Journal of Primary Education
9 (2) (2020) : 188 – 196

https://journal.unnes.ac.id/sju/index.php/jpe/article/view/31350

Implementation of Problem-Based Learning Model with Ethnomathematics Nuance Towards Students' Problem-Solving Ability and Mathematics Anxiety

Reza Patmara[1]✉ , Agus Wahyudin[2] & Endang Susilaningsih[2]

[1] Public Elementary School Wonosari 1 Ngaliyan, Semarang, Indonesia
[2] Universitas Negeri Semarang, Indonesia

Article Info

History Articles
Received:
May 2019
Accepted:
June 2019
Published:
August 2020

Keywords:
ethnomathematic, mathematics anxiety, problem-solving ability, problem-based learning

DOI
https://doi.org/10.15294/jpe.v9i2.31350

Abstract

The purpose of this study was to analyze the effectiveness and influence of the problem-based learning model with ethnomathematics nuance towards problem-solving ability and mathematics anxiety. The type of research used is a mixed method with concurrent embedded research design. The technique of collecting data uses a problem-solving ability test, questionnaires, interviews, and documentation. Data analysis technique using quantitative and qualitative analysis techniques. Quantitative data analysis techniques include proportion test, average difference test, direct effect test, moderating variable test, and Triangulation of qualitative data. The subject of research amounted to 78 students. The results showed that (1) The problem-based learning model with mathematical nuances effectively increased the average problem-solving ability to reach 75% classical completeness with $z_{value} = 1.64 \geq z_{table} = 1.64$, (2) The average score of problem-solving in experiment class was 74.6 and control class was 68.9 with $t_{value} = 2.56 > t_{table} = 1.99$, (3) There was a positive direct effect of model problem-based learning with ethnomathematics nuance on problem-solving ability with $t_{value} = 84.11$ at the level of 0.00, (4) Mathematics anxiety can strengthen the influence of problem-based learning with ethnomathematics nuance on problem-solving ability was 0.002 at sig level of 0.02, (5) Student with low anxiety can complete all of problem-solving stages, students wih moderate anxiety can understand the problem develop a plan, but less able to carry out the plan, and students with high anxiety can understand problems, but less able to develop a plan and implement a plan.

✉ Correspondence address:
Kuda No. 8 RT.03/RW.07, Wonosari, Ngaliyan,
Semarang, Jawa Tengah, 50186
E-mail: rezapatmara@gmail.com

p-ISSN 2252-6404
e-ISSN 2502-4515

INTRODUCTION

Mathematics is a science that covers all the bases of the development of modern technology, has an important role in various disciplines, and advances the power of human thought. Based on Minister of Education and Culture Regulation Number 22 of 2006 concerning of the standard of Content, the existence of mathematics also needs to be given to students since elementary school to equip students to think logically, analytically, systematically, critically, creatively and giving students with problem-solving ability.

According to Pradipta, Sudanyana, and Darsana (2013), the basis of mathematics learning is a problem, with problems, students can comprehend a concept by integrating the process of training and educating and emphasizing conceptual rather than procedural understanding. So that in the future students can comprehend whole mathematical concepts, learning problems related to daily life, solving their obtained problems and apply the obtained learning to their daily life.

According to the PISA in 2015 it was shown that the average score of Indonesian students for Indonesian literacy, mathematics and science achievements was 368 and was below the International average with a ranking of 63 out of 70 countries. The results of TIMSS in 2015 informed that the average score of Indonesian students' mathematics achievement of 397 was ranked 45 in 50 countries. The results of pre-research observations at Wonosari Elementary School 01 and 02 Semarang City, students' problem-solving ability were still low, and some student is less able to comprehend the problems, practicing problem-solving procedures to the results in solving problems, especially on geometry, two-dimensional figure. Suryanti (2013); Wahyuningtyas, Yuniasih, Irawan, and Susiswo (2018) explained that fourth-grade students have difficulties in understanding geometry material, whether it is two or three-dimensional figure, some students share common problems which is difficulties in understanding strategies to solve problems.

According to Nofitasari, Mastur, and Mashuri (2015) there are several factors that influence problem-solving ability, (1) teacher-centered learning so that students are less active during the learning process, (2) lack of students' interest and enthusiasm in participating in mathematics learning, (3) low ability of students in understanding story questions, (4) problem-solving questions are not associated with the culture around the students. Kiptiyah (2016) also mentioned other factors that influence among them are the habits of teachers in providing written test questions with routine questions individually rather than open-ended questions. Learning material that was given by the teacher also does not give a pleasant impression, it can be seen from the students learning activities, especially mathematics when mathematics learning takes place so that many students are less daring to express their opinions.

