KREANO
Jurnal Matematika Kreatif-Inovatif
http://journal.unnes.ac.id/nju/index.php/kreano

# Mathematical Literacy in Blended Learning Model of Realistic Mathematics Education (RME) Approach assisted by Google Classroom

**Ahmad Syarif[1]*, Prof. Dr. Dr. Wardono, M.Si.**
E-mail address : syarifahmad@students.unnes.ac.id , wardono@mail.unnes.ac.id

***Absract***

*The purpose of this study was to determine whether the Blended Learning model of RME approach is of good quality for students' mathematical literacy. This research method is quantitative method using true experiment with pretest-posttest control group design. The population in this study were VIII grade students of SMP N 30 Semarang in the 2022/2023 academic year. This study used random sampling technique with class VIII H as the experimental class and class VIII G students as the control class. The data analysis technique used was the test method. The results of the study obtained at the preparation stage, the learning device has received validation with at least good criteria. At the implementation stage, it received a minimum good assessment. At the evaluation stage, data analysis was carried out which included students' mathematical literacy reached BTA, students were classically complete, proportion, average, and the increase in mathematical literacy of the experimental class was higher than the control class. Based on the results of the analysis, it was found that the Blended Learning with RME approach assisted by Google Classroom was of high quality and could improve mathematical literacy.*

***Keywords****: Student Independence; Mathematics Literacy; Blended Learning. Google Classroom*

## INTRODUCTION

Education is an important factor determining the progress of the nation. The influence of education is very large for humans to be able to survive in the development of the times. Education is often understood as something that is normative or oriented towards certain values to develop human talents and abilities at an optimal level with the aim that a human being can achieve a higher dignity of life(angrayni, 2019)(Khoiriyah et al., 2018).

Anwar (2018) Anwar argues that mathematics is one of the basic sciences that has an important role in everyday life and also in the development of science and technology. Because of its enormous role, mathematics is considered the root of science. The demand for mathematical ability is not only seen from the ability to count, but also must have the ability to reason logically and critically in solving a problem(Sholihatunnisa et al., 2018). The problem solving in question is not just about solving written problems contained in the exam, but rather the problems faced in everyday life. This ability is known as mathematical literacy(Hera & Sari, 2015).

PISA defines mathematical literacy as an individual's capacity to formulate, use, and interpret mathematics in a variety of contexts(OECD, 2016). These include mathematical reasoning and the use of concepts, procedures, and facts to describe, explain, and predict phenomena(Hera & Sari, 2015).


p-ISSN: 2086-2334; e-ISSN: 2442-4218

Based on research conducted by PISA in Stacey Stacey (2015) in 2003 with a focus on mathematical literacy, Indonesia only ranked 39th out of a total of 41 participating countries, then in 2009 PISA again conducted research with a focus on mathematical literacy which was attended by 65 countries and Indonesia ranked 58th, even in 2012 PISA issued statistics on the average value of OECD countries with an average value of 494 while Indonesia's achievement was only 375 which is included in the bottom group(Pakpahan, 2016).

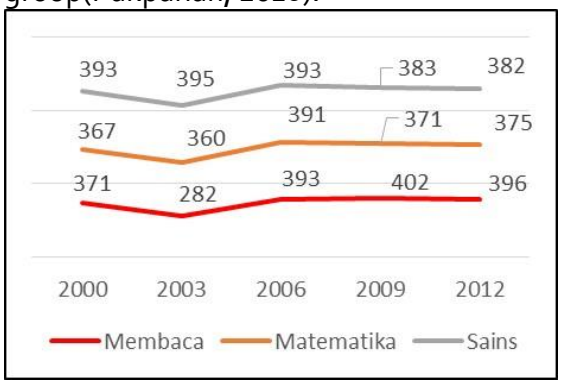


*Figure 1. Indonesian Students' Literacy Development 2000-2012*

While in the national scope, mathematics learning outcomes are also still somewhat concerning. This can be seen from the junior high school UN scores in 2016, 2017, and 2018 which show the low understanding of students related to mathematics in Indonesia. In 2016, the average UN score of junior high school students throughout Indonesia was 49.91, in 2017 it increased slightly to 51.16, but in 2018 it decreased significantly to 39.19(Sumaryanta et al., 2019). The ups and downs of the average math score show that the lack of quality of education in Indonesia, especially in the field of mathematics. The data is in line with observations made by researchers related to students' mathematical literacy where one of the mathematics teachers who teaches class VIII stated that most students still find it difficult when solving problems in the form of story problems.

