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Implementation of Core Learning Model to Improve Mathematical Literacy Students

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ABSTRACT
This research was conducted with the aim of knowing differences in the mathematical literacy abilities of class VIII students of MTs Salafiyah Syafiiyah Bandung before and after applying the CORE (Connecting, Organizing, Reflecting, Extending) learning model. The research method used is a pre-experimental design with a one-group pretest-posttest design and uses a quantitative research approach. The subjects of this study were class VIII D MTs Salafiyah Syafiiyah Jombang. The research instruments used were tests and non-tests. The test instruments were pretest and post-test description questions to measure students' mathematical literacy before and after implementing the CORE (Connecting, Organizing, Organizing, Learning) learning model. Reflecting, Extending). While the non-test instruments used were interviews with mathematics teachers in class VIII D to find out the implementation of learning carried out in class. The data analysis technique used was hypothesis testing. However, before testing the hypothesis, the data obtained first First, the normality test and homogeneity test were carried out. Based on the calculation of the paired sample t test, it shows that the t value is 13,818 with a significance of 0,000. The significance value shows 0.000 < error level of 0.05, so it can be concluded that Ha is accepted. Acceptance of this Ha means that there are differences in the level of mathematical literacy of class VIII students of MTs Salafiyah Syafiiyah Jombang before and after implementing the CORE learning model.

Keywords: CORE Learning Model; Mathematical Literacy; Mathematical Representation.

INTRODUCTION
Education is the basis for creating quality and competent next generations of the nation. According to PP No. 57 of 2021 concerning National Education Standards (2021) Chapter I Article 1 paragraph (1) states that education is a conscious and planned effort to create an atmosphere and learning process with the aim that these students actively develop their potential to have religious spiritual strength, control over self, personality, intelligence, noble character, and skills needed by himself, society, nation and state. The Minister of Education and Culture conveyed the scope of material in education in Indonesia through the Minister of Education and Culture for Research and Technology Number 7 of 2022 Concerning Education Content Standards (2022) Article 2 paragraph (4) one of which is mathematics. From this foundation, we know how important mathematics is in preparing the next generation of the nation.

Mathematics is not only a field that teaches how to count, but much more than that. Learning mathematics has concepts that students need to understand in order to be used in everyday life. In understanding the concept, students need a process that bridges and helps students to be able to achieve the concept. There are five standard processes in learning mathematics according to the National Council of Teachers of Mathematics which is also mentioned in Sari (2015) namely (1) problem solving, (2) communication, (3) reasoning and proof (reasoning and proof), (4) connections (connection), (5) representation (representation). These five competencies are packaged in one container called mathematical literacy. Mathematical literacy according to the OECD (2019) is a person's ability to formulate a mathematical concept, apply, and interpret mathematics in various contexts, which includes mathematical reasoning, using mathematical concepts, procedures, and facts to describe, explain and

predict a phenomenon. Or it can be said that mathematical literacy is an ability to translate mathematics as a concept and apply it in the real world. The Program for International Student Assessment (PISA) by the OECD is a program that assesses the extent to which a 15-year-old child's abilities and knowledge are useful for participation as a modern society. PISA explains six levels in mathematical literacy according to Kafifah et al., (2018) Level one is the lowest level and level six is the highest level.

Indonesia's PISA test results are still below the OECD (Organization for Economic Co-operation and Development) average as revealed by Kafifah et al., (2018)where the average score of Indonesia's mathematical literacy skills is still at the first level. According to the National Council of Teachers of Mathematics (2000) the fields or material in mathematics are interrelated with one another, so that when students do not understand or even do not understand a context in mathematics they will experience learning difficulties in chapters or sub-chapters. furthermore. So that this is what then makes students dislike mathematics because it is considered difficult. According to Nasrulloh & Nurlia (2021), low interest in learning, the way the teacher delivers the material, and the lack of active participation of students can be factors that influence this to happen. One thing that is very basic, namely the lack of active participation of students causes one of the requirements in learning according to Riyanto (2014) not to be met. So that the hope to achieve the learning objectives and the growth of the learning process is difficult to achieve.

