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Habituation of Mathematical Literacy Trained in Junior High School

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Abstract: The importance of literacy is a competency requirement that must be possessed by students to face competition in the 21st century. This is directly related to the extent to which students' scientific thinking processes understand and solve problems. This study aims to describe how literacy is trained in learning in junior high schools. The approach used is a qualitative approach with the type of phenomenological research. The participants in this study were 5 junior high school teachers who teach in the Special Region of Yogyakarta. Data was collected through virtual interviews with the help of the Google Meet platform. The data analysis model used is the model of Bogdan and Biklen with data collection procedures, data reduction, verification and conclusion. The results showed that literacy was trained on students with the habit of reading textbooks for 15 to 30 minutes every day by reporting their readings in student journals, teacher efforts in changing project and problem-based learning methods and strategies according to student conditions, and teacher habituation in providing HOTS level questions to train students' critical thinking processes, balance theoretical understanding and understand the surrounding environment.

Keywords: *Mathematics learning in junior high school, phenomenology study, training of mathematics literacy.*

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Introduction

Literacy is a competency that is becoming a trending topic in the world of education. This competency emphasizes students' thinking processes in solving and being critical of problems in everyday life (Astuti et al., 2018; Hassan et al., 2015). Including in solving problems, students need to have the ability to reason, design procedures and use mathematical concepts correctly in accordance with existing problems (Suprayitno, 2019). National Council of Teachers of Mathematics defines five important competencies, namely problem solving, communication, connection, reasoning and mathematical representation. The five are summarized into a series called mathematical literacy skills (Edward et al., 2000).

Literacy is considered important in supporting the learning process in schools, but the results are not directly proportional to the achievements of Indonesian students at the international level. In 2018, the literacy ability of Indonesian students, which was equivalent to junior high school, was below the average Programme for International Student Assessment (PISA) score of 371 (Suprayitno, 2019). Indonesia was also ranked 72 out of 76 countries that participated in the The Organisation for Economic Co-operation and Development (OECD) literacy assessment in 2018 (Suprayitno, 2019). This shows that there has been no significant change in the ability of Indonesian students related to literacy from year to year. In addition, it can also be indicated that there is a lack of special emphasis and attention in increasing students' self-potential regarding literacy.

The ability of Indonesian students can also be said that is still included in the low category. There are several factors that cause the low level of literacy ability which includes the condition of students who are unable to understand the material given by the teacher (Padmadewi & Artini, 2018), the weak understanding and skills of the teacher due to lack of training (Padmadewi & Artini, 2018; Sumartati, 2010), the provision of questions that do not meet the characteristics

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of literacy such as PISA and Trends in International Mathematics and Science Study (TIMSS) questions (Wardhani & Rumiati, 2011). Thus, causing the problem solving process that requires a long understanding of the problem to the interpretation of the results of the calculations carried out. In addition, the main problem is precisely in the learning process that is not contextual even though a series of teaching has complied with the rules of the 2013 curriculum (Sumartati, 2010). This is deemed inappropriate to do because it does not measure what should be measured.

Literacy pays attention from another point of view in the functioning of knowledge and abilities in all aspects of life. Ideally, literacy is given to students early, so that students are able to get used to thinking scientifically in responding to a life phenomenon. In addition, literacy is also able to be used as one of the superior abilities to solve problems, make analyzes to create effective solutions to problems in the environment according to conditions (Hassan et al., 2015; Özgen & Bindak, 2011). In supporting the development of thinking processes and increasing student potential, there is a government program on literacy listed in the 2013 curriculum. Literacy is a leading program in the development of education in Indonesia. Meanwhile, the success of a program can be known if it has been done. Measurement in the world of education is one of the activities of quantifying symptoms or an object that is important and needs to be done, which includes motivation, achievement to students' self-confidence when learning. Therefore, in knowing the progress of learning, it is necessary to measure so that it can reflect the results and it is easy to evaluate them. However, currently no information has been found regarding the implementation of literacy in detail in junior high schools, both appropriate and targeted implementation procedures, stages of assessing student literacy skills to implementation results that lead students to develop their life skills.

Implementation in training literacy and developing student potential can be done by applying the right learning model, so that students are able to interpret their involvement in the problem solving process with full accuracy and confidence (Larasaty et al., 2018). One of the learning models that can stimulate students' thinking processes is problem based learning (PBL) (Indah et al., 2016). In addition, the importance of teacher literacy skills and teacher approaches in facilitating and providing opportunities to develop students' thinking processes contextually. Therefore, student literacy needs to be trained during the learning process. Related to this, this study aims to describe how literacy is trained in learning in junior high schools.

