Utilization of Mediated Learning Media in Mathematics Learning During the Pandemic Period at SMKN 2 Pengasih

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Abstract: **The outbreak of the Covid-19 pandemic has changed the order of human life, from implementing social distancing, crowding, and the habit of washing hands or using hand sanitizer. This is done to reduce the spread of the covid-19 virus, including changes in the learning system, where there is a change from face to face, to using media as a learning tool. Mathematics learning is often regarded as a difficult subject, so that when mediated learning is applied, it experiences some difficulties. In this study, researchers used several learning media such as Whatsapp groups, zoom, googlemet, and google class room (GCR), to see which media was the most appropriate to use. In the delivery of information, it is necessary to have media to convey information, the theory related in this research is the uses and gratification theory. The use of media in the gratification of information means that each individual or group will actively choose media to meet their information needs. This study uses descriptive qualitative methods with primary data collection processes through telephone interviews, and secondary data through results. literature and internet studies related to research problems. The informants taken were active students affected by the Covid19 pandemic, and took part in mathematics subjects at SMKN 2 Pengasih. This study also discusses the interaction between teachers and students in learning mathematics.**

Keywords :**Learning, mathematics, mediation**

I. INTRODUCTION

The COVID-19 pandemic has changed the order of human life, including in the world of learning, where face-to-face learning has turned into mediated learning. Teachers are required to be able to master technology to support the learning carried out. In this study, researchers used how to apply mediated learning in mathematics. Mathematics is an exact science, where accuracy and formulas are put forward, a student is said to master the material if he is able to solve problems in accordance with the way and accuracy in answering. Learning during the pandemic, makes teachers need to find the right and right way in the learning process, including choosing the media used.

Learning media is very diverse, where this is influenced by technological developments. In 2019, according to (Jayani, 2021) internet users in Indonesia were in fifth position in March 2019, with as many as 143.26 million, the following is the order of internet users in the world:

Number	COUNTRY	NUMBER OF USERS
1	China	829 million
2	India	560 million
3	United States of America	292.89 million
4	Brazil	149.06 million
5	Indonesia	143.26 million

According to Dythia Novianty, 2021, the number of internet users in 2021 will increase, which is growing by 15.5 percent from 27 million people in 2021, reaching 202.6 million people. In addition, the number of internet users from gadgets in Indonesia recorded that there were 345.3 million users. Ngafifi (2014) states that technological progress is directly proportional to the development of knowledge, and is also able to have a positive impact on humans in helping their activities. The pandemic caused an increase in internet use, this increase was also contributed by the learning activities of students aged 5-24 years. According to Hadya Jayani (2021), in 2020 there were 59.33% internet users by students, an increase from 2016, which was 33.98%. The increase occurred in elementary/equivalent students increasing by 35.97%, junior high school/equivalent to 73.4%, high school/equivalent to 91.01% and higher education as much as 95.3%. The internet is a major need for students during the pandemic for teaching and learning activities.

The COVID-19 pandemic has forced teachers to be able to choose the right way of learning, given the many obstacles when distance learning is carried out. In accordance with the circular of the Minister of Education and Culture Number 4 of 2020, the distance learning process is carried out to provide a meaningful learning experience for students, without being burdened with the demands of completing all curriculum achievements for grade promotion and graduation, and the distance learning process can be focused on life skills education (Setiadi, 2020). From the explanation of the Minister of Education and Culture's decree, teachers can give varied assignments and not only focus on learning materials, which are also related to life skills education which is certainly able to give meaning to each student.

During the COVID-19 pandemic, mathematics learning experienced several obstacles, mathematics learning required students to think logically, systematically, analytically, creatively and able to work well with other students. Astuti & Sari (2017) mathematics is an intellectual skill, which involves the ability to reason, think systematically, critically and creatively. According to Hikmah (2021) the purpose of studying mathematics is to develop the ability to measure, count, analyze, and use formulas. In learning mathematics, students are required to be able to master the learning material. Especially for Vocational High School students, where learning mathematics is very necessary, as a basic ability that must be mastered in developing abilities in their fields. The interaction between teachers and students in learning mathematics is also important in learning mathematics.