Literacy is oriented towards the use of mathematical knowledge in everyday social life. Ojose stated that mathematical literacy is defined as the ability to know and apply mathematics to everyday life, meaning that every individual is required to be able to use their thinking. Some researchers explain that individual strength is needed to use the knowledge they have to solve problems. It is not enough to have strength, but each individual must have the ability to develop. The individual strengths in question are students' knowledge to analyze, think critically, convey ideas, formulate, solve, and interpret mathematical problems to various contexts(Anwar, 2018).

Based on a survey by Stricker, Weibel, dan Wissmath (dalam Cidral et al., 2018) blended learning is better than face-to-face learning. This is evidenced in their research which proves that the performance of students who get Virtual Learning Environment learning has better results compared to students who learn face-to-face only(Smith & Hill, 2019). This is due to three supporting factors, namely technical, individual motivation, and environmental characteristics that make the learning atmosphere feel different(Cidral et al., 2018). Blended Learning is a combination of traditional face-to-face learning and technology-mediated learning, combining the best aspects of both(Graham et al., 2013).

The learning model used in this study is Blended Learning which is supported by the Realistic Mathrmatics Education (RME) approach commonly known as Indonesian Realistic Mathematics Education. Students are given the opportunity to discover mathematics by managing and processing real-world situations or

mathematical relationships and processes that are real to them(Chisara et al., 2018). The use of unique and interesting learning media can be one way to implement and strengthen mathematical concepts and can trigger students to increase student independence in seeking information from various sources(Diana et al., 2020). The questions that the teacher asks students must be realistic, meaning that by giving questions that they can imagine. Then followed by students solving math problems that have been given by the teacher(Laurens et al., 2018). Thus, the RME approach is expected to encourage students to be more active in developing their own ideas in solving mathematical problems during the learning process under the direction of the teacher(Agustina et al., 2021).

To support the blended learning model, we need a media that can accommodate the discussion and students' assignments. Google Classroom is a suitable application for online learning activities, besides being easy to use this application is also familiar to most students(Mulatsih, 2020). There are many advantages of Google Classroom over other applications, including being able to create and manage classes, assignments, and grades as well as being able to provide direct feedback(Longa, 2021). Thus, it is hoped that this learning model assisted by media in the form of Google Classroom can have a positive impact on education in Indonesia(Daulay & Zakaria, 2021).

Another factor supporting successful learning is the internal factors of the students themselves. Learning will not be successful if students do not have the will to be independent. Independence according to Johnson in (Mulyono, 2021) is the freedom of students to use their own learning styles, progress at their own pace, explore according to what they are interested in, which indicates that they are authorized to choose their own decisions and are responsible for any decisions that have been chosen(Indah Fajrotuz Zahro et al., 2021). So with this can make students with high independence will be superior to students with low independence(Sandi, 2005).

Based on the description above, the objectives of this study are: (1) To test and find out that the Blended Learning model of RME approach assisted by Google Classroom is qualified and can improve mathematical literacy.

## METHODS

This research uses quantitative research methods. According to Sugiyono (2013) quantitative research methods are research methods based on positivistic (concrete data), research data in the form of numbers that will be measured using statistics as a calculation test tool, related to the problem under study to produce a conclusion. The experimental design in this study uses true experimental design with the form of the randomized pretest-posttest control group design. The quantitative method was used to (1) Test and find out whether the Blended Learning model of RME approach assisted by Google Classroom is qualified and can improve mathematical literacy. Sugiyono (2013) suggests that in this design there are two groups, namely the experimental group and the control group, each of which is randomly selected (R). And given a pre-test to find out if there is a difference from the experimental class and control class. The control class in this study was given a Problem Based Learning model. The experimental class applied Blended Learning model with RME approach assisted by Google Classroom. The population of this study was the VIII grade

students of SMP N 30 Semarang for the 2022/2023 academic year. Two sample groups were taken from the population by random sampling technique. The selected classes were class VIII G and VIII H. Class VIII H as the experimental class was given Blended Learning with RME approach assisted by Google Classroom, while class VIII G as the control class with PBL Saintifik learning. The data collection technique used in this research is the mathematical literacy test technique.