Methodology

Research Design

This research is a qualitative research with the type of phenomenological research. This research is based on the curiosity of the extent of the teacher's experience in the habit of practicing mathematical literacy in junior high school students. This experience can be the main reason for knowing the correct and appropriate understanding of mathematical literacy in teachers.

Sample and Data Collection

The selection of this type of research is based on the teacher's experience in training literacy during learning for junior high school students. The participants consisted of 5 different junior high schools in the Special Region of Yogyakarta. The five people were selected by purposive sampling, which has the specifications of teachers with a bachelor's background in education who have at least 10 years of teaching experience and understand the ins and outs of literacy in education. In-depth interviews were conducted with the 5 teachers virtually through the Google Meet platform with the consideration of the COVID-19 outbreak. The interview topics included 1) preparation in literacy training, 2) implementation of literacy training, 3) reflection on literacy implementation, and 4) the final result of the implementation of literacy training.

Analyzing of Data

The data obtained were then analyzed and classified according to the sub-themes raised. The data analysis model used is the model of Bogdan and Biklen (2007), with the aim of making it easier to narrow down the findings which are then adjusted to the research objectives that lead to the meaningfulness of the existing phenomena. The first step is to reduce the interview data and then it is presented in a table that is adjusted to the theme. The last stage is to connect the sub-themes. Obtaining information that is used as research data is a confidential document. In addition, this research guarantees the privacy of participants, so that it will not interfere with and affect the self-assessment of participants by outsiders. This is realized by the coding of the identity of the participants.

Trustworthiness

Qualitative research differs from quantitative research in the way it provides confidence, trustworthiness, accuracy, consistency and reasonable results (Denzin, 1978; Flick, 2018). One way to provide trust is through the triangulation method which leads to the participant's point of view when collecting data at different times (Campbell et al., 2020). The data collection technique used was interviews with the five mathematics teachers at least three to five times within 7 to 10 days and each interview session required an average of about 30 to 50 minutes per participant.

Results

The interview started by giving open questions to respondents about the extent to which knowledge was related to literacy. Four main findings were obtained related to the preparation, implementation, reflection, and final results of the literacy training activities. Furthermore, information is dug in more depth about the four conditions that exist in each school from each respondent. The next stage is the preparation of interview transcripts, data reduction, verification, and ends with drawing conclusions that produce four main themes. Adapted to the research objectives, the interviews focused on how literacy was trained during learning, especially for junior high school students. The results of the four topics are reduced and formed sub-themes that are interconnected with one another. The results of the research that have been analyzed are presented and explained in the explanation below.

Theme 1: Preparation in training literacy

Findings related to preparing to train literacy in students from the results of data analysis obtained three topics which include 1) Knowledge and understanding of teachers related to literacy that has been applied in schools, 2) Supporting devices in preparing for the implementation of literacy during learning, and 3) Targets for achieving literacy during learning. learning is expected to have a direct impact on student achievement. The results of data reduction can be seen in each theme exposure.

Table 1. Result of Preparation in training literacy

Response	Sub-Theme	Result Verification
The habit of reading information sources (books, newspapers or magazines such as automotive and non-comic texts) according to students' interests and the time to adjust the agreement from students 15 to 30 minutes every day, then students are asked to interpret and respond to the truth of the information, take its moral values, and apply in everyday life which is compiled in the form of narratives or student journals.	Teacher knowledge and understanding related to literacy that has been applied in school	Activities to familiarize students with reading information, interpreting and responding to the truth of information, taking its moral values, and applying it in daily life which is monitored from teacher assistance and balancing school facilities which have the aim of directing the appropriate meaning and attitude in responding to information so that it raises students' reading interest, improve student achievement, and anticipate student learning difficulties.
a. School facilities in the form of text books that are of interest to students. b. Giving motivation and teacher approach to students in interpreting and responding to an information. c. Students are given the opportunity to present the results of their reading in oral and written form.	Supporting devices in preparing for the implementation of literacy during learning	
a. Increase interest in reading, especially text books b. Anticipating difficulties in understanding and digesting the meaning of the question text or subject matter c. Maintain or improve student achievement, both academic and non-academic	Target achievement of literacy implementation during learning	

There are several teachers who state that the implementation of literacy habituation in schools is reading books for 15 minutes before the first lesson begins, although the positive impact is less visible. The habit of reading takes advantage of existing school facilities obtained from donations from outside parties, the desire of students to bring their own books or books from several sources of government-owned funds in the form of library facilities. In addition, the teacher's approach in motivating students and directing students to read textbooks is also an important supporting tool as a fence in interpreting information. In several schools, the majority of students who have high enthusiasm in these literacy activities are grade VII students than other upper class students. Students are more interested in discussing the problems of everyday life rather than discussing content or theory directly.

