21st century is an era of extraordinary development of information and communication technology (ICT), because all information on developments on this earth can be accessed using internet facilities and developed with various application features to make it easier to use. So it is not wrong if people call the 21st century the era of "the world is in the hands of humans", how could it not be by using a smartphone, for example, humans can access all information with Google. So that this is also widely used in various sectors of life, including the world of education

In the development of technology it also has an impact in the world of education, because when educational institutions do not take advantage of existing technology, there will be a lot of lags in its development, for example, for learning to use the internet as a learning resource and this has become familiar to today's young generation, so that schools or colleges high design learning also takes advantage of technological sophistication.

Therefore, the need for a concept and learning mechanism based on information technology is inevitable. Limited funding and educational facilities can be overcome by this digital learning system. The digital learning system is a form of learning implementation that utilizes technology. This digital learning system has an influence on the

transformation of conventional education into digital form, both in terms of content and systems.(Efendi et al., 2015, 484)

According to Munir (2017) The use of digital technology in the world of education has developments starting from the use of Audio Visual Aid (AVA) devices to deliver learning material in class, followed by the use of computers as a medium for accessing and processing information, using software on computers to facilitate processing and exchange. information (Amarulloh et al., 2019, 16).

In this regard, this paper will describe the practical level of digital learning in a private university in Malang, East Java, namely STAI Ma'had Aly Al-Hikam Malang, which in this case the learning uses campus Siakad which is designed in such a way that it can be used in learning for students

Discussion

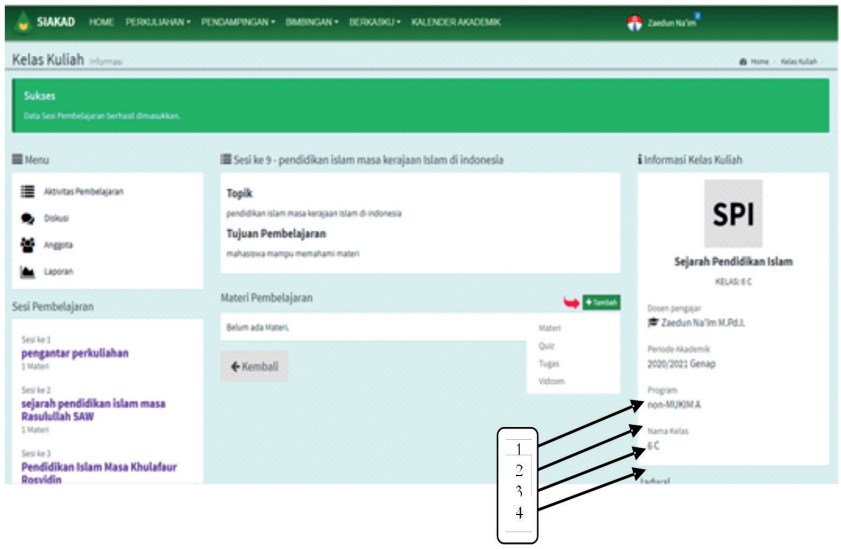
According to K. Osman, LC Hiong & R. Vebrianto that the challenges of the global digital era demand a variety of skills known as "7C" (The seven Cs: 21st Century Lifelong Skills) which includes: critical thinking and doing, creativity, collaboration, cross culture understanding , communication, computing (ICT literacy), career and learning self-engagement. This implies that one of the conditions in order to survive productively in the global digital era of the 21st century, every individual is required to be "literate" in technology. (Suciati, 2018, 11)

In this regard, tertiary institutions as one of the higher education institutions also have an obligation so that students can also be "literate" in technology, so that universities can provide services for students by optimizing technology, including in learning activities. In the modern learning process, learning resources are an important element in addition to the teacher. In general, learning resources can be defined as anything that can be used for learning. Learning resources can be categorized into three groups, namely people, environment, and media. Digital learning resources fall into the media category. Modern learning has three basic characters, namely active students (active learning),

student-centered (student-centered), and integrated with ICT including utilizing various sources.(Kusnandar, 2013, 584)

In the implementation of lecture learning at STAI Ma'had Aly Al-Hikam Malang and coincidentally the writer teaches at the campus also uses digital learning by utilizing media in the form of Siakad, for that at a glance the writer describes the learner's picture by displaying an image at the core of learning activities and the writer does not display all the detailed steps and I hope that the presentation of this digital learning model can be a reference for other educational institutions to use their attitude. The following is the explanation from the author:

There are several menu options in learning activities in Siakad, as follows:



Siakad source (www.staima-alhikam ac id)

Some of the selected features above are described as follows:

1. Material, Lecturers want to enter lecture material in the form of images, audio, video, or documents, so this feature makes it easier for lecturers to choose what they want.
2. Quiz, lecturers can provide quizzes or questions related to the material being taught so that they can be used as material for evaluating the level of student absorption of lecture material

3. Assignments, lecturers can provide daily assignments in which they can enter images, audio, video, or documents and just give questions or questions related to what the lecturer supports or can also give assignments in the form of discussions via chat in the Siakad, so that all results Student discussion chat can be known by the lecturer concerned
4. Vidcom, this feature can be used by lecturers if they want to do virtual face-to-face learning by setting up the zoom of the lecturer concerned to adjust the lecture schedule then the zoom link is inserted into Siakad, so that students when learning must also enter Siakad first.