In this study, researchers looked at how the understanding, interaction, and feedback received by students during the distance learning period used the media. In the mathematics learning process carried out by SMKN2 Pengasih teachers using several media, including: Whatsapp group, zoom, googlemet, and google class room (GCR). This study looks at how the use of mediated learning media in learning mathematics during the pandemic at SMKN 2 Pengasih.

II. LITERATURE REVIEW

Utilization of Learning Media

Learning media is used as a tool or an intermediary so that the learning process is more efficient, and easy to understand. (Susilana Rudi., 2009) explains that learning media comes from Latin, namely from the word "medium" which is an intermediary or introduction. The intermediary is as a liaison between the sender of the message and the recipient of the message, so that learning media is used for channeling messages to recipients of messages related to the purpose or learning process. Learning media can be in the form of print, audio, visual, audio visual where this media is used to facilitate the delivery of learning materials. According to Schraamm in (Falahudin, 2014) learning media is a messenger technology that can be used for learning, learning media can be in the form of software (software) and tools as hardware (hardware) that are used as a support in the delivery of these materials, so that learning media are used. for the delivery of messages for the purpose of the learning process. Media Learning media have various forms and functions depending on what is needed in the learning process.

With this media recipients of messages or people who participate in the learning process more easily understand the material. This makes every learning process the need for media to support the delivery of material. In addition to the ease of understanding the material presented, the learning media is also used as a means of support so that learning participants are active and independent in managing learning materials. Technological sophistication makes learning media develop, where space and time when delivering material is no longer an obstacle in the learning process.

Covid-19 pandemic

Covid-19 is a virus that emerged in 2019, where this virus causes sufferers to experience respiratory problems from mild to severe. Symptoms of exposed people are: fever, cough, shortness of breath (Islabiah, 2020). To see if someone is exposed to the virus or not, a series of tests can be carried out that looks for signs of the virus in the respiratory system. There are two types of causes of disease ranging from mild to severe symptoms. Common signs and symptoms of the corona virus are respiratory disorders such as fever, cough and shortness of breath. (Islabiah, 2020). Dewi (2020) there are two types of coronavirus, namely: Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) which cause disease, which can cause severe symptoms that can attack the respiratory tract.

Whatsapp group

WhatsApp adalah aplikasi yang dapat menghubungkan antar pengguna, teman, atau keluarga dimanapun dan kapanpun kita berada, ketika kita memiliki jaringan yang baik untuk mengakess aplikasi tersebut (Roida, 2020). Aplikasi whatsapp merupakan aplikasi pesan instan, dimana penggunanya mampu berkomunikasi dengan mengirimkan pesan, gambar, audio, visual, serta dapat melakukan panggilan baik dengan suara maupun video call (Tutiasri et al., 2019). Dengan menggunakan aplikasi whatsapp penggunanya bisa membuat grup, grup ini bisa digunakan untuk mendiskusikan suatu hal termasuk pembelajaran.Pengguna whatsapp grup memiliki dua karakteristik yakni: anggota aktif dan anggota pasif atau pembaca senyap, yang hanya mengamati percakapan dalam kelompok (Tutiasri & Kusuma, 2020)

Zoom Meeting

The Zoom meeting application is a video-based communication medium, when used in the learning process, users will feel they are face to face directly, because they both see each other even though they are in different places, and even though they are far apart (Astini, 2020). In this application, participants who join the screen with a capacity of 100 participants up to 1000 more, with this application learning activities can be done virtually.

Googlemet

The googlmet application has advantages and disadvantages according to Dara Sawitri (2020): advantages there are 7 advantages and 4 weaknesses. 7 advantages of googlemet are:

1. There is a White Board feature with the function of explaining something using pictures or numbers if it is difficult to explain it verbally.

2. The open source application makes it easy to download for free. This app is available on playstore or app store.
3. Video display can be clearer because of the High Definition (HD) resolution and also supported by other resolutions.
4. This application is easy to access and easy to use.
5. There is a video encryption service that can prevent or protect personal data stored in the application.
6. The video display can be adjusted according to the user's wishes, and the display is diverse and attractive.
7. Users of this application can invite up to 250 participants by subscribing to google suite.

The disadvantages of the Google Meet application are:

1. The free version of the application can only invite a maximum of 25 people.
2. There is no data saving feature during a call.
3. Not all facilities are open source, users must purchase a package from Google Suite before using more and more complete features, so that users are not free to use Google Meet.
4. Requires a fast and stable internet network. If the network quality is poor, the resolution and video speed will drop.

