

**THE INFLUENCE OF THE INDONESIAN REALISTIC MATHEMATICS
EDUCATION LEARNING MODEL (PMRI) ASSISTED BY THE
ETHNOMATHEMATICS WORKSHEET ON NUMERICAL LITERACY
ABILITY IN TERMS OF STUDENTS' LEARNING INTEREST**

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Received May 04, 2023; Revised June 01, 2023; Accepted June 15, 2023

Abstract:

Numerical literacy ability is an important ability that students must have. This study aims to analyze the impact of the Indonesian Realistic Mathematics Education learning model (PMRI) using ethnomathematics worksheet media on students' numeracy literacy skills related to students' learning interests. This research is quantitative research with a quasi-experimental design. The samples in this study were students of class VIII D and VIII F SMP Negeri 6 Magelang who were selected through cluster random sampling technique. In this study, the instrument used was numeracy literacy tests and student learning interest questionnaires. Based on data analysis calculations, the results show that: (1) The numeracy literacy skills of students who take PMRI learning assisted by ethnomathematics worksheets are better than students who take PMRI learning; (2) Students with high learning interest have better numeracy skills than students with moderate learning interest, students with moderate learning interest have the same good numeracy literacy skills as students who have low learning interest, and students with high learning interest have the ability better numeracy literacy than students with low interest in learning; (3) There is no interaction between the learning model and learning interest on students' numeracy literacy skills.

Keywords: PMRI Learning Model, Ethnomathematics LKS, Numerical Literacy Ability, Student Learning Interest

**PENGARUH MODEL PEMBELAJARAN PENDIDIKAN MATEMATIKA
REALISTIK INDONESIA (PMRI) BERBANTUAN LEMBAR KERJA SISWA
ETNOMATEMATIKA TERHADAP KEMAMPUAN LITERASI NUMERASI
DITINJAU DARI MINAT BELAJAR SISWA**

Abstrak:

Kemampuan literasi numerasi menjadi kemampuan penting yang harus dimiliki siswa. Tujuan penelitian ini adalah untuk menganalisis pengaruh model pembelajaran Pendidikan Matematika Realistik Indonesia (PMRI) menggunakan

media LKS etnomatematika terhadap kemampuan literasi numerasi siswa berkaitan dengan minat belajar siswa. Penelitian ini merupakan penelitian kuantitatif dengan desain eksperimen semu. Sampel yang digunakan adalah siswa kelas VIII D dan VIII F SMP Negeri 6 Magelang yang dipilih melalui teknik cluster random sampling. Dalam penelitian ini menggunakan instrumen berupa tes kemampuan literasi numerasi dan angket minat belajar siswa. Berdasarkan perhitungan analisis data, didapatkan hasil bahwa: (1) Kemampuan literasi numerasi siswa yang mengikuti pembelajaran PMRI berbantuan LKS etnomatematika lebih baik dibandingkan siswa yang mengikuti pembelajaran PMRI; (2) Siswa dengan minat belajar tinggi memiliki kemampuan literasi numerasi yang lebih baik daripada siswa dengan minat belajar sedang, siswa dengan minat belajar sedang memiliki kemampuan literasi numerasi yang sama baiknya dengan siswa yang memiliki minat belajar rendah, dan siswa dengan minat belajar tinggi memiliki kemampuan literasi numerasi yang lebih baik daripada siswa dengan minat belajar rendah; (3) Tidak terdapat interaksi antara model pembelajaran dan minat belajar terhadap kemampuan literasi numerasi siswa.

Kata Kunci: Model Pembelajaran PMRI, LKS Etnomatematika, Kemampuan Literasi Numerasi, Minat Belajar Siswa

How to Cite: Adiningsih, N. A., Rahmawati, F., & Chasanah, A. N. (2023). The Influence of the Indonesian Realistic Mathematics Education Learning Model (PMRI) Assisted by Ethnomathematics LKS on Numerical Literacy Ability in Terms of Students' Learning Interest. *MaPan : Jurnal Matematika dan Pembelajaran*, 11(1), 136-154. <https://doi.org/10.24252/mapan.2023v11n1a9>.

INTRODUCTION

Numerical literacy is an essential ability that students need to master. This can be seen from Government Regulation Number 57 of 2021 concerning National Education Standards which places character building by Pancasila values as well as student literacy and numeracy competencies as a focus in the Graduate Competency Standards so it needs attention. Numerical literacy is different from mathematical literacy even though both are based on the same knowledge and skills. Ekowati and Suwandayani (2019) explained that numeracy requires knowledge of mathematics, but learning mathematics does not necessarily develop numeracy skills. In simple terms, numeracy literacy is the ability to apply the concept of arithmetic and number operations skills in everyday life.