The descriptions above are some of the features that exist in the learning system of STAI Ma'had Aly Al-Hikam and all of these features if students conduct lectures through Siakad, automatically the presence of students will be recorded and the development of the Siakad is carried out by the campus IT development team and gradually experiences several times. Siakadnya development

The use of Siakad as a digital learning media can be said to be part of the application of E-learning, as the opinion of Setyaningsih et.al (2018) states that the use of e-learning is also a form of using digital media as a source of student learning (Setyaningsih & Prihantoro, 2018, 245). In addition, the use of e-learning in learning will be able to provide ample opportunities for students to develop optimally because with the content that has been uploaded by the lecturer, students are able to learn it repeatedly and can also discuss it through forums. (Setyaningsih & Prihantoro, 2018, 245)

Thus what universities do in digital media development is a must with the consideration of technological advances and competitive competition between educational institutions in providing the best service for students, so digital learning is one of the solutions in learning with any conditions. Moreover, the conditions of the Covid 19 pandemic, universities really need digital learning to keep learning activities running because face-to-face learning is still not allowed according to the rules of the government

Seeing the future prospects of digital learning, it is still wide open that it will continue to be in demand and develop, considering that learning is very tentative and can be done anywhere, so there is no barrier to the distance between lecturers and students in carrying out learning activities. However, to support the success of digital learning, the figure of an educator or lecturer must have various competencies

Therefore in order to carry out digital learning, the scope of competence for an educator or lecturer includes learning preparation consisting of planning and organizing learning, presentation skills both verbal and non-verbal, collaboration between teaching staff, question strategy skills, expertise in mastering learning materials, involving learners in learning and coordinating their learning activities, knowledge of learning theory, knowledge of digital learning, knowledge of learning planning, and mastering the learning media used (Amarulloh et al., 2019, 16)

Seeing the current development, of course, learning has great potential in filling learning activities in higher education. According to Kenji Kitao (1998) Digital learning has three potentials, the potential for digital learning that can be utilized in everyday life, including the potential for communication tools, the potential for tools for accessing information and the potential for educational or learning tools. Thus this digital learning has benefits besides being useful for learning it can also be used as a means of communication and as a means of accessing information

Conclusion

Digital learning is part of an important learning tool and is really needed by universities in any condition, either normally or the current COVID-19 pandemic, so that in an effort to provide services to students in the form of convenience in learning activities, STAI Ma'had Aly Al-hikam Malang develops its Siakad with learning features that make it easy for all lecturers

Of course, everything can go well if it is supported by the mastery of competence from lecturers both technically and non-technically,

so that learning can run well and can provide learning satisfaction for students.

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CHAPTER 12.

Digital Learning and Its Implications in Learning Mathematics

Molli Wahyuni

The Essence of Digital Learning

Digital learning is learning that is carried out with technology assistance. Digital learning was introduced by Jay Cross in 1999 along with the rapid development of web and internet-based technology and training.(Yoon, Kwon, & Shim, 2012; Lin & Chen, 2017).

Digital learning is known as learning that involves internet networks, computers, satellites, video, audio, interactive television and compact disks. All of that is used in network-based learning, computer-based learning and even in virtual learning. Keane, T (2012) revealed that digital learning consists of digital teaching materials, digital tools, digital delivery and autonomous learning.

Miyoshi, Tsuboyama-Kasaoka, & Nishi, (2012)and discusses the future perspective on application of its concepts to nutrition education in other Asian countries. In Japan, there has been a growing concern on increase of obesity and the metabolic syndrome among middle-aged men. Additionally, child obesity has also become one of the important health problems. The increased obesity among them is possibly associated with inappropriate dietary habits (eg skipping breakfast, excessive fat intake and insufficient vegetable suggests the advantages of digital learning compared to traditional teaching, namely learning without being limited by space and time, internet networks that help in obtaining the various data needed, content and schedules that can be adjusted, recording in detail the involvement of students

in learning, more interactive learning, teaching costs more efficient because it can be used many times, accumulates knowledge, increases interest in learning, increases skills and knowledge about information technology.

Digital technology has an important role in the transformation of modern-day learning (Blundell, Lee, & Nykvist, 2016; Howard & Mozejko, 2015)numerous key technologies (including digital technologies. The integration of digital technology in learning provides benefits for increasing standards; increase vocational relevance; contribute to a knowledge-based economy; enriching learning experience; changing pedagogy to be more student-centered, constructivist, and with a focus on higher-order learning.(Blundell et al., 2016; Fullan, 2013; Somekh, 2007)

Along with the changing educational paradigm that is influenced by the digitalization era, governments and businesses have invested heavily in research and development of digital teaching platforms. The software and hardware features for many digital teaching platforms have been upgraded, a variety of digital teaching materials have been created, and schools are actively bringing different digital teaching platforms into teaching, hoping to improve student learning outcomes. Using shared educational energy sources on pc networks to shorten the urban-rural learning gap has become a universal trend globally. It is undeniable for teachers to integrate data technology into subjects to support the implementation of education through teaching materials, teaching procedures, as well as a variety of learning media. Educators are responsible for making teaching more effective, allowing students to enjoy learning more, and improving the quality of the new generation with creative and rational communication and critical thinking with technology.(Lin & Chen, 2017). Digital learning aims to make students actively participate in educational activities in order to achieve the specified educational outcomes (Pai & Tu, 2011).

