Mathematics learning through e-learning during pandemic covid-19 in grade 9 of a junior high school in Bandung

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Abstract. Since March 11, 2020 the WHO has determined that the covid-19 pandemic is a global pandemic. Most countries in the world are affected by this pandemic, including Indonesia. Covid-19 pandemic has an impact on all aspects including the educational aspect. Limiting social interaction is an anticipation made to reduce the spread of the corona virus. In this case the teaching and learning activities in schools are eliminated, as an alternative, most of the learning is done by e-learning. In this context the research aims to find out mathematics learning through e-learning during the covid-19 pandemic, starting from the preparation of teachers and students, implementation, and evaluation. The research was done in grade 9 of a Junior High School in Bandung. The method used in this research was qualitative with a case study design. The results of the research are: (1) some applications such as WhatsApp, Google Classroom, Zoom, and Google Form can help students to learn mathematics. (2) learning through e-learning can run optimally if the teacher continues to coordinate with the homeroom teacher, learn about platforms in the use of e-learning, and becomes a creative teacher. (3) virtual board is an important platform for learning mathematics.

1. Introduction
A pandemic that killed many victims in the world that we are now familiar with the corona virus or earned the nickname covid-19. This pandemic began in the city of Wuhan, Hubei province, China [1]. The first unidentified patient infected with this virus on November 17, 2019 and reported to WHO on December 8, 2019. Wikipedia data as of June 5, 2020 shows that the country with the highest death toll due to covid-19 namely the United States as many as 110 thousand deaths. The process of spread is very fast to make many countries infected with this virus, including Indonesia. Based on Indonesian CNN data, the number of patients with the famous covid-19 virus up to May 6, 2020 confirmed 12,438 [2].

Several government policies undertaken to prevent the spread of the covid-19 virus, including the Indonesia Government. Indonesian government regulation, Number 21, 2020, concerning large-scale social restrictions (PSBB) in the context of covid-19, states that If PSBB is implemented in an area, the implementation of PSBB includes several things, which are listed in article 4: (1) Large-scale social restrictions include at least: (a) school and workplace entertainment, (b) restrictions on...
religious activities; and/or (c) limitation of activities in public places or facilities: (2) the limitation of activities as referred to in paragraphs (1) letters a and b must continue to consider the educational needs, work productivity, and worship of the population. Looking at the points above one of them is school consolation but taking into account educational needs, in fact teaching and learning activities continue to be carried out but in a different way where most educational units from kindergarten, elementary, junior high, high school, to tertiary institutions implement distance learning, namely by using e-learning.

E-learning is an extension of electronic learning (electronic learning) [3]. There is an understanding of e-learning from various sources: learning is designed to take advantage of electronic systems and the implementation of teaching and learning activities [4], the combination of distance learning with the use of technology [4], the learning process where the teacher and students do not face to face [4]. While the characteristics of e-learning itself are: The use of technology has a very large role in educational contributions, the use of teaching materials that make it easy for teachers and students to be able to access everything from materials, practice questions, and exams anywhere, and all learning administration activities that can be seen anytime and can be directly monitored by the head school or curriculum part [4]. Judging from the characteristics of e-learning, all points can be alternative learning during the covid-19 pandemic including mathematics learning. Mathematics Learning is an effort made by teachers, lecturers or trainers (educators) to students, students or trainees (students) which aims to facilitate understanding or skilled in mathematics where the role of educators in this case is to help students to learn mathematics and know the stages of mathematics to be understood or mastered by students [5]. Mathematics is often regarded as a difficult and frightening lesson, not infrequently on the occasion of face-to-face learning the teacher explains the process until students understand or master the material with repeated explanations or use interesting methods to make it easier for students to understand mathematical material. Mathematics learning during the covid-19 pandemic with e-learning certainly presents its own challenges for teachers in stages until students understand the material, therefore researchers aim to know and analyze the process of learning mathematics through e-learning during the covid-19 pandemic, starting from preparation conducted by teachers and students, the implementation, evaluation, and response of students to learning mathematics through e-learning during the covid-19 pandemic. The results are expected to be an evaluation for teachers and educational institutions and consideration of alternative learning when normal conditions return from the covid-19 pandemic by using e-learning.

2. Methods
This method used in this research was a qualitative research method with a case study design. Qualitative data can be broken down into three types of Patton [8]: First is observation results: detailed description of the situation, events, interactions, and behavior observed in the field, second is results of the conversation: direct quotations from people's statements about their experiences, attitudes, beliefs and thoughts during the in-depth interview opportunity. And the last written material: excerpts or all documents, correspondence, records and historical cases.

Data collection was done by using non-participant observation related: preparation and implementation of applications in learning mathematics through e-learning, then in-depth interviews with Mathematics teacher and Vice- principal of curriculum, and document studies on WhatsApp Group, learning on Google Classroom, and video recordings during mathematics learning.

Data analysis was carried out when the preparation of e-learning both from application preparation and socialization to students as well as analysis on the implementation of mathematics learning through e-learning until the data were obtained that were consistent with the objectives of this study. This research was conducted during the covid-19 pandemic about 2 months, from March to April 2020, in a Junior High School in Bandung. The subjects of the research were 9 graders of the school.

3. Result and Discussion
In March 2020 grade 9 had completed all the material in the second semester and the teacher had projected preparation for school exams and national examinations, but when the covid-19 pandemic
began to spread in Indonesia, several policies emerged for online distance learning or online from home. So, in the end the government determined that the national exam be cancelled this year. To anticipate the pandemic conditions, finally the 9th grade mathematics took the initiative to teach material that could be accepted as reinforcement, repetition, and preparation for the next level, until finally Algebra material listed at three meetings, namely on March 28, April 3 and 13 April 2020.

