International Journal of Research and Review
Vol. 10; Issue: 1; January 2023
Website: www.ijrrjournal.com
E-ISSN: 2349-9788; P-ISSN: 2454-2237

Increasing Students' Mathematical Problem Solving Ability Through Realistic Mathematics Education (RME)

Suryo Widodo[1], Ika Santia[2], Yuni Katminingsih[3], Aprilia Dwi Handayani[4]

[1,2,3,4]Department of Mathematics Education, Nusantara PGRI University of Kediri, Indonesia

Corresponding Author: Suryo Widodo

DOI: https://doi.org/10.52403/ijrr.20230109

ABSTRACT

This study aims to 1) analyze the improvement of mathematical problem-solving skills with realistic-based learning (Realistic Mathematics Education RME) as a whole and 2) analyze the improvement of mathematical problem-solving skills with realistic-based learning (Realistic Mathematics Education RME) based on education level. The sampling technique used was purposive sampling. The research method is a meta-analysis with a sample of 20 national journal articles. The data analysis technique used Cohen's d effect size. Sampling consisted of four levels, namely Elementary School (SD), Junior High School (SMP), Senior High School (SMA), and tertiary institutions. The results of the meta-analysis show that increasing mathematical problem-solving skills through realistic-based learning (Realistic Mathematics Education RME) has an Effect Size at the Elementary School (SD) level = 0.90 (high effect), at the Junior High School (SMP) level = 0 .63 (medium effect), at the high school level (SMA) = 0.23 (small effect). At the university level, it is 0.38 (small effect). Between the education levels of Elementary School (SD), Junior High School (SMP), High School (SMA), and College, the average value of Effect Size = 0.67 (moderate effect).

Keywords: Meta-analysis, Realistic Mathematics Education (RME), Mathematical problem-solving ability

INTRODUCTION

Education is an effort to develop the knowledge and abilities of students so that they have the potential to become real and can be helpful in everyday life. Education is one tool to measure the progress of a nation. The progress of a nation cannot be separated from a high level of educational success because education affects many things that affect the progress of a country. Therefore the success rate of a country's education determines the survival of its people. *Mathematics* is a universal science that underlies the development of modern technology and has an essential role in various scientific disciplines, and advances human thinking. The problem is that many students still do not like mathematics and think mathematics is boring (Nurjanah, 2019). Therefore, learning mathematics should focus on gaining knowledge and increasing mathematical skills achievement. This situation affects students' problem-solving abilities.

Problem-solving ability is the skill or potential possessed by students in solving problems and applying them in everyday life. Problem-solving ability is an effort students make in analyzing to find a solution to a problem they face. Education is essentially a continuous human process to overcome the problems faced throughout life (Hudojo, 2003, p. 148). Someone with high problem-solving abilities is expected to be able to deal with change, survive and make the right decisions in life in an ever-evolving world. However, the results of the PISA survey for math problem-solving skills every year show

Indonesia always scores below the international average and ranks below. In this survey, one aspect of mathematical problem-solving ability assessed was the ability to solve mathematical problems (Tarudin, 2012). The results of the 2012 PISA study, Indonesia was ranked 64th out of 65 participating countries with an average score of 375, while the international average score was 494. The results of the 2015 PISA study showed Indonesia was ranked 63rd out of 70 participating countries with an average score -average 386, while the international average score is 490 (OECD, 2016).

In addition, problem-solving is a crucial part of the mathematics curriculum because in the learning process and its completion, it is possible for students to gain experience using the knowledge and skills they already have to apply to solving non-routine problems (Suherman et al., 2001, p. 83). One of the factors causing the low ability to solve mathematical problems is the selection of learning models that are not appropriate for the conditions of students. One of the learning models that can be used to improve math skills is Realistic Mathematical Education (RME). The realistic mathematics learning model or Realistic Mathematics Education (RME) is a teaching approach based on real things for students (Zulkardi, 2006). This theory emphasizes process skills, discussing and collaborating, and arguing with classmates so that they can find out for themselves (Student Inviting), as opposed to the teacher giving (Teaching Telling). In the end, students use mathematics to solve problems individually or in groups. The main idea of the realistic / RME mathematics learning model is that humans must be allowed to reinvent mathematical ideas and concepts with adult guidance (Gravemeijer, 2009). Efforts to reinvent mathematical ideas and concepts are carried out by utilizing reality and the environment close to children. Research on learning realistic mathematics/RME has been carried out, and the results reveal that learning realistic mathematics/RME increases students' mathematical problem-solving abilities; however, many studies have been carried out by applying different types of Realistic Mathematics/RME learning.