The design of teaching and learning activities and the application of flexible technology features or digital learning have become major issues in technology-integrated education. Research findings(Lin & Chen, 2017)shows that digital learning has a positive effect on learning

motivation compared to traditional learning. Learning also has a positive and significant effect on student learning outcomes.

Digital Learning in Various Countries

Various countries in the world have been implementing digital learning in recent years. Moon and Villet (2016) argued that digital learning is reforming teacher education to promote equitable access and quality education in Sub-Saharan Africa. During the same period, an international survey revealed that Africa had the world's fastest growing self-contained eLearning sector (Sawahel, 2013), and a more recent report shows a 15.3 percent annual growth rate for e-Learning earnings across Africa (DOCEBO, 2014). Cellular telecommunications technology has jumped over conventional landline infrastructure, and non-voice applications such as text messaging are widely used. This is illustrated by the example of Namibia, where the Mobile Telecommunications Company (MTC) alone recruited 2 million subscribers in 2012 (Okutoyi, 2012). It is estimated that in the next five years there will be 700 million smartphone connections in Africa, more than double the number projected in North America. Mobile data traffic in Africa is set to increase fifteen fold by 2020. "The mobile industry will account for 8% of GDP by 2020 - double that worldwide. Internet penetration is increasing faster than anywhere else as data and device costs fall "(Mark Rice-Oxley, 2016).

In Australia, the introduction of digital technology in learning is linked to sharing efforts in the Australian government's digital education revolution program. Digital technology is used by teachers as a mediation tool in learning to increase student learning activities. This happens because it is influenced by elements of the socio-cultural context such as rules, community and the division of labor in groups. (Blundell et al., 2016;(Feldman & Weiss, 2010,(Nielsen & Miller, 2012)

Brief & Development, ndfrom the Texas School Administration Association (TASA) revealed that digital learning is causing a shift in the role and skills of teachers in America. The role of the teacher as the owner of learning content shifts to become a designer and facilitator who creates and guides students in learning. Teachers must be able to

take advantage of digital resources in learning. In facilitating learning, the use of technology must be relevant to meeting the individual needs of students. Then, teachers must also be able to provide digital assessments. Given this shift in roles, teachers must be trained to master digital learning. A number of schools in Texas since the past 21 years have innovated in integrating digital learning into the classroom.

A researcher from Finland, (Karppinen, 2005)reveals about meaningful learning with digital videos and online. Learning outcomes depend heavily on the use of integrated video as a learning resource and assignments. Cheng & Lou, (2013) using digital game-based technology in learning at the elementary school level and it has proven effective in increasing student interest in using it digital game based learning (DGBL).

In Indonesia, digital learning is faced with the challenges of wide geographic conditions that require maximum efforts to provide access to students in all regions. One of the State Owned Enterprises (BUMN), namely PT Telekomunikasi Indonesia Tbk, plays an active role in allocating Corporate Social Responsibility (CSR) funds to support the Indonesia Digital Learning program. Andriana, Novianti, Priyatna, & Rejeki, 2019 revealed that various programs implemented include seminars on the use of Computer Information Technology (ICT), learning methods, workshops to a competition entitled My Teacher My Hero.

Some Research on Digital Learning

Nokelainen (2006) researching about an empirical assessment of pedagogical usability criteria for digital learning material with elementary school students. The pedagogical aspect of designing or using digital learning materials is still rarely used. Pedagogical aspects of designing or using digital learning material are much less frequently studied than technical ones. Further, there are relatively few inventories measuring subjective end-user satisfaction with the pedagogical aspects of digital learning material and not a single inventory has undergone a rigorous process of empirical psychometric testing. The pedagogical usability criteria have been operationalized into an on-line Likert-scale

self-rating Pedagogically Meaningful Learning Questionnaire (PMLQ) that has 56 items. Evaluation of the usability of a LM is based on a fact that the learning content is based on a certain learning goal or goals. The criteria of pedagogical usability presented here have undergone two-step psychometric testing process using empirical samples of 5th and 6th grade elementary school students (n = 66 and n = 74). Students evaluated one LMS and four LM's with PMLQ. Results supported the existence of theoretical dimensions of the criteria. The PMLQ was able to capture differences in the pedagogical usability profiles of the learning modules. Generalizability of the pedagogical usability criteria to other domains is limited by the small sample size, the small age range of respondents' and the small number of learning material evaluated. However,

Chen, Lu, Chen, & Liu, (2011)in his article entitled A TAM-based study on senior citizens' digital learning and user behavioral intention toward use of broadband network technology services provided via television revealed that As population aging is a growing phenomenon in the 21st century, products and services aimed at the elderly have emerged one after the other. Great market opportunities in relation to senior citizens have attracted increasing investment from industries. Governments across the globe are making efforts to work out a variety of programs to meet the demands. Among them, the needs for information technology learning, and digital and mental growth are considered as the focus of future social and economic development. The results of this study are described in three aspects as follows: 1.perceived ease of use, social norms, mind-stimulating playfulness and product features are variables that have significant positive influence on perceived usefulness; 2. social norms and product features are variables that have significant positive influence on perceived ease of use; 3.perceived usefulness, perceived ease of use, social norms and network externality are variables that have a significant positive influence on user behavioral intention.

