Jurnal Theorems (*The Original Reasearch Of Mathematics*)
Volume 9, Nomor 1, Juli 2024
URL: http://ejournal.unma.ac.id/index.php/th

e-ISSN: 2528-102X
p-ISSN: 2541-4321

# LEARNING ACTIVITIES AND MATHEMATICAL PROBLEM SOLVING ABILITIES USING THE CONNECTING ORGANIZING REFLECTING EXTENDING (CORE) LEARNING MODEL FOR CLASS VIII STUDENTS OF SMP NEGERI 8 BUKITTINGGI

Anisah Gustiany[*1], Haida Fitri[2], Isnaniah[3], Tasnim Rahmat[4]
Program Studi Pendidikan Matematika, UIN Sjech M Djamil Djambek Bukittinggi, Indonesia

***Corresponding Author*[*]:**
Anisah Gustiany,
Program Studi Pendidikan Matematika,
UIN Sjech Djamil Djambek Bukittinggi,
Jl. K.H Abdul Halim No. 103, Majalengka, Indonesia.
Email: anisa.ag120800@gmail.com
Contact Person: 0822-5045-4281

***Article Info:***
Received 2024-01-19
Revised 2024-01-27
Accepted 2024-02-17

*How to Cite:*
Gustiany, A., Fitri, H., Isnaniah., Rahmat, T. (2024). Learning Activities And Mathematical Problem Solving Abilities Using The Connecting Organizing Reflecting Extending (Core) Learning Model
For Class Viii Students Of Smp Negeri 8 Bukittinggi. *Jurnal Theorems (The Original Reasearch of Mathematics*, *9*(1), 1-9.

*ABSTRACT*

This research was motivated by problems in grade VIII of SMP Negeri 8 Bukittinggi. From the results of observations and interviews, it was obtained that there is a lack of student mathematics learning activities, students' ability to solve math problems is still low, and learning is still teacher-centered. One alternative to overcome this problem is to apply the CORE learning model. This study aims to determine student learning activities in mathematics learning using the CORE learning model, and to determine students' mathematical problem solving abilities using the CORE learning model better than conventional learning. This type of research is a pre-experiment with The Static Group Comparison research design. The population in this study was all grade VIII students of SMP Negeri 8 Bukittinggi with a total of 5 classes. The sample of this study is class VIII.5 as an experimental class and class VIII.3 as a control class. The instruments used in the study were observation sheets of student learning activities and final tests of mathematical problem solving abilities. The data obtained from this study showed that (1) student learning activities in mathematics learning using the CORE learning model reached a level of 74%, which was classified as active, and (2) students' mathematical problem solving ability using the CORE learning model was better than students who followed conventional learning.

**Keywords**: learning activities, mathematical problem solving skills, CORE learning model

## INTRODUCTION

Learning in education units must be interactive, inspiring, interesting, and challenging to stimulate students' active participation and provide sufficient opportunities for students' initiative, creativity, and independence in accordance with their talents, interests, and physical and mental development. Thus, it can be concluded that one of the standards of the learning process in educational units is that learning must be able to motivate students and enable students to actively participate in learning activities. According to Wardika (2017), student activity is very important during the learning process because effective learning is if students have the opportunity to learn independently or self-activity.

e-ISSN: 2528-102X
p-ISSN: 2541-4321

Learning activities are very important in the learning process. Someone cannot be said to be learning if there is no activity or learning taking place. Because learning is an action taken to obtain certain experiences in accordance with the desired goals. Active learning is a process where students actively participate in the process of understanding facts, concepts, and skills through activities and doing tasks. In this process, students have the opportunity to build their own knowledge, attitudes, and skills through learning activities that provide opportunities for students to actively participate.

Paul B. Diedric states that students must carry out various learning activities in order to achieve maximum learning objectives, namely: visual activities, oral activities, listening activities, writing activities, drawing activities, motor activities, mental activities, and emotional activities (Wanto, 2017). Daitin Tarigan (2014), also said that in learning activities, student activity must be considered because learning is basically doing. Without activity, the learning process cannot go well. Therefore, student activity is a very important principle or element in the learning process, including in learning mathematics which really demands active involvement of students in learning.

Mathematics is a field of science that is taught and used by all levels of education, starting from elementary school to college. Mathematics is one of the subjects that must be studied and is expected not only to provide students with skills in applying calculations and formulas in answering test questions, but also to be able to develop their thinking and analysis skills to solve everyday problems. According to the provisions in Permendiknas Number 22 of 2006, stipulates that one of the objectives of learning mathematics at the junior high school / MTs level is that students can master skills in solving problems, which include the ability to understand problems, make mathematical models, solve the models made, and interpret the solutions found.