One of the process standards mentioned above, namely mathematical representation is an important component in growing students' mathematical literacy. Representation according to Hutagaol (2013) is the ability of students to communicate mathematical ideas that they get from being studied in a certain way. Some forms of representation that are often used are diagrams or pictures of objects, tables, mathematical statements, written text, or a combination of these. In mathematical contextual problems, students can use this representation to translate problems in the form of symbols or images. So that it can make it easier to choose the right strategy to solve the problem at hand. The math subject teacher at MTs Salafiyah Syafiiyah Jombang said that, most students were still unable to translate contextual questions in the form of symbols or mathematical statements, this would certainly have an impact on students' understanding of concepts in problem solving. So that students will say it is difficult if given contextual questions. For this reason, it is necessary to have a new atmosphere in the learning process so that students are active and can master the concept in question. According to Nasrulloh & Nurlia (2021), low interest in learning, the way the teacher delivers the material, and the lack of active participation of students can be factors that influence this to happen. One thing that is very basic, namely the lack of active participation of students causes one of the requirements in learning according to Riyanto (2014) not to be met. So that the hope to achieve the learning objectives and the growth of the learning process is difficult to achieve. For this reason, it is necessary to have a new atmosphere in the learning process so that students are active and can master the concept in question.

A new atmosphere in learning can be grown by applying a learning model that can move students to be active in the learning process. The learning model in question is the CORE learning model. According to Budiyanto (2016) the CORE learning model is a learning model that is based on constructivism, so it can be said that this model can foster student activity in the teaching and learning process. According to Rohmah & Ulya (2021)that learning activities in the CORE learning model are student-centered and the teacher acts as a facilitator. This learning model stands for connecting, organizing, reflecting, extending. These four components are stages carried out in the CORE learning it self (Friscillia et al., 2021). Connecting, which is the connection stage or connecting previous information with new information to be learned. The second is Organizing, here students are expected to be able to organize or process information from the previous stage in order to understand the material. Next is Reflecting, at this stage students are expected to rethink and deepen the material that has been obtained. The last is Extending, at this stage students develop and broaden their knowledge through an activity. Broadly speaking, this learning model emphasizes that students play an active role, think creatively and critically.

Budiyanto (2016) state that the CORE learning model is a learning model in which students are expected to connect and organize new knowledge with the knowledge they have learned then reflect on the knowledge and concepts being studied which are then studied. can expand students' knowledge during the teaching and learning process (extending), the CORE learning model is also one of the learning models based on constructivism so that it can be said that this model can foster student activity in the teaching and learning process. The CORE (Connecting, Organizing, Reflecting, Extending) learning model is a learning model that can generate student literacy through an active and effective learning

syntax. In this learning process students are guided to connect their knowledge with the new knowledge being taught, with groups students can communicate ideas with their friends and then organize between these ideas to become a new concept. Furthermore, with the guidance of the teacher, students can correct the new knowledge/concept. If they have reached the correct concept, students can apply this knowledge in the context of word problems where it is almost the same as the process carried out during the learning stage. With interaction between friends, students will better understand what is learned during the learning process. This is in accordance with what was cited by Nasrulloh et al., (2019) that peer tutor explanations will be more easily absorbed. In this learning model students play an active role in learning, educators only act as mentors and facilitators.

Previous research regarding mathematical literacy by Nasrulloh & Nurlia, (2021) showed that the application of a problem-based learning model was effective in increasing class VII students' mathematical literacy in problem solving abilities. The thesis submitted by Friscillia et al., (2021) showed significant results in increasing the mathematical literacy of class VII students by applying the CORE learning model. From the results of these two studies, researchers are interested in researching and analyzing mathematical literacy skills in the representative competence of class VIII students by applying the CORE (Connecting, Organizing, Reflecting, Extending) learning model. This learning model was chosen for research because the CORE learning model is in accordance with what is expected in the 2013 curriculum, namely students are able to build their own knowledge through the stages in the CORE learning model.

METHOD

The purpose of this research is to find out the mathematical literacy skills of students in class VIII D Mts Salafiyah Syafiiyah Bandung, Diwek, Jombang by applying the CORE learning model. So the right type of research for this research according to Sugiyono (2016) is to use the type of pre-experimental research design with the type of one-group pretest-posttest design. The independent variable in this study is the CORE learning model, while the dependent variable in this study is the mathematical literacy of class VIII D MTs Salafiyah Syafi'iyah Bandung. This study used a quantitative research method approach, with the research population being grade 8. The research subjects were class 8-D.