Research on digital learning was also carried out by(Cheng & Lou, 2013) entitled Investigating elementary school students' technology acceptance by applying digital game-based learning to environmental education. In order to improve and promote students' environmental

knowledge, attitudes, and behavior, integrating environmental education into the primary education curriculum has become a key issue for environmental education. For this reason, Cheng, et al studied applying elementary school students' acceptance of technology to digital game based learning (DGBL) to environmental education. The results show that the DGBL system is suitable for both genders at all levels of experience. In addition, the 4th grade students' "perceived ease of use", "perceived usefulness", "attitudes toward use", and "intention to use"

Lai (2020)researching Digital technology and the culture of teaching and learning in higher education. This paper discusses how the use of digital technologies may support a shift of cultural practices in teaching and learning, to better meet the needs of 21st century higher education learners. Researchers conclude that the use of digital technologies has been suggested as a means to respond to these changes. In terms of improving the learning experiences of the students, the impact of digital technologies has so far been rather limited. It is suggested that the use of digital technologies can improve the quality of the learning experiences if they are used as a participatory communicative tool to support collaboration and co-construction of knowledge.

Karppinen, (2005)wrote an article on Meaningful Learning with Digital and Online Videos: Theoretical Perspectives. In this article theoretical perspectives for analyzing the pedagogical meaningfulness of using videos in teaching, studying, and learning are presented and discussed with a special focus on using digital and online video materials. Out of existing theoretical literature six characteristics of meaningful learning were selected. The characteristics provide insights into how digital and online videos can be used in a pedagogically meaningful way in teaching, studying, and learning processes. It is evident that videos viewed either through television or computer can be seen as tools for learning.

Lin & Chen, (2017) researching the Effects of Digital Learning on Learning Motivation and Learning Outcome. In this study, students are tested and proceeded to a questionnaire survey to understand the

opinions about digital learning. To effectively achieve the research objectives and test the research hypotheses, quasi-experimental research is applied in this study. The research results conclude that 1. Digital learning presents better positive effects on learning motivation than traditional teaching does, 2. Digital learning shows better positive effects on learning outcomes than traditional teaching does, 3. Learning motivation reveals significantly positive effects on learning effect in learning outcome, and 4. Learning motivation appears remarkably positive effects on learning gain in learning outcome.

Implications of Digital Learning in Mathematics Learning

Mathematics plays a very important role in everyday life. Therefore, learning mathematics is mostly done by connecting mathematical concepts in real life. Mathematics learning by applying digital learning is increasingly being researched and implemented in an effort to improve the quality of mathematics learning in line with increasingly advanced technological developments.

The implementation of digital learning in mathematics learning can be carried out outdoors. Cahyono & Ludwig (2019) uses a portal and mobile application for math assignments and is designed around the city where the research is located. The application is uploaded by the teacher and students carry out activities with the application to complete mathematical modelling assignments. The use of technology helps teachers facilitate outdoor mathematics learning activities. In addition, students gain experience and gain increased mathematical abilities.

Galimova, Konysheva, Kalugina, & Sizova, (2019) revealed that currently education is used as a basic foundation in various activities, because mathematics is a tool to formulate phenomena in various fields studied. In this digitalization era, it is very possible to carry out the process of learning mathematics by utilizing online services, digital learning technology, and augmented reality technology. The implementation of evaluation in mathematics learning can also be converted into a digital learning environment.

A research based on Indonesian culture, namely the Digital Wayang Kulit Model, has been applied to learning mathematics. Jasni & Zulikha (2016) proposed a model called Digital Wayang Kulit (DWK) to help elementary school students learn mathematics. The concept of culture combined with technology becomes an interesting innovation to be integrated in mathematics learning. Not only associated with the art of wayang kulit, mathematics learning has also been applied using digital stories. Starčič, et.al, (2015) mentioned that new technology made it possible to design a digital story to create meaningful learning and hone communication skills.

Mathematics learning has changed in the digital era (Klingenberg, Holkesvik, & Augestad, 2020). Students with special needs, for example visually impaired, face difficulties in learning mathematics due to the lack of learning resources that support understanding mathematical concepts. Learning mathematics using audio is one way that can be done to overcome these student difficulties. However, further research is needed on the role of digital technology in improving the ability of elementary school students to understand mathematics.

Case study in Netherlands describes the role of formative assessment in mathematics e-learning integrated into the state testing system (Tempelaar & Cuypers, 2012). The repeated use of formative tests in mathematics e-learning programs provides much-needed feedback to optimize learning for each student.

Lanka, First, & Africa, emphasized the importance of the role of digital technology in learning mathematics. The problems that still occur include that there are still mathematics lecturers who have not fully implemented numerical skills in learning mathematics. In learning arithmetic, this is due to the lack of lecturer training, limited guidance in the use of digital technology, lack of time to involve information and communication technology and the difficulty of accessing digital resources in accessing the material required for mathematics.

The existence of relevant mathematics learning media is very helpful in implementing digital learning. The development of screen record-based learning media has been one of the innovations made by many researchers to support the success of learning mathematics

in this digital era. Some of the known screen recording applications include Bandicam, Zoom, Screencastify, Screen o-matic and others. (Wahyuni, et.al, 2021) revealed that the screen recording method is one way to make learning videos that are presented in the era of the Covid 19 pandemic. Screen recording-based learning media helps convey teaching materials to students with videos showing the face of the lecturer and lecture material.