For this reason, learning that can guide students in the problem-solving process which also gives a pleasant impression combined with the elements of local culture to increase students' devotion and also reduce the level of students' ability when learning mathematics is needed. In this study, a problem-based learning model using ethnomathematics is used. The use of problem-based learning models with ethnomathematics nuances is an innovation in learning. According to Etherington (2011), the constructivist learning model helps students to develop the ability to communicate and cooperate. Ellianawati, and Subali (2010) problem-based learning is a way to teach by exposing students to a problem so that it can be solved or solved. Abdullah, Mastur, and Sutarto research (2015) informed that the problem-based learning model would be easier for students to learn when using problems in the environment around students, especially the local culture where students live. According to Sochima, and Unodiaku (2013), cultural aspects cultivation, especially in mathematics learning, is called Ethnomathematics. D'Ambrosio (1985) further explains that the purpose of using Ethnomathematics is to describe different events to apply mathematics, especially in various community activities.

The use of the problem-based learning model with ethnomathematics nuance from Abdullah, Mastur, and Sutarto (2015) shows that it is less significant and tends to fluctuate its effect on the variable problem-solving ability.

The existence of a research gap about the lack of significance provides an opportunity for the researchers to propose other factors that can strengthen or weaken the influence of problem-based learning models with ethnomathematics nuance on problem-solving ability, namely mathematics anxiety from Ismawati, Masrukan, and Junaedi (2015) as a moderating variable. Richardson, and Suinn (1972) stated that mathematical anxiety is a negative feeling towards mathematics learning arising from an individual's emotional response to the individual's experience at the school level. The emergence of negative feelings towards learning mathematics has a negative impact as well, according to Zakaria, and Nordin (2008) concluded that high mathematical anxiety could cause students who are weak in calculations, lack of understanding and tend to lack initiative in finding strategies and relationships between mathematical domains.

METHODS

This study used a mixed method research design with a type of concurrent embedded research. The design of this study combined quantitative and qualitative research methods with a quantitative approach as a primary approach. The population in this study was problem-solving ability in grade IV elementary school students in Ngaliyan sub-district, Semarang City. The sampling technique used by the researcher was a simple random sampling. The sample obtained was 74 students from 2 elementary schools in Ngaliyan sub-district.

The research variables are problem-solving ability (KPM), problem-based learning models with ethnomathematics nuances (PBL-E), and mathematics anxiety (KM). Data collection techniques used problem-solving ability test, learning response questionnaire, mathematics anxiety questionnaire, interviews, and documentation. Quantitative data analysis techniques include descriptive analysis, classic assumption test includes normality test and heteroscedasticity test and hypothesis testing, which includes average difference test, direct influence analysis, and moderated regression analysis (MRA). Qualitative data analysis includes data reduction, presenting data, and drawing conclusions.

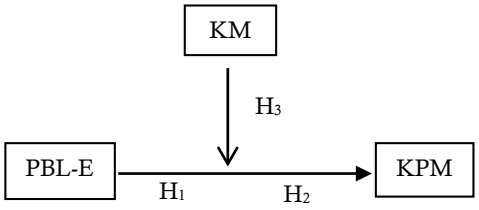


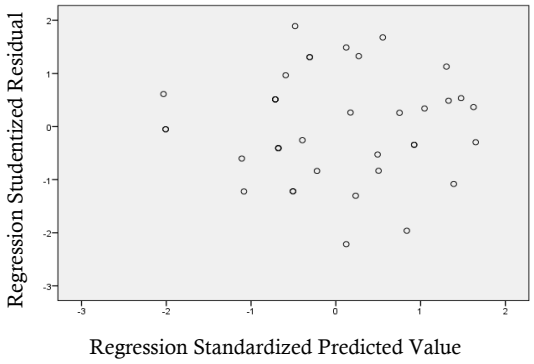
Figure 1. Hypothetical Research Model

RESULTS AND DISCUSSION

The results of the normality test in this study include the normality test in the experimental class — analysis of processing normality test data using SPSS Statistics 23 with the Kolmogorov-Smirnov technique. Based on the SPSS output, it is known that the fourth variable significance value is 0.200. The assumption of normality is fulfilled because the Kolmogorov Smirnov value is greater than 0.05, so it can be understood that the data tested is normally distributed, meaning that the assessment aspects given to each element in the sample apply proportionally.