Along with the large number of thesis research that discusses the same topic or study with various characteristics and results contained therein, it demands re-examining the research. The aim is to review related or similar studies to obtain accurate conclusions. One method that can be used to obtain accurate and credible results is the meta-analysis method. Meta-analysis is a statistical method for combining quantitative results from several studies to produce an overall summary of empirical knowledge on a particular topic (Anadiroh, 2019). This method aims to answer questions concerning the problem of differences between the experimental and control groups if it is based on research results that continue to increase from year to year (Prasetiyo et al., 2010). The meta-analysis states the findings of the study by Effect Size. This is done to examine the diversity or non-diversity of research results due to the increasing number of similar studies and often increasing the variation in research results. Based on this background, a study will be conducted entitled "Meta Analysis of Increasing Mathematical Problem Solving Ability through Realistic Mathematical Education (RME) Learning". (Meta-analytic study on research articles in the Mathematics Education study program published in journals accessed via Google Scholar)

MATERIALS & METHODS

This research is a meta-analysis using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) method. The choice of the PRISMA method was based on the consideration that it has very systematic stages and correct procedures according to scientific research principles (Parwata, 2021). The steps of the PRISMA method are: 1) background and purpose, 2) research question, 3) searching for the literature, 4) selection criteria, 5) practical screen, 6) quality checklist and procedures, 6) data extraction strategy, 7)

data synthesis strategy (Retnawati et al., 2018). Operationally, the steps for implementing the PRISMA method are described in Figure 1.

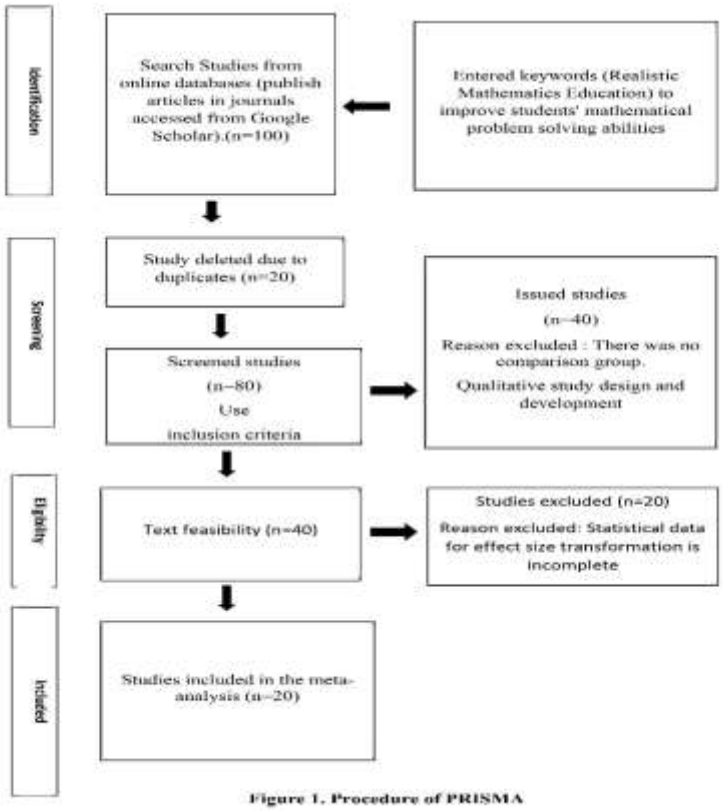

Figure 1. Procedure of PRISMA

The research questions were formulated based on pre-post contrast, which aims to examine changes in the problem-solving ability variable before and after treatment using the RME learning model. The research population is similar studies and is relevant to the title of the effect of the RME learning model on students' problem-solving abilities. Search research data using the Google Scholar database (https://scholar.google.com/). The research sample was selected from the population using the following criteria: (1) determining keywords, namely RME, Realistic Mathematics Education, problem-solving, and problem-solving ability; (2) country: Indonesia; (3) types of publications, namely scientific articles in national journals obtained from Google Scholar; (4) year of free publication; and (5) the type of quasi-experimental research design is nonequivalent pre-test and post-test control group design. The flow of searching articles and proceedings can be shown in Figure 2 as follows.