Based on the description of this, it can be concluded that digital learning is an inevitable necessity along with the development of information and communication technology. Teachers and lecturers-of course, including mathematics teachers and lecturers-must further improve their ability to master technology so that they can apply it in learning. Daily life-oriented learning is one method that can be used in the implementation of digital learning. The state has an obligation to provide access to all students in various regions so that digital learning programs do not only belong to students in certain regions. Students must also prepare themselves to face global competition in the growing digital learning paradigm.

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CHAPTER 13.

Zoom as the Learning Media

Hajar Nurma Wachidah

Zoom as the Learning Media

Industry 4.0 has developed rapidly in the world of education. One of the development is digital learning which plays as an important facility for students to deploy digital technology capabilities as a personal means that can be used to interact with educational institutions, fellow students, and teachers. The most important aspect of Education 4.0 is that the learning process depends on the student's personality. Personalization and flexibility are important themes in the Education 4.0 scheme. These aspects could be facilitated by digital learning. Online digital learning programs can give students the opportunity to choose what they want to learn, when, and where.

In the midst of the spread of the Covid-19 virus in Indonesia, it has its own impact on education. The government issued several policies or measures that can be taken during the coronavirus pandemic. One of the policies taken is to disburse all teaching and learning activities which then turn into an online or online system. The circular of the Ministry of Education No. 2 of 2020 and No. 3 of 2020 on the prevention and handling of corona virus disease (Covid-19) requires educational institutions to implement online learning. (Junita Monica dan Dini Fitriawati, 2020)

It can be predicted that the role of distance learning by using digital learning will be increased due to the potential of artificial intelligence in the learning personalization process, as well as by the development of new media and technologies that allow students to

experience more effective learning in increasingly free places and times, such as virtual reality technology and cloud computing. Thus, it is necessary to innovate and use digital learning competitively for all students.

Digital learning planning requires the cooperation of many people and reflects on many possible learning design scenarios. Teachers are an important part of the development team. Through the application of information and communication technology which is the development of technology, including computer media. Computers are information and communication-based technology tools and applications that are utilized as the main tools to process data into useful information by processing, presenting, and managing information. Data processing by computer is called Electronic Data Processing (EDP). (Nana 2019: 82-90)

The selection of internet-based technology learning media must be thoroughly considered to be appropriate and not adversely affect the benefits of learning. Where an educator must be able to understand the principles and factors that can affect the effectiveness of digital technology in the learning process (Putrawangsa & Hasanah, 2018). One of the distance learning that can be implemented in students is by video conference. Learning by video conference can replace learning that is usually done face-to-face in the classroom into virtual face-to-face activities through the help of internet-connected applications.

One of the participants was raised by a video conference application, namely zoom. Zoom can be categorized as an online learning medium that can be interpreted as a type of teaching and learning that allows the delivery of teaching materials to students using Internet media. Online learning media as an alternative to electronic-based learning provides many benefits, especially to the educational process conducted remotely. In making online learning media need to consider their hopes and objectives in following online learning media, speed in accessing the internet or network, bandwidth limitations, costs for internet access, as well as the background of knowledge related to readiness in following learning (Brahma, 2020). The effectiveness of learning using Zoom can be achieved one of them by using learning

media in the learning process that suits the situation and conditions, both from the material content and the state of the student's environment. The delivery of a concept to students will be conveyed well if the concept requires students to be directly involved in it.

Innovation of Students in Zoom

There needs to be innovation in learning activities where students are more active with a variety of learning media in the pandemic period 19. By managing students can produce a new and can be implemented in accordance with the science studied. One of the learning media is zoom. Saputra (2011:14) states that the zooming presentation Prezi zoom in and zoom out with map books display can change everything in terms of creating and displaying an idea or idea on a display and can see the interrelationship in a slideshow with other slides easily, dynamically, and with a very smooth transition without having to lose direction. This is very helpful in learning and makes it easier for students to understand the material being displayed.

In addition, Roblyer (in Sutrisno, 2011: 60) states that a very basic important issue is that zoom media can help lecturers and students to increase creativity, motivation and give opportunities to change the learning process in a better direction. Furthermore, Daryanto (2010:53) argues that there are several reasons that zoom media needs to be integrated in learning (1) with the presence of zoom media there is a paradigm shift of learning that was originally centered on educators into learning centered on learners. In this case educators can be interpreted as facilitators and catalysts in learning, (2) the learning model integrated with zoom media is an active and collaborative learning model.

The explanation above shows that learning media is experiencing a paradigm shift in thinking. At first, educators who transfer knowledge directly to students even as a single resource person change to a pattern of collaboration that leads to students learning actively. Various kinds of creativity of learners can be poured through zoom learning media. Referring to the above indicators, it can be concluded that the change in learning paradigm and skills to design learning based on Information and Communication Technology (ICT) characterizes a new paradigm

of learning that is centered on learners. Participants are taught zoom media in learning can facilitate learners in mastering the material because the zoom media can simultaneously present the outline of language learning as well as the details in turn so that many materials can be viewed simultaneously or intact. The complete presentation in one screen makes students not easily forget the aspects of the language that have previously been learned.