The results of heteroscedasticity test in this research include heteroscedasticity test in the experimental class. Analysis of the processing of heteroscedasticity test using SPSS Statistic 23 with the technique of looking at the scatterplot graph between the predictive value of the dependent variable, namely ZPRED with the SRESID residual.

Based on the scatterplots graph in figure 2, it can be seen that the points spread randomly and spread both above and below the number 0 on the Y-axis. It can be seen that there is no heteroscedasticity in the regression model so that a decent regression model is used to analyze the relationships between variables research.



Dependent variable: Problem-solving abilities

Figure 2. The Form of the Experimental Class Scatterplots

Classical Completeness of Learning Results

The learning outcomes completeness test aims to find out the percentage of the problem-solving ability of students in the fourth grade of an elementary school that obtains learning problems based learning with ethnomathematics nuances reaching classical completion of 75% with students reaching KKM ≥ 65.

The calculation results show that z_{value} = 1.645 with z_{table} = 1.645. Because $z \geq z_{(0.5-\alpha)}$ or 1.645 ≥ 1.645, which means the proportion of students taught with CORE learning models reaches KKM more than 65 with classical completeness of more than 75%. So it can be concluded that the value of problem-solving ability.

This is by the research conducted by Nofitasari, Mastur, and Mashuri (2013) that there is an increase in classical completeness in the problem-based learning model using peer tutoring with ethnomathematics nuances reaching more than 75%. This is proved by the results of the calculation of the right-hand proportion test z_{value} = 2.38 > z_{table} = 1.64.

Comparison of Problem-solving Ability

The difference test of the average experimental class and control class was conducted to determine the effectiveness of learning problem-based learning models with ethnomathematics nuances on the problem-solving ability of fourth-grade students in elementary school.

Table 1. Average Difference Test Results

	Mean	t_{value}	t_{table}	Sig.
Experiment	74.6	2.56	1.99	0.01
Control	68.9			

Based on calculations using t-test independent samples, the results informed that t_{value} = 2.56 > t_{table} = 1.99. The average problem-solving score in the experimental class was 74.6, and the average problem-solving score in the control class was 68.9. So it can be concluded that the value of problem-solving ability in problem-based learning models with ethnomathematics is better than problem-solving ability in the control class.

Learning with a problem-based learning model with ethnomathematics nuances lies activities that help students recognize problems through different ways of interacting with the local culture of students. This method makes student learning won't be boring, comfortable, and helps them solve problems more effectively.

This result is following the research conducted by Abdullah, Mastur, and Sutarto (2015) which states that there are differences in the average results of the problem-solving ability tests in the experimental class and the control class. The results informed that the experimental class with PBL model with ethnomathematics obtained an average of 81.23 while the control class average was 77.21 with the results of the t-test obtained by t_{value} = 2.119 > t_{table} = 1.65.

Effect of Moderating Variables

The test of the effect of moderating variables was conducted to determine the effect of mathematical anxiety in moderating the effect of problem-based learning model variables with ethnomathematics nuances towards problem-solving ability using regression analysis (moderated regression analysis).

Table 2. Results of Direct Influence Analysis

Independent variable	R square	Beta	t	Sig.
PBL model and etno	0.995	0.997	84.11	0,00

Dependent variable: Problem-solving ability

Table 3. MRA Analysis Result

Independent variable	Beta	t	Sig.
PBL etno * Mathematics anxiety	0.002	2.33	0.026

Dependent variable: Problem-solving ability

The most influential activity in problem-solving ability is the introduction of problems through audio-visual media that showcase the original culture of Semarang City. One item statement from the indicator is mathematics learning becomes easier and more enjoyable. Learning with a problem-based learning model with ethnomathematics nuances are considered to facilitate students in solving mathematical problems.

This is following Piaget's and Vygotsky's development theory, which explains that elementary school-age children need real situations in the learning process, and social interaction learning is also following the result of the study. Therefore, learning the problem-based learning model with ethnomathematics nuances seeks to present a real situation about child's culture and social environment through the presentation of images and video shows of the local culture of students, especially the culture of Semarang City. Agreeing with this, the results of the research conducted by Prabawa, and Zaenuri (2017) stated that PjBL learning with ethnomathematics nuances can increase the average problem-solving ability by 83.93 in the experimental class, and the results of the study of Abdullah, Mastur, and Sutarto (2015) stated that the use of ethnomathematics PBL models increased the average problem-solving ability in the experimental class by 81.23.

