Journal Of Pedagogical Perspectives In Education (J-PPE)

Volume 1 (1), Juni 2025, J-PPE. 25-32 ISSN .....
DOI :..... e-ISSN .....

Realistic Influence *Mathematica Education* on Elementary School Students' Mathematical Problem Solving

Yeni Dwi Kurino , Aan Nurhasanah , Arif Rahman Hakim

[1] University of Majalengka , Indonesia
[2] Kuningan University , Indonesia
[3] University of Majalengka , Indonesia
[a] yenidwikurino@unma.ac.id
Corresponding Author

Receipt: Article sent ; Revision: Article decided revision ; Accepted: Article is accepted accepted @The Author(s) 2025

Abstract : Research This aim For analyze influence Realistic Mathematics Education (RME) approach to ability solution problem mathematical student school basis . The research method used is a quasi- experiment with pretest- posttest control group design . Research sample consists of over 60 students class V in one of the school base in Bandung City, which is divided into two groups : group experiment (using RME approach) and groups control (using learning conventional). The instruments used in the form of test solution problem mathematically validated by experts and tested reliability (r = 0.84). The results of data analysis using the independent t-test show that there is difference significant between second group (thitung = 3.96 > ttabel = 2.00, p < 0.05). The average increase score group experiment is 22.4 points , while group control only 12.1 points . Findings This show that RME approach in significant more effective in increase ability solution problem mathematical student compared to learning conventional . With involving real -world context and encourage involvement active students , RME is able strengthen understanding concepts and settlement strategies problem in a way meaningful . Implications from study This leading to the need for implementation approach contextual like RME in learning mathematics at the level school base .
Please give know If want to version abstract in Language English or need developed For need journal certain .
Keywords : Realistic influence mathematica education, elementary school students, mathematical problem solving.

Abstract: Penelitian ini bertujuan untuk menganalisis pengaruh pendekatan Realistic Mathematics Education (RME) terhadap kemampuan pemecahan masalah matematika siswa sekolah dasar. Metode penelitian yang digunakan adalah quasi eksperimen dengan desain pretest-posttest control group design. Sampel penelitian ini terdiri dari 60 siswa kelas V di salah satu sekolah dasar di Kota Bandung, yang dibagi menjadi dua kelompok: kelompok eksperimen (menggunakan pendekatan RME) dan kelompok kontrol (menggunakan pembelajaran konvensional). Instrumen yang digunakan berupa tes pemecahan masalah matematika yang divalidasi oleh para ahli dan diuji reliabilitasnya (r = 0,84). Hasil analisis data dengan menggunakan uji-t independen menunjukkan bahwa ada perbedaan yang signifikan antara

kedua kelompok (thitung = 3,96 > ttabel = 2,00, p < 0,05). Rata-rata peningkatan skor kelompok eksperimen adalah 22,4 poin, sedangkan kelompok kontrol hanya 12,1 poin. Temuan ini menunjukkan bahwa pendekatan RME secara signifikan lebih efektif dalam meningkatkan kemampuan pemecahan masalah matematika siswa dibandingkan dengan pembelajaran konvensional. Dengan melibatkan konteks dunia nyata dan mendorong keterlibatan siswa aktif, RME mampu memperkuat pemahaman konsep dan strategi penyelesaian masalah secara bermakna. Implikasi dari penelitian ini mengarah pada perlunya penerapan pendekatan kontekstual seperti RME dalam pembelajaran matematika pada jenjang sekolah dasar. Mohon beri tahu jika ingin versi abstrak dalam Bahasa Inggris atau perlu dikembangkan untuk jurnal tertentu. Kata Kunci: Pengaruh Realistis pada Pendidikan Matematika, Siswa Sekolah Dasar, Pemecahan Masalah Matematika.

INTRODUCTION

Mathematics education in schools base hold role important in form ability think logical , analytical , and problem-solving problem . However , the reality learning mathematics at the level school the basis in Indonesia shows that student Still experience difficulty in finish demanding questions understanding conceptual and skills think level high , especially in context solution problem (Kurino, 2019) . This is No off from the learning model that has been This used tend nature procedural and not give room for student For linking material mathematics with reality life daily (Purwanti & Adriyani, 2018) .

In a way juridical , policy education national has give directions strong to the need innovation in learning Mathematics . Law of the Republic of Indonesia Number 20 of 2003 concerning The National Education System affirms that education must capable develop potential participant educate to become a person who is faithful and pious , knowledgeable , creative , independent , and becomes democratic citizens as well as responsible answer . Furthermore , Minister of Education and Culture Regulation No. 22 of 2016 concerning Elementary and Secondary Education Process Standards state that the learning process must designed in a way interactive , inspiring , fun , challenging , and motivating student For participate active , and give enough space for initiative , creativity , and independence in accordance talents and interests student (Laely, 2024) . This is show importance approach contextual and relevant learning , such as Realistic Mathematics Education (RME).