A variety of interesting zoom displays one of which can enlarge or accentuate certain parts that are being discussed or talked about make the focus of the learner's attention focused on the aspect highlighted, but still look at other aspects that remain listed in the zoom. In addition, the delivery of materials can be leaked from the beginning of learning to completion. Thus, zoom media makes it easy for learners to capture the outline of learning and its details simultaneously. There are many learning media that are applied in teaching and learning activities, one of which is learning with the media. According to Kem &Dayton (in Arsyad, 2002: 20) learning media has three main functions namely, (1) motivating interests or actions, (2) presenting information, (3) giving instructions. Basically learning media has positive functions and benefits that can facilitate the success of the teaching and learning process (PBM). According to Law (in Sutrisno, 2011: 57) "media based on Information and Communication Technology (ICT) is a medium, internet or web that can be used as an intermediary to replace other media".

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From the above statement it can be said that the media is the unification of two or more communication media such as text, graphics, animation, audio and video with interactive computer characteristics to produce one attractive display. Based on this, the selection of media in the learning process should pay attention to the characteristics of other components such as goals, materials, strategies and evaluation of learning. Thus, teaching and learning activities can use learning applications that can support communication needs anywhere and anytime with educators without having to meet physically in person. As an effective solution for lecturers and students to keep teaching and learning activities running well.

Advantages and Disadvantages of Zoom

Communication Technology Company from the United States merits the latest application system namely Zoom which is a type of application technology or website designed as a form of convenience for discussion or live broadcast of remote conferences. Various applications offered to accommodate the demand for online services, especially video conferencing (online meetings) resulted in a 443% increase in participants in application services such as Zoom, Microsoft Teams, and CloudX (CNN Indonesia, 2020) as well as several other applications namely Jitsi meet, Skype, and Google meet (Asfar &Asfar, 2020). However, the most accessible app is Zoom. The advantages and disadvantages of a diverse Zoom have always been its own point of view. As the advantages of zoom include:

a. Large Space Capacity

Basically, remote discussion or conference technology was created to make it easier for students to communicate with members. Not infrequently also that the members of each

discussion group have a considerable number. This can be traced further when used in the education sector, which is generally accessed by many people.

The zoom application service feature can be used for video conferencing or online meetings based on cloud computing. The Zoom app becomes a bridge to meet other people virtually, whether it's a video or voice call and both audio and video at once. The app can be used on a variety of devices including mobile, desktop, phone, and space systems. The term Zoom refers to the ability of this application in a hosted video conference with the ability to invite participants in a meeting via webcam or smart phone online. Currently, the demand for active learners zoom application as much as 2.22 million per month during March 2020. Therefore, zoom app students experienced an increase compared to 1.99 million active students in 2019. (Dewi, 2020)

Large capacity facilitates lecturers, academic community and government in carrying out various activities. Conferences that are usually carried out face to face can now be held with the cloud meeting zoom service in the post-Covid 19 era.

b. Multifaceted Features

Natural zoom features of various forms one of the new features of zoom aims to provide confidence for its students. On average, students have less confidence when using remote discussion technology. The amazing advantage of Zoom Cloud Meeting application is that there are a variety of interesting features. Can record and save videos during meetings, brighten your skin tone, change the background as desired, and schedule online meetings. These features may only be available in the Zoom app. There is also a unique and unprecedented background replacement feature.

In addition to the image features available in Zoom technology, there is also an access feature to turn sound and images on and off. This access is claimed to be quite useful for students especially on sound quality. When a discussion

is running, it must certainly provide conditions conducive to smooth activities. Turning off the microphone in discussion participants can be one of these alternatives. The forum chat feature is also available in the zoom app to generate effective discussions without having to directly ask audience questions. Thus, it can be effective during learning activities (KBM). In addition, there is a Record and live button on YouTube so that it can save the conference activities that have taken place can be accessed again live on YouTube.

c. High Access Quality

Zoom has high access quality to available sounds and images. In a discussion forum or live broadcast, of course, discussion participants need an actual and clear source of information. Many ways are done by students to meet these needs. Such as providing speakers at home, turning on access with a large monitor screen, and a wide variety of others.

But for those of you who are loyal to zoom users, there is no need to worry about the above problems. Because, zoom provides high quality access to its students. This is certainly a positive side for zoom users in general. Not infrequently, Zoom users find it very helpful with features like this.

If zoom users are pleased, there is also high-quality access to the presentation screen. The presentation screen is provided so well for Zoom users for easy comfort and smooth discussion. Similarly, the live broadcast owned by Zoom technology is not much different from the quality of discussion access in general.

Zoom developers are aware that the Zoom app has some drawbacks that need updating. Among other things, it does not meet the expectations of community privacy and security, so it will improve by conducting a transparency report detailing data or content from government authorities. Some of Zoom's security loopholes are sharing student data with Facebook. Zoom never realized that in the future with a matter of weeks, everyone will suddenly learn, work, and socialize from home, in

fact Zoom does not have end to end security features for students (Budiansyah, 2020; Iyengar, 2020), only manages and stores all user data encryption keys as well as infrastructure using the cloud. Therefore, data is not able to be fully protected (Iskandar, 2020). A Toms Guide report in April 2020 revealed that more than 500,000 zoom accounts were traded on the dark web or cyber black market due to the theft of passwords and names of students, and Kaspersky researchers said they had found more than 500 suspicious documents that falsified Zoom and contained adware and malware (legalreaindonesia.com, 2020).

