(JIML) JOURNAL OF INNOVATIVE MATHEMATICS LEARNING
Volume 8, No. 3, September 2025
P-ISSN 2621-4733
E-ISSN 2621-4741
https://dx.doi.org/10.22460/jiml.v8i3.p23867

THE EFFECTIVENESS OF ELICITING ACTIVITIES MODEL IN LEARNING MATHEMATICS BASED ON INITIAL MATHEMATICAL SKILLS

Eveline Stephanie[1], Heris Hendriana[2], Tatang Supriatna[3], Nelly Fitriani [4]

[1]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia.
evelinestephanie@gmail.com
[2]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia.
herishen@ikipsiliwangi.ac.id
[3]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia.
statang776@gmail.com
[4]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia.
nhe.fitriani@gmail.com

ARTICLE INFO

Article history:

Received Jul 05, 2024
Revised Mar 17, 2025
Accepted Jun 12, 2025

Keywords:

Eliciting Activities Model
Learning Mathematics
Initial Mathematical Skills

ABSTRACT

Elementary mathematics education necessitates new instructional strategies that can address the varied baseline competencies and backgrounds of kids. The Eliciting Activities Model is a strategy that prioritizes student-centered discovery to enhance learning outcomes. This study seeks to examine the use of the Eliciting Activities Model on mathematics learning outcomes, focusing specifically on students' beginning mathematical competencies and their educational backgrounds. This quantitative study was carried out in three elementary institutions: SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu, encompassing a total of 81 pupils. The research utilized a survey methodology and applied Two-Way ANOVA to investigate the impact of school origin and beginning mathematical proficiency, along with their interaction, on mathematics learning outcomes. The data gathering process included pre-tests to evaluate students' basic mathematical competencies and post-tests to measure learning results following the implementation of the model. The findings indicated substantial disparities in mathematics learning outcomes contingent upon school origin and pupils' beginning competencies. A notable interaction effect was observed, wherein students with high beginning ability from SDS Yayasan Beribu attained superior learning outcomes relative to students from SDN Batujajar 3 and SDN Sukamaju. The findings indicate that the Eliciting Activities Model effectively improves mathematics learning outcomes, especially when tailored to students' beginning skills and the educational environment.

Corresponding Author:

Eveline Stephanie,
Department of Mathematics Education,
Institut Keguruan dan Ilmu Pendidikan Siliwangi,
Jl. Terusan Jend. Sudirman, Cimahi, Indonesia
Email: evelinestephanie@gmail.com

How to Cite:

Stephanie, E., Hendriana, H., Supriatna, T., & Fitriani, N. (2025). The Effectiveness of Eliciting Activities Model in Learning Mathematics based on Initial Mathematical Skills. *JIML,* 8(3), 468-479.

INTRODUCTION

Mathematics constitutes a fundamental discipline that significantly contributes to the enhancement of students' cognitive faculties. The acquisition of mathematical knowledge is imperative for fostering essential life skills such as problem-solving, analytical reasoning, and

decision-making, in addition to aiding individuals in attaining proficiency with numerical concepts and formulas. Mathematics serves as a pivotal subject that facilitates intellectual advancement and equips individuals for future professional endeavors, as it underpins advancements in science, technology, economics, and quotidian existence according NCTM (Nugraha, 2024). Presently, the pedagogy of mathematics is focused on cultivating creative, critical, and logical thinking competencies among students, with the aim of realizing these competencies as a primary objective in mathematics education (Rosidi, 2023).

Nevertheless, both on a global scale and specifically within the Indonesian context, the outcomes of mathematics education persistently face a multitude of enduring challenges. International assessments, such as the PISA (Programme for International Student Assessment), consistently demonstrate that students struggle to apply mathematical concepts to practical situations, signifying a deficiency in both reasoning and problem-solving capabilities. In Indonesia, similar concerns are observable, as evidenced by national examination results and learning assessments which indicate that a significant number of students fail to meet the fundamental competency standards in mathematics. Contributing factors to this phenomenon include a predominance of teacher-centered pedagogical approaches, the absence of contextualized learning experiences, and a limited application of innovative instructional models according to OECD (Anggraena et al., 2022). Mathematical thinking skills are non-algorithmic, intricate, and necessitate independent thought, frequently encompassing uncertainty, which demands much contemplation and interpretation (Partono et al., 2021).