Based on the pre-research in class VIII D and VIII F at SMP Negeri 6 Magelang, the average student score obtained from the initial numeracy literacy test results was 24.26 which is in the low category. This is because only

a few students whose work results fulfill all indicators of numeracy literacy skills. This ability includes using various numbers and symbols related to basic mathematics in solving practical problems in the context of everyday life, analyzing information displayed from tables, graphs, and pictures, and interpreting the results of this analysis to predict and make decisions (Han, Susanto, Dewayani, Pandora, Hanifah, Mifthahussururi, Nento, & Akbari, 2017). These results are in line with Putri's research, Utomo, and Zukhrufurrohmah (2021) which states that some students get low numeracy literacy ability test scores because they only fulfill one indicator out of three indicators.

Numerical literacy in schools is still low due to the lack of attractive learning models and media (Ambarwati & Kurniasih, 2021). The conventional learning model where learning is still teacher-centered and the media is only textbooks makes students less involved in learning (Cahyani, Nullhakim, & Yuliana, 2021).

The results of interviews with teachers and the deputy head of curriculum SMP Negeri 6 Magelang also stated that the use of learning models and media was still limited. The learning model used is a direct learning model and media that help deliver material using only textbooks. The teacher-centered direct learning model makes students less active in learning. The teacher explains the material and students receive information, making only a few students active in learning, even though the teacher has provided opportunities for students to ask questions and do practice questions. Therefore, it is necessary to innovate learning models and media that can help improve the quality of learning mathematics.

One of the learning models that are innovative and is considered capable of improving numeracy literacy skills is the Indonesian Realistic Mathematics Education (PMRI). This is in line with the Minister of National Education of the Republic of Indonesia Number 41 of 2007 concerning Process Standards which mandates that the learning process should be carried out through a process of exploration, elaboration, and confirmation in which the three types of processes are characteristics of PMRI (Wijaya, 2012).

PMRI is a learning model with instructional guidelines and aims to support students to build mathematical knowledge through contextual problems (Zulkardi & Putri, 2020). The PMRI syntax includes understanding contextual problems, explaining contextual problems, solving contextual

problems, comparing and discussing answers, and concluding (Wahyudi, Joharman, & Ngatman, 2017).

Learning can be optimal if it is supported by appropriate learning media. One of the learning media that can be used easily and can encourage student involvement in learning is the Student Worksheet. Research by Miftah and Setyaningsih (2022), states that the use of worksheets as learning media effectively supports students' numeracy literacy skills.

Based on the characteristics of PMRI which uses contextual problems and can be integrated with other topics, the PMRI learning model can be modified by combining elements of local culture. A development in education that builds mathematics by adapting local culture and then using it in mathematics learning activities is called ethnomathematics (Marsigit, 2016).

Adha and Refianti's research (2019) stated that Student Worksheets (LKS) designed using the PMRI learning model based on the South Sumatra context had a potential effect on students' learning outcomes. From the results of interviews at SMP Negeri 6 Magelang, it was found that there was no ethnomathematics LKS as a supporting medium in learning mathematics. Therefore, it is necessary to try out learning innovations with ethnomathematics worksheets to improve students' abilities.

In the world of education, students' abilities are not only influenced by external factors but also influenced by internal factors, one of which is student interest in learning. Guilford (1969) stated that interest in learning is a desire in students psychologically to learn something which includes feelings of pleasure, interest in learning, showing attention while studying, and involvement in learning. Based on research, it was found that if there is an increase in interest in learning, it will be followed by an increase in learning outcomes. Thus, teachers must know students' learning interests so that they can encourage students to be active in learning mathematics.

Based on research conducted by Novitasari, Febriyanti, and Wulandari (2022) with the title Effectiveness of Ethnomatematics-Based Worksheets with a STEM Approach to Critical Thinking Ability it was found that the critical thinking skills of students who carry out Ethnomatematics-based LKS-assisted learning are better than students who do learning without ethnomathematics worksheet. Other research from Ryan, Fitzmaurice, and O'donoghue (2022) with the title Student Interest and Engagement in Mathematics After the First Year of Secondary Education states that student interest in learning influences students in learning mathematics which ultimately affects students' abilities.

Based on the explanation above, the authors are interested in researching students of class VIII using the PMRI learning model assisted by an ethnomathematics worksheet on students' numeracy literacy abilities in terms of student learning interest. This study had a goal, namely to identify differences in the numeracy literacy abilities of students who were taught by the PMRI learned model assisted by ethnomathematics worksheets with students who were taught by the PMRI learned model, compare the numeracy literacy abilities of students who had high, medium, and low learned interest, and analyze interactions between learned models and students' learned interest on students' numeracy literacy skill.