Some of zoom's weaknesses in its security application are as follows (Iskandar, 2020):

1. Data exposé sent to Facebook. This is the first issue that exploded to the public that is without notice and without the consent of zoom learners in exposing data to Facebook on the iOS version. Finally, zoom remove SDK Login via Facebook (FB). This FB login feature is the door to send some data to FB. Facebook is not aware of the data exposé system that has occurred without the consent of students.
2. The issue of participants educated encryption in marketing activities. Zoom claimed to use end to end encryption technology but in practice they did not do it at all. Zoom only uses Transport Layer Security (TLS) such as updates from SSL (Secure Socket layer) which is a way for websites to establish secure connections with learners' web browsers. In the end, neither video conference nor webinar is protected, thus opening up the possibility for wiretapping or information theft. On the other hand, Zoom can see the contents of the meeting and webinar.
3. Vulnerable to Data Theft. The chat feature in the Zoom app provides a security loophole because it can be used to steal usernames and passwords on Zoom users in Windows. The trick is to send a chat with a link URL. This is why many Zoom accounts are hacked and their username passwords are sold on the dark web. The trick is to use UNC inject,

which means the URL of the link sent to the chat room when live Zoom occurs.

4. Malware Threat The installation of Zoom application in Mac OS occurs with a strange model and similar to malicious software or also called malware. The installation gives rise to a tendency to manipulate and mismatch between the description and that done by Zoom software.
5. Zombie computer Patrick Wardle is a former NSA (National Security Agency) contractor and a hacker explains that Zoom could be used to snoop on malware. Zoom could later be used as a bridge for hackers to turn computers into controlled zombie computers.
6. Key Management Systems about 5 of the 73 key management systems are located in China, citizen lab reports. Key management systems are systems for processing encryption that happens to use only TLS.

Aside from the security of the use of zoom, some of the weaknesses that can be analyzed are:

1. The tendency to steal user face mapping in the form of screenshoots with cybersecurity accounts from CISSRec, Pratama Persadha mentioned that the data that is most feared from Zoom users is the mapping of the faces of the audience. Because, this data collection according to him can be used by hackers to unlock devices with facial biometric scanning. This student's face mapping is dangerous because some devices now unlock passwords with faces. It can be interpreted if there is misuse or leaking of user's face data will result in a large security risk (CNN Indonesia, 2020).
2. The occurrence of zoom booming is not because of a conference participant but ability to follow the activities that have been done by the host. This is common and there is no effective solution. People who are not among the participants sometimes can get a zoom meeting address from others.

3. Data theft through LinkediN Zoom App is accused of matching with the students' LinkedIn profiles. If other people in the online meeting use a service called LinkedIn Sales Navigator, they'll be able to see other participants' LinkedIn profiles, just by clicking an icon near their account name (Pratnyawan, 2020).
4. Zoom Username and Password Theft system through chat feature when live Zoom is done allows participants to get TXT file with transcript of chat message in meeting (Mashabel SE Asia, 2020).
5. Mac OS devices detect as Malware Zoom Installation with Mac OS operating system there is a mismatch, namely zoom application is considered as malware on the Mac operating system. This indicates that the discrepancy between the description and that of the Zoom software (Untari, 2020).
6. The control center by Long the Bane Feature Host has several features including "participant attention tracking". If enabled, this feature will allow the host to monitor the participant/participant's computer. Hosts can see indicators in the meeting or webinar attendee pane if the attendee doesn't have the Zoom Desktop Client or Mobile App in focus for 30 seconds. Focus means students have zoom meeting view open and on (Mashable SE Asia, 2020).

Thus there is a solution from the zoom security by providing the latest update zoom application with version 5.0. This is in response to polemics received by Zoom due to user privacy violations. The latest Zoom app adds 256-bit GCM AES encryption, enhanced host control center, stronger password protection and more. Advanced Encryption Standard with Galois Counter Mode (AES-GCM) was introduced by the United States National Institute of Standards and Technology (NIST), where AES-GCM is suitable for use in communications or electronic applications by providing encryption and integrity of high-speed authentication data to enhance the level of privacy protection

and data hacking (Ahmad, Wei, &Jabbar, 2008).

The step that can be taken by the host is to disable the ability of video conference participants to change their name, while the presentation material can only be done by the host and participants who are given permission. Zoom also now enables passwords by default for most customers, and IT admins can determine the complexity of passwords for Zoom business learners. The Zoom lounge feature is also on by default for basic accounts, single license pro, and education. This feature allows hosts to hold attendees in a virtual space before they are allowed to attend a meeting (Warren, 2020).

The lack of zoom application provides a warning to users, especially for academic community to be more careful and take care of everything related to personal privacy. And it can be concluded that with these shortcomings, the zoom application needs to be upgraded periodically.

Analysis Of The Use Of Zoom Media As A Means Of Student Learning

Teaching and learning activities (KBM) during the pandemic can be carried out virtually learning. Virtual learning is a communication activity between lecturers and students in carrying out distance learning through the internet / Intranet LAN / WAN excluding CD-ROM. Deni Darmawan ,2014), p. 25 Then, Abidin and Nawi who stated that e-learning is a learning that uses online system (internet-based) as a medium of interaction between teachers and students. It can be accommodated that virtual learning is distance learning with online internet media and generates a good communication between educators and students, making it easier for both parties because the delivery of teaching materials is faster, easier, and more efficient. One of them is a zoom application.