Even more, mathematical reasoning abilities sometimes need the evaluation of several criteria, which may lead to conflicts, the development of open-ended solutions, and a considerable allocation of work (Cai & Leikin, 2020; Chytry & Kubiatko, 2021; Lovanti & Setiawan, 2023; Sukarna et al., 2020; Yuliani et al., 2020). As a result, it is essential that the fundamental mathematical skills of students are perpetually bolstered to enable the cultivation of higher-order mathematical proficiencies (Maryati & Monica, 2021)

Students sometimes mistakenly believe that mathematics comprehension is limited to a privileged minority (Safithri et al., 2021). Although several learning approaches promote the cultivation of mathematical thinking skills, students are predominantly conditioned to participate in passive listening during mathematical activities led by instructors (Suryani et al., 2020). The solution of mathematical problems explained is more about one solution that does not stimulate macro interpretations for students. This is followed by practice problems, which tend to be very differentiated in difficulty (Auliya et al., 2022; Meisya & Arnawa, 2021; Rusliah et al., 2021; Sari & Surya, 2017; Willis et al., 2022). Role learning refers to educational practices that promote the memorization of procedures without a comprehensive comprehension of the subject matter. This method is sometimes overlooked by educators, who may regard it as a permissible practice due to the diverse mathematical competencies of students and the considerable quantitative disparities among them (Nisa et al., 2023).

The primary objective of the study is to enhance comprehension of how innovative, student-centered learning methodologies, such as Model Eliciting Activities (MEAs), can beneficially impact mathematics learning outcomes, especially concerning students' initial mathematical competencies and educational background. This study seeks to connect abstract mathematical knowledge with practical application by presenting empirical evidence about the efficacy of MEAs in enhancing students' conceptual understanding, problem-solving skills, and overall academic achievement in mathematics.

The study’s hypothesis is that the application of the Model Eliciting Activities (MEAs) approach significantly improves students’ mathematics learning outcomes. Specifically, it is hypothesized that: (1) A significant disparity exists in mathematics learning outcomes between

students instructed via the MEAs approach and those who are not; (2) The enhancement of mathematics learning outcomes through MEAs is contingent upon students' foundational mathematical competencies; (3) The efficacy of the MEAs approach is contingent upon the students' school affiliation.

The Model Eliciting Activities (MEAs) method is a viable way to enhance mathematics learning results in light of these limitations. MEAs are intended to provide students with authentic, open-ended challenges that need the development of mathematical models through active investigation and logical reasoning. This method transitions the emphasis from passive learning to active participation, prompting students to relate mathematical concepts to real-world scenarios and to cultivate a more profound conceptual comprehension. Consequently, MEAs not only rectify the shortcomings of traditional, teacher-centric approaches but also foster higher-order thinking and learner autonomy.

Empirical research has proven the beneficial impact of MEAs on mathematics learning results. (Al Ayyubi & Rohmatulloh, 2023) demonstrated that MEAs substantially enhance students' capacity to analyze, represent, and articulate mathematical concepts inside problem-solving scenarios. Substantiate the assertion that MEAs enhance student engagement, conceptual retention, and profound comprehension in mathematics (Hamilton et al., 2008). Consequently, the MEAs technique is both theoretically robust and empirically efficacious in improving students' mathematical proficiency.