Mathematics learning in schools mostly involves problem solving skills, because without the development of these skills, students will only learn to follow steps and imitate examples without real understanding of the concepts. In addition, mathematical problem solving is one of the learning objectives of mathematics and is one of the forms of learning outcomes. Problem-solving ability is a skill or potential that students have that allows them to solve various problems and use these abilities in everyday life.

According to Suratmi and Purnami, students need to have problem solving skills in order to follow the learning process well. Students must develop problem solving skills as a way to deal with problems related to learning activities, especially in the context of mathematics (Pratiwi & Alyani, 2022). Branca also emphasized the importance of problem solving skills in learning mathematics because (1) problem solving is the general purpose of teaching mathematics, (2) problem solving is an important part of the methods, procedures, and strategies of the mathematics curriculum, (3) problem solving is a basic skill in learning mathematics (Sumartini, 2016). Therefore, mathematical problem solving ability is an important part of the mathematics learning process. Based on the stages of mathematical problem solving ability by Polya, the indicators of mathematical problem solving ability are as follows: understanding the problem, planning strategies, implementing strategies, and checking back. (Argarini, 2018).

Based on the description above, a student should ideally be actively involved in learning and have a good ability to solve math problems. However, in reality, the ability to solve mathematical problems and the level of student participation in learning at school are still unsatisfactory and need to be improved. Based on observations and interviews, some of the findings found are: (1) the low level of student learning activities in mathematics, (2) students' ability in solving mathematical problems is still low, (3) learning is still centered on the role of the teacher, (4) the variety of learning models applied is still limited.

Less than optimal student activity in learning activities and low student math problem solving skills. It is suspected that this is because a learning model that requires students to be active in the learning process has not been applied. With active students in learning, it will have a positive impact on students, namely being able to play an active role in solving math problems. In order to improve the ability to solve math problems and active involvement of students in the learning process and overcome student boredom, teachers need to have the ability to choose the appropriate model, strategy, or method. One of the learning models that can be used to overcome these problems is the Connecting Organizing Reflecting Extending (CORE) learning model. Henceforth in this research, the Connecting Organizing Reflecting Extending (CORE) learning model is shortened to CORE learning model.

CORE learning model is a discussion learning model that focuses on students' ability to influence the development of their knowledge so that students are actively involved in the learning process and have the ability to solve or solve mathematical problems faced. This model involves the process of Connecting (connecting old information with new information or between concepts), Organizing (organizing the information obtained), Reflecting (reflecting back on the information that has been obtained), and Extending (expanding knowledge). The CORE learning model has advantages including: it can develop student activeness in learning and develop problem-solving skills. Based on the advantages of the CORE learning model. Therefore, this model is suitable for increasing involvement in the learning process and improving students' ability to solve math problems.

In accordance with the research results of Satriani, Dantes and Jampel (2015), in the journal of educational research and evaluation said that, the mathematical problem solving ability of students who followed the CORE learning model was significantly better than conventional learning. As well as

Jurnal Theorems (*The Original Reasearch Of Mathematics*)
Volume 9, Nomor 1, Juli 2024
URL: http://ejournal.unma.ac.id/index.php/th
e-ISSN: 2528-102X
p-ISSN: 2541-4321

Rizki Sariningtias (2022), said that, the CORE learning model emphasizes the involvement of student activities in learning activities. With active students in learning activities, it is expected to affect understanding and can develop mathematical problem solving skills.

Based on the description above, the authors are interested in conducting research with the title "Learning Activities and Mathematics Problem Solving Ability Using the Connecting Organizing Reflecting Extending (CORE) Learning Model for Class VIII Students of SMP Negeri 8 Bukittinggi".

## METHODE

The type of research conducted is experimental research. This research uses a pre-experiment approach. The research design used was The Static Group Comparison Design. The treatment given to the experimental group was the application of the CORE learning model, while the control group was conventional learning as usual. The population in this study included all VIII grade students at SMP Negeri 8 Bukittinggi. The research sample consisted of class VIII.5 as the experimental group and class VIII.3 as the control group.

The instruments used in this study are observation sheets of student learning activities during the learning process, as well as tests of mathematical problem solving skills in the form of essay questions. The data analysis techniques used include the use of observation sheets to observe student learning activities in the form of percentages during the learning process using the CORE learning model, and test data analysis through normality test and variance homogeneity test, then continued with data analysis using t-test.

