Jurnal Penalaran dan Riset Matematika
Vol. 4 No. 2, 2025, pp: 129-140
p-ISSN2961-8134, e-ISSN2962-4150

Description of Mathematical Problem-Solving Ability Reviewed from the Learning Readiness of Grade VII Students of Unismuh Makassar Middle School

Sitti Rahmah Tahir1 Rezki Ramdani2 Sukmayanty Arifin
[1,2,3]Universitas Muhammadiyah Makassar, Indonesia.
** Author Correspondence. E-mail:sukmayantyarifin19@gmail.com*

ARTICLE HISTORY:
Received: August 30, 2025
Revised: September 12, 2025
Accepted: October 25, 2025
Published: October 30, 2025

KEYWORDS:
Description, Mathematical problem solving ability, Readiness to learn.

ABSTRACT
This study aims to: (1) describe the mathematical problem-solving ability in terms of the learning readiness of seventh-grade students of SMP Unismuh Makassar, (2) analyze how students with low, medium, and high learning readiness fulfill the four problem-solving indicators according to Polya (understanding the problem, making a plan, implementing the plan, and re-checking), and (3) identify the problem-solving stages that are most influenced by the level of learning readiness. This study uses a qualitative approach with a descriptive design. The data analysis technique uses the Miles and Huberman interactive model through three stages: data condensation, data presentation, and drawing conclusions. The results of the study show different patterns in problem-solving ability based on the level of learning readiness: (1) students in the low learning readiness category show limitations in three stages, only able to fulfill the indicator "making a plan" well, but not yet able to fulfill the indicators "understanding the problem," "implementing the plan," and "re-checking"; (2) students in the medium learning readiness category showed better abilities, able to fulfill three indicators ("making a plan," "implementing a plan," and "re-checking") well, although they were still not fully able to fulfill the "understanding the problem" indicator; (3) students in the high learning readiness category showed a unique pattern with strengths in the understanding and planning aspects, able to fulfill the "understanding the problem" and "making a plan" indicators well and correctly, but were not yet fully able to fulfill the "implementing a plan" and "re-checking" indicators.

Introduction

Education is crucial for humans because it is an investment in human resources for the future. It also serves as an effort to improve and develop the quality of human resources. With the rapid development of education, to adapt scientific advancements to our country's education system, educational institutions are tasked with improving their performance. To improve the quality of education, the teaching and learning process is crucial. One of the main factors influencing the quality of education is the quality of the learning process itself.

Mathematics is one of the subjects that must be taught in elementary and secondary schools. This is in line with the functions of mathematics, namely: 1) Forming and developing students' logical thinking skills so they can solve problems in everyday life, 2) Practicing communication skills using numbers and symbols, 3) Teaching students to always be oriented towards the truth through developing logical, critical, creative, objective, rational, careful, disciplined, and cooperative attitudes, and 4) Improving their ability to think logically and critically. Mathematics is one of the disciplines taught at all levels of education, from elementary to secondary level, even in higher education. Students are expected to develop mathematical skills in addition to personal development through mathematics. This expertise is the result of a combination of mathematics lessons with mastery of life skills that students will need in the future. Students need to master good mathematical skills to handle mathematical problems that occur throughout their lives and as provisions to face difficulties in the future. Mathematical literacy is one of the mathematical abilities that can be developed.

The learning process is influenced by several factors, one of which is readiness. Readiness itself, according to JamiesDrever (Slameto, 2010), is the willingness

to respond or react. Readiness itself can be defined as a student's willingness related to careful planning or readiness to apply skills. This must be considered during the student learning process because student learning outcomes will be better if they learn and are prepared. With good learning outcomes, it is hoped that students will understand how to solve problems.

Based on initial observations conducted on October 31, 2024, researchers interviewed a mathematics teacher at Unismuh Makassar Middle School. The interview revealed that some students lacked readiness to learn the material presented. This resulted in low student engagement in solving math problems, leading to a tendency to give up easily. Furthermore, students were less enthusiastic about taking notes during the teacher's presentation.

One contributing factor is students' high level of internet connectivity. During the learning process, students' attention is often diverted to their mobile devices, disrupting their concentration. On the other hand, student interviews revealed diverse perspectives on mathematics. Some students stated that they disliked mathematics if the teacher's teaching style was perceived as uninteresting or unexciting. Others stated that they sometimes enjoyed mathematics, but sometimes not, depending on the circumstances. Some students also enjoyed mathematics somewhat, although their motivation was not entirely consistent. Despite differences in their level of interest in mathematics, all students demonstrated a readiness to learn in the early stages of learning. This was indicated by routines such as reciting prayers before studying, preparing books, pens, rulers, and other tools needed to support the mathematics learning process. However, some students still struggled to grasp basic concepts, such as integers and the use of number lines. This information suggests that student motivation and readiness to learn are influenced by various factors, including teaching methods, classroom atmosphere, and the level of student engagement in the learning process.