METHODS

This study uses an approach quantitative. The research method used is experimental research. The design of the experiment in this research is quasi-experimental. Quasi-experimental design in this study used the nonequivalent posttest-only control group design. The learning model (A_j) used is the PMRI learning model assisted by ethnomathematics worksheet (A_1) and PMRI (A_2). The students' learning interest (B_i) is divided into three categories, namely high (B_1), medium (B_2), and low (B_3). The illustration of this research design is presented in table 1 below.

Table 1. Research Design

$B_i \backslash A_j$	B_1	B_2	B_3
A_1	A_1B_1	A_1B_2	A_1B_3
A_2	A_2B_1	A_2B_2	A_2B_3

Variables used in this research are the independent variables that include the learning models and student learning interest as well as dependent variable is the ability of numeracy literacy. The population is class VIII students of SMP Negeri 6 Magelang for the 2022/2023 academic year, which included six classes, namely class VIII A to class VIII F. The sample for this research was taken by cluster random sampling technique, elected classes VIII D and VIII F, which consisted of 54 students. Using the cluster random sampling technique, class VIII D was selected as the control class and VIII F as the experimental class. Before administering the interest in learning questionnaire, an analysis of the initial ability test results was first carried out

to determine whether or not the abilities of the control class and the experimental class were the same. The interest in learning questionnaire instrument is used to measure the level of interest in learning which is then grouped into high, medium, and low categories. The questionnaire used in this study was a standard questionnaire designed by Schiefele, Krapp, Wild, and Winteler (1993). The test instrument is used to measure students' numeracy literacy abilities.

Before the two instruments were tested, they first must be in validation by experts namely two mathematics education lecturers and one teacher of mathematics to determine the validity of the instrument. The instrument was also tried out in the trial class, namely class VIII E. The results of the trial test on the questionnaire were used to determine the reliability value while the numeracy literacy ability test instrument was used to analyze the reliability, discriminating power, and difficulty level of the instrument items. Technique preliminary data processing using the t-test and final data using a two-way ANOVA test to find out the mean difference between the two independent variables that affect one dependent variable and then continue the post-ANOVA follow-up test, namely the Scheffe test if H_0 is rejected. Processing of this data using Microsoft Excel with the following formula:

1. Test whether the control class and the experimental class have the same initial abilities using the t-test with the following formula (Sugiyono, 2013).

$$S_{gabungan} = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} \quad (1)$$

$$t_{hitung} = \frac{\bar{X}_1 - \bar{X}_2}{S_{gabungan} \sqrt{\frac{n_1+n_2}{n_1 \cdot n_2}}} \quad (2)$$

Information:

\bar{X}_1 = mean score of experimental class students

\bar{X}_2 = mean value of control class students

n_1 = number of experimental class students

n_2 = number of control class students

s_1^2 = experiment class variant

s_2^2 = control class variant

2. Testing the hypothesis using a two-way ANOVA test with a summary in table 2 below (Budiyono, 2015).

Table 2. Summary of the Two-Way Anava Test

Source	JK	Dk	RK	F_{obs}	F_{α}
Learning model (A)	JKA	$p - 1$	RKA	F_a	$F_{\alpha,p-1,N-pq}$
Interest in learning (B)	JKB	$q - 1$	RKB	F_b	$F_{\alpha,q-1,N-pq}$
Interaction (AB)	JKAB	$(p - 1)(q - 1)$	RKAB	F_{ab}	$F_{\alpha,(p-1)(q-1),N-pq}$
Error	JKG	$N - pq$	RKG	-	-
Total	JKT	$N - 1$	-	-	-

The following is the decision-making for the two-way anava test.

- (1) If $F_a \in DK$, then H_{0A} is rejected.
- (2) If $F_b \in DK$, then H_{0B} is rejected.
- (3) If $F_{ab} \in DK$, then H_{0AB} is rejected.

3. Testing, if H_0 is rejected, is continued using the post-ANOVA follow-up test, namely the Scheffe with the formula (Budiyono, 2015).

a. Comparison of means between lines

$$F_{i-j} = \frac{(\bar{x}_i - \bar{x}_j)^2}{RKG \left(\frac{1}{n_i} + \frac{1}{n_j} \right)} \tag{3}$$

b. Comparison of means between columns

$$F_{i-j} = \frac{(\bar{x}_i - \bar{x}_j)^2}{RKG \left(\frac{1}{n_i} + \frac{1}{n_j} \right)} \tag{4}$$

c. Comparison of means between cells in the same column

$$F_{ij-kj} = \frac{(\bar{x}_{ij} - \bar{x}_{kj})^2}{RKG \left(\frac{1}{n_{ij}} + \frac{1}{n_{kj}} \right)} \tag{5}$$

RESULTS AND DISCUSSION

A. Pre-requisite Testing

The prerequisite tests carried out in this study were the normality test and the homogeneity test. The normality test aims to determine whether the sample comes from a normally dispersed population or not. The normality test used in the prerequisite test uses the Lilliefors test. The following is a summary of the normality test results presented in table 3 as follows.