Before testing the research sample, the mathematical literacy questions were tested first in the trial class, namely class VIII A who had received the material to determine the validity, reliability, discriminative, strength, and difficulty level of each item on the mathematical literacy test questions. Quantitative data analysis consists of preliminary data analysis and final data analysis. After the data is valid, the test instrument can be tested on the experimental and control classes which will then be analyzed initial data and final data analysis. Initial data is analyzed before treatment is given. This is done to determine whether the samples have the same initial conditions. The initial data used is the initial test score of mathematical literacy for class VIII G and VIII H SMP N 30 Semarang and the final data analysis is the value of mathematical literacy test results after treatment. The final data analysis was used to determine whether the Blended Learning with RME approach assisted by Google Classroom was qualified and could improve mathematical literacy.

## RESULTS AND DISCUSSION

### Results

The quality of learning is assessed from three aspects, namely planning, implementation, and evaluation of learning. This research has fulfilled the three aspects of learning quality, namely: (1) at the learning planning stage, all learning tools and instruments used in the research were valid and scored at least good; (2) at the learning implementation stage, the average score of student responses and learning observations scored at least good; and (3) at the learning evaluation stage, the average test based on BTA, classical completeness test, two mean difference test, proportion difference test, and difference test of average increase in mathematics literacy.

### Lesson Planning

At this stage, the learning tools consist of syllabus, lesson plans, student worksheets, teaching materials, mathematics literacy test questions, and independence questionnaires. The purpose of learning tools is to help improve students' mathematical literacy during the learning process. The learning tools and instruments were tested for validity first before being used by the validator and received a score with a minimum predicate of good. Validators in this study were supervisors and mathematics teachers of SMP Negeri 30 Semarang. The following is a table of criteria that will be used.

*Table 1. Learning Tool Assessment Criteria*

| Interval | Criteria |
|---|---|
| $20 < N \leq 36$ | Not good |
| $36 < N \leq 52$ | Less Good |
| $52 < N \leq 68$ | Fairly Good |
| $68 < N \leq 84$ | Good |
| $84 < N \leq 100$ | Very good |

The following will present the results of validation of learning devices by validators.

*Table 2. Results of Learning Device Assessment by Validators*

| No | Component | Value | Criteria |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | Syllabus BL | 90 | Very good |
| 2 | Syllabus PBL | 88 | Very good |
| 3 | RPP BL | 90 | Very good |
| 4 | RPP PBL | 87 | Very good |
| 5 | LKPD | 88 | Very good |
| 6 | Teaching Materials | 90 | Very good |
| 7 | Mathematical Literacy Trial Test Questions | 90 | Very good |

Based on the table above, it is known that the learning tools that will be used to conduct research are included in the excellent category based on validation by validators, both from learning tools that will be used for experimental classes on the Blended Learning model RME approach assisted by Google Classroom and those that will be used for control classes with the PBL model Saintifik approach.

**Learning Implementation**

During the learning process, all teacher activities were observed by the observer to assess whether the researcher implemented the learning in accordance with the lesson plan or not. In this study, the observer was a mathematics teacher at SMPN 30 Semarang, Mr. Drs. Slamet Peni, who was in charge of observing the learning process according to the Teacher Activity Observation Sheet (TAOS). The following are the results of the observation of teacher activity by the observer.

*Table 3. Teacher Activity Observation Results*

| Meeting- | Value |
|---|---|
| 1 | 99,2 |
| 2 | 100 |
| 3 | 100 |
| Average | 99,7 |

The average value of observations made by observers is 99,7 which indicates that the teacher's skills in teaching the Blended Learning approach RME learning model assisted by Google Classroom are included in the excellent criteria. After three lessons, each student was asked to provide an assessment of the learning they had received, namely the Blended Learning approach RME learning model assisted by Google Classroom. The results of the student response assessment were analyzed and the overall average score was 76,93%. So it can be concluded that the Blended Learning model of RME approach assisted by Google Classroom is in good criteria and shows a positive response.

**Teaching Evaluation**

In the evaluation stage, quantitative analysis in the form of hypothesis testing was carried out with the aim of knowing students' mathematical literacy in learning the RME Blended Learning Approach Model. The initial and final data of mathematical literacy test results were processed using predetermined methods. The results of data processing were used to answer the hypothesis in the study and then to draw conclusions. The results of descriptive analysis of mathematical literacy of both classes will be presented in the table below.