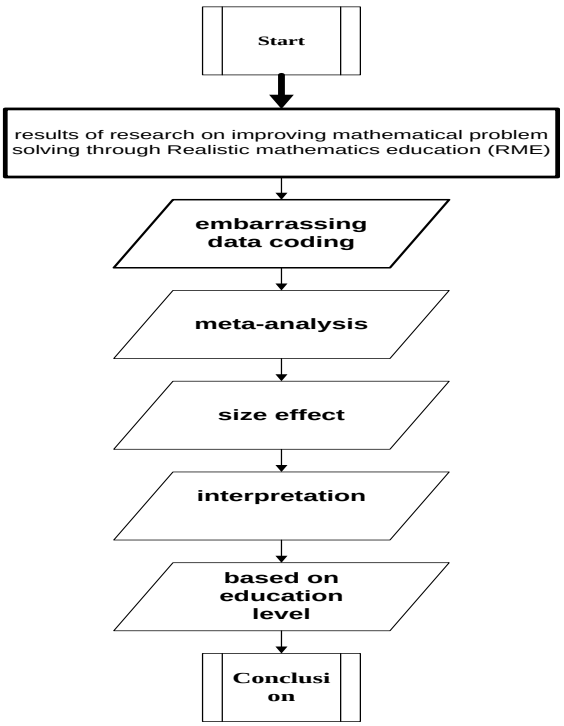

Figure 2. Article search flow

This research was conducted from March to June 2022 in Kediri (Nusantara University PGRI Kediri). The research data were processed and analyzed using manual calculations with a formula to calculate the effect size value of the articles that were the research samples. The criteria used to form the interpretation of the effect size results using reference from Cohen's (Becker, 2000) are shown in

Table 1. Interval effect size

No	Interval	Interpretasi
1	$0{,}2 \leq d < 0{,}5$	Small leffect
2	$0{,}5 \leq d < 0{,}8$	Moderate effect
3	$d \geq 0{,}8$	Large effect

RESULT

The research questions were formulated based on pre-post contrast, which aims to examine changes in the problem-solving ability variable before and after treatment using the RME learning model. The research population is similar studies and is relevant to the title of the effect of the RME learning model on students' problem-solving abilities. Search research data using the Google Scholar database (https://scholar.google.com/). The research sample was selected from the population using the following criteria: (1) determining keywords, namely RME, Realistic Mathematics Education, problem-solving, and problem-solving ability; (2) country: Indonesia; (3) types of publications, namely scientific articles in national journals obtained from Google Scholar; (4) year of free publication; and (5) the type of quasi-experimental research design is nonequivalent pre-test and post-test control group design. The flow of searching articles and proceedings can be shown in Figure 2 as follows.

