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# IDENTIFICATION OF ONLINE-BASED MATHEMATICS LEARNING PROCESS REVIEWED FROM JUNIOR HIGH SCHOOL STUDENT LEARNING OUTCOMES

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***Abstract***

*This study aims to describe the identification of the mathematics learning process in junior high school students during online learning in terms of learning outcomes. This study uses a qualitative descriptive approach. The data analysis technique used a questionnaire with google forms and a comparison of student scores during online learning and before online learning. The subjects of this study were students of grade 8 SMP Eka Sakti Semarang. The number of students was 67 people from two different classes. The results show that online learning is considered to be the solution for teaching and learning activities to continue in the midst of this pandemic. Based on the results of data analysis, it can be concluded that the online-based mathematics learning process of junior high school students using Google Classroom includes three stages, namely the preliminary stage in the form of learning preparation, the core stage in the form of learning methods, and the evaluation stage in the form of learning outcomes for students. Student learning outcomes before face-to-face online learning were higher than when learning online using Google Classroom. The cause of low online learning outcomes is because when online applications are too complex students are unable to learn mathematics optimally, as well as when there is a lot of data that must be conveyed but internet or network access becomes slow, of course this will interfere with student activities.*

**Keywords:** Learning Process, Mathematics Learning, Online, Learning Outcomes

## INTRODUCTION

Dewi & Septa (2019), stated that education is essentially a process to prepare humans to survive in their environment *(life skills).* According to Yensy (2019), mathematics is a branch of science that plays an important role in human life and is the basis for other sciences. Ulfa (2019), stated that mathematics can train high-level thinking skills in solving problems. Utami & Derius (2020), stated that many skills can be developed from learning mathematics, including problem solving, mathematical communication, and mathematical connections. However, mathematics is always considered difficult for students because abstract mathematics objects use many formulas so that students' views on mathematics lessons in school are difficult and complicated lessons to apply and understand. Coupled with the current conditions, the world is being shocked by the outbreak of the Covid-19 pandemic which has made several countries set policies to impose *lockdowns* in order to prevent the spread of the coronavirus.

Since March 2020, the Covid-19 outbreak has also begun to hit Indonesia. In Indonesia itself, a Large-Scale Social Restrictions or PSBB policy has been implemented to suppress the spread of this coronavirus. If Indonesia is enforcing the PSBB policy, then all activities carried out outside the home must be stopped until

this pandemic subsides. This of course greatly affects all aspects of life, especially education in Indonesia. As an effort to prevent the transmission of Covid-19, the government has issued various policies to deal with teaching and learning problems during the pandemic, namely by prohibiting schools from carrying out face-to-face learning, and conducting the Learning from Home (BDR) or *Study from Home (SFH) program.* However, the problem is that currently the education system is faced with a situation that requires teachers to be able to master distance learning media, especially during the Covid-19 pandemic outbreak.

According to Sunhaji (2014), learning is an educational interaction activity between teachers and students based on the existence of goals in the form of knowledge, attitudes and skills. Meanwhile, according to Arifin (2010), learning is a systematic and systemic process or activity that is interactive and communicative between educators (teachers) and students, learning resources, and the environment to create a condition that allows student learning actions to occur. In line with the definition of learning with the implementation of the *Study From Home (SFH)* program, students can still interact with teachers directly or indirectly, for example chatting or *video calling* using several applications such as *classroom, video convergence,* phone or *live chat, zoom, whatsapp group* (direct), or by sending *emails* (indirectly) to just collect assignments, Distance Learning (PJJ) using several of these applications has a great effect on the quality of learning outcomes. Febriani, Widada, & Herawaty (2019), said that students' ability to understand mathematical concepts needs to be developed because it is in accordance with the demands of the 2013 curriculum and is one of the goals of every material delivered by teachers, because teachers or educators are student guides to achieve the expected concepts.

Based on the background description above, the author is interested in raising the topic in the form of further research on the mathematics learning process from the implementation of the *Study from Home* (SFH) policy during the Covid-19 pandemic on learning outcomes, by taking the title "Identification of Online-Based Mathematics Learning Process Reviewed from Junior High School Student Learning Outcomes".