> "*My students in grade 7 have a different spirit, Miss, maybe the new students are still early and they are foreign to them because of new habits in their new environment. They like to discuss everyday life and we criticize together" (Last-B)*

> *"My students like it too, Miss, for example, if I ask why the road for the visually impaired at the Trans Jogja bus stop is tilted? What is the slope so that it is easy for those in need to pass? So, there are social values, morals, gradient theory as well" (Laks-S)*

The two excerpts from the interview answers above are the expressions of teachers who try to familiarize literacy in classroom learning by adjusting the 2013 curriculum and the conditions of students at every level of education. In addition, the achievement targets expected by teachers during the literacy habituation process have not been realized properly, in terms of interest in reading non-lesson textbooks by students, as well as increasing student achievement. This is indicated by the presence of students who still have difficulty in understanding and translating the language of

the problem into the language of mathematics, so that student learning achievement is still far from expectations or below the minimum completeness criteria.

Theme 2: Implementation of literacy training

There are three sub-themes that arise related to the implementation of literacy habits obtained from respondents who tell their experiences according to what they have experienced. The three sub-themes include 1) the ideal implementation of literacy during classroom learning, 2) efforts to provide treatment so that literacy habituation goes well, and 3) an assessment system for students in the implementation of literacy habituation.

Table 2. Result of implementation of literacy training

Response	Sub-Theme	Result Verification
➢ Reading culture is very lacking so that it has an impact on weak literacy, students have not been able to interpret and respond to information, create communication and discussion with friends who have read the same information. ➢ Students are asked to criticize the problems found in the information and write them down in a note or journal report. ➢ The results of the journal are used by the teacher in compiling test items that are adapted to the context of daily life in the form of using simple language, problems in the school and community environment.	Implementation of the ideal literacy habit	The habit of reading textbooks can be a starting point in literacy which is strengthened by the meaning, attitude in receiving information, and discussing the information obtained by students. This is one of the gaps for the teacher to compile test items that have elements of daily life according to what students know. However, the assessment in the implementation of literacy does not have a standard and the assessment rubric has not been specifically described.
➢ Teachers and students play an active role in literacy activities so as to create role models for students. ➢ Teachers and students exchange sources of information in the form of textbooks and review together. ➢ The teacher provides opportunities for students to express opinions from what they have read, and the teacher facilitates students in discussing. ➢ Giving problem-based questions or HOTS regularly, translating according to what students understand, and solving problems from the student's point of view.	Efforts made in familiarizing students with literacy activities	
➢ Special assessment for literacy does not yet have its own standards and rubrics, only entered in the understanding of students being able to discuss mathematical symbols into language and vice versa. ➢ The assessment system is not clear, what aspects must be assessed, as well as the type of literacy is difficult to distinguish, because all learning is related to literacy. ➢ The implications and usefulness of the assessment results are not directed to meet a particular goal.	Assessment of the implementation of literacy activities	

Based on the low reading interest of students, the implementation of habituation of literacy training has not yet had an impact on student achievement. Although the habituation of literacy training has been carried out by schools through teachers by means of student report journals, students are still not able to interpret, respond to and criticize the problems that exist in the information that has been obtained. However, the most important thing, through the refraction of this training to students, the teacher is able to find out test items with certain criteria for the condition of students who have low reading interest. Efforts are made by the teacher to make the habit of literacy training meaningful, focused on discussion and facilitating student opinions so that there is an exchange of ideas with students, thus attracting students' thinking that is more open and able to solve problems from the student's perspective.