Table 2. Research sample data

No	Code	Year	Author	Title	Journal
1	A 1.1	Nomor 1, Tahun XI, 2008	Sri Wulandari Danoebroto.	Improving Problem Solving Skill Using The Pmri And Metacognitive Training	Jurnal Penelitian Dan Evaluasi Pendidikan
2	A 1.2	Vol. 6, No.2, Agustus 2019	Winarti Dwi Febriani, Geri Syahril Sidik, Dan Riza Fatimah Zahrah.	The Influence of Realistic Mathematics Education and Direct Instruction Learning on Problem Solving and Mathematical Communication Ability of Elementary School Students	Jurnal Tunas Bangsa
3	A 1.3	Vol 4. No. 1, (2017)	Asrina Mulyati	The Influence of the RME Approach on Students' Problem-Solving Ability in Mixed Count Operations Material in Class IV Sd It Adzkia I Padang	Jurnal Didaktik Matematika
4	A 1.4	Vol. 2 (3) 2018	I Kadek Agus Alit Dwipayana, Desak Putu Parmiti, Komang Sujendra Diputra	The Effect of Open Ended Based Realistic Mathematics Education Approach on the Thinking Ability of Grade V Elementary Students	Journal Of Education Technology
5	A 1.5	2017	Mety Asih Purnamasari, S.Pd.I	Effect of Realistic Mathematics Learning Approach on Mathematical Problem-Solving Ability	Jurnal INSTITUT AGAMA ISLAM NEGERI PURWOKERTO
6	A 1.6	Volume 3, Number 2, Tahun 2019.	Utami Dewi Narayani	The Effect of a Realistic Mathematical Approach Based on Concrete Media Assisted Problem Solving on Mathematics Learning Outcomes	Jurnal Ilmiah Sekolah Dasar
7	A 1.7	Volume 6, Nomor 1 Tahun 2019	Ismi Danic, I Gusti Ngurah Japa, Dan Komang Sujendra Diputra	Strengthening Students' Mathematical Problem Solving Ability Through Open-Ended Based Realistic Mathematics Learning	Jurnal Ilmiah Pendidikan Citra Bakti
8	A 2.1	Vol. 6 No. 1, Mei 2020	Rianita Simamora	Model Realistic Mathematic Education Ditinjau Dari Aspek Kemampuan Pemecahan Masalah Aljabar	Jurnal Math Educator Nusantara (JMEN)
9	A 2.2	Vol. 5 No. 1, (2021)	Ima Nurfadilah, Hepsi, Abdul Fatah	Using Realistic Mathematics Education In Mathematical Problem-Solving Ability Based On Students' Mathematical Initial Ability	Jurnal Prima Pendidikan
10	A 2.3	Vol. 2 No. 2, (2018)	Saprizal	Utilization of Audio Visual Media Based on Realistic Mathematics Education (RME) on the Problem-Solving Ability of Mts Raudhatun Najah Langsa Students	Jurnal Ilmiah Pendidikan Matematika ALQALASADI
11	A 2.4	Vol 3, No 2, (2017)	Susanti	Improving Mathematical Problem-Solving Ability and Self-Efficacy of MTs Students	Suska: Journal Of Mathematics Education

				Through a Realistic Mathematics Education Approach	
12	A 2.5	Vol.3 No.2 Edisi Januari 2018	Muhammad Syahril Harahap	Improving Mathematical Problem Solving Ability With the Use of Rme (Realistic Mathematics Education) Teaching Materials	Jurnal Education And Developmentinstitut Pendidikan Tapanuli Selatan
13	A 2.6	2020	RENI WAHYUNI	The Influence of Realistic Mathematical Education (Rme) Models on Students' Ability to Understand Mathematical Concepts at State Junior High School 7 Muaro Jambi	Jurnal Universitas Islam Negeri Jambi
14	A 2.7	Volume 6, Nomor 2, 2020	Hasniati, Ernawati Jais, Dan Herlawan.	Improving Problem-Solving Ability Through Realistic Mathematics Education (Pmr) in Grade VII Students of Tomia 1 Middle School	Jurnal Akademik Pendidikan Matematika
15	A 2.8	Volume 01, No 02, September 2019	Endi Zunaedy Pasaribu, Mesra Wati Ritonga, Dan Nur Diana Hasibuan.	The Effect of a Realistic Mathematics Education Approach on Students' Mathematical Understanding Ability at Mts. Al-Washliyah Simpang Marbau	Jurnal Pena Cendikia
16	A 2.9	2010	Syarif Hidayatullah Jakarta	The Effect of a Realistic Mathematics Education Approach on Students' Mathematical Problem-Solving Ability	Jurnal Universitas Islam Negeri Jakarta
17	A 2.10	Vol. 6 No. 1, Mei 2020	Rianita Simamora	Realistic Mathematical Education Model Viewed From The Aspect Of Algebraic Problem-Solving Ability	Jurnal Math Educator Nusantara (JMEN)
18	A 3.1	2018	Vera Nopianti, Siregar, Ramlah, Kiki Nia Sania Effendi	Application of Realistic Mathematics Education (RME) Approach to High School Students' Mathematical Problem-Solving Ability	Sesiomadika: Prosiding Seminar Nasional Matematika
19	A 3.2	Vol. 1, No. 2, (2016)	Sarbiyono	Application of a Realistic Mathematical Approach to Students' Mathematical Problem-Solving Ability	JRPM (Jurnal Review Pembelajaran Matematika)
20	A 4	Vol. 04 No. 01, Juni 2019	Shinta Maya Sari	The Effect of a Realistic Mathematics Education (RME) Approach With a Concept Map Strategy on the Mathematical Problem-Solving Ability of PGMI IAIN Bengkulu Students	Jurnal Pendidikan Matematika Raflesia