Table 3. Summary of Normality Test Results

Class	N	L_{count}	L_{table}	Decision
Experiment	27	0.124	0.1542	Normally distributed
Control	27	0.0959	0.1542	Normally distributed
High learning interest	14	0.1142	0.227	Normally distributed
Medium learning interest	27	0.1289	0.1542	Normally distributed
Low learning interest	13	0.1884	0.234	Normally distributed

Based on the table it can be seen test analysis results in normality for testing the normality of the experimental class, control class, high, medium, and low learning interest obtained that result $L_{hitung} \leq L_{tabel}$, so it means, normally distributed data.

Furthermore, the homogeneity test was carried out using the Bartlett test. The homogeneity test in the final data analysis was carried out in both classes, the experimental class and the control class. Then a homogeneity test was also carried out on high, medium, and low learning interest. The homogeneity test is presented in table 4 below.

Table 4. Summary of Homogeneity Test Results

	dk	L^2_{hitung}	L^2_{tabel}	Decision
Learning model	1	0.0004	3.8415	Homogeneous data
Learning Interest	2	3.6802	5.9915	Homogeneous data

Based on the table it can be seen that for the homogeneity test of the two learning models and the homogeneity test of interest in learning, the value obtained is $L^2_{hitung} < L^2_{tabel}$, then both variances are homogeneous.

B. Hypothesis Test

1. Two-Way Analysis of Variance with Different Cells

Two-way Anava is a technique for testing hypotheses that compares independent sample differences with two or more factors. Anava of two unequal cell paths is used if the frequency of each cell is not the same (Budiyono, 2015). This test can be carried out after the data is declared to be normally distributed and homogeneous.

- a. $H_{0A}: \mu_1 = \mu_2$ (there is no difference in numeracy literacy skills between students who take part in learning using the PMRI learning model assisted by ethnomathematics worksheets and the PMRI learning model).
 $H_{1A}: \mu_1 \neq \mu_2$ (there are differences in numeracy literacy skills between students who take part in learning using the PMRI learning model assisted by ethnomathematics LKS and the PMRI learning model).
- b. $H_{0B}: \mu_1 = \mu_2 = \mu_3$ (there is no difference in numeracy literacy skills between students with high, medium, and low learning interest categories).
 $H_{1B}: \mu_1 \neq \mu_2, \mu_1 \neq \mu_3, \mu_2 \neq \mu_3$ (at least two means are not the same/there are differences in numeracy literacy skills between students with high, medium, and low interest in learning).
- c. $H_{0AB}: \mu_{ij} = 0$, for each $i = 1, 2$ and $j = 1, 2, \text{ and } 3$ (there is no interaction between the learning model and learning interest on numeracy literacy skills).
 $H_{1AB}: \mu_{ij} \neq 0$, for each $i = 1, 2$ and $j = 1, 2, \text{ and } 3$ (there is an interaction between the learning model and learning interest on numeracy literacy skills).

The results of the calculation of the two-way analysis of variance *posttest data* on numeracy literacy skills are shown in table 5 below.

Table 5. Results of Two-Way ANOVA Test Analysis

Source	JK	dk	RK	F _{obs}	F _{tabel}	Conclusion
Learning Model (A)	1361	1	1361	8,464	4.04	H ₀ rejected
Interest in Learning (B)	11737	2	5869	36,505	3,19	H ₀ rejected
Learning Model * Interest in Learning (AB)	529	2	265	1,645	3,19	H ₀ accepted
Error	7717	48	161			
Total	21344	53				

The test criteria for two-way ANOVA, namely if $F_{hitung} > F_{tabel}$, then H₀ is rejected. Based on the table it can be concluded as follows.

- a. Obtained $F_{A \text{ hitung}} = 8,464 > F_{A \text{ tabel}} = 4,04$, so based on the two-way ANOVA test criteria it was concluded that H_{0A} was rejected. This means that there is a difference in effectiveness between learning models on numeracy literacy skills.
- b. Obtained $F_{B \text{ hitung}} = 36,505 > F_{A \text{ tabel}} = 3,19$, so based on the two-way ANOVA test criteria it was concluded that H_{0B} was rejected. This means that there are differences in numeracy literacy abilities between students with high, medium, and low learning interest categories.
- c. Obtained $F_{AB \text{ hitung}} = 1,645 \leq F_{AB \text{ tabel}} = 3,19$, so based on the two-way ANOVA test criteria it is concluded that H_{0AB} is accepted. This means that there is no interaction between the learning model and students' learning interest in students' numeracy literacy abilities.

2. Post-ANOVA Follow-Up Test

The test chosen to follow up on ANOVA is the Scheffe test. Follow-up testing after ANOVA was carried out on the first and second hypotheses because it was based on the ANOVA hypothesis testing H_{0A} and H_{0B} was rejected. Marginal average data is shown in Table 6 as follows.