## RESEARCH METHODS

This type of research is a type of qualitative descriptive research. According to Prabowo and Heriyanto (2013), the qualitative descriptive approach method is a data processing method by analyzing factors related to the research object by presenting data in more depth to the research object. According to Fadhilah Rahmawati & Zahid Abdush Shomad (2019), descriptive qualitative research is aimed at describing a situation or phenomena as they are. The main purpose of descriptive qualitative research is to provide an overview or characteristics of a situation or phenomenon.

According to Sugiyono (2013), data collection techniques are the most strategic step in research, because the main purpose of research is to obtain data. The data collection technique for this research is to use the questionnaire or questionnaire method. Data collection is taken from the results of responses or responses to questionnaires that have been disseminated. A questionnaire is a research instrument in the form of a list of questions to get information from the respondents. The questionnaire contains several questions about perceptions or views on the problem being researched. This data and information collection technique was carried out online by distributing a questionnaire through the *Google form platform* with the research subject of 60 junior high school students with a grade 8 population

at Eka Sakit Semarang Junior High School. In addition, student daily score data before and during online learning is also needed to assess how students' learning outcomes compare.

This research procedure consists of 3 stages, namely the first stage is the preparation/design stage to obtain the needed information, the second stage is the implementation stage where the questionnaire that has been made is distributed to the subject concerned, the last stage is the data analysis stage. The results of the research that will be analyzed descriptively are questionnaire data containing some of the questions mentioned above and also data on students' daily grades before and during online learning. The data analysis carried out aims to give meaning to the data that has been collected.

## RESULTS AND DISCUSSION

Online learning is considered a solution for teaching and learning activities to continue in the midst of this pandemic. According to Mustakim (2020), although students prefer face-to-face learning, they accept the reality of online learning as a consequence of the government's *implementation of work from home*. Online learning has become a demand in the world of education since the last few years. Online learning also utilizes applications on *smartphones* or laptops that support learning. This is in line with the statement according to Fitra, et al. (2020), that online learning is learning that is carried out *online* and carried out anywhere and anytime, and can be used with smartphones, laptops, and *tablets*.

Based on research at Eka Sakti Junior High School Semarang, it shows that in the online mathematics learning process, it includes three main stages, namely the preliminary activity stage, the core activity stage, and the evaluation activity stage. The preliminary stage of this questionnaire data experienced by students is to feel difficulties in understanding mathematics learning online due to explanations from teachers who are difficult to understand and learning support provided by schools, namely borrowing books and providing data packages, not helping students in completing assignments, students prefer to use the internet as a learning resource. The core stage of the results of the questionnaire data of Eka Sakti Semarang Junior High School students during the draring learning process, students use *the google classroom application*. According to Abdul (2016), *google classroom* is an internet-based service provided by *google* as an *e-learning* system. According to Nurani, et al. (2020), *the classroom* application also makes it easier for teachers to evaluate every activity that students have done. In addition, *google classroom* also has many features that are practical, efficient and guaranteed to be safe. In the evaluation stage during online learning, students benefit more because students do not need to prepare to go to school, and the material is given in the form of videos so that they can be played back if they do not understand, but in this online learning students also experience obstacles, namely divided student concentration and the internet network that makes students not focus on learning.

### Descriptive Analysis of Learning Outcome Data

From the learning carried out by Eka Sakti Semarang Junior High School students in mathematics learning will be tested to find out how far the understanding of the material has been mastered as seen from the learning results, this is also not only done before online learning but also done during online learning. So that from this work, an assessment will be given as a benchmark for understanding the mathematics material that has been mastered. Descriptive analysis data on student

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learning outcomes in mathematics subjects can be seen in Table 1. next.

Table 1. *Descriptive Analysis of Learning Outcome Data*

| Descriptive Analysis | Value Before Online | Value Online |
|---|---|---|
| Highest Score | 98 | 100 |
| Lowest Score | 70 | 16 |
| Average | 80,2 | 63,9 |
| Median | 78 | 64 |
| Total Completed Score | 62 | 25 |
| Total Incomplete Scores | 3 | 42 |
| Total Value None | 2 | 0 |

From the table above, it can be seen that the average learning value during online has decreased by 16.3 compared to before online learning. In terms of completeness, the percentage of student completeness decreased compared to face-to-face learning. The completeness of student learning outcomes is the main requirement that needs to be considered in determining the effectiveness of learning.