*Table 4. Experimental and Control Class Pretest and Posttest Results*

| No | Statistical Description | Experiment Class | Control Class |
|---|---|---|---|

| | | Pre Test | Pos t Test | Pre Tes t | Post Test |
|---|---|---|---|---|---|
| 1 | Highest score | 80 | 96 | 76 | 96 |
| 2 | Lowest score | 44 | 52 | 44 | 48 |
| 3 | Average | 62,43 | 81,75 | 57,81 | 70,12 |

The initial data of mathematical literacy was tested first regarding the normality test, homogeneity test and the similarity test of two means before further hypothesis testing was carried out. The initial data was obtained from the pretest results of mathematical literacy of class VIII G and class VIII H. The following will present the results of the normality test, homogeneity test, and the equality test of the two means of the initial data.

*Table 5. Preliminary Data Analysis Results*

| **Uji yang dilakukan** | **Kelas** | **Sig** | **Deskripsi** |
|---|---|---|---|
| Normalitas | VIII G<br>VIII H | 0,55<br>0,75 | Normal<br>Normal |
| Homogenitas | VIII G<br>VIII H | 0,385<br>0,385 | Homogen<br>Homogen |
| Kesamaan Rata-rata | VIII G<br>VIII H | 0,092<br>0,092 | Rata-rata sama<br>Rata-rata sama |

Based on the test results, it shows that the initial data comes from a population that is normally distributed, homogeneous and the average is the same. Then the sample can be selected and used as an experimental class and control class where VIII H is the experimental class and VIII G is the control class.

Hypothesis testing was carried out on the results of the mathematical literacy posttest in the experimental and control classes. But before that it is necessary to do a prerequisite test before hypothesis testing in the form of normality test and homogeneity test on posttest results with the following results.

*Table 6. Final Data Analysis Results*

| **Test performed** | **Class** | **Sig** | **Description** |
|---|---|---|---|
| Normality | VIII G<br>VIII H | 0,073<br>0,200 | Normal<br>Normal |
| Homogeneity | VIII G<br>VIII H | 0,291<br>0,291 | Homogen<br>Homogen |

Based on the results above, it is concluded that classes VIII G and VIII H are normally distributed and have the same variance. Furthermore, the assessment of learning outcomes is measured based on hypothesis testing, namely the average test based on BTA, classical completeness test, proportion difference test, average difference test, and average improvement test.

Hypothesis 1 (mean test based on BTA) with the criteria that $H_0$ is rejected if $t_{count} \geq t_{table}$, with dk = (n-1) and opportunities $(1-a)$ and $a = 5\%$. The result is $t_{count} = 9{,}4539$ and $t_{table} = t_{(0,05)(32)} = 1{,}6955$. So $t_{count} = 9{,}4539 > 1{,}6955$. $H_0$ rejected so that the average posttest of students' mathematical literacy on the Blended Learning model RME approach assisted by Google Classroom has reached BTA.

Hypothesis 2 (classical completeness test) with the test criteria that $H_0$ is rejected if $z_{count} \geq z_{table}$, with $z_{0,5-a}$ obtained standard normal distribution with odds $(0{,}5-a)$ and $a =$

5%. The calculation results are $z_{count} = 3{,}8971$ and $z_{table} = 1{,}645$. So that $z_{count} = 3{,}8971 > z_{table} = 1{,}645$ so that $H_0$ is rejected. So, the proportion of students who completed learning in the experimental class with the RME Blended Learning Approach model assisted by Google Classroom is more than 60%.

Hypothesis 3 (mean difference test) with the test criteria that $H_0$ is rejected if $t_{count} \geq t_{1-a,}t_{1-a,}$ with $d_k = (n_1 - n_2 - 2)$ obtained t distribution with odds $(0{,}5 - a)$ dan $a = 5\%$. The calculation results obtained $t_{count} = 3{,}8013 > t_{table} = 1{,}678$ so that $H_0$ is rejected. So, the average mathematical literacy of students with Blended Learning RME approach assisted by Google Classroom is more than the average mathematical literacy in the PBL-Scientific class.