Based on table 2, it is known that the t-count value is 84.11 with a coefficient value of 0.99 significance at the level of 0.00. The results of this significance are smaller than the 0.05 significance limit. This means that there was a direct positive effect of learning problem-based learning models with ethnomathematics nuances on the problem-solving ability of 99.5%.

The role of mathematical anxiety is analyzed using the moderated regression analysis. Based on the analysis in table 3, information was obtained that the coefficient of efficiency of MPBL-E * KM was 0.002 at a significance level of 0.026. The significance level is less than 5%, which is 0.026 < 0.05. This means that mathematics anxiety can strengthen the influence of learning based on problem-based learning with ethnomathematics on problem-solving ability.

Moderating Analysis of Mathematical Anxiety in the Effect of Problem-based Learning Model with Nuance of Mathematics on Problem-solving Ability

This research analyzed the Problem-based Learning model with ethnomathematics nuances on students' problem-solving ability in terms of mathematical anxiety. According to Polya (1973) there are four steps in the problem-solving process: understanding the problem, planning problem-solving, implementing problem-solving, and review. Whereas for indicators of mathematical anxiety, which become moderator variables include: attitude, cognitive, and somatic.

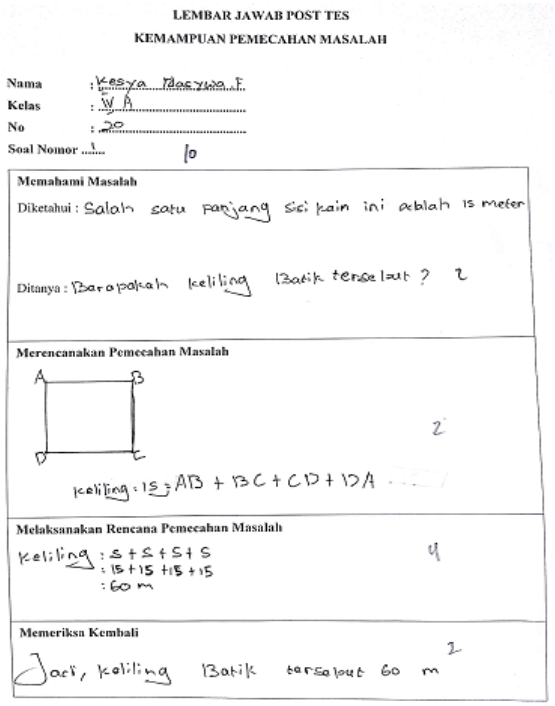
After being proven to overcome mathematical difficulties with problem-solving, interviews were then conducted with the subject of the study. Then it was completed and categorized based on the students' mathematical difficulties.

In order to find out the description of problem-solving ability in terms of mathematical anxiety in learning problem-based learning models with ethnomathematics nuances. The following are examples of mathematical questions in learning problem-based learning models that give cultural nuances to each problem to know that their local culture can develop well as in figure 3.

Problem No. 1
Batik is a nation culture that we must preserve. Each region has typical batik design in each region. One of them is Semarang City with it's Semarangan batik. This pictorial batik warak ngendok is a typical one from Semarang City. A tailor received an order to make curtains, from Semarang batik, the tailor measured one of the lengths of the fabric side is 15 meters. What is the circumference of the batik?

Figure 3. Example of Problem Solving Ability Test

The following are the answers of the student who have low math anxiety.


LEMBAR JAWAB POST TES
KEMAMPUAN PEMECAHAN MASALAH

Nama : Kesya Maeyna F
Kelas : IV A
No : 20
Soal Nomor ...1... 10

Memahami Masalah
Diketahui : Salah satu panjang sisi kain ini adalah 15 meter
Ditanya : Berapakah keliling batik tersebut ? 2