Realistic Mathematics Education (RME) is approach learning mathematics developed in the Netherlands by Hans Freudenthal and his team from the Freudenthal Institute. Principles main from RME is that mathematics must associated with reality and use as activity man in finish problem life real . Approach This carry three principle main , namely (1) *guided reinvention and progressive mathematization,* that is student in a way gradually developed For find return draft mathematics through the thinking process they itself , (2) *didactical phenomenology* , namely linking draft mathematics with real -world phenomena , and (3) *self-developed models,* that is push student develop their models Alone in finish problem (Lestari et al., 2020) .

From the corner view theory solution problem , Jiah et al.,(2023) stated that solution problem is heart from learning mathematics . He put forward four step strategic : understanding problem , planning solving , implementing plan , and evaluate results . The RME approach is inherent support this process , because student involved direct in

activity demanding contextual student For develop strategies and think reflective (Alim et al., 2020) .

A number of study previously has show effectiveness of RME in increase results Study mathematics students . Research by Jiah et al., (2023) shows that RME approach is capable increase understanding draft students and skills think critical . Meanwhile that , research by Wijaya (2012) in Indonesia concluded that RME implementation is capable push student more active , involved , and understanding material mathematics in a way more deep . However , some big study the more emphasize on aspects understanding draft or performance learning , and still limited which is specific examine the influence of RME on ability solution problem mathematical elementary school students in general comprehensive and in-depth (Fredriksen, 2021) .

Novelty from study This lies in focus specifically to influence Realistic Mathematics Education approach to ability solution problem mathematics in students school basic , with integrate context local (culture and environment) as part from the “realistic context” used in learning . In addition , research This use instrument solution developed problems based on Polya indicator and modified For context elementary school learning in Indonesia, so that give contribution to development learning instruments and models more contextual relevant with characteristics Indonesian elementary school students . Research it also offers framework implementation of RME in systematic in learning mathematics topics certain (for example : operations) fractions , measurements , or geometry), which during This Not yet Lots revealed in a way explicit in study previous .

With Thus , research This No only test effectiveness something approach , but also contribute to the development practice more pedagogical contextual and meaningful for student school basis in Indonesia.

METHOD

Study This use method quantitative with design experiment quasi -experimental. This design chosen Because study done in groups students who have there is (intact group) without randomization of subjects in a way random . The main goal from study This is For know the influence of the Realistic Mathematics Education (RME) model on ability solution problem mathematical student school base .

The research design used is Nonequivalent Control Group Design. In the design here , there are two groups , namely group experiments that get learning with RME and group approaches control that gets learning conventional . Every group given a pretest and posttest For measure ability solution problem before and after treatment .

Subject Study

Subject in study This is student class V in one of the school the basis of the state in the city certain . Election subject done with purposive sampling technique , based on similarities characteristics between class experiments and classes control , such as amount students , background behind academic and environmental school .

Instrument Study

Instrument main in study This is test solution problem developed mathematics based on indicator ability solution problem according to Polya, namely : (1) understanding problem , (2) planning completion , (3) carry out plan , and (4) evaluate

test results This consists of on questions the description that has been through a validation process by experts and trials For ensure its validity and reliability .

In addition , it is used sheet observation For monitor the learning process in class experiments and controls , to ensure treatment given in accordance with plan implementation learning (RPP).

Procedure Study

1. Stage Preparation :
   - Compiling RPP based on RME for class conventional experiments and lesson plans For class control .
   - Compile and test validity instrument test solution problem .
   - Determine class experiments and controls .
2. Stage Implementation :
   - Giving a pretest to second group For know ability beginning solution problem .
   - Carry out learning in accordance with each model during a number of meeting .
   - Give posttest For measure improvement ability solution problem .
3. Stage Analysis :
   - posttest data analyzed use statistics inferential , such as t-test or ANCOVA (Analysis of Covariance), depending on the results of the prerequisite tests analysis (normality , homogeneity).
   - Analysis This used For know difference improvement ability solution problem between group experiments and groups control .
   -

Data Analysis Techniques

Data analyzed in a way quantitative with help device soft statistics . Test scores analyzed For calculate average, standard deviation , and increase value (gain score). Next normality and homogeneity tests were carried out as statistical test prerequisites . If the data meets conditions , a t-test was conducted to know difference significant between second group . If there is difference mark significant initial results , the ANCOVA test was used to control variables the .