Statistical data were recorded from each of the research samples above, including the number of samples for each experimental and control group, the mean value (mean), and the standard deviation (SD). Furthermore, the effect size calculation of the sample components that are late to be obtained is carried out according to the criteria and formula that have been determined. The data and results of the overall effect size calculation are presented in Table 3 and Figure 3 below.

Table 3. Overall effect size data

No	Code	Lots of Samplesl		Average		SD comb	ES
		Exsp group	Control group	Exsp group	control group		
1	A 1.1	22	26	22,91	20,85	58,00	0,03
2	A 1.2	34	33	71,32	61,51	28,27	0,34
3	A 1.3	40	41	73,92	64,82	31,00	0,29
4	A 1.4	60	60	98,25	57,24	19,47	2,10
5	A 1.5	18	18	86,10	71,72	11,73	1,22
6	A 1.6	30	30	19,36	13,70	18,34	0,30
7	A 1.7	36	38	77,00	56,00	10,13	2,07
8	A 2.1	30	30	60,70	52,30	37,04	0,22
9	A 2.2	14	10	51,57	39,80	32,81	0,35
10	A 2.3	31	31	79,48	74,91	23,58	0,19
11	A 2.4	33	33	80,01	79,20	16,80	0,04
12	A 2.5	33	32	32,00	24,32	10,18	0,75
13	A 2.6	20	20	77,00	57,75	17,73	1,08
14	A 2.7	32	32	84,70	65,25	9,65	2.01
15	A 2.8	30	20	77,70	60,00	19,57	0,90
16	A 2.9	30	30	31,00	19,50	19,31	0,22
17	A 2.10	30	30	60,76	52,38	37,04	0,22
18	A 3.1	36	36	80,31	77,42	13,06	0,25
19	A 3.2	40	40	10,15	8,85	5,13	0,38
20	A 4	35	34	78,76	71,53	18,58	0,38
Average 20 Article							0,67

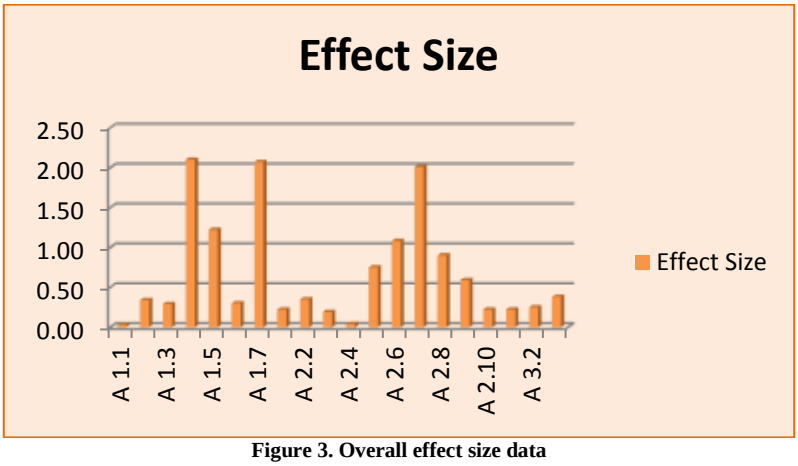

Figure 3. Overall effect size data

The results of the data analysis in Table 3 and Figure 3 show that there are 6 articles with a large effect size value, 2 articles with a medium effect size value, and 12 articles with a small effect size value. From the calculation, the total effect size is 0.67 in the medium category. Thus it can be concluded that there is an influence of the RME learning model on problem solving abilities with a moderate effect. These criteria are in accordance with Cohen's reference (Becker, 2000), namely:

Small effect : $0{,}2 \leq d < 0{,}5$
Moderate effect : $0{,}5 \leq d < 0{,}8$
large effect : $d \geq 0{,}8$

Based on the calculation of the overall average effect size. The average calculation will also be carried out based on the level of education. The following is an Effect Size diagram for each level of education starting from Elementary School (SD), Junior High School (SMP), Senior High School (SMA) and Higher Education (Figure 4).

Gambar 4. Diagram *effect size* semua jenjang

Based on Figure 4 above, the average SD level ES score is in the Large effect, the SMP level average ES score is in the Moderate effect, the SMA level ES average score is in the Small effect while the ES average score is in the College level to small effect. This means that the increase in mathematical problem-solving skills based on realistic learning has an average RME of ES = 0.67 with Moderate effect criteria.

DISCUSSION

This study uses the meta-analysis method to determine the influence of the Realistic Mathematics Education (RME) learning model on mathematical problem-solving abilities. To find out the effect on this

learning, it is necessary to calculate the effect size so that it can be mapped and analyze the influence involved in Realistic Mathematics Education (RME) learning.

The effect size calculation is carried out on the raw data contained in the statistical data of the article. The results of these calculations form the basis of the meta-analysis process. The magnitude of the influence of Realistic Mathematics Education (RME) on students' mathematical problem-solving abilities is obtained: the resulting size is in the medium category, namely Moderate 0.67 in Cohen's criteria d. This figure means that the Realistic Mathematical Education (RME) model in mathematics learning can improve the problem-solving abilities of students in the experimental class by 0.67 times the influence of the control class. While the article with the smallest effect size value is an article with code A 1.1 (0.03), and the one with the most significant effect size is an article with code A 1.4 (2.10). This explains that learning mathematics using the Realistic Mathematical Education (RME) learning model is effective and suitable for the classroom learning process, so the Realistic Mathematical Education (RME) learning model is more suitable for use in mathematics classes than conventional learning models. In addition, the influence of Realistic Mathematics Education (RME) on students' problem-solving abilities based on educational level revealed that the elementary school level improved students' mathematical problem-solving abilities in the experimental class of 0.90 in the high category. The highest effect size value of 2.10 in article A 1.4, and the smallest effect size value is 0.03 in article A 1.1. The highest Effect Size value for the SD level is article A 1.4. at the junior high school level, it improved students' mathematical problem-solving abilities in the experimental class by 0.63. The largest effect size value of 2.01 in article A 2.7, and the smallest effect size value is 0.04 in article A 2.4. At the high school level, it improved students' mathematical problem-solving skills in the experimental class by 0.23. With a supremum effect size value of 0.25 in the article A 3.2 and an infimum effect size value of 0.22 in article A 3.1. At the university level, it is 0.38

Applying the Realistic Mathematics Education (RME) learning model at these four levels of education has effects in different categories. The value of this effect size is in the category in Cohen's criteria d. This shows that the use of the Realistic Mathematical Education (RME) model is suitable and more effective at the Elementary School (SD) level because it has a maximum effect size level of 0.90, which is suitable for use in efforts to improve mathematical problems solving skills at various levels of education in Indonesia.

CONCLUSION

Overall, the Realistic Mathematics Education (RME) learning model is able to improve students' mathematical problem-solving skills in the experimental class with an effect size of 0.67 times that of the control class. The effect of applying Realistic Mathematics Education (RME) learning based on educational level is able to improve students' mathematical problem-solving abilities. At the primary school level, the mean ES is (0.90) in the high category. At the same time, the average ES for the junior high school level is (0.63) in the moderate category. The average ES for the SMA level is (0.23) with the small category. Then in universities in the low category with an average score of ES (0.38). So based on the results of these data, it can be concluded that Realistic Mathematics Education (RME) Learning is more effective and well applied at the elementary level education level because it produces a higher effect size value than the other levels, namely an Effect Size of 0.90.