Merencanakan Pemecahan Masalah
A B D C
keliling : 15 : AB + BC + CD + DA 2

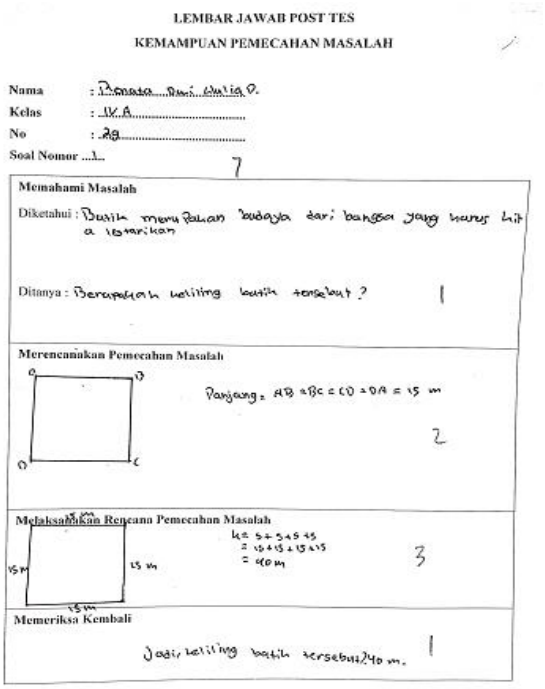
Melaksanakan Rencana Pemecahan Masalah
keliling : 15 + 15 + 15 + 15
: 15 + 15 + 15 + 15
: 60 m 4

Memeriksa Kembali
Jadi, keliling batik tersebut 60 m 2

Figure 4. Student's Who Have The Low Mathematics Anxiety Answer Sheet

Based on the results of answers (figure 4) and interviews with the students with low math anxiety, it can be concluded that the subject can easily understand all the information in the test questions. When they were asked if they could write the appropriate formula, subjects with low math anxiety felt confident that they could and describe the concept of the flat building needed and applied their formulas and ideas because they did not feel nervous and rush. Subjects with low math anxiety could easily write down the formulas and answers on other sheets first to ensure the truth of the answers they made. Subjects with low math anxiety were also able to reexamine their answers; they were able to take advantage of the remaining time to check their answers and conclude each item. Subjects were able to prepare themselves by learning a few days before the test was held and doing the work relaxing.

The following are the answers of the student who have moderate math anxiety.


LEMBAR JAWAB POST TES
KEMAMPUAN PEMECAHAN MASALAH

Nama : Bonata Dwi Putra P.
Kelas : IV A
No : 29
Soal Nomor ...1... 7

Memahami Masalah
Diketahui : Batik merupakan budaya dari bangsa yang harus kita lestarikan
Ditanya : Berapakah keliling kain tersebut ? 1

Merencanakan Pemecahan Masalah
A B D C
Panjang : AB = BC = CD = DA = 15 m 2

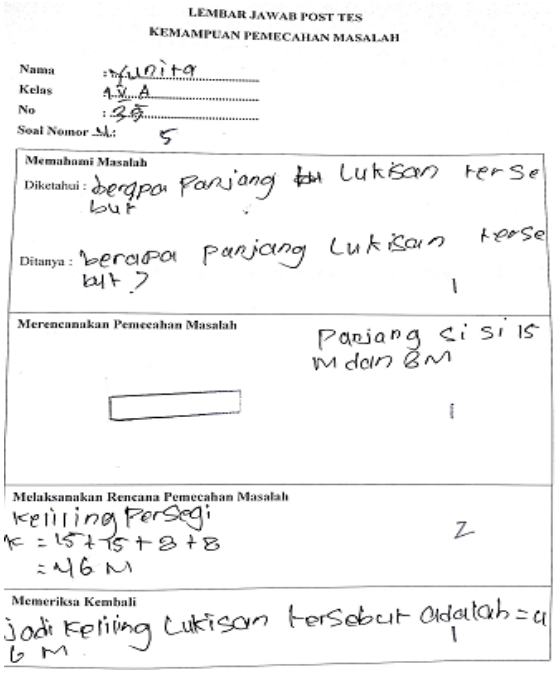
Melaksanakan Rencana Pemecahan Masalah
15 m 15 m 15 m
K = S + S + S + S
= 15 + 15 + 15 + 15
= 60 m 3

Memeriksa Kembali
Jadi, keliling batik tersebut 60 m. 1

Figure 5. Student's Who Have Fair Mathematics Anxiety Answer Sheet

Based on the results of answers (figure 5) and interviews with the students who had moderate mathematics anxiety it can be concluded that subjects with moderate levels of mathematical anxiety, they were still able to understand the problem, in this case, the identification of information from the question and wrote down the things that were known and asked. Also, subjects with fair math anxiety, have a little difficulty in producing other ideas or ways if they forgot the formula, but they were still able to produce the right answer even though it took a long time. Subjects with fair math anxiety were having a little trouble passing this stage, even though they were not in a hurry to work but their beliefs in working according to their ability, they were still often seen matching their answers with other friends. When rechecking, the two subjects were only able to check several items, and not all of their items were able to conclude correctly.