Google Class Room (GCR)

With this media recipients of messages or people who participate in the learning process more easily understand the material. This makes every learning process the need for media to support the delivery of material. In addition to the ease of understanding the material presented, the learning media is also used as a means of support so that learning participants are active and independent in managing learning materials. Technological sophistication makes learning media develop, where space and time when delivering material is no longer an obstacle in the learning process.

Uses and Gratification Theory Uses and Gratification Theory

This theory discusses how users of media content to fulfill it, Users (Uses) and Users (Uses). Media users are considered active and selective to meet their needs when using media. This theory focuses on the power of the audience, and the audience plays an active role in interpreting the media they choose, and is responsible for the use of the media chosen to be used according to their needs. McQuail (1987), in this theory there is a level of diversity, namely:

1. Allocation of time on different media.
2. The relationship between the use of media with the use of time for other activities.
3. There is a relationship between the use of media with self-adjustment and social relations.
4. Different media functions or content types.
5. Mass media users have various reasons.

Cognitive Development Theory

The formation of knowledge related to how to interact with the social environment, during adolescence or high school, is a period of development before becoming an adult. Sary (2017) at this time teenagers get and apply their knowledge, at this time the brain has developed maturely. Mental development also builds cognitive skills as a process and filters information as a thinking process (Jahja, 2011). According to Widyastuti (2009) mental and cognitive development of adolescents consists of two developments, mental development is characterized by sensitivity and aggressiveness from external stimuli where the tendency to form peer groups and obey parents. Second, in cognitive development, adolescents think abstractly, such as actively giving criticism and a tendency to try new things.

III. RESEARCH METHODE

Research on the use of mediated learning media in mathematics learning during the pandemic at SMKN 2 Pengasih is a qualitative descriptive study. Sugiyono (2013) this research method is defined as a scientific way of obtaining data or for certain purposes. The type of research used is descriptive research, which aims to explore the opinions of the students of SMKN 2 Pengasih when learning mathematics during the pandemic. Bungin (2011) qualitative descriptive research is designed to describe, summarize various conditions, situations, or social reality phenomena that exist in the community in the object of research. In this study, researchers conducted interviews with 60 students who took part in mediated distance learning during the pandemic.

IV. RESULT AND DISCUSSION

Utilization of Mediated Learning Media

Distance learning during the pandemic requires teachers to be creative, including in the use of learning media. Including the use of Whatsapp groups, zoom, googlemet, and google class room (GCR) selected by the teacher to deliver the material. There are advantages of each of the learning media used. How the interaction between teachers and students during distance learning, the use of media also has an effect. The use of Whatsapp group media, zoom, googlemet, and google class room (GCR) makes student admissions different. According to Schraamm in (Falahudin, 2014) learning media carry messages that can be used for learning, learning media in the form of software and hardware are used to support message delivery for the learning process. Digital technology in education during the COVID-19 pandemic was used for learning, to avoid exposure to the virus. Here's how students assess the use of interactions built by teachers with students through mediated learning media is good or maximum, namely:

Informant 12
It can be maximal, because in addition to being given written material, the teacher also explains the material being taught
Informant 18

Yes, if I think it's maximum enough
Informant22
Yes, because the material can be accessed at any time
Informants 27 and 48
can be maximized because the teacher remains consistent in giving assignments
28 informant
you can because it will be easier if you can interact directly and it will be easier to understand the material and ask questions that have not been understood
informant 30
Yes, because the teacher explains clearly
Informant 49
Yes, because learning can be done
50 informant

Yes, because after giving the material the teacher also asks students to work on the questions (1 student 1 question). That way the teacher also understands whether the students have understood or not. So, in my opinion, the teacher's interaction is maximal.