**Descriptive Analysis of Student Learning Level Outcome Data**

The results of student data were obtained through *a google form measurement scale*. Students are asked to answer the questions contained in the questionnaire by choosing one of the alternative answers. The questions consisted of 25 questions containing three indicators. The data on respondent results can be seen from Table 2. next.

Table 2. *Descriptive Analysis of Indicator Data*

| Indicator | Presentase (%) |
|---|---|
| Study Concentration | 47,22 |
| Internet Network | 41,67 |
| Discussion/ Group Work | 11,11 |

Based on this data, it shows that the obstacle experienced by students during online learning is concentration during learning. In fact, according to Aviana & Hidayah (2015), concentration is the main capital for students in receiving teaching materials and is an indicator of the success of learning implementation. According to Nusufi (2016), concentration is a person's ability to focus on a chosen stimulus (one object) in a certain time. Meanwhile, according to Sardiman (2011), concentration means all the power of attention to a learning situation. One example that affects student concentration is the presence of TV/game interference during the learning process, making students less focused in the learning process.

From the results of the data analysis obtained, learning outcomes are divided into three category levels, namely low, medium, and high.

Table 3. *Descriptive Analysis of Student Learning Level Outcome Data*

| | Low Levels | Medium Level | High Level |
|---|---|---|---|

| | Before Online | Online | Before Online | Online | Before Online | Online |
|---|---|---|---|---|---|---|
| Lowest Score | 70 | 16 | 70 | 72 | 98 | 100 |
| Value limit below MOH | ≤ 70 | ≤ 70 | 71 ≤ value≤ 79 | 71 ≤ ≤ 79 | ≥ 80 | ≥ 80 |
| Number of students who have grades below the MOH | 5 people | 42 people | 32 people | 8 people | 30 people | 17 people |

**Analysis of Student Learning Outcome Data Barriers**

From the results of the low-level student learning data, online pre-online learning is more effective than online because in the online assessment there are 42 people who have incomplete scores, while in pre-online there are 5 people who have incomplete scores. The cause of students during online learning who have incomplete assessments during online learning is because students perceive that formulas in mathematics look difficult so that to receive mathematics learning, students need time to understand the formula, especially teaching and learning activities when online that use applications or teaching indirectly will increase student confusion or the long process of receiving the material explained by the teacher. According to Asmuni (2020), the online learning system is a learning system without direct face-to-face between teachers and students, but *online* using the internet network, especially when online learning requires a considerable amount of space on *mobile phones* and a stable internet network, if the network is unstable during teaching and learning activities, then the material delivered by the teacher is not fully accepted by students, In addition, it is also due to concentration that according to Slameta (2010), students who concentrate on learning can be observed from some of their behaviors during the teaching and learning process, which can result in online learning concentration can be divided so that the material that has been delivered by the teacher is not necessarily accepted by the students.

From the data on the learning outcomes of the middle level students, in pre-online learning which has a minimum score of 32 completeness criteria and in online learning which has a minimum score of 8 people in the completion criteria. The cause of students during online learning according to Riyana (2019), online learning emphasizes more on the accuracy and foresight of students in receiving and processing information presented online, so that those who have the right score meet the minimum completeness criteria because students feel that learning support for learning companions is inadequate during online learning so that learning support is more effective when learning face-to-face with teachers who can discuss without any obstacles, besides that students also feel less motivated in their learning which results in when teaching and learning activities take place students are not enthusiastic about the learning and the learning that has been explained by the teacher is not fully accepted by the students.