## FINDINGS

a. Student Learning Activities

Data on student learning activities while using the CORE learning model was collected through direct observation by two observers during the learning process.

Table 1. Percentage Results of Observations of Student Learning Activities

| No. | Activity Indicator | Meeting to | I | | II | | III | | Rata-Rata |
|---|---|---|---|---|---|---|---|---|---|
| | | Number of Student present | 25 | | 26 | | 29 | | |
| | | Observed activity | jml | % | jml | % | jlm | % | % |
| 1. | *Visual activities* | Students read the instructions and problems in the LKPD | 15 | 60% | 20 | 77% | 25 | 86% | 74% |
| 2. | *Oral activities* | Students ask questions about material they do not understand both within the group and to the teacher. | 14 | 56% | 19 | 73% | 23 | 79% | 69% |
| 3. | *Listening activities* | Students listen to their friends presenting in front of the class | 17 | 68% | 21 | 81% | 26 | 90% | 80% |

e-ISSN: 2528-102X
p-ISSN: 2541-4321

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 4. | *Writing activities* | Students write the results of their discussion into the LKPD | 19 | 76% | 23 | 88% | 25 | 86% | 83% |
| 5. | *Mental activities* | Students solve the problems in the LKPD | 14 | 56% | 16 | 62% | 20 | 69% | 62% |
| **Persentase** | | | | 63% | | 76% | | 82% | |
| **Average** | | | | | | 74% | | | |

From table 1, it can be concluded that student activity in learning as a whole has increased significantly at each meeting. The average percentage of student activity after being calculated from each indicator shows 74%. By looking at learning activities with an average of 74% classified in the active category.

In the visual activities indicator, student learning activities read the instructions and problems contained in the LKPD at each meeting have increased. At the first meeting, the level of student activity reached 60%, which can be categorized as quite active. In the second meeting, the level of student activity increased to 77%, which can be categorized as active. Meanwhile, in the third meeting, the level of student activity reached 86%, which can be categorized as very active. The average student learning activity is 74%, which is also included in the active category.

In the oral activities indicator, students' learning activities asking questions about material that is not understood at each meeting have increased. At the first meeting, the level of student activity reached 56%, which can be categorized as quite active. In the second meeting, the level of student activity increased to 73%, which can be categorized as active. In the third meeting, the level of student activity reached 79%, which can also be categorized as active. The average student learning activity is 69%, which is included in the active category.

In the indicator of listening activities, students' learning activities listening to their friends presenting in front of the class at each meeting have increased. At the first meeting, the level of student activity reached 68% which was classified as an active category. In the second meeting, the level of student activity increased to 81%, which can be categorized as very active. In the third meeting, the level of student activity reached 90%, which can also be categorized as very active. The average student learning activity is 80%, which is included in the very active category.

In the writing activities indicator, students' learning activities in writing the results of their discussions into the LKPD at each meeting have increased. At the first meeting, the level of student activity reached 76%, which was classified as an active category. In the second meeting, the level of student activity increased to 88%, which can be categorized as very active. In the third meeting, the level of student activity reached 86%, also included in the very active category. The average student learning activity was 83%, which can be categorized as very active.

e-ISSN: 2528-102X
p-ISSN: 2541-4321

In the mental activities indicator, the learning activities of students writing the results of their discussions into LKPD at each meeting have increased. At the first meeting, the level of student activity reached 56%, which can be categorized as quite active. In the second meeting, the level of student activity increased to 62%, which is included in the active category. In the third meeting, the level of student activity reached 69%, which is also classified as active. The average student learning activity is 62%, which is classified as active.

In the experimental class, observations were made three times a meeting to see how student learning activities during learning by using the CORE learning model. Based on the observations of the observers, student learning activities generally increased every meeting, with an average of three meetings. Based on the learning activity criteria set by Nuraini, it can be concluded that student learning activities have generally reached an active level in each observed indicator.