Table 6. Marginal Mean Data

Learning model	Interest to learn			Total	Marginal Average
	High	Medium	Low		
PMRI assisted by Ethnomathematics	67	33	37	137	41
LKS					
PMRI	57	30	18	105	35
Total	124	62	54	241	
Marginal Average	61,5	31,3	26,46		

Based on table 6, it is found that the PMRI learning model assisted by ethnomathematics LKS is more effective in improving students' numeracy literacy skills than the PMRI learning model. Referring to table 5 regarding the summary of the results of the ANOVA test of two different cell paths, it can be seen that H_{0B} is rejected, it can be concluded that there are differences in students' numeracy literacy abilities between learning interests. Several comparative tests need to be carried out to analyze the differences in each

group. A summary of the results of the comparative test between columns is presented in table 7 as follows.

Table 7. Post-ANOVA Follow-up Test Result

H_0	F_{obs}	$(2)F_{(0,05;2,48)}$	Decision
$\mu_a = \mu_b$	55,334	6,38	H_0 rejected
$\mu_b = \mu_c$	0,840	6,38	H_0 accepted
$\mu_a = \mu_c$	51,320	6,38	H_0 refused

The test criteria for two-way ANOVA, namely if $F_{hitung} > F_{tabel}$, then H_0 is rejected. Based on the table it can be concluded as follows.

- Obtained $F_{a-b\ hitung} = 55,334 > F_{a-b\ tabel} = 6,38$, so based on the two-way ANOVA test criteria it was concluded that H_0 is rejected. This means that there are differences in the numeracy literacy abilities of students with high learning interest categories and students who have medium learning interest categories.
- Obtained $F_{b-c\ hitung} = 0,840 \leq F_{b-c\ tabel} = 6,38$, so based on the two-way ANOVA test criteria it is concluded that H_0 is accepted. This means that there is no difference in the numeracy literacy abilities of students with medium learning interest and students who have low learning interest.
- Obtained $F_{a-c\ hitung} = 51,320 > F_{a-c\ tabel} = 6,38$, so based on the two-way ANOVA test criteria it was concluded that H_0 is rejected. This means that there are differences in the numeracy literacy abilities of students with high learning interest categories and students who have low learning interest categories.

3. First Hypothesis

Based on the marginal average, the PMRI learning model assisted by ethnomathematics LKS is more effective than model PMRI learning on students' numeracy literacy skills. Learning in the experimental class with the PMRI learning model assisted by ethnomathematics worksheets is carried out by presenting contextual problems through worksheets that contain mathematical concepts in the culture around students which makes students closer to mathematics to create meaningful learning. Furthermore, PMRI learning is assisted by ethnomathematics worksheets, and group learning in solving problems based on the culture in the student's environment so that

students are interested and help each other, discuss, and exchange information related to the problems presented.

Based on the findings in the field, the factors that led to students who were taught using the PMRI learning model assisted by ethnomathematics LKS had better numeracy skills, namely first, the experimental group had more involvement in learning. Students in the experimental class respond to teacher questions that present mathematical problems from the surrounding culture. This is in line with constructivism theory where during the learning process students are directed to develop their knowledge to achieve learning goals.

Second, students are enthusiastic about participating in the learning process and group discussions. This is shown when students complete the problem stages in the ethnomathematics LKS and make presentations. Student involvement and enthusiasm in PMRI learning assisted by ethnomathematics LKS has a positive influence on student understanding. This is following the research of Nursyahidah, Saputro, and Rubowo (2018) which states that PMRI learning with ethnomathematics can support students' understanding of learning mathematics. The existence of ethnomathematics can develop students' understanding from the informal level to the formal level.

In PMRI learning assisted by ethnomathematics LKS, students are encouraged active in learning that uses media with the surrounding cultural context. In addition, in PMRI learning assisted by ethnomathematics LKS, there is explain step contextual issues related to the culture around students and given directions settlement. This makes some students ask if they don't understand the problem served and the teacher will provide instructions in the process to increase students' ability to solve problems. This is following the results of research by Shahbari and Daher (2020) which states that realistic learning through ethnomathematics can improve students' ability to solve problems.

Learning in the control class is done with a model PMRI learning. This learning is done in groups and begins with contextual problems so that students build their knowledge. In constructing their knowledge, the learning steps are the same as those carried out in the experimental class. The difference is that in the control class, students are given worksheets that contain contextual problems. This LKS presents real and concrete problems around students that can be imagined by students. However, during learning some students are less involved in solving problems. From the results of

observations, the lack of student participation in learning is because students feel less interested. After all, the problems presented are often encountered in their lives.