From the data on the learning outcomes of high-level students, pre-online learning is more effective than online learning, judging from the number of students who get scores more than the minimum completeness criteria during face-to-face learning, which is 30 people even though the highest score is achieved during online learning, but the number of students who score more than the minimum completeness criterion is 17 people. The cause of students during online learning

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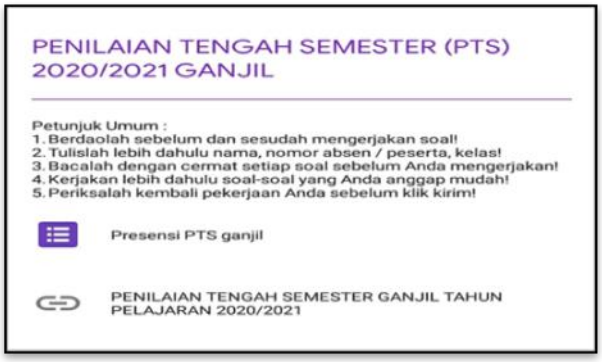
that has a score of more than the minimum completeness criteria is because students not only learn from what the teacher gives but students also use free online learning applications which according to Prasojo & Riyanto (2011), information technology is defined as a science in the field of computer-based information and its development is very rapid. Along with the development of technology, this learning makes students master the learning better and increase student knowledge, besides that students also take advantage of learning support from schools in the form of books to help understand the material and work on assignments. Online learning also has potential, as stated by Setyosari & Punaji (2015), that learning through networks has potentials, including: the meaning of learning, then accessing and improving learning outcomes.

Online learning is not as effective as face-to-face learning because some of the material must be explained directly and more completely. The lack of effective communication between teachers and students makes students not accept the concept of the material directly, so when students find difficult problems, students tend to negotiate by accepting the situation or resign and remain silent because of the students' lack of understanding of the online-based mathematics lesson. The lack of communication between students and other students causes online learning to be boring for students. This is in line with Putria, Luthfi, & Din (2020), that online learning has an impact on students, the impact experienced by students is that they feel very saturated and bored of learning.

Some other things that also cause online learning to be less effective are signal constraints, both teachers and students lack mastery of the online learning media platforms used. As an example of learning activities using online media, it can be seen in Figure 1, as follows.




Gambar 1. Student Activities When Learning Using *Google Classroom*

It can be seen from the picture during the online learning. In Figure 1. Shows about the teacher's activity when assigning assignments to students during online learning using *Google Classroom* and students accessing *Google Classroom* to work on the assignment. According to Zainal Abidin (2020), learning methods in the current era of globalization, the use of technology is needed for the development of mathematics learning media and multimedia, especially during the Covid-19 pandemic where the implementation of mathematics learning activities is quite difficult for students and teachers due to *social distancing rules*.

## CONCLUSION

Based on the results of data analysis, it can be concluded that the mathematics learning process of junior high school students online-based using *Google Classroom* includes three stages, namely the preliminary stage in the form of learning preparation, the core stage in the form of learning methods, and the

evaluation stage in the form of learning outcomes for students. Student learning outcomes before face-to-face online learning were higher than during online learning using *Google Classroom*. The cause of low online learning results is because when online applications are too complicated, students are not able to learn mathematics to the maximum, as well as when there is a lot of data that must be conveyed but internet or network access becomes slow, of course this will interfere with student activities.

## BIBLIOGRAPHY

Abdul, B. H. (2016). Efektivitas Penggunaan *E-Learning Moodle, Google Classroom* dan Edmodo. *Jurnal I-Statement*, 2(1).

Abidin, Z. (2020). *Belajar Matematika di Era Covid-19*. Bandung: PT Refika Aditama.

Arifin, Z. (Cetakan Ke-5.). (2010). *Metodologi Penelitian Pendidikan Filosofi, Teori Dan Aplikasinya*. Surabaya: Lentera Cendekia.

Asmuni. (2020). Problematika Pembelajaran Daring di Masa Pandemi Covid-19 dan Solusi Pemecahannya. *Jurnal Paedagogy: Jurnal Penelitian dan Pengembangan Pendidikan*, 7(4).

Aviana, R. & Hidayah, F. F. (2015). Pengaruh Tingkat Konsentrasi Belajar Siswa Terhadap Daya Pemahaman Materi Pada Pembelajaran Kimia di SMA Negeri 2 Batang. *Jurnal Pendidikan Sains Universitas Muhammadiyah Semarang*, 3(1).