The use of this zoom media aims to be able to blind the characteristics of virtual e-learning. According to Dwi Salma in his book there are four characteristics of virtual learning, namely:

a. Utilizing electronic technology services; where educators and students can communicate relatively easily without being limited by protocol.

a. Harnessing the advantages of computers (digital media and computer networks)

b. Using teaching materials is independent

c. Utilizing the curriculum learning schedule resulting from learning progress and matters related to education administration.

The above characterization describes the virtual learning output that can be held well regardless of the media used either zoom, google meet etc. As far as analysis has taken place in universities and schools. Effective use of media in all kinds of learning activities or conferences i.e. zoom. The zoom media provides a function for the implementation of virtual learning for students as follows:

1. Supplement: zoom as a virtual e-learning media is an additional learning resource that can add insight to students' knowledge. Students can instantly receive additional material without having to access it on the web or books, although by accessing it students can improve their understanding of the materials learned in the classroom.
2. Complement: with the availability of zoom media, the material delivered by lecturers to students requires e-learning websites to have content that is in accordance with the curriculum and learning needs so that the content can be used as reinforcement material, remedial, training media, or tools in providing online assignments for students who follow class learning.
3. Substitutions: Zoom is a medium for face-to-face learning but still requires it to be active and refer to the curriculum, complete with its methods integrated in the material - and a range of learning features so that its web-based learning system can be used to replace some of it. This learning model gives students the widest possible opportunity to manage their learning activities according to their time. In this case, zoom-based or web-based learning

serves to overcome the weaknesses of the face-to-face learning system in terms of space and time of learning implementation and the provision of diverse learning resources. This learning model is usually known as blended learning or hybrid learning.

The above function as an analysis of the lack of use of zoom media in its implementation that has been carried out in various schools and universities. Among others:

The occurrence of a less supportive network when there are students affiliated in the interior so that teaching and learning activities are less effective, interaction between educators and learners or even between fellow learners themselves. In addressing the lack of effectiveness of interaction can use Shannon and Weaver communication model which is an information resource that emphasizes that every information presented (message) is a communication process and focuses more on the level of carefulness. The main focus of this model is to determine the way in which communication channels can be used efficiently. The main channels used are telephone cables and radio waves. This is evidenced by the findings that the author found when the communication process between lecturers and students using telephone media and internet facilities then there was an interaction between the two with and pay attention to each other and provide feedback in the form of questions about the learning that took place.

Shannon and Weaver's communication model can be applied with zoom media, among others:

1. *Information source*

   Humans are the main source of effective communication because the human brain stores an idea, the idea is verbal and nonverbal. This allows you to provide valid information. How learning that has taken place during the pandemic is virtual. One form of learning with synchronous learning. Synchronous training requires educators and students to access the internet at the same time. Which has the same characteristics as teaching and learning activities in the classroom. However, the class is virtual

and participants are spread all over the world and connected through the internet, to help the way of communication when using internet facilities, namely by using the Zoom Cloud Meetings application device.

The implementation of information systems relevant to the zoom application can make it easier for users (lecturers and students) to communicate relatively well without being limited by distance. Communication devices in the form of smartphones or computers, must be owned by every lecturer and student because the media is an important element in conducting remote communication.

2. *Transmitter/ Encoding*

Transmitter is a face-to-face learning with a video call. The organ of the voice-forming body, namely the mouth, is a face-to-face communication tool that has a role as a medium communication tool. The communication process that takes place between lecturers and students, namely the two interacting with each other using the application, is done in two ways through audio and video calls. Thus the media transmitter is in the form of a zoom that is used as a learning medium.

While Encoding is a password-shaped message, it is necessary to turn the idea in the brain into a password or symbols in the form of verbal or non-verbal words. This happens during the discussion process or Q&A between lecturers and students when answering a question with a nod of the head without any sound and seen in the video call. Facial expressions that appear to be encodings that appear virtually using the zoom application.

3. *Channel*

A channel is a channel for conveying messages, commonly referred to as the media. The media used is a zoom cloud meetings application. In practice learning can be done in two ways, namely by audio and video available in the application. If a lecturer is not clear in addressing the material then it is necessary to use the

channel through the zoom application in virtual learning. The video in the application can be clearly seen by students who do not understand the lecture materials so that lecturers can provide relevant solutions.

4. *Receiver/ Decoding*

Receivers are the target of messages sent by communicators. In teaching and learning activities that act as receivers are lecturers. The lecturer's explanation can be accepted by the student so as to interpret the message and translate the message into useful information for him. The interpretation process performed by students is called decoding. Decoding that has been sent by the communicator becomes understandable information. The faster the student's interpretation of the message delivered by the lecturer, the more effective the communication process. If virtual learning with zoom media then the receiver and decoding process can be conveyed well if without any signal constraints, quotas etc.

5. *Destination*

Shannon and Weaver's fifth model communion process is Destination. Where human brains that receive messages containing various memories or thoughts about the possibility of the meaning of the message. Students receive signals through hearing and vision. Then, the signal is described and interpreted in the brain into a meaningful message. In destination model communication can use zoom media to be able to receive messages properly.

6. *Noise Source*

An important concept in Shannon and Weaver's model is noise. In this model of interference there are three types: technical glitches, semantic disorders, and effectiveness disorders. But often what happens in learning through zoom is technical

glitches. This can be addressed following the progress of learning and the results are shared with students.

The above discussion is an insight to help the process of communication and teaching and learning activities with the use of zoom media for students because it is necessary for the media to facilitate lecturers to convey messages to students through unique, creative and effective applications.

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