The following are the answers of a student who have high math anxiety.


LEMBAR JAWAB POST TES
KEMAMPUAN PEMECAHAN MASALAH

Nama : Yunita
Kelas : 4 A
No : 35
Soal Nomor 5

Memahami Masalah
Diketahui : berapa panjang dari lukisan tersebut
Ditanya : berapa panjang lukisan tersebut ?

Merencanakan Pemecahan Masalah
Panjang sisi 15 M dan 8M

Melaksanakan Rencana Pemecahan Masalah
Keliling Persegi
K = 15 + 15 + 8 + 8
= 46 M

Memeriksa Kembali
Jadi Keliling Lukisan tersebut adalah = 46 M

Figure 6. Student's Who Have High Mathematics Anxiety Answer Sheet

Based on the results of answers (figure 6) and interviews with the students who had high math anxiety, they were unable to concentrate because they felt nervous if the time provided was finished, so they were not writing both information that was known and what was asked in the question precisely. Subjects with high mathematical anxiety have not been able to find a suitable way that is applied following what they get during the learning of problem-based learning models with ethnomathematics nuances. Subjects with high mathematical anxiety have difficulties carried out problem-solving because of weakness planning to solve problems, from the beginning they were doing the questions in a hurry and unsure of their answers; the subject often relied on other friends' answers which ultimately made the subject took more time to work. When checking the answers, subjects with high math anxiety, were unable to recheck because there was no time left for them to recheck each item.

Based on the analysis, there were clear differences between subjects who had low, moderate, and high mathematics anxiety levels in completing the problem-solving ability test. The difference in the level of difference is also explained by Apriliani, and Suyitno (2016) that there are differences in creative thinking, students who are in the category of low math anxiety, moderate to panic or high.

Table 4. Student Problem-solving Ability in Terms of Mathematical Anxiety

Research subjects	Mathematics anxiety level	Problem-solving ability stage			
		1	2	3	4
WO-1	Low	√	√	√	√
WO-2	Low	√	√	√	√
WO-3	Moderate	√	√	-	√
WO-4	Moderate	√	√	-	√
WO-5	High	√	-	-	√
WO-6	High	√	-	-	√

Explanation:
√ = able to pass
- = not able to pass

So that it can be concluded that to solve the problem well, students must go through the stages that need to be being passed, starting from understanding the problem by writing something that is known and asked from the question, problem-solving planning by determining proper strategy to work, implementing the problem-solving plan until checking the answer. Preparation for the test is also necessary, starting from preparation before the test when the test starts until the test is done, some will face anxiety, fear, and rush can cause failure in working on test questions and individual achievements. Hembree (1990) also stated that mathematics anxiety is inversely related to mathematical achievement, so students who have high math anxiety will have low achievement.

CONCLUSION

Based on the result of the research and discussion that has been described, it can be concluded that there is an increase in mathematics problem-solving ability after learning on the problem-based learning model with ethnomathematics nuance. Analysis of problem-solving ability regarding students mathematics anxiety obtained the result that students with low level were able to complete all stages of problem-solving stages. Students with moderate level are also able to pass the stages but are still lacking to carry out the plan. Students

with high-level mathematics anxiety can understand the problem but are unable to devise and carry out the plan.

REFERENCES

Abdullah, D. I., Mastur, Z., & Sutarto, H. (2015). Keefektifan model pembelajaran problem based learning bernuansa etnomatematika terhadap kemampuan pemecahan masalah siswa kelas viii. *Unnes Journal of Mathematics Education*, *4*(3), 286-291. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujme/article/view/9056

Apriliani, L. R., & Suyitno, H. (2017). Kemampuan berpikir kreatif matematis berdasarkan kecemasan matematika pada pembelajaran creative problem solving berteknik scamper. *Unnes Journal of Mathematics Education Research*, *5*(2), 131-138. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujmer/article/view/12929