The research instrument used in the form of tests and non-tests. The test instruments used were pretest and post-test. The pretest is in the form of a question sheet containing 5 description questions about the surface area of cubes and blocks and their combinations which are given before applying the CORE learning model. While the post-test question sheet contains 5 description questions about the surface area of cubes and blocks and their combinations which are given after applying the CORE learning model. The non-test instrument used in this study is in the form of interviews with subject teachers to find out the initial conditions related to students' mathematical literacy abilities as well as to assess the implementation of learning activities in class. In addition, this study uses learning instruments in the form of LKPD (Student Worksheets) and RPP (Learning Implementation Plans) which are used as guidelines in carrying out learning activities in class.

The instruments that have been compiled are then tested for the validity and reliability of the instruments. The validity test was carried out by testing the content validity and construct validity. Content validity testing. Construct validity testing. In this test, the average score obtained from two experts or two validators is used with the following formula:

$$p = \frac{Number\ of\ Indicator\ Scores}{Total\ Maximal\ Number\ of\ Indicator\ Scores} \times 100\%$$

There:
P = Presentation of indicator

According to Purwanto (2018)content validity is carried out to find out to what extent the contents of the research instrument are relevant to the research variables used, the test is carried out by connecting the score of each question item to the total score with the test used is the Pearson bivariate correlation with the help of the IBM SPSS Statistics application 21, the error rate used is 0.05%. With the validity criteria if r-count > r-table, then the instrument is declared valid. Meanwhile, in testing reliability with internal consistency, according to Sugiyono (2016) one trial was carried out. Reliability testing uses the

Alpha formula (α) with the help of the IBM SPSS Statistics 21 application. If the Cronbach's Alpha value is > 0.06, the instrument is said to be reliable.

The hypothesis test was carried out to find out whether there were differences in the results of the mathematical literacy test for class VIII D MTs Salafiyah Syafi'iyah Jombang before and after receiving the CORE learning model. Before testing the hypothesis, the data obtained was tested for normality and homogeneity. The data normality test used the Kolmogorov Smirnov normality test with the IBM SPSS Statistics 21 application. If the significance value is > 0.05, the data is normally distributed. Furthermore, homogeneity testing was carried out, homogeneity testing using the help of the IBM SPSS Statistics 21 application with the Levense formula. If the resulting significance value is more than the error level (0.05), it can be said that the data is homogeneous. The data obtained from the results of the pre-test and post-test are in the form of interval data, so the researcher will compare the results of the pre-test and post-test using a statistical test with the type of parametric statistical t-test related (paid sample t-test) with the help of the IBM SPSS Statistics 21 application. If the significance value is < 0.05, then Ho is rejected and Ha is accepted. This means that there are differences in students' mathematical literacy abilities between before and after applying the CORE learning model.

RESULT AND DISCUSSION

The research was conducted on 23-28 May 2022 at MTs Salafiyah Syafiiyah Bandung Diwek Jombang with 22 research subjects in class VIII D. The material tested was Flat Sided Buildings with sub-chapters tested for the surface area of cubes and blocks. In this study the learning tools used included the Learning Implementation Plan (RPP) with the CORE learning model, Student Worksheets (LKPD), as well as test questions that contained mathematical literacy, each of which had been validated by two validators. The test questions used as research instruments have been tested for validity and tested for reliability through IBM SPSS Statistics 21.

Result

After testing the construct validity by two experts, then the content validity of the test items was tested by means of trials on 12 students who would then be tested for content validity and reliability. The following table shows the results of the validity test of the pretest questions.

Table 1. Test Results for the Validity of Pretest Items

Number test	r-Table	R-Count	Information
1	.576	.714	Valid
2	.576	.976	Valid
3	.576	.896	Valid
4	.576	.966	Valid
5	.576	.954	Valid

Based on the results of the content validity test of the pretest item content above, the r-count of questions 1-5 is greater than the r-table (r-count > r-table), so the pretest questions are declared valid. Because the validity test shows that the items in the pretest are valid, the pretest questions can be used for research to measure students' mathematical literacy abilities before implementing CORE learning. Furthermore, the results of the validity test of the post-test questions can be seen in table 2 below:

Table 2. Test Results for the Validity of Posttest Items

Number test	r-Table	R-Count	Information
1	.576	.947	Valid
2	.576	.799	Valid
3	.576	.983	Valid
4	.576	.972	Valid
5	.576	.967	Valid