Hypothesis 4 (different proportion test) with the test criteria that $H_0$ is rejected if $z_{count} \geq z_{0{,}5-a,}$, obtained standard normal distribution with odds $(0{,}5 - a)$ and $a = 5\%$. The calculation results obtained $t_{count} = 2{,}3192 > t_{table} = 1{,}645$ so that $H_0$ is rejected. So, the proportion of students who are complete in the Blended Learning RME approach assisted by Google Classroom is more than the proportion of students who are complete in the PBL-Scientific class.

Hypothesis 5 (different test of average improvement) with the test criteria that $H_0$ is rejected if $t_{count} > t_{table}$ where $t_{1-a}$ is obtained from the distribution of student t with $dk = n_1 + n_2 - 2$ , odds $(1 - a)$ and $a = 5\%$. The calculation results obtained $t_{count} = 1{,}720296$ with $a = 5\%$ and has $dk = n_1 + n_2 - 2 = 62$. Furthermore, the calculation obtained $t_{table} = 1{,}678$. This shows that $t_{count} > t_{table}$. Then it can be concluded that $H_0$ is rejected. So, the average increase in students' mathematical literacy test results in the class with Blended Learning RME approach assisted by Google Classroom is more than the average increase in mathematical literacy test results in the PBL-Scientific class.

## Discussion

### *Discussion of Learning Quality*

At the lesson planning stage, the learning tools consist of fragments of the syllabus, lesson plans, teaching materials, student worksheets, and mathematics literacy tests. Learning tools are made as guidelines or directions in helping to improve students' mathematical literacy during the learning process. Learning tools that have been completed must be validated by the validator first before being used in the learning process. The results of the validation of learning devices obtained from validators must get a score with at least good criteria in order to be used, so that the device is feasible to use with some improvements based on suggestions and input from validators.

In the learning implementation stage, the Blended Learning Model of RME Approach assisted by Google Classroom overall went well. Learning was carried out for three meetings in both experimental and control classes by following school provisions and observed by observers. The observer gave a very good score to the researcher regarding the entire learning process. Then students with a total of 32 students

provide an assessment of learning through student response sheets with the category obtained is good.

At the learning evaluation stage, quantitative analysis is carried out using hypothesis testing to prove that students' mathematical literacy in the RME Blended Learning Approach model assisted by Google Classroom has fulfilled several things, namely as follows:

1.) The average value of mathematical literacy in the Blended Learning Model of the RME Approach assisted by Google Classroom reaches BTA. This is also supported by research conducted by Shiyanatus Suhailah (2019) which states that the results of student exams using PjBL learning in terms of independence reach actual completeness, namely 75 using an average test based on BTA.

2.) Mathematical literacy in the RME Approach Blended Learning Model assisted by Google Classroom also achieved classical completeness at least 60% of the number of students in one class exceeded the BTA. This is supported by research from Niasri (2019) with data obtained from posttest results showing the percentage of classical completeness of students after receiving Blended Learning is 86,67% (26 out of 30) students. This means that students' mathematical literacy skills have increased after applying the PBL model in mathematics learning.

3.) The average value of students' mathematical literacy in Blended Learning RME Approach assisted by Google Classroom is higher than student learning with PBL Saintifik Learning. These results support research conducted by D.N. Permatasari (2021) which states that the average mathematical literacy of seventh grade students of SMP N 28 Semarang using Blended Learning is higher than that of seventh grade students of SMP N 28 Semarang who are given learning with the Discovery Learning Approach.

4.) The proportion of students' mathematical literacy in Blended Learning with RME Approach assisted by Google Classroom is higher than students' learning with PBL Saintifik Learning. It is also in line with Hanum Resta Jati's research (2022) which states that learning the PjBL model with the RME approach effectively improves the mathematical literacy of class VIII students.

5.) The average increase in students' mathematical literacy in blended learning RME approach assisted by Google Classroom is higher than students with PBL Saintifik learning. The results of the above research are also supported by the research of Helmi Yahya Nurdiansyah and Enju Harja Sutisna (2018) which shows the results that there are significant differences in students' mathematical literacy between learning with the RME approach and conventional.

**Research Implications**

It is hoped that this research can be a consideration for teachers to pay attention to independence in mathematics learning and the Blended Learning Model Realistic Approach assisted by Google Classroom can be applied by teachers to improve students' mathematical literacy.