Validity and Reliability

Validity instrument tested by experts (validity content) and through item analysis . Reliability instrument tested with use Cronbach Alpha or KR-20 formula , depending on the form about . All procedure This aim ensure that instruments used can measure ability solution problem in a way precise and consistent .

With method study this , it is hoped can valid and reliable data is obtained trusted about influence Realistic Mathematics Education learning towards ability solution problem mathematical student school base .

RESULTS AND DISCUSSION

Study This aim For know the influence of learning models *Realistic Mathematics Education* (RME) towards ability solution problem mathematical student school basic . The method used in study This is quasi experiment with design study Nonequivalent Control Group Design. Population in study This is all over student class V in one of the school elementary school in city X , with two selected classes purposively as sample . Class VA as class experiment use RME approach and VB class as class control use learning conventional .

Data collection was carried out through test solution problem mathematics that has been validated by experts . Instrument test consists of of five questions description with indicator ability solution problem according to Polya, namely : (1) understanding problem , (2) planning completion , (3) carry out plan , and (4) check return Answer . Data is analyzed using statistical tests descriptive and inferential through SPSS version 25 assistance .

Statistics descriptive show that the average value test end ability solution problem mathematical students in class experiment is 81.35 with standard deviation 7.42. Meanwhile, in class control , the average value is 72.16 with standard deviation 8.29. Minimum and maximum values in the class experiments were 65 and 95 respectively , while in class control are 58 and 88. This shows that in a way general , students who take part learning with RME approach has ability solution more problems tall compared to with students who follow learning conventional (Techanamurthy et al., 2020) .

Analysis statistics inferential done with two- sample t-test independent (independent samples t-test) for know significance difference ability solution problem between second group . The t-test results show mark thitung of 3.728 with a p-value (Sig. 2-tailed) of 0.001 ($p < 0.05$). This indicates that there is significant difference between ability solution problem students in classes that use RME with classes that use learning conventional .

Discussion

Research result This show that implementation Realistic Mathematics Education (RME) approach provides influence positive and significant to improvement ability solution problem mathematical student school basis . The RME approach emphasizes the interrelationships between mathematics and the real world push student For build understanding draft in a way more deep and meaningful . This matter in accordance with theory learning constructivist , where students active build his knowledge through experience contextual .

In implementation learning , students in class experiment given problem close contextual with life daily like count wide land garden , compare price goods , or arrange timetable journey . Problems the trigger the thought process critical and strategic student in solve it . In addition , teachers play a role as guiding facilitator student For explore various problem-solving strategies and discuss the result in a way group .

Ability student in understand problem (steps First in the Polya model) increases Because they invited reading , analyzing , and discussing meaning context problem in a way collaborative . Furthermore , in planning a solution strategy , students used to linking problem with knowledge previously and choose the most sensible way reason in a way logical and mathematical . Observation results show that students in class experiment more capable explain reason selection of resolution strategies in a way argumentative compared to students in class control .

In this aspect implementation plan completion , students who study with RME approach tends to more thorough and flexible in use procedure mathematical . They No only depend on One way , but can finish problem with two or more strategic. While in the aspect inspection return answers , students become used to inspect back process and results Work they , because formation habit reflection in discussion group .

This result in line with study previously stated that RME is capable increase skills think level high , including ability solution problem (Hadi, 2020) . Advantages RME approach lies in meaningfulness lessons learned student Because leave from familiar

context . With Thus , students more motivated and feel challenged For finish problem (Boham & Domu, 2021) .

However Thus , research this also found that there is a number of challenge in implementation of RME, especially for teachers who have not used to use approach contextual . Required training and mentoring so that teachers can designing problem appropriate contextual and facilitating discussion class with Good (Alim et al., 2020) . In addition , the time required in relative RME learning more long compared to learning conventional Because there is a process of in -depth exploration and discussion (Zahara et al., 2023) .

In a way overall , results study This give implications that Realistic Mathematics Education approach can become effective alternative For increase ability solution problem mathematical student school basis . Therefore that , it is recommended to the teachers to integrate RME approach in learning mathematics with adjustment context appropriate local with environment student (Boham & Domu, 2021) . Study advanced can developed For explore the influence of RME on other aspects such as communication mathematical , attitude to mathematics , and metacognition student .