Based on the results of the content validity test of the post-test items above, the r-count of questions 1-5 is greater than the r-table (r-count > r-table) so that both post-test questions number 1 to number 5 are declared valid. Because they have been declared valid, the post-test questions can be used for research to measure students' mathematical literacy skills after applying CORE learning. The pretest and post-test questions have been tested for validity, then the questions are tested for reliability using the help of the IBM SPSS Statistics 21 application. Test results the reliability of the pretest post-test questions can be seen in table 3. below:

Table 3. Reliability Test Results of Pretest Post-test Questions

Test	Cronbach's Alpha	N of Item
Pretest	.939	5
Post-test	.963	5

Based on the results of the pretest and post-test reliability tests, it can be concluded that the pretest Cronbach's Alpha value is 0.939 while the post-test Cronbach's Alpha value is .963. The value of Cronbach's Alpha pretest and post-test is more than 0.60 so it can be concluded that the pretest and post-test questions are declared reliable and can be used for research. A data can be tested using parametric statistics if the data is normally distributed. The following is the result of calculating the normality test using the IBM SPSS Statistics 21 application.

Table 4. Normality Test Result

Soal	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	Df	Sig.
Pretest	.199	22	.024	.899	22	.029
Post-test	.082	22	.200	.975	22	.833

Based on the results of the normality and homogeneity tests which showed that the data were normally distributed and homogeneous, the data was then subjected to a two-sample paired t-test using the IBM SPSS Statistics 21 application to test the hypothesis proposed. The results of the t-test for two paired samples can be seen in Table 6. The following:

Tabel 5. Paired Sample t Test Result

Paired Differences					t	Df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
44.81818	21.51503	3.24351	38.27702	51.35935	13.818	43	.000

Discussion

The mathematical literacy studied includes two indicators, namely (1) using representations to model and interpret mathematical contextual problems (2) choosing and applying between mathematical representations to solve problems. Students' mathematical literacy can be known through the results of the tests being tested. The researcher gives pretest questions to find out students' mathematical literacy before applying the CORE learning model and post-test questions to find out students' mathematical literacy after applying the CORE learning model. Before being given pretest questions regarding the surface area of cubes and blocks, students had been taught this material by the math teacher at MTs Salafiyah Syafiiyah but the learning method used by the teacher is the conventional method.

Contextual problems of pretest questions, students are asked to use their understanding to make a mathematical model of the problem. In this indicator, what is assessed in student work is how students can write what is known from the problem (length (p), width (l), height (t)) and or draw a geometric shape from the problem. The results of the pretest showed that the mathematical literacy skills of class VIII D MTs Salafiyah Syafiiyah Bandung were still low. On indicator 1 studied, the results of the pretest showed 42% of students were able to use representations to model and interpret mathematical contextual

problems, while the post-test results showed 75% of students were able to use representation. Comparison of the percentage of indicator 1 can be seen in graph 1. below:

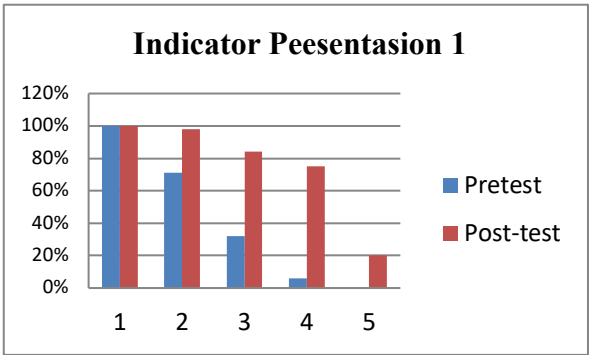

Figure 1. Indicator Persentasion

Based on the data obtained, 100% of students were able to apply indicator 1 to question number 1 both pretest and post-test questions. This means that students' mathematical literacy skills at level 1 are fulfilled. In problem number 3 with the level of mathematical literacy 2, the pretest results showed 32% of students could fulfill this indicator, while in the post-test the percentage of students increased to 84%. Problem number 4 which contains level 2 in mathematical literacy, shows an increase before and after implementing the CORE learning model. Where the results of the pretest showed that only 6% of students could fulfill indicator 1, while the post-test results increased to 75%. In question level 3, namely number 5, in the pretest, no students were able to represent the problem in symbolic form, while in the post-test, 20% of students were able to translate the problem in mathematical symbols. The average number of students who were able to translate questions in the form of symbols/pictures in the pretest questions was 42%, while in the post-test results 75% of students were able to translate the questions.