> *"…they have a high level of curiosity, Miss. They look very lazy when asked to read a book, so if I want to say they have good literacy, the fact isn't match the reality, Miss. But if I want to say it's lacking, it's the truth, in reality they haven't been able to respond, besides being asked to take the meaning of the information correctly, they only dare to have an opinion" (Ist-K)*

> *"sometimes, I make HOTS questions for daily tests, depending on your environmental conditions, sometimes I like to take up problems that have happened, for example like this pandemic, I try to raise the issue of cloth mask manufacturers, it will be much easier for students to understand, it's all around us , and cultivate the entrepreneurial side too … " (Laks-S)*

"*Why doesn't it seem like there is no special rubric for any literacy grades, so far it's only been seen that students can write what they know, ask questions and the process of solving them, Miss., …" (Arac-K)*

The habit of literacy training is not evenly distributed at every level of education due to low student interest in reading, but the teacher still strives for the implementation of literacy to run. One easy way is by giving daily test questions by raising problems in the community. It's just that it's still very unfortunate regarding the assessment of literacy that has not shown the clarity of a special rubric in assessing the level of students in literacy. In addition, the usability of the results of the literacy assessment does not yet have clarity, as a support for grade promotion or school graduation. In addition, it also raises the possibility that the results of the literacy assessment are used as a standard in improving the quality of the preparation of test items.

Theme 3: *Reflection on the implementation of literacy*

Reflection on the implementation of literacy in learning is influenced by the preparation and implementation of literacy training habits. The theme of this reflection raises three sub-themes which include 1) commitment in carrying out literacy activities to achieve the desired target, 2) Obstacles encountered in implementation, and 3) Monitoring the implementation of literacy. The three of them revealed the process of carrying out habituation, from literacy training to assessment for students.

Table 3. Reflection on the implementation of literacy

Response	Sub-Theme	Result Verification
➢ Consistent in assisting students to obtain valid information and discuss together in addressing problems in the information that has been obtained. ➢ It is a challenge for teachers, how do teachers present learning that prioritizes literacy and is in accordance with today's era, so that students are able to follow learning well and get maximum learning achievement. ➢ Preparation of more communicative HOTS level test items so that students are able to interpret the meaning of the question request with various keywords in the question.	Commitment in carrying out literacy activities to achieve the desired target	Commitment in carrying out literacy habituation is more indicated by the existence of learning that prioritizes literacy and in accordance with the times, the teacher's consistent attitude in assisting students, and discussing with students, thus giving rise to the idea of preparing communicative and easy questions in the preparation of mathematical models, although there are still obstacles in building student atmosphere and student interest in reading sources.
➢ It is difficult to build a stable mood of students to want to read textbooks in class. ➢ Information in limited textbook reading resources and more interesting online reading sources	Constraints faced in the implementation of literacy	
➢ There is no special monitoring of student progress, but only confirmation to students what books and how the results of book reviews have been read. ➢ Literacy monitoring is only seen when students understand HOTS level math problems related to mathematical modeling on story questions with long exposure.	Monitoring the implementation of literacy	

Based on the information in Table 3, a reflection of the implementation of literacy training habits can be observed that has a high commitment in seeking the implementation of literacy activities despite the obstacles faced. Commitment is shown by mentoring students, seeking learning that focuses on literacy and practicing literacy through test items that show the critical side of students. The obstacles experienced by teachers in learning when getting used to the implementation of literacy are more on the mood of students to read textbooks, which has an impact on reading interest. In addition, students' interest began to lead to digital information so as to allow students to have a tendency to have low interest in reading textbooks.

"*The teacher's challenge is also this, they must be smarter in making learning variations that can spur students to think critically so that they not only know the concept but also arrive at its application. …" (Laks-S)*

"*The child's mood is very difficult to predict, if he reads more on the cellphone than in the text book, it becomes difficult to understand when he reads about the text book, which makes reading interest low … " (Rhy-K)*

"...Special monitoring doesn't exist, it's just more of a confirmation of understanding, Miss, what do they get from reading book X, for example, then if they study it, it's more about the HOTS level in the form of a story with a complex sentence … " (Arac-K)

A challenge in educating students, leading students to be interested in reading textbooks, in addition to changing the concept of learning into learning that is in accordance with its era. Monitoring literacy results is not only academically seen from the results of the completion of test items, but rather on student behavior in responding to problems from an

information. Concretely, it is taught by the teacher through test items with long exposure so that students are able to understand and interpret the intent and request of the question.

Theme 4: The final result of the implementation of literacy training

The results of its implementation make literacy the end of preparation, implementation and reflection. The sub-themes obtained in the final results include two things which include the first is the results in students from the implementation of literacy, and the second is what is in learning in the implementation of literacy.