Readiness to learn is one of the elements that plays a role in determining student success. Students must be ready to learn. When they are ready to learn, they tend to be more engaged in the learning process. One component that influences children's cognitive traits is their learning capacity (Slameto, 2010). Readiness to learn also indicates that students recognize the importance of learning.

Learning combined with good learning readiness will make it easier for students to understand and respond positively to the lessons given by the teacher. This condition clearly impacts student learning outcomes (AR Pratama, 2017). Students who are not prepared to learn will face difficulties, discomfort, and discouragement, including in learning mathematics.

Research Methods Research Types

The type of research used in this study is qualitative research using a descriptive approach. This approach aims to gather information about the phenomena occurring in the field during the study. This study aims to describe mathematical problem-solving abilities in terms of the learning readiness of seventh-grade students at SMP Unismuh Makassar.

Research Location

This research was conducted at Unismuh Makassar Middle School, located at Jl. Talasalapang No. 40 D, Gunung Sari, Rappocini District, Makassar City, South Sulawesi Province. This research was conducted in the 2025 academic year.

Research Subjects

The subjects of this study were seventh-grade students of SMP Unismuh Makassar. Each student was a subject. However, only three students participated in the mathematics problem-solving ability test and the interview session. The procedure for determining the subjects of this study was carried out by dividing students into groups based on high, medium, and low learning readiness categories using statements in a questionnaire distributed to 16 seventh-grade students as respondents. This study will only be conducted in one class, namely class
VII A2 SMP Unismuh Makassar. The mathematical problem-solving ability test was given to students in the form of a descriptive test consisting of one question on integers. Afterward, selected students were interviewed in person to obtain information.

Research Instruments

Research instruments include:

- Learning Readiness Questionnaire

  A learning readiness questionnaire is a research instrument used to measure the extent to which a person, especially a student, is ready to participate in the learning process. This questionnaire contains a series of statements designed to

  digging up information about the physical, psychological, emotional, material conditions and initial knowledge of students before they start learning activities.

- Mathematical Problem Solving Ability Test

  The instrument used in this study to measure mathematical problem-solving ability was a descriptive test designed to evaluate students' ability to analyze, formulate, and solve mathematical problems. This test is designed to measure students' critical thinking skills, logic, and creativity in applying mathematical concepts to real-world or abstract situations. The results of this test can provide an overview of the extent to which students understand and are able to apply mathematical concepts independently.

- Interview Guidelines

  The purpose of this instrument is to gain in-depth information regarding students' or related parties' understanding, experiences, and perspectives on mathematics learning. Interview guidelines were used to obtain qualitative data that cannot be captured through written tests, such as learning motivation, obstacles encountered, and other factors influencing students' learning processes. Interview results can help teachers or researchers understand students' learning contexts more holistically. The type of interview used was a semi-structured interview.

Data collection technique

- **Administration of Questionnaires and Tests**

  Data collection through questionnaires is conducted by providing or distributing a list of questions or statements to respondents in the hope of eliciting answers. This data collection method utilizes a list of statements given to research subjects to answer. The questionnaire method is used to collect data on students' learning readiness during the learning process. The learning readiness data referred to in this study are scores from statements made according to learning readiness indicators. A mathematical problem-solving ability test is an evaluation procedure aimed at assessing a person's ability to understand, analyze, and solve mathematical problems.

Interview

Interviews, conducted directly between subjects and researchers, are a data collection technique known as interviews. The interviews in this study were conducted with three subjects representing high, medium, and low levels of learning readiness, as determined based on the results of a math problem-solving ability test.

Results and Discussion of Research Results

The research results describe the mathematical problem-solving abilities of grade VII students of SMP Unismuh Makassar based on three categories of learning readiness.