In the second indicator, namely selecting and applying between mathematical representations to solve problems, some students were unable to solve problems involving a combination of geometric shapes between cubes and blocks. The percentage of test results on indicator 2 can be seen in Figure 2. below:

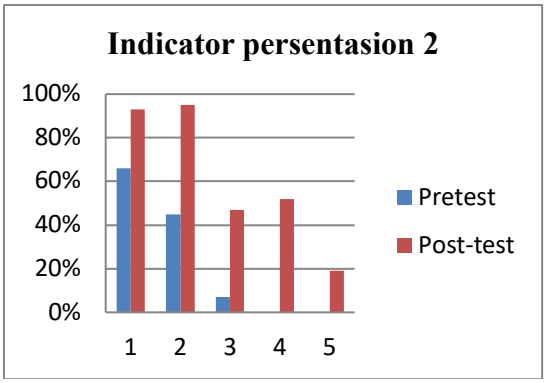

Figure 2. Indicator Persentasion

Based on the data above, 66% of students were able to choose, and apply between mathematical representations to solve problems in pretest question number 1 with a level of mathematical literacy 1. In the post-test questions there was an increase to 93% of students. 45% for pretest questions number 2 and 95 % of students were able to solve problems on post-test questions. Meanwhile for level 2, namely question number 3, the pretest results showed only 7% of students were able to solve problems using representations and 47% of students were able to fulfill the second indicator after applying the CORE learning model. Level 2 questions another, namely number 4, the pretest results showed that no students were able to solve this problem. However, after applying the CORE learning model 51% of students were able to solve level 2 questions. Problem number 5 with a mathematical literacy level of 3, no students

were able to solve problems that given when given the pretest questions. After learning using the CORE model, the post-test results showed 19% of students were able to complete this level 3 question.

Students with low ability tend not to write down detailed answers to what is asked and the strategies used in solving problems as usual. Students with moderate abilities tend to be able to identify problems well, but there are students who are not able to answer the strategy correctly and have a lot of calculation errors and are not careful in the process of working on the questions. Students with high mathematical abilities tend to be better because they are able to do calculations correctly and are able to identify questions correctly with various ways of doing them.

Based on the description of the research results above, it is known that students with low, medium and high abilities have different levels of ability in terms of understanding mathematical literacy. Even though they did not meet all the indicators of mathematical literacy, students were able to understand the meaning of the questions and were able to complete each question given. Some students are able to interpret and solve problems and are even able to communicate correct answers. This is in accordance with the notion of mathematical literacy, namely mathematical literacy is an individual's ability to formulate, use and interpret mathematics in various contexts. This is also in accordance with Tobondo, (2015) opinion that mathematical literacy is the ability possessed by students in assembling knowledge, formulating, solving and interpreting problems based on reason by using existing concepts and facts and through appropriate procedures.

In line with the research conducted of Friscillia et al., (2021) that students became very active in learning the material of cubes and blocks which were given treatment using the CORE type cooperative learning model. The application of learning with the CORE model can make students very active in all steps in the CORE learning model demanding student activity as evidenced by this model students are very active at the Connecting stage at this stage students are asked to connect past knowledge with future lessons either by reading or pay attention to pictures or visual activities, then the Organizing stage with the knowledge they have acquired students are asked in groups to organize the questions or knowledge they have obtained at this stage students are expected to express opinions or oral activities, this stage also really requires student activity from forming a group to getting answers at this stage the stages are related, then at the Reflecting stage at this stage students are tested again for their understanding at this stage it is also very necessary for students to be active in thinking and solving questions at this stage students carry out visual activities experiments in solving problems, then the final stage Extending or broadening students' knowledge by giving questions to see how far students' knowledge of the lessons that have been learned at this stage is also very much needed by students' activeness in conducting visual activity experiments, students are also required to state, formulate oral activities.

CONCLUSION

Based on the results of the research and discussion above, the conclusion that can be drawn is that there are significant differences in the mathematical literacy abilities of class VIII D MTs Salafiyah Syafiiyah Bandung before and after applying the CORE learning model. This is shown in the paired t test where the resulting significance value is 0,000 which is less than the error level used, which is 0.05, so that Ha: there are differences in students' mathematical literacy skills before and after applying the CORE learning model (connecting, organizing, reflecting, extending). This difference can be seen from the average results of the mathematical literacy test which shows that the average post-test score is higher than the pretest score. The results of this study can be used as a reference for further research, and the learning model used can be applied in learning to improve mathematical literacy student.

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