Educators must implement strategies, techniques, and learning approaches that inspire students to understand the material independently of their instructors' guidance and instruction in order to improve students' mathematical thinking abilities. The approach can be either student-centered or it can teach students to work independently. The Model Eliciting Activities approach is an alternative learning method that has been developed to enhance the mathematical knowledge of students and to demonstrate their active participation (Al Ayyubi & Rohmatulloh, 2023). Moreover, the MEAs approach is rarely employed in the initial development of students' mathematical abilities (Suryani et al., 2020).

The MEAs approach can enhance mathematical abilities, encompassing creative, critical, and logical thinking skills, along with higher-order thinking, by identifying models, concepts, and mathematical elements related to real-life scenarios in problem-solving. Considering that mathematical concepts are frequently abstract and disconnected from students' everyday experiences, it is essential to employ media that can illustrate these concepts, rendering them tangible. Geogebra can be utilized to demonstrate the subject matter, hence aiding the incorporation of abstract concepts into students' daily experiences. This study aims to examine the implementation of the Eliciting Activities Model on mathematics learning outcomes for students' basic mathematical competencies, emphasizing the impact of school origin. This research aims to elucidate effective mathematical methodologies applicable in educational settings to augment students' cognitive capacity in mathematics learning.

METHOD

The study was carried out across three distinct educational institutions: SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu. The study utilized a quantitative approach, concentrating on the collection and analysis of numerical data to uncover patterns, test hypotheses, and draw general conclusions. This study utilizes a survey methodology alongside a two-way ANOVA test analysis to explore the connections between students' mathematics learning outcomes, their school origins, and their initial mathematical abilities. This study involved sixth-grade elementary school students, chosen through purposive sampling to ensure representation from various school backgrounds. The study involved sixth-grade students from SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu. The sample included 31 students from SDN

Batujajar 3, 30 students from SDN Sukamaju, and 20 students from SDS Yayasan Beribu, resulting in a total of 81 students for the inferential statistical analysis. The tools employed in this study comprised a mathematical ability test to evaluate students' initial skills, a learning outcome test to gauge students' achievements following the educational intervention, and a questionnaire to gather additional data concerning student demographics and learning experiences. The study utilizes a blend of assessments and surveys. The investigation process was conducted in multiple stages: (1) preparing and validating the research instruments, (2) conducting a pre-test to assess students' initial mathematical abilities, (3) implementing the Model Eliciting Activities (MEAs) learning intervention, (4) administering a post-test to evaluate students' mathematics learning outcomes, (5) distributing questionnaires to collect additional supporting data, and (6) gathering and organizing the data for analysis. The Kolmogorov-Smirnov test was employed to conduct a normality test and a homogeneity test, which were conducted to evaluate the data analysis requirements. The data were subsequently analyzed using two-way ANOVA to investigate the interaction effects between students' initial mathematical abilities and their school of origin on their mathematics learning outcomes. In order to ascertain whether the observed differences were statistically significant, the significance level was established at 0.05. SPSS version 26 was employed to conduct all statistical calculations.

RESULTS AND DISCUSSION

Results

The Alternative Hypothesis (H_1) and the Null Hypothesis (H_0) are as follows:

H_0 : There is no difference in math learning outcomes based on students' school of origin

H_1 : There are differences in math learning outcomes based on students' school of origin

H_0 : There are no differences in mathematics learning outcomes based on students' initial mathematical abilities

H_1 : There are differences in mathematics learning outcomes based on students' initial mathematical abilities

H_0 : There is no interaction between school origin and students' initial mathematical skills in determining mathematics learning outcomes.

H_1 : There is an interaction between school origin and students' initial mathematical skills in determining mathematics learning outcomes.

Table 1. Between Subject Factor

	Value Label	N
School of Origin	SDN Batujajar 3	31
	SDN Sukamaju	30
	SDS Yayasan Beribu	20
Initial Mathematics Skills (IMS)	High	23
	Medium	26
	Low	32

Table 1 shows that SDN Batujajar 3 had 31 students, SDN Sukamaju had 30 students, and SDS Yayasan Beribu had 20 students, culminating in a total of 81 students. The initial mathematical

abilities of students categorized as high, medium, and low were recorded at 23, 26, and 32, respectively.