Table 4. Result of the final result of the implementation of literacy training

Response	Sub-Theme	Result Verification
➢ Students are only able to understand the problem and then do it mathematically, but students are still not able to interpret the problem even though in a series of items, elements of everyday life have been inserted. ➢ Students who do not like to read and find it difficult to map problems are easier to judge that their literacy level is low, as well as seen from the results of the student's mathematical modeling work. ➢ The meaning of the results has not been directed so that the assessment is only guided by the indicators of each subject matter in the lesson plans so that literacy is only inserted in it in the form of right and wrong from modeling that is understood by students.	The meaning of the assessment results from the literacy training	The meaning of literacy assessments for students is easily detected by the teacher by looking at students who do not like to read and find it difficult to map problems to questions, even though the assessment is only based on indicators in the lesson plans, but at least students are still able to understand the surrounding conditions and try to think mathematically and openly. indicated by student achievement.
➢ Students are able to understand the surrounding conditions, able to interpret mathematically and openly thinking, and able to apply it in everyday life consciously. ➢ Simultaneously, students are able to understand language and mathematics, thereby realizing sustainable literacy and having an impact on student achievement.	Implications of literacy in classroom learning	

The meaning of the results of the literacy assessment has not shown a clear direction. The literacy assessment process is only limited to the teacher seeing the student's ability to what extent students can interpret the questions into simple language before entering into mathematical calculations. In addition, the assessment is only based on the indicators contained in the lesson plans for each material, not an assessment with special indicators for literacy assessment. Therefore, it raises the implications of the implementation of literacy training on students' understanding of the surrounding conditions and expects that literacy will not only develop in subject matter but is mutually sustainable in order to have a positive impact on student achievement.

> "*The assessment is according to the indicator, Miss, students can model what that is, the rest is just from what I see, students can write anything in the answer to the question*" (Last-B)

> "*…maybe if there is an assessment rubric, the system is like a story rubric, it can be detailed, but where will the assessment results go, because the ending must be in the application of everyday life, Miss* (Arac-K)

The difficulty of mapping the problem by students based on low reading interest, and the impact on the interpretation of mathematical modeling is less. On the other hand, in providing assessments, teachers have not mastered the extent to which literacy can be assessed. The teacher only knows the extent of the assessment through the indicators written in the lesson plans. However, the important implication that has been shown by students at school is that students are able to understand existing conditions, are able to think openly and try to apply them in everyday life.

Discussion

Literacy training is one way to improve student achievement and the human resources quality of student (Retnawati & Wulandari, 2019). The training process certainly has stages from preparation, implementation, reflection, to the final result of the literacy that has been trained. Based on the findings in this study, preparation for training literacy in students is only limited to getting students to read information for a limited time (15-30 minutes), interpreting and responding to the truth of information, taking its moral values, and applying it in daily life which is monitored from mentoring teacher. In line with Jailani et al., (2020), namely that literacy activities should not only read, but also interpret and respond to the truth of information and apply it in everyday life. As is the case with ideally the concept of literacy, namely students' literacy skills are focused on three important things, namely formulating and strategy, using and interpreting in real life (Maulina & Retnawati, 2018).

The implementation of literacy habituation must be supported from various parties, both from the teacher, the school environment and the students themselves (Aziz et al., 2018). The teacher is able to get used to practicing mathematical literacy through the preparation of test items that have elements of daily life according to what students know. However, there are obstacles in conducting an assessment in the implementation of literacy. The obstacle is that there is no standard and the rubric of the assessment has not been specifically described. School facilities are a supporting factor in the implementation of literacy training habits by providing books that lead to the future of students, able to motivate students (Nikmah et al., 2021), and provide an overview for students to excel in accordance with their interests and areas of expertise, both academic and non-academic.

On the other hand, the obstacles that make students habitually practice mathematical literacy are teacher-centered learning (Özgen & Bindak, 2011). In the findings of this study, teachers are still constrained in understanding the meaning of mathematical literacy. This shows one of the main obstacles in the habit of educating mathematics learning which is not an element of mathematical literacy. The teacher's lack of understanding is indicated by some of the teachers are not aware of the existence of learning methods and strategies that focus on literacy even though it is the most important part during the learning process. These methods and strategies must have elements that lead to critical thinking skills and a balanced understanding of theory (Gashan, 2015). Through the preparation stage in learning, teachers are able to change learning methods and strategies that involve students and train literacy in them (Azizah et al., 2015; Syam et al., 2018; Warsito, 2018). The right method in familiarizing learning with literacy is a problem based learning (Cahyani & Setyawati, 2016; Farhan & Retnawati, 2014; Hidayati & Retnawati, 2018; Syam et al., 2018), problem posing based on collaborative learning (Hery, 2017), and also cooperative problem solving (Sari et al., 2019).