Subjects in the Low Learning Readiness (LREA) Category

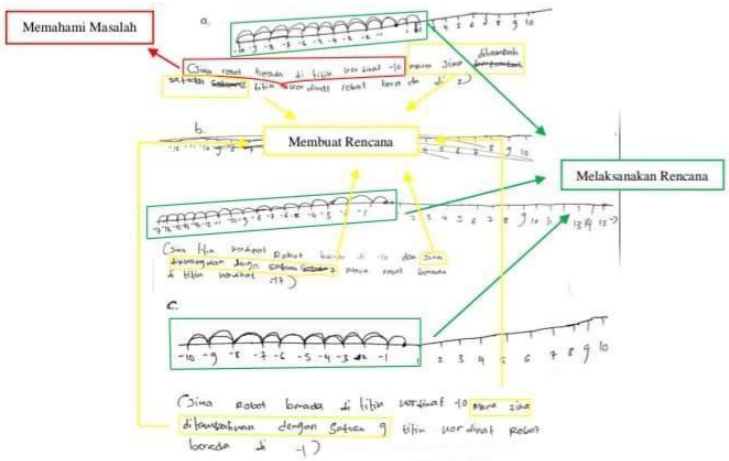

Figure 1 shows the KS answers. The low category subject was able to plan, based on both test and interview results. However, the subject was unable to understand the problem, implement the plan, and recheck the problem. In the understanding problem indicator, the subject made a mistake in understanding continuous movement, while in the implementing the plan indicator, the subject was inconsistent in continuing calculations from the previous position. Furthermore, in the rechecking indicator, the subject did not conduct an adequate check of the steps that had been completed. Thus, although the KR subject demonstrated a fairly good understanding of some indicators, there are still several areas that need improvement to improve overall mathematical problem-solving abilities.

Subject Category: Medium Learning Readiness (KS)

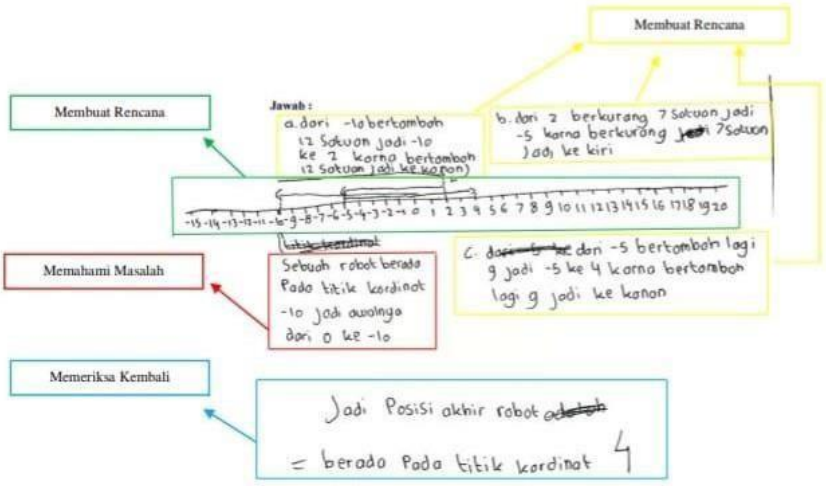

Figure 2 shows the KS's answers. Subjects in the moderate category are capable of three indicators: making a plan, implementing the plan, and reviewing, but are not yet capable of understanding the problem completely. This indicates that KS subjects have partial problem-solving skills and still need improvement in the initial stages of understanding the problem.

High Learning Readiness (KT) Category Subjects

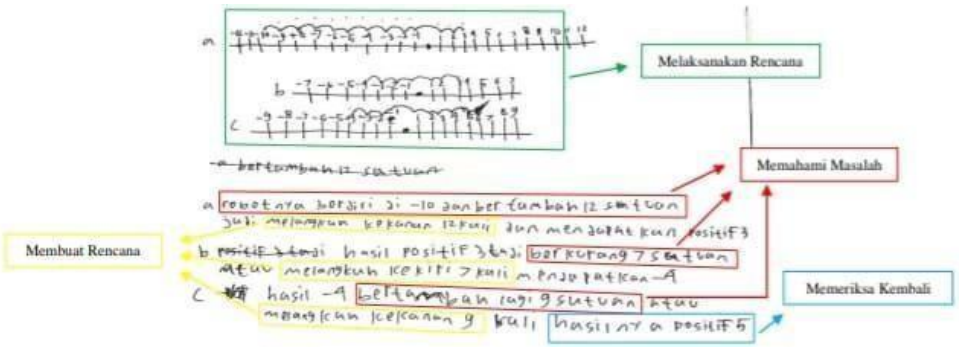

Figure 3 shows the KT answers. The high category subject was able to meet the indicators of understanding the problem and making a plan, but still failed to achieve the indicators of implementing the plan and reviewing it. This indicates that although the subject understood the problem and was able to formulate steps to resolve it, he still had difficulty executing the plan accurately and did not systematically review his work.