From the answers of the informants related to mediated distance learning who felt the benefits of learning due to several factors, namely: the teacher taught in writing or distributed the material and then explained the material. By using mediated learning media, the material can be accessed at any time, the material presented by the teacher is stored on the media and can be repeated. The learning process cannot be separated from the communication process, where there are components: communicators, messages, communicants, media, and feedback. In the learning process media selection is very important, because each media has different characteristic (Ririn Puspita Tutiasri, Niko Kurniawan Laminto, n.d.). The opinions of informants 30 and 49 regarding distance learning are a solution during the pandemic, because through the media the teacher can explain the material and learning can take place. Giving questions also has an effect on distance learning, where the teacher gives different questions to students and sees how students understand the material presented. The use of learning media helps the effectiveness of the learning process, message delivery, and learning content (Wiratmojo & Sasonohardjo, 2002) There are some students who feel that distance learning is less effective for several reasons, namely:

Informant 1
No, because the easiest explanation to understand is to listen directly to the teacher
Informant 3
If you use online media, it's not optimal because our interactions can't be as flexible as offline learning
Informant 9
No because not all math material can be explained visually and listening
informant 11

No, because the teacher in giving explanations cannot be directly face to face and only given material so that the material is a bit difficult to understand
Informant 13
No, because time is limited and there are often signal problems that result in information being left behind
24 informant
Less than optimal, because when the teacher explains the teacher can't make sure the child is paying attention or not, it's different when PTM
Informant 29

Not enough, because no explanation is given, only material to be summarized. Sometimes I do googlemeet but it wastes internet quota.

The students feel that distance learning is not optimal because the media makes the boundary between teachers and students, the interaction between teachers and students is limited because they feel face-to-face learning makes interaction or delivery of material easier. In addition to the limitations of mediated distance learning, it is also due to the quota factor, where internet quotas create problems when learning using media. in distance learning students also feel less effective where teachers cannot pay maximum attention to each student due to media constraints or internet quotas. Sometimes students are embarrassed to ask questions when they don't understand the material presented, or because of the quota so the video is turned off. This makes the teacher less than optimal in seeing the expressions of students when given assignments or during discussions.

Teacher and student interaction in distance learning

Mathematics subjects are different from other subjects, where the teacher explains the formula to develop the ability to measure, count, analyze (Hikmah, 2021). In this study, the researcher wanted to see the extent of the interaction or understanding of students during distance learning. The answers from students varied between the importance of the interaction between teachers and students, and more importantly understanding the subject matter. The following are the answers from informants who answered that the interaction between teachers and students was more important:

Informant 1
It is more important to establish intimacy with students because if they are familiar with students and students are also happy with the teacher, it will foster enthusiasm for learning about these subjects.
Informant 3
It is more important to ask how they are and make friends with students first, because students will be more comfortable and it will be embedded in them if math is fun
15 informant
The teacher asks how things are, and establishes intimacy with students
22 informant

Interaction. Because I am still in grade 10, the material can still be found from many sources. But if the interaction with the teacher is bad, it will affect students in carrying out these subjects, maybe it can be in the mood or it may not like the lesson because of bad teacher interaction.

26 informant

More importantly, the teacher asks how things are, and establishes intimacy with students

34

Establish familiarity with students because the learning materials have already started face-to-face

33 informant

Establish new familiarity in delivering learning materials so that students can be more familiar and are not ashamed to ask the teacher

52 . informant

In my opinion, the interaction between the teacher and students is more important but also given a little bit of learning.

Interaction during distance learning is very important according to some informants where, by asking how they are and establishing intimacy with students, students are more daring to ask questions. The interaction between teachers and students using mediated media makes students more attitude when face-to-face learning is carried out later. Interaction is very important in the cognitive formation of students where when students receive the material they will know what the application of the material will be for. The benefits of using learning media according to (Susilana Rudi., 2009) are: making the abstract from verbal clear, overcoming the limitations of space, time, energy and sensory power, creating motivation to learn, individuals can adjust their way of learning independently according to their talents and abilities. visual, auditory, kinesthetic, Provide the same experience and stimulation.

V. CONCLUSION

During the COVID-19 pandemic, mediated distance learning is very important, where students get material and build intimacy with teachers. There are advantages and disadvantages when using mediated learning media, especially mathematics, where teachers need to find the right media to use when learning. The interaction between teachers and students is also a determining factor for students to be comfortable when delivering material

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REFERENCE

[1] Astini, N. K. (2020). Tantangan dan Peluang PemanfaatanTeknologi Informasi dalam Pembelajaran Online Masa Covid-19.Jurnal Ilmu Pendidikan, 3(2), 241-255.