Declaration by Authors

Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Achmad, A., Irmansyah, (2011), The Effectiveness of Learning Mathematics Through Realistic Mathematics Education (RME) Learning Models on Increasing Understanding of Elementary Students' Mathematical Concepts, Journal of Education, 12(1), 33-40, https://doi.org/10.33830/jp.v12i1.483.2011
2. Amin, M. K., (2020), Meta-Analysis Of The Effectiveness Of Cooperative Learning On Mathematics Learning Achievement (Meta-Analysis Thesis Research Study of Mathematics Education Students at Pancasakti University, Tegal, 2016 to 2019), Dissertation, Universitas Pancasakti Tegal, http://repository. upstegal.ac.id/ id/eprint/2266
3. Pasaribu, E.Z, Ritonga, M.W, Hasibuan, N.D., (2019), The Effect of a Realistic Mathematics Education Approach on Mathematical Understanding student AbilitySiswa on MTs Al-Washliyah Simpang Merbau, *Pena Cendekia*, 1(2).
4. Fadhliyah, (2020), Meta-Analysis of the Effect of Cooperative Learning Models on Mathematics Learning for Elementary School Students. Theses, UIN Syarif Hidayatullah, Jakarta.
5. Firmansyah, U. A., Tandililing, E., dan Mursyid, S., (2022), Meta-Analysis of Research on Problem Based Learning in 2013-2018, Equatorial Journal of Education and Learning *(JPPK)*, 11(6), 158-167, http://dx.doi.org/10.26418/jppk.v11i6.55254 .
6. Fitriana, H. (2010). The Effect Of Realistic Mathematics Education Approaches On Students' Mathematical Problem-Solving Ability. *Theses* UIN Jakarta
7. Hasniati, Ernawati Jais, H. (2020). Improving Problem Solving Ability Through Realistic Mathematics Education (PMR) in Grade VII Students of SMP Negeri 1 Tomia. *Jurnal Akademik Pendidikan Matematika*, 6(2) 133–139.
8. Ismi Danic, I Gusti Ngurah Japa, K. S. D. (2019). Strengthening Students' Mathematics Problem Solving Ability Through Open-Ended Realistic Mathematics Learning. *Jurnal Ilmiah Pendidikan Citra Bakti*,6, 9–22.
9. KUSUMADEWI, R. (2018). Implementation Of The Problem-Based Instruction Model To Improve The Mathematical Problem-Solving Ability And Mathematical Disposition Of Smp Students *(Doctoral dissertation, FKIP UNPAS).*
10. Lisa. (2019). Application of Realistic Mathematics Learning to Improve Mathematical Problem Solving Ability of Students of SMP Negeri 8 Lhokseumawe. 3(1), 363–372.
11. Muhammad Syahril Harahap. (2018). Improving Mathematical Problem Solving Ability With The Use Of Rme (Realistic Mathematic Education) Teaching Materials. *Jurnal Education And Developmentinstitut Pendidikan Tapanuli Selatan*, 3(2), 56–60.
12. Mulyati, A. (2017). The Effect of the RME Approach on Students' Problem Solving Ability in Mixed Arithmetic Operation Material in Grade IV SD IT Adzkia I Padang. *Jurnal Didaktik Matematika 4(1)*, 90–97.
13. Nurfadilah, I., Nindiasari, H., & Fatah, A. (2021). Using Realistic Mathematics Education In Mathematical Problem-Solving Ability Based On Students' Mathematical Initial Ability.*Jurnal PRIMA Pendidikan 5*(1), 35–46.
14. [14] Parmiti, D. P., & Diputra, K. S. (2018). The Effect Of A Realistic Mathematics Education Approach Based On Open Ended On The Thinking Ability Of Students In Elementary School V.*Journal of Education Technology. Vol. 2 (3)* pp. 87-94
15. Pt, Ni., & Dewi, U. (2019). The Effect of a Realistic Mathematical Approach Based on Concrete Media Assisted Problem Solving on Mathematics Learning Outcomes.. *Jurnal Ilmiah Pendidikan Dasar*, *3(2*), 220–229.
16. Purnamasari, M. A. (2017). The effect of a realistic mathematics learning approach on the ability to solve mathematical problems. *Theses*, IAIN Purworejo.
17. Reni Wahyuni. (2020). The Effect Of Realistic Mathematic Education (Rme) Model On Students' Mathematical Concept Understanding Ability In Junior High School 7 Muaro Jambi.*Jurnal Universitas Islam Negeri Jambi*,
18. Rezki, E. (2019). Analysis of Students' Mathematical Connection Ability Using Contextual Teaching And Learning (Ctl) and Realistic Mathematical Education (RME) *Approaches. Doctoral dissertation*, Unimed).
19. Rianita Simamora. (2020). Model Realistic Mathematic Education ditinjau dari aspek