Discussion

The results of this study show variations in mathematical problem-solving abilities among seventh-grade students at Unismuh Makassar Middle School, categorized based on their learning readiness. These findings confirm that learning readiness significantly influences students' ability to solve mathematical problems, in line with the concept that the learning process is influenced by psychological factors such as readiness.

Students with low learning readiness demonstrated limited ability in solving mathematical problems using the Polya approach. Although KR was able to make a good plan, such as determining the starting position and direction of movement, and choosing the appropriate strategy, he struggled to understand the problem as a whole, especially regarding the continuous movement that should be considered. Furthermore, KR subjects were unable to execute the plan correctly because they often started calculations from the same starting point without considering the final position that should be the next starting point. KR also did not conduct adequate backchecks, so errors in calculation steps were not detected, resulting in inaccurate final results. These results are in line with the opinion of Suryadi (2012) who stated that low problem-solving ability in students is closely related to weak mastery of basic mathematical concepts and a lack of experience in solving contextual problems in stages.

Students with moderate learning readiness demonstrated good skills in three indicators of mathematical problem-solving using the Polya approach: planning, implementing the plan, and double-checking. However, the KS subjects were not yet able to fully understand the problem. Although they could explain the sequence of robot movements verbally in a fairly structured manner, their understanding of the problem context was still limited, particularly in relating the starting point and direction of movement to the overall problem. On the other hand, the KS subjects were able to design appropriate solution steps, implement the plan systematically and carefully, and double-check to ensure the accuracy of the results. However, the lack of understanding at the initial stage remained a major obstacle to comprehensive problem-solving. These results are in line with

with the findings of Simamora (2023) who stated that students with moderate abilities can understand problems, plan, and implement solutions, but still need to improve their ability to review their work results. Similarly, Malikah (2023) found that students with moderate abilities were able to solve problems according to Polya's theoretical stages, although there were small errors at each stage. In the test and interview results, subjects in the moderate category (KS) were able to plan and implement the solution steps well, according to Polya's theoretical stages, but still showed deficiencies in the problem understanding stage. KS subjects did not fully understand the problem as a whole, which is in accordance with Simamora's findings that students with moderate abilities can understand problems and implement solutions, but need to further improve their ability to review their work results. This is also in line with Malikah's findings that students with moderate abilities can solve problems according to Polya's stages although there were small errors at each stage, as happened to KS subjects who were not fully adequate in understanding the problem but were quite good in other stages.

Students with high learning readiness demonstrated good problem-solving skills and developed a plan for solving mathematical problems using the Polya approach, but struggled to implement the plan and review their results. The KT subjects were able to identify important information in the problem and clearly formulate steps for solving, demonstrating a good understanding of the problem context. However, in implementing the plan, the subjects lacked thoroughness in their calculations, resulting in errors in the final results. Furthermore, although the subjects attempted to review their results, they did not employ a systematic or in-depth review strategy, resulting in errors in the process going undetected. Thus, although the KT subjects were able to plan and understand the problem well, their ability to implement and review their results still needed improvement. These results indicate that although the subjects had a good understanding of the problem and were able to plan a solution, there were still weaknesses in their

implementing plans and reviewing work results. This aligns with the findings of Purnamasari and Setiawan (2019) who stated that students with high initial mathematical abilities still experienced difficulties in reviewing their work results.

Table 1 Mathematical Problem Solving Ability of Subjects in Low, Medium, and High Categories

Problem Solving Indicator	Readiness to Learn		
	KR	KS	KT
1. Understand the Problem	–	–	□
2. Make a Plan	□	□	□
3. Implement the Plan	–	□	–
4. Double Check	–	□	–

2. Conclusion and Suggestions

- Students with low learning readiness are only able to plan problem solving, but fail to meet other indicators such as understanding the problem, implementing the plan, and evaluating the results. They have difficulty understanding the problem comprehensively, are stuck in limited understanding, and cannot execute the plan properly due to errors in steps and calculations. Furthermore, they also do not double-check after completing problem-solving problems, indicating weaknesses in mastery of basic concepts and self-reflection skills.
- Students with moderate learning readiness can effectively meet the three indicators of problem-solving ability: designing a solution, implementing the plan, and reviewing. However, their understanding of the core issues is still lacking, particularly in connecting information comprehensively. However, they demonstrate strong evaluative skills when reviewing their work.
- Students with high learning readiness are able to understand problems and plan solutions effectively. However, they still struggle to execute their plans and accurately review their work. Although they can identify information and develop steps,

steps well, they are less thorough in implementation and have not implemented a proper inspection strategysystematic, so that some errors go undetected.