Table 2. Descriptive Statistics

School of Origin	IMS	Mean	Std. Deviation	N
SDN Batujajar 3	High	79.30	6.617	10
	Medium	64.10	3.247	10
	Low	52.36	4.296	11
	Total	64.84	12.23	31
SDN Sukamaju	High	88.70	5.926	10
	Medium	73.38	2.264	8
	Low	64.58	2.429	12
	Total	74.97	11.17	30
SDS Yayasan Beribu	High	90.00	.000	3
	Medium	86.38	3.021	8
	Low	75.33	2.345	9
	Total	81.95	6.700	20

Table 2 indicates that the average overall mathematical initial ability of students at SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu is 64.84, 74.97, and 81.95, respectively. The values for standard deviation are 12.23, 11.17, and 6.7.

Table 3. Tests of Normality

	Statistics	df	Sig.
Standardized Residual	.083	81	.200*

The standardized residual value presented in Table 3 above is 0.200. The data indicates that the significance value exceeds 0.05, suggesting that the distribution of the data is normal.

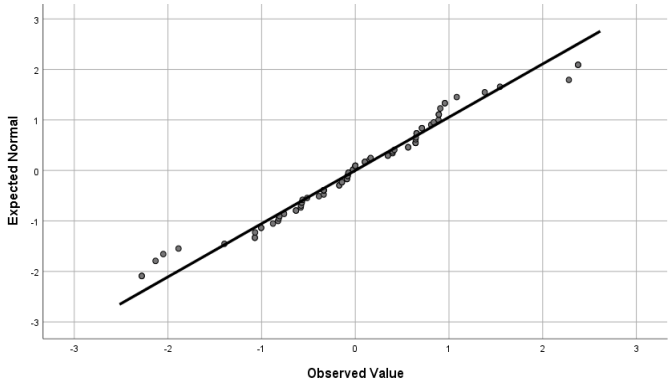

Figure 1. Normal Q-Q Plot of Standardized Residual

Figure 1 demonstrates that most standardized residual values for mathematics learning outcomes, relative to students' initial mathematical abilities, are clustered around the diagonal line. This suggests that the data follows a normal distribution. Additionally, a test for homogeneity of variance will be performed.

Table 4. Levene's Test of Equality of Error Variances

	Statistics	df1	df2	Sig.
Based on Mean	3.270	8	72	.063

Table 4 indicates a significance level of 0.063 based on the mean. The data indicates that the significance value exceeds 0.05, suggesting that the variance of the student's math learning outcomes variable is homogeneous.

Table 5. Tests of Between-Subjects Effects

Source	Type III Sum of Square	df	Mean Square	F	Sig.
Asal Sekolah	3924.272	2	1962.136	117.894	.000
KAM	5415.662	2	2707.831	162.699	.000
Asal Sekolah*KAM	298.583	4	74.646	4.485	.003

Based on Table 5 above, it can be seen that the Sig. School Origin, Mathematical Initial The values for Ability and School Origin*KAM are 0.000, 0.000, and 0.003, respectively. The data indicates a significance value less than 0.05, leading to the conclusion that differences in mathematics learning outcomes exist based on students' school origin and initial mathematical abilities. Additionally, there is an interaction between school origin and initial mathematical abilities affecting mathematics learning outcomes. The interpretation of the output from post hoc tests regarding school origin and students' initial mathematical ability further elaborates on the results of the obtained hypothesis.