At the end of the lesson, students are given the opportunity if there are things that are not understood, but students do not ask questions and remain silent. Whereas in learning, the teacher also encourages students to solve problems and be active. The lack of student involvement certainly greatly influences students' understanding of learning material and in the end, also affects student abilities. This is in line with the research of Christianity and Cendana (2021), which states that if students' involvement in learning makes students able to find the relevance of lessons to their own lives it will affect their abilities in learning and support the achievement of learning goals.

4. Second Hypothesis

a. High Learning Interest with Medium Learning Interest

Students' numeracy literacy skills are influenced by students learning interests. Students with high learning interests have better numeracy literacy skills than students with medium learning interests. Students with a high interest in learning can solve questions according to indicators of numeracy literacy ability. Although not able to answer correctly as a whole, after being analyzed, students who have a high interest in learning have carried out indicators of numeracy literacy skills, namely using symbols, analyzing information, and interpreting the results of the analysis.

Based on the results of research in the field, students who have a high learning interest in solving problems can link their knowledge with information in the problem and recheck the completion of the problem, while students with medium learning interest can link their knowledge with some of the information in the problem, but are less thorough in solve problems.

It was also found that another factor that distinguished students with high learning interest and medium learning interest was the presence of students' attention between categories of learning interest. Students with high learning interests seek help from fellow friends who are considered more in control and teach each other friends who ask for help, while students with medium learning interests are trying to work on problems independently so that when the teacher asks questions, students with high learning interest understand more and can answer correctly. This is in line with the research of Nurdiyana, Pujiastuti, and Anriani (2022) which states that students with high

learning interests will give systematic and precise answers compared to students with medium learning interests who give less accurate answers.

b. Medium Learning Interest with Low Learning Interest

Students with medium learning interests have the same good numeracy literacy skills as students who have low learning interests. After analysis, students with medium and low learning interests were only able to fulfill 2 to 3 indicators. This is in line with research from Sapitri, Utami, and Mariyam (2019) which states that students with medium learning interest and low learning interest are only able to meet some indicators or have the same abilities.

Factors that influence the occurrence of this are students who have medium and low learning interests are less interested and pay less attention to learning which has an impact on their ability to solve problems. This is also following the research of Indra & Rahadyan (2021) which explains that both of them are unable to solve problems due to a lack of student attention in learning so when the context of the problem is presented, students have difficulty determining the appropriate formula to find solutions to problems based on the context presented.

c. High Learning Interest with Low Learning Interest

Students with high learning interests have better numeracy literacy skills than students with low learning interests. Students with high interest in learning can complete all indicators of numeracy literacy skills and students with low interest in learning only fulfill 2-3 indicators of numeracy literacy ability. In this case, it can be seen that the numeracy literacy skills of students who have a high learning interest are different from those with a low learning interest. This is in line with research conducted by Fauzanah, Aminudin, and Ubaidah (2022), namely in the high category, students can fulfill the three indicators of numeracy literacy ability, while the low category is quite capable of fulfilling the first indicator, but is less able to fulfill the second and third indicators.

This is because students with high learning interests have high attention and interest in participating in learning so their involvement in learning is quite large which ultimately increases their understanding of learning material. In addition, students who have a high interest in learning have encouragement that arises from themselves to solve existing problems. This is different from students who have low interest in learning where they have less motivation in themselves to learn.

5. Third Hypothesis

There is no interaction between the learning model and students' learning interest in numeracy literacy skills. Based on the research procedures that have been carried out, it is possible that there was no interaction due to several things. First, students are unprepared for the material to be taught so learning becomes hampered, especially whether high, medium, or low interest. Students have not been able to build their knowledge and develop a mathematical mindset and have not been able to choose the appropriate strategy to solve problems. Second, the learning time sometimes does not correspond to reality, such as when it coincides with after sports class so the condition of students is less enthusiastic which will affect their understanding. In line with the research results of Trisnawati, Yulianto, and Ningsih (2023) which stated that the lack of student readiness and inappropriate learning hours resulted in no interaction.

Not proving the third hypothesis can also be interpreted if outside this research model, there are also control variables that are also influential, such as initial abilities, learning styles, gender, and learning conditions. In line with research which states that various uncontrollable factors can affect interactions between variables (Mulyanto, Gunarhadi, & Indriayu, 2018). Previous research also stated that there was an interaction between the learning model and initial abilities on students' abilities (Annurwanda & Friantini, 2019).

Third, some students lack the desire in themselves to study mathematics so students only depend and rely on their group mates which is research of Zambrano, Kirschner, Sweller, and Kirschner (2019) state that some students are less involved in group activities because tend to depend on the dominant student in the group.

The mean value of numeracy literacy skills in each category of interest in learning using the PMRI learning model assisted by ethnomathematics worksheets is always greater so that there can be no interaction between variables. This is similar to research by Samirah, Pramudya, and Kuswardi (2019) and research by Astuti, Gunarhadi, and Mintasih (2020) which states that the ability of experimental class students in each category of interest in learning is always greater, so there is no interaction between variables.