Suggestion

Based on the findings, analysis and conclusions outlined previously, here are some suggestions that can be given:

1. For students, it is recommended that they practice solving mathematical problems more often in a systematic and thorough manner.
2. For teachers, it is hoped that the learning process can be optimized by getting students used to being actively involved in mathematical problem-solving activities, in order to encourage students' development in their critical and analytical thinking skills.
3. For future researchers, it is hoped that this research can be further developed by expanding the scope of the variables studied and involving a more diverse range of subjects. This step is believed to make a significant contribution to enriching studies related to students' mathematical problem-solving abilities.

BIBLIOGRAPHY

Abdurrahman, R., & Hadi, M. S. (2023). Hubungan Kesiapan Belajar Dengan Hasil Belajar Matematika Peserta Didik. CommunityDevelopment Journal: Jurnal Pengabdian Masyarakat, 4(2), 1529-1535.

Alwiyah, D., & Imaniyati, N. (2018). Keterampilan mengajar guru dan kesiapan belajar siswa sebagai determinan terhadap hasil belajar siswa. Jurnal Manajerial, 17(1), 95-103.

Lestari, I. (2015). Pengaruh waktu belajar dan minat belajar terhadap hasil belajarmatematika. Formatif: jurnal ilmiah pendidikan MIPA, 3(2).

Malikah, S. (2023).Analisis kemampuan pemecahan masalah matematis Siswa pada barisan danderetaritmetikaberdasarkanteoriPolya. Primatika:JurnalPendidikan Matematika, 12(2), 89-98.

Nurfitriyanti, M. (2016). Model pembelajaran project based learning terhadap kemampuan pemecahan masalah matematika. Formatif: Jurnal Ilmiah Pendidikan MIPA, 6(2).

Nanang, N. (2012). Meningkatkan Kemampuan Siswa dalam Pemecahan Masalah Matematik melalui Pendekatan Metakognitif. Mosharafa: Jurnal Pendidikan Matematika, 1(1), 1-8.

Purnamasari, I., & Setiawan, W. (2019).Analisis kemampuan pemecahan masalah matematis siswa SMP pada materi SPLDV ditinjau dari kemampuan awal matematika. Journal of Medives: Journal of Mathematics Education IKIPVeteran Semarang, 3(2), 207-215.

Sumartini,T.S.(2016).Peningkatankemampuanpemecahanmasalahmatematissiswamelalui pembelajaran berbasis masalah.Mosharafa: Jurnal Pendidikan Vol.4No2,Tahun2025,hal.129-140Jurnal Penalaran dan Riset MatematikaVol. 4No. 2, 2025, pp: 129-140p-ISSN 2961-8134, e-ISSN 2962-4150140 Matematika, 5(2), 148-158.

Sugiyono, P. D. (2023). Metode Penelitian Kualitatif (Untuk penelitian yang bersifat : eksploratif, enterpretif, interaktif dan konstruktif).Alfabeta Bandung:Alfabeta

Sholikhah,A.(2018). Deskripsi Kemampuan Pemecahan MasalahDitinjau dari Kesiapan Belajar Siswa pada Siswa Kelas VII SMP Negeri 1 Kalimanah (Doctoral dissertation, Universitas Muhammadiyah Purwokerto).\ggSlameto.(2013).Belajardanfaktor faktoryangmempengaruhinya.Jakarta:PTAsdi.

Simamora, E. W. (2023). Analisis Kemampuan Pemecahan Masalah Matematis Siswa SD Berdasarkan Teori Polya. Jurnal Pendidikan dan Konseling (JPDK), 5(2), 2783-2789.

Widiarti, E. (2018). Pengaruh Motivasi Belajar dan Kesiapan Belajar Siswa Terhadap Hasil Belajar Mata Pelajaran Ekonomi Siswa Kelas X Ilmu-Ilmu Sosial di SMA Negeri 2 Banguntapan, Bantul. Jurnal Pendidikan Ekonomi, 7(4), 298-305.

Wanto,A.H.(2017).StrategipemerintahKotaMalangdalammeningkatkankualitaspelayanan publik berbasis konsep smart city.JPSI (Journal of Public Sector Innovations),2(1), 39-43.

Zuschaiya, D., Wari, E., Agustina, Y., & Lailiyah, S. (2021). Pengaruh kesiapan belajar dan kemampuan berhitung terhadap hasil belajar matematika. JPMI (Jurnal Pembelajaran Matematika Inovatif), 4(3), 517-52