D'Ambrosio, U. (1985). Ethnomathematics and its place in the history of mathematics. *For the Learning of Mathematics*, *5*(1), 44-48. Retrieved from https://www.usd.ac.id/fakultas/pendidikan/s2_pen_matematika/fl13/An%20article%20by%20Ubiratan%20D'Ambrosio.pdf

Ellianawati, & Subali, B. (2010). Penerapan model praktikum problem solving laboratory sebagai upaya untuk memperbaiki kualitas pelaksanaan praktikum fisika dasar. *Jurnal Pendidikan Fisika Indonesia*, *6*(2), 90-97. Retrieved from https://journal.unnes.ac.id/nju/index.php/JPFI/article/view/1119

Etherington, M. B. (2011). Investigative primary science: a problem-based learning approach. *Australian Journal of Teacher Education, 36*(9), 36-57. Retrieved from http://ro.ecu.edu.au/ajte/vol36/iss9/4

Hembree, R. (1990). The nature, effects, and relief of mathematics anxiety. *Journal for Research in Mathematics Education*, *21*(1), 33-46. Retrieved from https://www.jstor.org/stable/749455

Ismawati, N., Masrukan, & Junaedi, I. (2015). Strategi dan proses berpikir dalam menyelesaikan soal pemecahan masalah berdasarkan tingkat kecemasan matematika. *Unnes Journal of Mathematics Education Research*, *4*(2), 93-101. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujmer/article/view/9835

Kiptiyah, S. M. (2017). Kemampuan berpikir kreatif pada problem based learning ethnomathematics berdasarkan minat belajar. *Journal of Primary Education*, *5*(2), 104-112. Retrieved from https://journal.unnes.ac.id/sju/index.php/jpe/article/view/12900

Minister of Education and Culture Regulation. (2006). *Standar isi pendidikan dasar dan menengah*. Jakarta: Kemendibud.

Nofitasari, L., Mastur, Z., & Mashuri. (2016). Keefektifan model pembelajaran tutor sebaya bernuansa etnomatematika terhadap kemampuan pemecahan masalah peserta didik pada materi segiempat. *Unnes Journal of Mathematics Education*, *5*(1), 54-60. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujme/article/view/9336

Polya, G. (1973). How to solve it. *The Mathematical Gazette, 30*(290), 181-182. Retrieved from https://www.jstor.org/stable/3609122?origin=crossref&seq=1#page_scan_tab_contents

Prabawa, E. A., & Zaenuri. (2017). Analisis kemampuan pemecahan masalah ditinjau dari gaya kognitif siswa pada model project based learning bernuansa etnomatematika. *Unnes Journal of Mathematics Education Research*, *6*(1), 120-129. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujmer/article/view/18426

Pradipta, Md. A., Sudanyana, I. Ngh., & Darsana, I. W. (2013). Pengaruh model pembelajaran problem based learning melalui pendekatan realistic mathematics education terhadap hasil belajar matematika kelas iv sekolah dasar. *MIMBAR PGSD Undiksha*, *1*(1), 1-10. Retrieved from https://ejournal.undiksha.ac.id/index.php/JJPGSD/article/view/1208

Richardson, F. C., & Suinn, R. M. (1972). The mathematics anxiety rating scale: psychometric data. *Journal of Counseling Psychology, 19*(6), 551-554. Retrieved from https://journals.sagepub.com/doi/10.2466/pr0.2003.92.1.167

Suryanti. (2013). Pembelajaran pemecahan masalah pada sistem persamaan linear dua variabel bagi siswa kelas viii madrasah tsanawiyah. *Cakrawala Pendidikan*, *15*(1), 121-127. Retrieved from http://digilib.stkippgri-blitar.ac.id/196

Wahyuningtyas, D. T., Yuniasih, N., Irawan, E. B., & Susiswo. (2018). Desain modul pembelajaran geometri dengan pendekatan contekstual teaching and learning untuk siswa sekolah dasar. *Sekolah Dasar: Kajian Teori dan Praktik Pendidikan*, *27*(1). Retrieved from http://journal2.um.ac.id/index.php/sd/article/view/1418

Zakaria, E., & Nordin, N. M. (2008). The effects of mathematics anxiety on matriculation students as related to motivation and achievement. *Eurasia Journal of Mathematics, Science and Technology Education*, *4*(1), 27-30. Retrieved from http://www.ejmste.com/The-Effects-of-Mathematics-nAnxiety-on-Matriculation-Students-nas-Related-to-Motivation-and-nAchievement,75303,0,2.html