[2] Astuti, A., & Sari, N. (2017). Pengembangan lembar kerja siswa (lks) pada mata pelajaran matematika siswa kelas x sma. Jurnal Cendekia: Jurnal Pendidikan Matematika, 1(2), 13–24.

[3] Bungin, B. (2011). Metode Penelitian Kuantitatif edisi kedua. In Jakarta: Kencana.

[4] Dythia Novianty, D. P. (2021, February). Jumlah Pengguna Internet di Indonesia Capai 202 , 6 Juta Orang Prediksi Pengangguran Bertambah 4 , 25 Juta Orang akibat Corona | Katadata …. 1–7. https://www.suara.com/tekno/2021/02/15/123000/jumlah-pengguna-internet-di-indonesia-capai-2026-juta-orang

[5] Falahudin, I. (2014). Pemanfaatan Media dalam Pembelajaran. Jurnal Lingkar Widyaiswara, 1(4), 104–117. https://juliwi.com/published/E0104/Paper0104_104-117.pdf

[6] Hadya Jayani, D. (2021). Penggunaan Internet di Kalangan Siswa Sekolah Semakin Meningkat. In Databoks (Issue I). https://databoks.katadata.co.id/datapublish/2021/05/03/tren-siswa-sekolah-menggunakan-internet-semakin-meningkat#

[7] Hikmah, Y. N. (2021). Pembelajaran Matematika Saat Covid-19 , Ini Kendalanya Ternyata Buah Ini Untuk Uban. https://www.suaramerdeka.com/pendidikan/pr-04274348/pembelajaran-matematika-saat-covid-19-ini-kendalanya?page=all

[8] Jahja, Y. (2011). Psikologi perkembangan. Kencana.

[9] Jayani, D. H. (2021). Indonesia Peringkat Kelima Dunia dalam Jumlah Pengguna Internet. Databoks, 1–6.

[10] Sary, Y. N. E. (2017). Perkembangan Kognitif dan Emosi Psikologi Masa Remaja Awal. Jurnal Pengabdian Kepada Masyarakat, 1(1), 6–12.

[11] Setiadi, Y. (2020). Pemanfaatan Media Sosial Untuk Pembelajaran Dari Rumah Bagi Siswa Sekolah Dasar Di Masa Pandemi Covid-19. LPMP Lampung, September, 1–8. http://lpmplampung.kemdikbud.go.id/detailpost/pemanfaatan-media-sosial-untuk-pembelajaran-dari-rumah-bagi-siswa-sekolah-dasar-di-masa-pandemi-covid-19

[12] Sugiyono, P. D. (2013). Metode penelitian manajemen. In Bandung: Alfabeta, CV.

[13] Susilana Rudi., R. C. (2009). Media Pembelajaran: Hakikat,Pengembangan,Pemanfaatan,dan Penilaian. In Media Pembelajaran. Cv. Wacana Prima. https://doi.org/10.3168/jds.2017-13062

[14] Tutiasri, R. P., & Kusuma, A. (2020). Millennial generation and family literacy within the dissemination of hoax in Whatsapp group. Informasi, 50(2), 153–164.

[15] Tutiasri, R. P., Kusuma, A., & Sumardjijati, S. (2019). Perilaku Remaja dalam Penyebaran Hoax di Grup WhatsApp. Jurnal Ilmu Komunikasi, 2(1). https://doi.org/10.33005/jkom.v2i1.36

[16] Tutiasri, R.P., Niko Kurniawan Laminto, K. N. (n.d.). Pemanfaatan Youtube Sebagai Media Pembelajaran Bagi Mahasiswa di Tengah Pandemi Covid-19. Jurnal Komunikasi, Masyarakat Dan Keamanan (KOMASKAM), 1–15. http://ejurnal.ubharajaya.ac.id/index.php/KOMASKAM/article/view/311

[17] Widyastuti, Y. (2009). Dkk, 2009, Kesehatan Reproduksi. In Yogyakarta: Fitramaya, Info Media.

[18] Wiratmojo, P., & Sasonohardjo. (2002). Media Pembelajaran Bahan Ajar Diklat Kewidyaiswaraan Berjenjang Tingkat Pertama. Lembaga Administrasi Negara.