It is also important for teachers to create good communication with students during learning, so that it raises students' critical understanding (Hassan et al., 2015; Nikmah et al., 2021), knowing students' moods and building conducive learning. These activities will be realized when teachers and students are able to play an active role in exchanging ideas, creating role models for students and providing opportunities for students to express their opinions. Habituation like that makes students able to think openly and show their abilities. Through this, the solution in anticipating students' difficulties in answering and understanding questions from the teacher. Thus, students are able to dominate the problem solving process during learning and are able to improve students' literacy skills (Aziz et al., 2018; Hadi & Novaliyosi, 2019; Jailani et al., 2020).

In learning, the teacher begins to try to get used to giving practice questions and sample questions that have contextual problem characteristics, and require critical thinking such as PISA and TIMSS questions (Directorate of Basic Education Teacher Development, 2018; Özgen & Bindak, 2011; Wardhani & Rumiati, 2011). The questions given are questions that are arranged in accordance with the demands of the curriculum, which are known as HOTS questions (Azizah et al., 2015; Muhazir et al., 2021). This HOTS question is what motivates students to be able to think critically, apply, and provide solutions to everyday problems. In addition, through habituation of HOTS questions, students can easily understand the problems interpreted in mathematical modeling (Hassan & Wai, 2019; Syam et al., 2018; Warsito, 2018).

The form of the HOTS questions is accustomed in the form of essay questions or story questions that guide students in understanding the meaning and solutions that will be taken by students. However, it is very unfortunate that literacy training through HOTS questions can only be assessed with item assessment indicators, even though students' literacy skills are a part of preparing students for the industrial revolution 4.0 which is related to 21st century abilities and skills in the form of character building and academic points (Hassan & Wai, 2019; Septikasari & Frasandy, 2018). Therefore, teachers must be more active in training literacy in learning by strengthening academic knowledge, increasing student skills according to their interests, and providing problem-solving projects that are resolved to bring up a solution. In addition, the need for the preparation of a clear assessment rubric to assess the extent to which students' literacy skills are adjusted to the level of students' knowledge.

Conclusion

Based on the discussion that is adapted to the research objective, namely how literacy is desired in learning in junior high school, it can be said that mathematical literacy is applied to students who are only limited to reading texts for 15 to 30 minutes every day. In strengthening this habit, the teacher asks students to report their reading results in the form of student journals. The literacy that is reached by the teacher and accustomed to the students is not yet in sync with the true meaning of mathematical literacy. However, the teacher has tried to provide optimal learning. This is shown by changing the project and problem learning methods and strategies according to the student's condition, as well as the habituation of the teacher in giving HOTS level questions to train students' critical thinking processes, balance theory and understand the surrounding environment. It's just that without realizing that the teacher's efforts have been included in the meaning of habituation of mathematical literacy in mathematics learning.

Recommendations

Teachers must be more active in understanding the meaning of mathematical literacy, so that they are able to be more optimal in training mathematical literacy appropriately in students. In addition, teachers' mastery of mathematical literacy is able to strengthen academic knowledge, improve students' skills according to their interests, and provide problem solving solutions that are resolved to come up with solutions. Thus, teachers can easily compile an assessment rubric that explains mathematical literacy to the extent that students' literacy skills are adjusted to the level of students' knowledge both in terms of mathematical context and mathematical content. In addition, based on the findings in our research, we hope to encourage future researchers to evaluate the implementation of mathematical literacy in schools, researchers can formulate effective and systematic plans to improve mathematical literacy in students, as well as provide strategic steps in improving teacher competence to foster and familiarize literacy in learning mathematics.

Limitations

There are noteworthy limitations of this study. Limited results only from qualitative data collection. It is possible to measure the extent to which teachers understand mathematical literacy in quantitative terms. Both can be used in mixed research so that the results are very strong and can explain that the importance of mathematical literacy should also be owned by mathematics teachers and not only for students.

Authorship Contribution Statement

Rachmaningtyas: Contributed to data collection, data analysis, interpretation, drafting and revision of the manuscript. Kartowagiran: Contributed to drafting, technical support, supervision, and final approval. Sugiman: Contributed to the concept and design of the data, supervision and final approval. Retnawati: Contribution to the concept and design of research instruments, data analysis, and manuscript revision. Hassan: Contributed to manuscript revision and technical support.

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