The PMRI learning model assisted by ethnomathematics worksheets uses culture-based worksheets that make students more enthusiastic and involved in solving problems. This is to the research of Paramartha, Suharta, and Parwati (2020) which states that the use of ethnomathematics LKS makes

students enthusiastic in learning because it is supported by a curiosity about culture so that learning becomes meaningful and fosters an increase in students' abilities.

CONCLUSION

Based on the results of the analysis and discussion of the influence of the Indonesian Realistic Mathematics Education Learning Model (PMRI) assisted by ethnomathematics LKS on numerical literacy ability in terms of students' learning interest, it can be concluded that: (1) The numeracy literacy skills of students who join PMRI learning assisted by ethnomathematics worksheet were better than students who join PMRI learning. (2) Students with high learning interest have better numeracy literacy skills than students with medium learning interest, students with medium learning interest have the same good numeracy literacy skills as compared to students with low learning interest, and students with high learning interest have the ability better numeracy literacy than students with low learning interest. (3) There is no interaction between the learning model and learning interest in students' numeracy literacy skills.

The implications of this research, namely as follows: (1) The PMRI learning model assisted by ethnomathematics LKS is a learning model that can be said to be good for improving students' numeracy literacy skills. Therefore, the PMRI learning model assisted by ethnomathematics LKS can be a consideration for teachers in preparing lessons. (2) Students' interest in learning affects students' numeracy literacy skills. Students with high learning interests have an average learning outcome higher than students with medium or low learning interests. During the learning process, students are expected to increase their attention and involvement in learning to improve the quality of learning. (3) In the learning process it is hoped that there will be a collaboration between students and teachers in finding solutions to improving numeracy literacy skills, even though there is no interaction between learning models and learning interest in students' numeracy literacy abilities.

REFERENCES

Ambarwati, D., & Kurniasih, M. D. (2021). Pengaruh problem based learning berbantuan media youtube terhadap kemampuan literasi numerasi siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 5(3), 2857–2868.

<https://doi.org/10.31004/cendekia.v5i3.829>.

- Annurwanda, P., & Friantini, R. N. (2019). Efektivitas penerapan metode round table dan ekspositori terhadap prestasi belajar matematika ditinjau dari kemampuan awal. *Riemann: Research of Mathematics and Mathematics Education*, 1(1), 1-13. <https://doi.org/10.38114/riemann.v1i1.19>.
- Astuti, N. R., Gunarhadi, & Mintasih. (2020). The effect of RME on mathematics learning outcomes viewed mathematic communication skills. *International Journal of Educational Research Review*, 5(1), 43-53. <https://doi.org/10.24331/ijere.650864>.
- Budiyono. (2015). *Statistika untuk penelitian*. Surakarta: UNS Press.
- Christanty, Z. J., & Cendana, W. (2021). Upaya guru meningkatkan keterlibatan siswa kelas K1 dalam pembelajaran synchronous. *Journal of Elementary Education*, 04(03), 3.
- Dwi Cahyani, I., Nulhakim, L., & Yuliana, R. (2021). Pengembangan media pembelajaran scrapbook dongeng fabel terhadap minat literasi siswa SD. *MIMBAR PGSD Undiksha*, 9(2), 337. <https://doi.org/10.23887/jjpsgd.v9i2.35271>.
- Ekowati, D. W., & Suwandayani, B. I. (2019). *Numerical literacy for elementary school*. Malang: UMM Press.
- Fauzanah, A. E., Aminudin, M., & Ubaidah, N. (2022). Analisis kemampuan literasi numerasi siswa dalam menyelesaikan masalah pecahan. *Jurnal Pendidikan Sultan Agung*, 1(3), 198-205.
- Guilford, J. P. (1969). *Personality*. New York: MC.Graw Hill Book Company.
- Han, W., Susanto, D., Dewayani, S., Pandora, P., Hanifah, N., Mifthahussururi, Nento, M. N., & Akbari, Q. S. (2017). *Materi pendukung literasi numerasi*. Retrieved from <https://gln.kemdikbud.go.id/glnsite/wp-content/uploads/2017/10/materi-pendukung-literasi-numerasi-rev.pdf>.
- Indra, K., & Rahadyan, A. (2021). Analisis kemampuan numerasi siswa kelas XI dalam penyelesaian soal tipe AKM pada pokok bahasan sistem persamaan linear tiga variabel. *Jurnal Didactical Mathematics*, 3(2), 84-91. <https://doi.org/10.31949/dm.v3i2.1810>.
- Marsigit, M. (2016). Pembelajaran matematika dalam perspektif kekinian. *Math*