**Research Limitations**

In this study there are still some shortcomings because there are obstacles in terms of implementation. First, because it was only carried out for three meetings and the number of students in

one class so that the Blended Learning RME Approach assisted by Google Classroom was less than optimal.

Second, because the research uses application technology in the form of Google Classroom, where the application is new to some students so that they are still in the adjustment stage in its use which causes the use of the application to be less than optimal. Then because the application requires a stable internet network, so that when the internet network is decreasing students have difficulty accessing the application. And there are also some students who have difficulty accessing Google Classroom because their cellphones have low specifications or don't even have a personal cellphone.

The existence of limitations in this study does not make this study a failure, but through research with the Blended Learning model of the RME approach assisted by Google Classroom it can be concluded that good quality and can improve students' mathematical literacy at SMP Negeri 30 Semarang, so that it can be used as an innovation and alternative that can be used by educators in conducting learning.

## CONCLUSIONS

Based on the results and discussion of the research that has been described, it can be concluded that the learning model of Blended Learning RME Approach with Google Classroom is of good quality. This is evidenced by (1) At the planning stage, the learning tools used for the learning process have received validation with at least good criteria, (2) At the implementation process stage, the quality of the teacher received scores from observers with very good criteria and scores from student responses in the good category (3) At the evaluation stage, students' mathematical literacy scores reached more than BTA, students were classically complete, the average of experimental class students was more than the control class, the proportion of experimental class students' completeness was more than the proportion of control class students, and the increase in students' mathematical literacy in the experimental class was more than the control class.

## REFERENSI

Agustina, V. Y., T, A. Y., & Ijuddin, R. (2021). Pengaruh Pendekatan Realistic Mathematic Education (Rme) Terhadap Hasil Belajar Peserta Didik Dalam Materi Lingkaran Di Sma Panca Setya Sintang. *Jurnal AlphaEuclidEdu*, *2*(2), 191. https://doi.org/10.26418/ja.v2i2.49584

angrayni, afrita. (2019). Problematika pendidikan di Indonesia. *Fakultas Ushuluddin Dan Dakwah IAIN Ambon |2*, 1–10.

Anwar, N. T. (2018). Peran Kemampuan Literasi Matematis pada Pembelajaran Matematika Abad-21. *Prosiding Seminar Nasional Matematika*, *1*, 364–370.

Arikunto, S. (2018). *Dasar-dasar Evaluasi Pendidikan* (R. Damayanti (ed.); Kedua). Bumi Aksara.

Chisara, C., Hakim, D. L., & Kartika, H. (2018). Implementasi Pendekatan Realistic Mathematics Education (RME) dalam Pembelajaran Matematika. *Prosiding Seminar Nasional Matematika Dan Pendidikan Matematika (Sesiomadika)*, 65–72. http://journal.unsika.ac.id/index.php/sesiomadika

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-Learning Success Determinan. *Computers and Education*, *122*(351), 273–290. https://doi.org/10.1016/j.compedu.2017.12.001.This

Daulay, L. A., & Zakaria, R. (2021). The effectiveness of google classroom as a tool to support online science learning : a literature review. *Journal of Physics: Conference Series*. https://doi.org/10.1088/1742-6596/1918/5/052069

Diana, P. Z., Wirawati, D., & Rosalia, S. (2020). Blended Learning dalam Pembentukan Kemandirian Belajar. *Alinea: Jurnal Bahasa, Sastra, Dan Pengajaran*, *9*(1), 16. https://doi.org/10.35194/alinea.v9i1.763

Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *Internet and Higher Education*, *18*, 4–14. https://doi.org/10.1016/j.iheduc.2012.09.003

Hera, R., & Sari, N. (2015). *SEMINAR NASIONAL MATEMATIKA DAN PENDIDIKAN MATEMATIKA UNY 2015 713 Literasi Matematika: Apa, Mengapa dan Bagaimana?* 713–720.

Indah Fajrotuz Zahro, I. F. Z., Rizky Amalia, R. A., & Sugito, S. (2021). Deskripsi Kemandirian Siswa dalam Pembelajaran Daring Pada Masa Pandemi Covid. *Attanwir : Jurnal Keislaman Dan Pendidikan*, *12*(1), 63–75. https://doi.org/10.53915/jurnalkeislamandanpendidikan.v12i1.50

Khoiriyah, M., S, A., & Muhtadi. (2018). Hubungan Antara Pemanfaatan Penggunaan Bantuan Operasional Sekolah Dengan Prestasi Belajar Siswa Di Min Pucangsimo Bandarkedungmulyo Jombang. *Arsy: Jurnal Studi Islam*, *2*(1), 49–63.