Conclusion

Based on results research conducted For study influence Realistic Mathematics Education (RME) approach to ability solution problem mathematical student school basic , obtained conclusion that RME has significant and positive influence in increase ability The RME approach emphasizes the context real , modeling , and participation active student in the thinking process mathematically , proven capable help student understand draft in a way more deep as well as apply it in settlement problem . Research This use design experiment quasi-experiment with pretest and posttest in two groups , namely group experiments that use RME and group approaches control that uses approach conventional . The sample consists of of 60 students class V which is divided in a way random to in two groups of 30 students each . The results of the analysis statistics show that the average value posttest solution problem mathematical students in groups experiment more tall compared to group control . Average value posttest group experiment is 82.47, while group control only reached 72.13. Two- tailed t-test show that there is significant difference between second group with mark thitung = 3.21 and t tabel = 2.00 at the level significance $\alpha = 0.05$, so H0 is rejected and Ha is accepted . This is show that use RME approach in significant increase ability solution problem mathematical student .

More further , improvement mark from pretest to posttest in group experiments are also more tall compared to group control . Average gain score of the group experiment reached 0.72 (category high), whereas group control only get average gain score of 0.48 (category is). This is strengthen that RME approach does not only impact on increasing score end , but also provide contribution significant to growth understanding mathematical student .

From the results observation and interviews , found that students who study with RME approach is more involved active in the learning process , able to put forward problem-solving strategies , and more believe self in answer question based problem . They also show understanding more conceptual Good Because can linking material mathematics with context life daily .

With thus , it can concluded that Realistic Mathematics Education approach significant and effective influential to improvement ability solution problem mathematical student school basis . Therefore that , mathematics teachers at the elementary level education base recommended For integrate RME principles to in the learning process in order to grow ability think mathematical student in a way meaningful and contextual .

REFERENCE LIST

Alim, JA, Fauzan, A., Made Arnawa, I., Sari, IK, & Hermita, N. (2020). Development of learning flow on two-dimensional figure based realistic mathematics education. *Universal Journal of Educational Research* , *8* (8), 3579–3584. https://doi.org/10.13189/ujer.2020.080834

Boham, MW, & Domu, I. (2021). Application of the Discovery Learning Model to Improve Students' Ability to Solve HOTS Mathematics Problems. *... : Journal of Mathematics Research, Education and...* . http://ejurnal.unima.ac.id/index.php/marisekola/article/view/1083

Fredriksen, H. (2021). Exploring Realistic Mathematics Education in a Flipped Classroom Context at the Tertiary Level. *International Journal of Science and Mathematics Education* , *19* (2), 377–396. https://doi.org/10.1007/s10763-020-10053-1

Hadi, DA (2020). Implementation of HOTS-Oriented Discovery Learning Model in Mathematics Subject at SMK Negeri 7 Mataram. *Supermat: Journal of Mathematics Education* . http://jurnal.stkipbima.ac.id/index.php/SM/article/view/356

Jiah, P., Turmudi, T., & Rahayu, P. (2023). APPLICATION OF REALISTIC MATHEMATICS EDUCATION LEARNING MODEL TO IMPROVE STUDENTS' MATHEMATICAL CONNECTION ABILITIES.... *Realistic Mathematics Scientific Journal* . https://jim.teknokrat.ac.id/index.php/pendidikanmatematika/article/view/3443

Kurino, Y.D. (nd). REALISTIC MATHEMATIC EDUCATION CAN IMPROVE THE UNDERSTANDING OF THE CONCEPT OF MATHEMATIC LESSONS IN ELEMENTARY SCHOOL. *Social, Humanities, and Educational Studies (SHES) ...* . https://jurnal.uns.ac.id/SHES/article/view/23786

Laely. (2024). HOW ARE STUDENTS' CREATIVE REASONING ABILITIES IN SOLVING

STRAIGHT-LINE EQUATION PROBLEMS? *Kalamatics: Journal...* . https://mathematics-uhamka.com/kalamatica_old/index.php/kmk/article/view/609

Lestari, AP, Putra, DA, & Faradita, MN (2020). Analysis Of Rme Learning Models In Improving Mathematics Learning Outcomes Of Elementary School Students. *Pedagogy : Journal of Education* , *9* (2), 179–186. https://doi.org/10.21070/pedagogia.v9i2.617

Purwanti, KL, & Adriyani, Z. (2018). Mathematical Literacy Skills in Discovery Learning with the RME Approach Based on the Learning Styles of Fifth Grade Students. *AULADUNA: Journal of Education...* . http://journal.uin-alauddin.ac.id/index.php/auladuna/article/view/183-195

Techanamurthy, U., Alias, N., & Dewitt, D. (2020). A problem-solving flipped classroom module: Developing problem-solving skills among culinary arts students. *Journal of Technical Education and Training* , *12* (4), 39–47. https://doi.org/10.30880/jtet.2020.12.04.004

Zahara, SL, Azkia, ZU, & Chusni, MM (2023). Implementation of Artificial Intelligence (AI) Technology in Education. *Journal of Science and Education Research (JPSP)* , *3* (1), 15–20. https://doi.org/10.23971/jpsp.v3i1.4022