Table 6. Multiple Comparisons by School of Origin

School of Origin	School of Origin	Mean Difference	Std. Error	Sig.
SDN Batujajar 3	SDN Sukamaju	-10.13*	1.045	.000
	SDS Yayasan Beribu	-17.11*	1.170	.000
SDN Sukamaju	SDN Batujajar 3	10.13	1.045	.000
	SDS Yayasan Beribu	-6.98*	1.178	.000
SDS Yayasan Beribu	SDN Batujajar 3	17.11*	1.170	.000
	SDN Sukamaju	6.98*	1.178	.000

Table 6 indicates that the significance value between SDN Batujajar 3 and SDN Sukamaju, SDN Batujajar 3 and SDS Yayasan Beribu, as well as SDN Sukamaju and SDS Yayasan Beribu, is 0.000. The data obtained indicates a significance value of less than 0.05, suggesting a difference in student math learning outcomes based on school origin among SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu. The asterisk on the mean difference value indicates that the differences in student math learning outcomes based on school origin are statistically significant.

Table 7. Multiple Comparisons of Initial Mathematics Skill

KAM	KAM	Mean Difference	Std. Error	Sig.
High	Medium	10.97*	1.168	.000
	Low	21.38*	1.115	.000
Medium	High	-10.97*	1.168	.000
	Low	10.40*	1.077	.000
Low	High	-21.38*	1.115	.000
	Medium	-10.40*	1.077	.000

Table 7 indicates that the significance value for the initial mathematical abilities of students categorized as high versus medium, high versus low, and medium versus low is 0.000. The data indicates that the significance value is less than 0.05, suggesting differences in students' mathematics learning outcomes based on their initial mathematical abilities, categorized as high versus medium, high versus low, and medium versus low. The presence of the * sign on the Mean Difference value indicates that the differences observed in mathematics learning outcomes, based on students' initial mathematical abilities, are statistically significant.

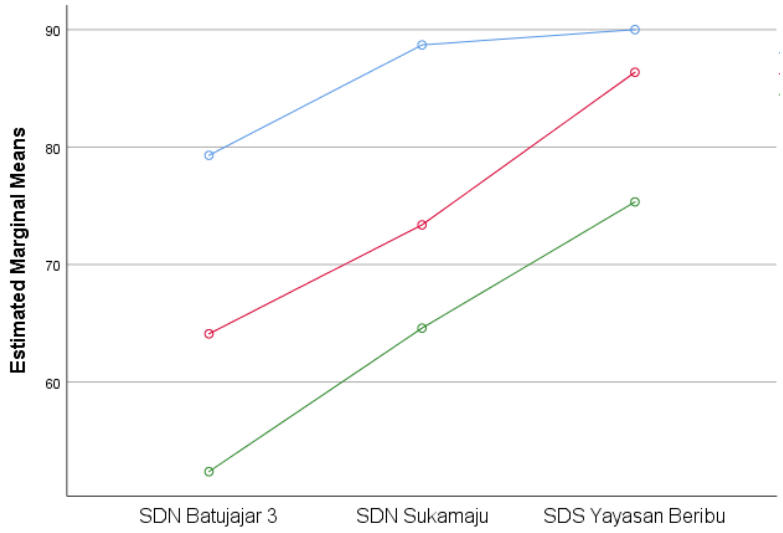

Figure 2. Estimated Marginal Means of Learning Outcomes

Figure 2 presents the profile plot of school origin alongside students' initial mathematical ability, classified into high, medium, and low categories. The blue line indicates students possessing high initial mathematical ability, the red line denotes those with medium ability, and the green line signifies students with low ability. Students with high initial mathematical abilities at SDS Yayasan Beribu demonstrate superior performance relative to those at SDN Sukamaju and SDN Batujajar 3. Students with medium initial mathematical abilities at SDS Yayasan Beribu exhibit performance levels that surpass those of students at SDN Sukamaju and SDN Batujajar 3. Students at SDS Yayasan Beribu with high initial mathematical abilities outperform those at SDN Sukamaju and SDN Batujajar 3. Similarly, students with low initial mathematical abilities at SDS Yayasan Beribu also perform better than their counterparts at SDN Sukamaju and SDN Batujajar 3.