Laurens, T., Batlolona, F. A., Batlolona, J. R., & Leasa, M. (2018). How does realistic mathematics education (RME) improve students' mathematics cognitive achievement? *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(2), 569–578. https://doi.org/10.12973/ejmste/76959

Longa, A. E. (2021). Penggunaan Aplikasi Google Classroom dalam Upaya Meningkatkan Hasil Belajar Matematika Pada Siswa Kelas X Ips 3 SMA Negeri 1 Maumere. *Journal on Teacher Education*, *2*(2), 49–57.

Mulatsih, B. (2020). Penerapan Aplikasi Google Classroom, Google Form, dan Quizizz dalam Pembelajaran Kimia di Masa Pandemi Covid-19. *Ideguru: Jurnal Karya Ilmiah Guru*, *5*(1), 16–26.

Mulyono, D. (2021). The influence of learning model and learning independence on mathematics learning outcomes by controlling students' early ability. *International Electronic Journal of Mathematics Education*, *12*(3), 689–708. https://doi.org/10.29333/iejme/642

OECD. (2016). *PISA 2015 Results in Focus*. Paris. http://hdl.voced.edu.au/10707/418134

Pakpahan, R. (2016). Faktor-faktor yang Mempengaruhi Capaian Literasi. *Jurnal Pendidikan Dan Kebudayaan*, *1*, 30–42.

Sandi, G. (2005). Pengaruh Blended Learning Terhadap Hasil Belajar Kimia Ditinjau Dari Kemandirian Siswa. *Jurnal Pendidikan Dan Pengajaran*, 241–251.

Sholihatunnisa, L., Darmawansyah, M. I., Sa'adah, N., & Susilawati, W. (2018). Problematika Pendidik Dan Peserta Didik Terhadap Pelajaran Matematika. *Prisma*, *7*(2), 145. https://doi.org/10.35194/jp.v7i2.249

Smith, K., & Hill, J. (2019). Defining the nature of blended learning through its depiction in current research. *Higher Education Research and Development*, *38*(2), 383–397. https://doi.org/10.1080/07294360.2018.1517732

Stacey, K. (2015). The International Assessment of Mathematical Literacy: PISA 2012 Framework and Items. *Selected Regular Lectures from the 12th International Congress on Mathematical Education*, 771–790. https://doi.org/10.1007/978-3-319-17187-6_43

Sugiyono. (2013). *Metodologi Penelitian Kuantitatif, Kualitatif dan R&D*. ALFABETA.

Sumaryanta, S., Priatna, N., & Sugiman, S. (2019). Mapping of the Result of Mathematics. *Indonesian Digital Journal of Mathematics and Education*, *6*(1), 543–557. http://p4tkmatematika.kemdikbud.go.id/journals/index.php/idealmathedu/

Appendix A.