Learning Mathematics through e-learning is a new thing so it needs to be adjusted and prepared. The first thing to do is socialize about the use of mathematics learning applications through e-learning using WhatsApp, Google Classroom, Zoom, and Google forms. Regarding compilation for e-learning students have downloaded several applications and can be used appropriately in mathematics learning.

The implementation of learning mathematics through e-learning include: Homeroom teacher reminder students to join Mathematics in WhatsApp Group 1 hour before the lesson begins then Homeroom teacher invites the mathematics teacher to attend WhatsApp Group 1 hour later. The mathematics teacher conducts conditioning by greeting students on the WhatsApp group then conditioning students to attend Google Classroom, conveying learning steps, and filling attendance.

Students read what the teacher upload on Google Classroom which contains e-learning guides, materials, and videos then download and study the teaching material provided. Then the teacher invites students to read and understand Mathematics topics and videos for 20 minutes, after 20 minutes have passed, the teacher conditions the students present at the video conference (zoom) at the zoom meeting reinforcement of matter.

If it is finished before closing the meeting on the zoom, the teacher reflects on the material and mathematics learning through e-learning, then teacher gives an assignment, where the questions can be downloaded on Google Classroom then students work on the questions on the Google form.

In Figures 1 and 2 below are shown material and quizzes on Google Classroom and meetings in zoom.

Figure 1. Display material and questions on Google classroom

Figure 1 shows the display of teaching materials in the form of modules and youtube videos linked to Google Classroom with the aim of strengthening the understanding of the linear one variable equation (PLSV) and the linear inequality of one variable to support the prerequisite material at the next level in class X.
Figure 2 shows the appearance of learning carried out by students during the Covid-19 pandemic, namely the delivery of face-to-face online material where the material is in the form of modules and videos that can be downloaded in google classroom. Then as an evaluation of learning carried out on Google form where the results of student work can be seen in real time on the google form by the teacher. Like a zoom meeting that contains exposure and repetition of algebra material, before the meeting is zoomed in, some rules are conveyed that must be obeyed by students when conducting a video conference.

Evaluation forms of learning are in the form on Google forms and video project makers, where each student must make a video that contains a solution to the problem they are good at. To determine the material that the teacher conveys fully to students by selecting material that has been delivered in grades 7 to 9. Students are given the opportunity to explore creativity in making videos, the time provided in making videos for one week, and sending directly sent via email to the mathematics teacher of the class 9. Based on the results of the average value of a number making videos from a grade 9, with the determination of the minimal completeness criteria value of 75, then from 20 students, 18 students completed the minimal completeness criteria with the highest grade 98, and 2 students under the minimal completeness criteria.

After observing the preparation and implementation of learning mathematics through e-learning, as a form of evaluation an in-depth interview was conducted to the mathematics teacher, students, and vice-principal of the curriculum section regarding the response in terms of the ease and constraints faced in the application and e-learning platform. learning in mathematics that has been implemented.

Based on interviews obtained several facilities in terms of applications and media used in learning from the teacher's side, namely: In the zoom application the teacher can teach in real time and help with the delivery of mathematical material, on the Google form can immediately see the results of students working in real time too, in a more efficient time because there is no need to go to school, remembering that the school is implementing a moving class system for each lesson, with e-learning the process of transferring learning becomes shorter only requiring time for student conditioning on WhatsApp. In a space for more flexible teaching, it can be done anywhere with the record of having a good internet connection. From the student side some of the conveniences felt when learning mathematics through e-learning during the covid-19 pandemic: students can share references obtained from various sources with other students easily and quickly. Broadly speaking, e-learning makes it easier in terms of efficiency in using time by maximizing the ever-growing technology[9].

In addition to the several conveniences that were obtained by several obstacles also in terms of applications and media that must be faced during mathematics learning through e-learning during the covid-19 pandemic, some obstacles were taken from the side of students and teachers, namely: some students did not have the tools to do mathematics learning through e-learning students who do not have devices that support mathematics learning through e-learning (Mobile), as for the anticipation that has been done namely the mathematics teacher prepares a hard file module that must be taken to school while still complying with health regulations during the pandemic covid-19. Unstable internet connections hinder the process of learning mathematics through e-learning, especially in video conferencing, similar difficulties exist with research: Challenges affecting adoption e-learning in public universities in Kenya [10]. Some students who are not accustomed to using mathematics learning
devices through e-learning at the initial meeting thus inhibiting learning, with video conferencing students do not record much material so that the absorption of material is not effectiveness such as face-to-face learning in the classroom, the use of virtual whiteboard devices that are not yet accustomed to their use while in reality the virtual whiteboard is an important explanation of mathematics material in e-learning.

4. Conclusion
Based on the above research it can be concluded several things mathematics learning through e-learning is one of the learning alternatives during the covid-19 pandemic where the use of several applications ranging from WhatsApp, Google Classroom, Zoom, and Google Form helps mathematics learning through e-learning. Virtual Board is an important platform in learning mathematics in the explanation of material, so that every mathematics teacher is expected to be able to use the application in learning mathematics through e-learning. Learning mathematics through e-learning can run optimally if the teacher continues to coordinate with the homeroom teacher, continues to learn about platforms in the use of e-learning, and becomes a creative teacher.

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