Discussions

The findings of the research, as elaborated earlier, demonstrate that the implementation of Model Eliciting Activities (MEAs) on students' foundational mathematical skills, categorized by school affiliation—specifically SDN Batujajar 3, SDN Sukamaju, and SDS Yayasan Beribu—produced the subsequent outcomes: A total of 31 students, followed by 30 students, and then 20 students, respectively. The distribution of students categorized by their initial mathematical abilities across the three schools was as follows: 23 exhibited high abilities, 26 demonstrated medium abilities, and 32 were classified as having low abilities. The categorization of students was determined by their foundational mathematical competencies, particularly in relation to essential concepts and calculations that bear significance for the acquisition of more advanced mathematical learning resources at both primary and secondary educational stages. The evaluation of students' foundational mathematical competencies at the elementary level pertains to essential mathematical operations and rudimentary logic, alongside tangible reasoning (Pancawardana et al., 2023).

The Eliciting Activities methodology is grounded on realism and necessitates the use of supplementary media to enhance students' comprehension of the material. Considering that technology is an integral aspect of daily life, it can serve as a resource for pupils. To facilitate creative thinking among students, it is essential to stimulate this process using digital visualizations. Consequently, Geogebra serves as an essential instrument for comprehending mathematical concepts in the realms of analysis and geometry (Lailiyah & Mardliyah, 2021; Lestari & Sundi, 2021; Utaminingsih & Subanji, 2021).

Students are categorized based on their initial mathematical ability, which includes high, medium, and low classifications. At SDN Batujajar 3, the distribution of students in each category is as follows: 10, 10, and 11. At SDN Sukamaju, the figures are 10, 8, and 12, whereas at SDS Yayasan Beribu, the figures are 3, 8, and 9.

The average values for students at SDN Batujajar 3 in the category of initial mathematical abilities are 79.3 for high, 64.1 for medium, and 52.36 for low classifications. The corresponding standard deviations are 6.617, 3.247, and 4.296, respectively. Furthermore, SDN Sukamaju exhibits an average value and standard deviation categorized into high, medium, and low classifications of 88.7, 73.38, 64.58, and 5.926, 2.264, 2.429, respectively. At SDS Yayasan Beribu, the descriptive statistics are reported as follows: 90, 86.38, 75.33, and 0.000, 3.021, 2.345. To validate the differences and interactions noted in students' mathematics learning outcomes, it is essential to establish that these outcomes are not merely a reflection of their initial mathematical abilities, which have been categorized based on the students' school of origin. Therefore, it is essential to conduct a Two-Way ANOVA test, which relies on inferential statistics.

This study employed a Two-Way ANOVA test, contingent upon the assumptions of normal distribution and homogeneity of variances. Should both conditions be rejected, it becomes essential to employ the Median Test. Inferential statistical tests utilizing the Kolmogorov-Smirnov method produced a standardized residual value with a significance level exceeding 0.05, suggesting that the data followed a normal distribution. The conclusion was substantiated by the observations on the normal diagonal line of the Q-Q plot for standardized residuals. The homogeneity test for the significance value based on the mean shows that the data exceeds 0.05, indicating that the student's mathematical learning variable is homogeneous. Thus, the ANOVA Two Ways test may be conducted.

The findings from the ANOVA Two Ways test revealed significant variations in mathematics learning outcomes, influenced by students' school origin, their initial mathematical abilities, and the interplay between these two factors. The significance value was below 0.05, suggesting that these differences hold statistical significance. Moreover, the variances noted in students' mathematics learning outcomes, influenced by their school origin and initial mathematical competencies, are authentic and can be elucidated. The interaction observed indicates that students classified in the higher category at SDS Yayasan Beribu possess superior initial mathematical abilities compared to their counterparts at SDN Batujajar 3 and SDN Sukamaju. This holds equally for students categorized within the medium and low tiers. To put it differently, one can assert that the mathematics learning outcomes at SDS Yayasan Beribu surpass those of SDN Batujajar 3 and SDN Sukamaju, while the mathematics learning outcomes at SDN Batujajar 3 exceed those at SDN Sukamaju.