From the explanation above, it can be concluded that the application of the CORE learning model is effective in increasing student involvement in the learning process. This finding is in line with what has been conveyed by Aris Shoimin (2014) and Nurhadifah Amaliyah et al. (2019), that the CORE learning model can develop students to be more active during learning. This research also supports the findings of research conducted by Edy and Fatchiyah (2022), the CORE learning model has a strong focus on student learning activities in connecting old information with new knowledge, organizing ideas, processing information, reflecting on learning activities, and strengthening understanding of newly acquired knowledge. Therefore, learning mathematics using this CORE learning model can increase student activeness in the learning process.

b. Math Problem Solving Ability Test

The final test is an essay question consisting of three questions. The results of the calculation were carried out to calculate the average value, and standard deviation for each sample class. These values are shown in the following table of the results of the calculation of students' mathematical problem solving ability data:

Table 2. Data Calculation Results of Mathematical Problem Solving Ability

| Kelas | $N$ | $X_{max}$ | $X_{min}$ | Rata-rata | $S$ |
|---|---|---|---|---|---|
| Eksperimen | 26 | 100 | 50 | 80,2 | 14,2 |
| Kontrol | 26 | 100 | 50 | 70,6 | 13,3 |

From the table above, it can be observed that there is a difference in the average value between the experimental class and the control class. The average value of the experimental class was 80.2 while the average value of the control class was 70.6. This shows that the average value of the experimental class is higher than the control class. Thus, based on these data, it can be concluded that learning using the CORE learning model is better than conventional learning.

Data analysis was conducted by testing normality to determine whether the data from the sample classes were normally distributed. In addition, the variance homogeneity test was also conducted to ensure that the variances of the two sample groups were comparable. Furthermore, hypothesis testing was conducted to test the significant difference between the two sample groups..

Table 3. Normality Test Result

| Kelas | α | *P-value* | *N* | $L_0$ | $L_{tabel}$ | Distribusi |
|---|---|---|---|---|---|---|
| Eksperimen | 0,05 | >0,150 | 26 | 0,143 | 0,161 | Kelas Berdistribusi Normal |
| Kontrol | | >0,150 | 26 | 0,139 | 0,161 | Kelas Berdistribusi Normal |

Based on table 3 presented, it can be seen that the Lo value is smaller than the Ltabel value for both the experimental and control classes. In addition, the P-value obtained through the use of Minitab software with a significance level of α = 0.05, also shows that the P-value > α. Therefore, it can be concluded that both sample data have a normal distribution.

Tabel 4. Variance Homogeneity Test Results

| α | *P-value* | $f_{table}$ | $f_{hitung}$ | Kesimpulan |
|---|---|---|---|---|
| 0,05 | 0,312 | 1,964 | 1,137 | Variansi Homogen |

The fcount value at the α = 0.05 significance level is smaller than the ftable. In addition, the P-value results obtained using Minitab software also show that the P-value is greater than α. Therefore, with fcount < ftabel and P-value > α, the null hypothesis (H0) is accepted while the alternative hypothesis (H1) is rejected. This indicates that the sample data has a homogeneous variance.Setelah mengetahui bahwa data dari kedua kelompok sampel terdistribusi secara normal dan homogen, langkah selanjutnya adalah melakukan uji hipotesis menggunakan uji-t. Hasil uji-t untuk kedua kelompok sampel dapat ditemukan pada tabel berikut ini:

Tabel 5. Hypothesis Test Results

| Kelas | N | Rata-rata | $t_{hitung}$ | $t_{tabel}$ | α | *P-value* |
|---|---|---|---|---|---|---|
| Eksperimen | 26 | 80,2 | 2,52 | 1,67 | 0,05 | 0,01 |
| Kontrol | 26 | 70,6 | | | | |

Based on this analysis, it can be concluded that with a tcount greater than the ttable, which is 2.52 which exceeds the ttable value of 1.67, and a P-value of 0.01 which is smaller than the real level

Jurnal Theorems (*The Original Reasearch Of Mathematics*)
Volume 9, Nomor 1, Juli 2024
URL: http://ejournal.unma.ac.id/index.php/th

e-ISSN: 2528-102X
p-ISSN: 2541-4321

α = 0.05, the null hypothesis (H0) can be rejected. Thus, it can be concluded that "students' mathematical problem solving ability using the connecting organizing reflecting extending (CORE) learning model is better than students who follow conventional learning".

From the data analysis, it can be observed that the average of experimental class students is higher than the average of control class students. The average of the experimental class students was 80.2, while the average of the control class students was 70.6. This shows that the average of the experimental class is better than the control class. Thus, it can be concluded that the use of the CORE learning model in students' mathematical problem solving is better than conventional learning. This is in line with the statement put forward by Aris Shoimin (2014), which states that the CORE learning model can develop problem-solving skills. This finding also supports research conducted by Dwi Suci et al. (2021), which shows that the CORE learning model is able to develop skills in problem solving. In learning activities, students are actively involved in building knowledge, so that learning becomes meaningful. In addition, this study also supports research conducted by Gusti Ayu et al. (2015), where the CORE learning model acts as a guide that helps students explore their abilities in solving the problems given.