- Didactic: Jurnal Pendidikan Matematika*, 2(3), 132–141. <https://doi.org/10.33654/math.v2i3.40>.
- Miftah, R. N., & Setyaningsih, R. (2022). Development of LKPD based on minimum competency assessment (AKM) on geometry material to improve numeracy literacy skills. *Journal of Mathematics Education Study Program*, 11(3), 2199–2208.
- Mulyanto, H., Gunarhadi, & Indriayu, M. (2018). The effect of problem-based learning model on student mathematics learning outcomes viewed from critical thinking skills. *International Journal of Educational Research Review*, 3(2), 37–45. <https://doi.org/10.24331/ijere.408454>.
- Novitasari, N., Febriyanti, R., & Wulandari, I. A. (2022). Efektivitas LKS berbasis etnomatematika dengan pendekatan stem terhadap kemampuan berpikir kritis. *Vygotsky: Jurnal Pendidikan Matematika Dan Matematika*, 4(1). <https://doi.org/10.30736/voj.v4i1.521>.
- Nurdiyana, R. A., Pujiastuti, H., & Anriani, N. (2022). Analisis kemampuan pemahaman matematis siswa ditinjau dari minat belajar. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 12(1), 55. <https://doi.org/10.33087/dikdaya.v12i1.274>.
- Nursyahidah, F., Saputro, B. A., & Rubowo, M. R. (2018). Supporting second grade lower secondary school students' understanding of linear equation system in two variables using ethnomathematics. *Journal of Physics: Conference Series*, 983(1). <https://doi.org/10.1088/1742-6596/983/1/012119>.
- Paramartha, I. G. L., Suharta, I. G. P., & Parwati, N. N. (2020). Penerapan lembar kerja siswa (LKS) matematika berbasis etnomatika untuk meningkatkan kemampuan pemecahan masalah dan membangun karakter positif. *Journal for Lesson and Learning Studies*, 3(1), 30–40.
- Putri, B. A., Utomo, D. P., & Zukhrufurrohmah. (2021). Analisis kemampuan literasi numerasi peserta didik SMP dalam menyelesaikan soal cerita aljabar. *JRPM (Jurnal Review Pembelajaran Matematika)*, 6(2), 141–153. <https://doi.org/10.15642/jrpm.2021.6.2.141-153>.
- Ryan, V., Fitzmaurice, O., & O'donoghue, J. (2022). Student interest and engagement in mathematics after the first year of secondary education. *European Journal of Science and Mathematics Education*, 10(4), 436–454. <https://doi.org/10.30935/SCIMATH/12180>.

- Samirah, S., Pramudya, I., & Kuswardi, Y. (2019). Eksperimentasi model pembelajaran kooperatif teknik make a match pada materi persamaan dan pertidaksamaan linear satu variabel ditinjau dari minat belajar matematika. *Jurnal Pendidikan Matematika Dan Matematika*, 3(3), 275–285.
- Sapitri, Y., & Utami, C. (2019). Analisis kemampuan pemecahan masalah matematis siswa dalam menyelesaikan soal open-ended pada materi lingkaran ditinjau dari minat belajar. 2(1), 16–23.
- Schiefele, U., Krapp, A., Wild, K. P., & Winteler, A. (1993). Fragebogen zum Studieninteresse. *FSI, SIQ*. <https://doi.org/10.1037/t64341-000>.
- Shahbari, J. A., & Daher, W. (2020). Learning congruent triangles through ethnomathematics: The case of students with difficulties in mathematics. *Applied Sciences (Switzerland)*, 10(14). <https://doi.org/10.3390/app10144950>.
- Sugiyono. (2013). *Metode penelitian kualitatif, kuantitatif dan R&D ((Cet.IV))*. Alfabeta.
- Trisnawati, T., Yulianto, D., & Ningsih, E. F. (2023). The influence of Indonesian realistic mathematics learning (PMRI) based ethnomathematics on the improvement of mathematical communication skills in terms of gender. *Scientific Journal*, 13(3), 552–561.
- Wahyudi, M., Joharman, M., & Ngatman, M. (2017). The development of realistic mathematics education (RME) for primary schools' prospective teachers. *Ictte*, 158, 814–826. <https://doi.org/10.2991/ictte-17.2017.83>.
- Wijaya, A. (2012). *Realistic mathematics education: An alternative approach to learning mathematics*. Yogyakarta: Science Graha.
- Zambrano, J., Kirschner, F., Sweller, J., & Kirschner, P. A. (2019). Effects of group experience and information distribution on collaborative learning. *Instructional Science*, 47(5), 531–550. <https://doi.org/10.1007/s11251-019-09495-0>.
- Zulkardi, & Putri, R. I. I. (2020). New school mathematics curricula, PISA and PMRI in Indonesia (chapter 3). In *Standards-Based School Mathematics Curricula*. Springer Singapore. <https://doi.org/10.4324/9781003064275-1>.