kemampuan pemecahan masalah aljabar. *Jurnal Math Educator. 6(1)*, 22–29.
20. Saprizal. (2018). Utilization of Audio Visual Media Based on Realistic Mathematics Education (RME) on the Problem Solving Ability of Mtss Raudhatun Najah Langsa Students. J*urnal Ilmiah Pendidikan Matematika Al Qalasadi 2*(2), 41–49.
21. Sarbiyono. (2016). *Application Of Realistic Mathematics Approaches To Students' Mathematical Problem-Solving Ability. JRPM*(*Jurnal ReviewPembelajaran Matematika).1*(2), 163–173.
22. Sari, S. M. (2019). *The Influence of Realistic Mathematics Education (RME) Approach With Concept Map Strategy on Mathematical Problem-Solving Ability of PGMI IAIN Bengkulu Students. 04*(01), 53–59.
23. SIALLAGAN, S. B. (2022). The Effect Of Stad-Type Cooperative Learning Model On Students' Mathematical Problem Solving Ability In Class Viii Spldv Materials Of Parulian 2 Private High School, Medan, *Theses*, UHN.
24. Sri Wulandari Danoebroto. (2008). Improving Problem Solving Ability Through Pmri Approach And Metacognitive Training. Jurnal Penelitian dan Evaluasi Pendidikan, 1(9) 73–87.
25. Supardi, U. S. (2012). The effect of realistic mathematics learning on mathematics learning outcomes in terms of learning motivation. *Jurnal Cakrawala Pendidikan*, *5*(2).
26. Susanti. (2017). Improving Mathematical Problem Solving Ability and Self-Efficacy of MTs Students Through Realistic Mathematics Education Approach.Journal of Mathematics Education *3*(2), 92–101.
27. Usniati, M. (2011). Improving mathematical reasoning skills through a problem solving approach. *Theses.* UIN Jakarta
28. Vera Nopianti Siregar, Ramlah, K. N. S. E. (2018). Application Of The Realistic Mathematics Education (RME) Approach To High School Students' Mathematical Problem Solving Ability.*Prosiding Sesiomadika*, *1*(1a). Taken from https://journal.unsika.ac.id/index.php/sesiomadika/article/view/2149. 245–257.
29. Wahyuningsih, S., Pudyaningtyas, A. R., Hafidah, R., Syamsuddin, M. M., Nurjanah, N. E., & Rasmani, U. E. E. (2019). The Effects of the STEAM Method on the Creativity of 5-6 Year Old Children. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *4*(1), 295-301.
30. Widana, I. W. (2021). Realistic Mathematics Education (RME) to Improve Students' Mathematical Problem-Solving Ability in Indonesia. *Jurnal Elemen*, *7*(2), 450–462. https://doi.org/10.29408/jel.v7i2.3744
31. Winarti Dwi Febriani, Geri Syahril Sidik, R. F. Z. (2019). The Effect Of Realistic Mathematics Education And Direct Instruction Learning On Problem Solving And Mathematical Communication Ability Of Elementary Students. *Jurnal Tunas Bangsa 6*(2), 152–161.

How to cite this article: Suryo Widodo, Ika Santia, Yuni Katminingsih et.al. Increasing students' mathematical problem solving ability through Realistic Mathematics Education (RME). *International Journal of Research and Review*. 2023; 10(1): 68-76.
DOI: *https://doi.org/10.52403/ijrr.20230109*

******