## CONCLUSION

Based on the results of data collection and data analysis, it can be concluded from this research that: 1) student learning activity in mathematics learning using the CORE learning model is 74% based on the criteria, so the activity is classified as active, 2) students' mathematical problem solving abilities using the CORE learning model are higher. better than students who took conventional learning in class VIII SMP Negeri 8 Bukittinggi.

## REFERENCE

Agustianti, R., dkk. (2022). *Filsafat Pendidikan Matematika.* Padang Sumatera Barat : Global Eksekutif Teknologi.

Aliwanto. (2017). Analisis Aktivitas Belajar Siswa. *Jurnal Konseling*, 3(1), 64-71.

Ansori, M. (2014). Implementasi Pembelajaran Core (Connecting Organizing Reflecting Extending) Pada Materi Turunan Fungsi Untuk Meningkatkan Aktivitas Dan Kemampuan Pemecahan Masalah Siswa Kelas XI IPA 1 SMAN 1 Jerowaru. *Jurnal Media Pendidikan Matematika*, 2(2), 2338-3836.

Argarini, D. F. (2018). Analisis Pemecahan Masalah Berbasis Polya Pada Materi Perkalian Vektor Ditinjau Dari Gaya Belajar. *Jurnal Matematika dan Pembelajaran*, 6(1), 91-99.

Masita, F. N. (2022). *Pengembangan Pembelajaran Matematika.* Yogyakarta : Nas Media Pustaka.

e-ISSN: 2528-102X
p-ISSN: 2541-4321

Nurbaiti. (2022). *Pembelajaran Matematika Berbasis Problem Based Learning.* Jawa Tengah : Penerbit NEM.

*Peraturan pemerintah No. 19 Tahun 2005 tentang Standar Nasional Pendidikan*

Permendiknas RI, *Peraturan Menteri Pendidikan Nasional No. 22 Tahun 2006 Tentang Standar Isi Untuk Satuan Pendidikan Dasar dan Menengah.*

Pratiwi, D. T. dan Alyani, F. (2022). Kemampuan Pemecahan Masalah Matematika Siswa Kelas V SD Pada Materi Pecahan. *Journal For Lesson and Learning Studies*, 5(1), 136-142.

Rahma, A.T., dkk. (2020). Pengaruh Motivasi Belajar Siswa Terhadap Kemampuan Pemecahan Masalah Matematika Siswa di Kelas VIII MTsN 3 Agam Tahun Pelajaran 2018/2019. *Al-Qalasadi : Jurnal Ilmiah Pendidikan Matematika Iain Bukittinggi,* 4(1), 56-62.

Sariningtias, R., dkk. (2022). Pengaruh Penerapan Model Pembelajaran CORE Terhadap Kemampuan Pemecahan Masalah Matematis Siswa. *Jurnal Karya Pendidikan Matematika*, 9(2), 400-409.

Satriani, G. A. N. D., dkk. (2015). Pengaruh Penerapan Model CORE Terhadap Kemampuan Pemecahan Masalah Matematika dengan Kovariabel Penalaran Sistematis Pada Siswa Kelas III Gugus Raden Ajeng Kartini Kecamatan Denpasar Barat. *Jurnal Penelitian dan Evaluasi Pendidikan*, 5(1), 1-10.

Shoimin, A. (2014). *68 Model Pembelajaran Inovatif Dalam Kurikulum 2013.* Yogyakarta : Ar-Ruzz Media.

Suherman, E., dkk. (20A;03). *Strategi Pembelajaran Matematika Kontemporer.* Bandung : UPI)

Sumartini, T. S. (2016). Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa Melalui Pembelajaran Berbasis Masalah. *Jurnal Pendidikan Matematika STKIP Garut*, 5(2), 148-158.

Suryani, M. dkk. (2020). Analisis Kemampuan Pemecahan Masalah siswa Berdasarkan Kemampuan Awal Matematika. *Jurnal Pendidikan Matematika*, 9(1), 119-130.

Tarigan, D. (2014). Meningkatkan Aktivitas Belajar Siswa dengan Menggunakan Model Make A Match Pada Mata Pelajaran Matematika di Kelas V SDN 050687 Sawit Seberang, *Jurnal Kreano*, 5(1), 56-62.

Wardika, Kd. W., dkk. (2017). Penerapan Model CORE (Connecting, Organizing, Reflecting, Extending) Meningkatkan Hasil Aktivitas Belajar Perakitan Komputer Kelas X TKJ 2. *Jurnal Pendidikan Teknik Elektro Undiksha,* 6(3), 1-10.