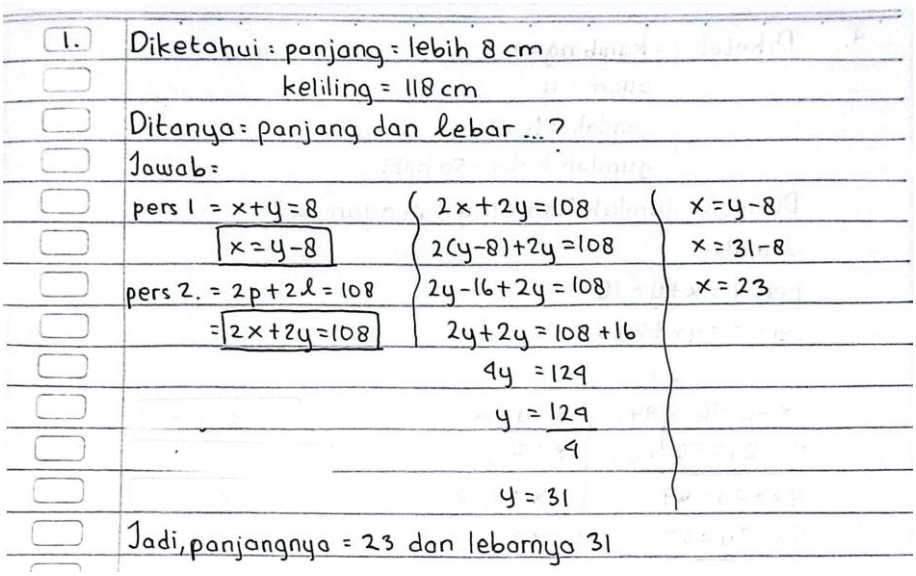


*Figure 2. Results of One Student's Work on Problem Number 1*

The picture above represents the work of one of the students in the mathematical literacy posttest. The results explain that the student was able to work on the problem well because the student's mathematical literacy was good, so that the process could be done coherently and was able to fulfill all components of mathematical literacy. The test aims to find out and measure something with predetermined rule(Arikunto, 2018). The following is a table of Pretest and Posttest scores of mathematical literacy of control and experimental classes.

*Table 7. List of Pretest and Posttest Values of Mathematical Literacy of Experimental and Control Classes*

| Kelompok Kontrol (VIII G) | | | | Kelompok Eksperimen (VIII H) | | | |
|---|---|---|---|---|---|---|---|
| No | Kode Siswa | Nilai Pretest | Nilai Posttest | No | Kode Siswa | Nilai Pretest | Nilai Posttest |
| 1 | K-1 | 76 | 88 | 1 | E-1 | 50 | 88 |
| 2 | K-2 | 44 | 52 | 2 | E-2 | 70 | 92 |
| 3 | K-3 | 60 | 76 | 3 | E-3 | 72 | 88 |
| 4 | K-4 | 68 | 80 | 4 | E-4 | 66 | 84 |
| 5 | K-5 | 56 | 64 | 5 | E-5 | 74 | 96 |
| 6 | K-6 | 72 | 92 | 6 | E-6 | 68 | 92 |
| 7 | K-7 | 64 | 84 | 7 | E-7 | 76 | 96 |
| 8 | K-8 | 52 | 64 | 8 | E-8 | 46 | 84 |
| 9 | K-9 | 52 | 68 | 9 | E-9 | 66 | 72 |
| 10 | K-10 | 44 | 52 | 10 | E-10 | 80 | 96 |
| 11 | K-11 | 52 | 68 | 11 | E-11 | 48 | 52 |
| 12 | K-12 | 64 | 80 | 12 | E-12 | 68 | 76 |
| 13 | K-13 | 44 | 48 | 13 | E-13 | 44 | 64 |
| 14 | K-14 | 68 | 84 | 14 | E-14 | 44 | 60 |
| 15 | K-15 | 76 | 92 | 15 | E-15 | 62 | 80 |
| 16 | K-16 | 72 | 84 | 16 | E-16 | 66 | 76 |
| 17 | K-17 | 68 | 76 | 17 | E-17 | 56 | 80 |
| 18 | K-18 | 44 | 64 | 18 | E-18 | 76 | 96 |
| 19 | K-19 | 60 | 72 | 19 | E-19 | 52 | 68 |
| 20 | K-20 | 56 | 56 | 20 | E-20 | 64 | 80 |
| 21 | K-21 | 52 | 64 | 21 | E-21 | 72 | 84 |
| 22 | K-22 | 76 | 96 | 22 | E-22 | 64 | 84 |
| 23 | K-23 | 50 | 56 | 23 | E-23 | 74 | 92 |
| 24 | K-24 | 56 | 64 | 24 | E-24 | 50 | 88 |
| 25 | K-25 | 60 | 76 | 25 | E-25 | 76 | 92 |
| 26 | K-26 | 48 | 64 | 26 | E-26 | 76 | 92 |
| 27 | K-27 | 56 | 76 | 27 | E-27 | 72 | 84 |
| 28 | K-28 | 48 | 56 | 28 | E-28 | 48 | 68 |
| 29 | K-29 | 64 | 76 | 29 | E-29 | 64 | 72 |
| 30 | K-30 | 48 | 56 | 30 | E-30 | 44 | 88 |
| 31 | K-31 | 52 | 60 | 31 | E-31 | 48 | 76 |
| 32 | K-32 | 48 | 56 | 32 | E-32 | 62 | 76 |