Dewi, P. S. & Septa, H.W. (2019). Peningkatan Kemampuan Pemecahan Masalah dan Disposisi Matematis Siswa dengan Pembelajaran Berbasis Masalah. *Mathema: Journal Pendidikan Matematika*, 1(1), 31-39.

Febriani, P., Widada, W., & Herawaty, D. (2019). Pengaruh Pembelajaran Matematika Realistik Berbasis Etnomatematika terhadap Kemampuan Pemahaman Konsep Matematika Siswa SMA Kota Bengkulu. *Jurnal Pendidikan Matematika Raflesia*, 4(2).

Fitra, A., dkk. (2020). Pemanfaatan dan Pengelolaan Google Classroom Sebagai Media Pembelajaran dan Pengajaran Daring Bagi Guru-Guru SMP. *Jurnal Pengabdi*, 3(2), 101-109.

Mustakim. (2020). Efektivitas Pembelajaran Daring Menggunakan Media Online Selama Pandemi Covid-19 Pada Mata Pelajaran Matematika. *Al Asma: Journal of Islamic Education,* 2(1).

Nurani, dkk. (2020). Analisis Proses Pembelajaran Matematika Berbasis Daring Menggunakan Aplikasi Google Classroom Pada Masa Pandemi Covid-19. *Jurnal PGSD*, 6(1).

Nusufi, M. (2016). Melatih Konsentrasi Dalam Olahraga. *Edukatif FKIP Unsyiah*, 15(2), 54 – 61.

Prabowo, A. & Heriyanto. (2013). Analisis Pemanfaatan Buku Elektronik (E-Book) Oleh Pemustaka Di Perpustakaan SMA Negeri 1 Semarang. *Jurnal Ilmu Perpustakaan*, 2(2).

Prasojo, L. D. & Riyanto. (2011). *Teknologi Informasi Pendidikan*. Yogyakarta: Gava Media.

Putria, H., Luthfi, H. M., & Din, A. S. (2020). Analisis Proses Pembelajaran Dalam Jaringan (DARING) Masa Pandemi COVID-19 pada Guru Sekolah Dasar. *Jurnal Basicedu*. 4(4), 861-872.

Rahmawati, F. & Zahid, A. S. (2019). Analisis Hambatan Dalam Proses Pembelajaran Siswa Tunagrahita di Kelas Inklusi. *Konferensi Nasional Penelitian Matematika dan Pembelajarannya (KNPMP) IV*, 2019. Surakarta:

Universitas Muhammadiyah Surakarta.

Riyana, C. (2019). *Produksi Bahan Pembelajaran Berbasis Online*.Universitas Terbuka.

Sardiman, A. M. (2011). *Interaksi Motivasi Belajar Mengajar*. Jakarta: Rajawali Pers.

Setyosari & Punaji. (2015). *Metode Penelitian Pendidikan dan Pengembangan Edisi ke Empat*. Jakarta: Prenadamedia Group.

Slameto. (2010). *Belajar dan Faktor-Faktor Yang Mempengaruhinya*. Jakarta : Rineka Cipta.

Sugiyono. (Cetakan ke-19). (2013). *Metode Penelitian Kuantitatif, Kualitatif dan R&D.* Bandung: Alfabeta.

Sunhaji. (2014). Konsep Manajemen Kelas dan Implikasinya dalam Pembelajaran. *Jurnal Kependidikan*, 2(2), 30-46.

Ulfa, M. (2019). Strategi Preview, Question, Read, Reflect, Recite, Review (PQ4R) pada Pemahaman Konsep Matematika. *Mathema: Journal Pendidikan Matematika*, 1(1), 48-55.

Utami, Y.P. & Derius, A.D.C. (2020). Study At Home: Analisis Kesulitan Belajar Matematika Pada Proses Pembelajaran Daring*. Jurnal Ilmiah Matematika Realistik (JI-MR)*, 1(1), 20-26.

Yensy, N. A. (2020). Efektifitas Pembelajaran Statistika Matematika melalui Media Whatsapp Group Ditinjau dari Hasil Belajar Mahasiswa (Masa Pandemik Covid 19). *Jurnal Pendidikan Matematika Raflesia,* 5(2), 65-74.