The application of the Eliciting Activities Model, alongside Geogebra, significantly influences students' mathematical learning outcomes, especially in concept comprehension and enhancement of their foundational mathematical skills, irrespective of their proficiency level Nurhusain (2021), Pohan et al. (2023), Rusliah et al. (2021), Salafy & Susanah (2022), dan Wijayanti et al. (2021), which suggests that the Model Eliciting Activities, which are derived

from the real-life experiences of students, have a substantial impact on both the context and the interactions between students as they learn mathematics.

Model Eliciting Activities (MEAs) are techniques of teaching mathematics that stress contextual problem solving. Students are taught problem solving, creative thinking, and mathematical modeling through a sequence of assignments that require them to build mathematical models that may be applied to real-world problems. MEAs help improve students' knowledge of the relationship between mathematics and the real world, which has been shown to raise students' enthusiasm and drive to pursue mathematics (Pertamawati & Retnowati, 2019).

An example of a MEA is the design of a robust but cost-effective bridge. This exercise requires students to examine a variety of elements, including building materials, architectural style, and financial difficulties. The activity also allows children to practice mathematical concepts including structure calculations, material qualities, and cost estimation. Thus, MEAs teach students to apply their mathematical reasoning to address real-world situations (Chamberlin, 2021). Model Eliciting Activities (MEAs) are a learning method that emphasizes real-world problems that necessitate inventive problem-solving and mathematical modeling. Using this approach, students are capable of developing models or solutions to intricate problems. Additionally, they prioritize the process over the final outcome (Niss & Blum, 2020).

Researchers from Rutgers University in the United States of America were the ones who initially developed this model in the 1990s. In addition, the history of the development of Model Eliciting Activities was carried out by these researchers. When it comes to learning mathematics, this method is a novel approach that places an emphasis on finding solutions to real-world situations. Taking this into consideration, the MEAs model possesses a number of qualities, one of which is the inclusion of a number of significant elements that set it apart from traditional learning approaches. Real-world problems are the focal point of this approach, which also necessitates creative thinking, fosters collaboration among students, necessitates mathematical modeling, places an emphasis on the process rather than the outcome, and encourages students to analyze and evaluate themselves.

The objective of learning through Model Eliciting Activities is to enhance students' competencies in problem-solving, mathematical modeling, collaboration, and the application of mathematical concepts in real-world contexts. MEAs also assist students in mastering advanced mathematical topics and enhancing their creative, critical, and analytical skills. This methodology can be immediately applied to mathematics education. This application is crucial for assessing the impact of this learning paradigm on the educational process. The activities of designing real-world challenges, creating modeling guides, interacting with students, presenting answers, and reflecting exemplify engagement with the model. Educators are crucial in assisting pupils with mathematical modeling and problem-solving.

In this context, a number of case studies have been carried out in order to examine the efficacy of model-invoking activities in terms of enhancing the problem-solving abilities of students and their comprehension of mathematical ideas. The findings indicate that MEAs have the potential to considerably enhance students' problem-solving abilities as well as their understanding of mathematical ideas. Nevertheless, there are issues that arise, such as the preparation of the design of problems that are pertinent to the actual world, the conduct of student performance assessment, and the development of modeling standards. Both formal and informal education systems have the potential to benefit tremendously from the use of MEAs, which have the ability to enhance the quality of mathematics education. As a result, it is possible to assert that the Eliticing Activities Model is a learning model that places an emphasis on problem solving in a case that is to be studied. Of course, this problem refers to problem solving that involves

the real world, and it is designed to be simple to comprehend and simple to implement in order to make learning more engaging and motivating for children.

CONCLUSION

This study reveals that variations in mathematics learning outcomes are influenced by students' school origins, their initial mathematical competencies, and the interplay between these two factors. The findings underscore the complex dimensions of student achievement in mathematics, indicating that both the educational environment and initial competency levels significantly influence learning results. The disparities in mathematics learning outcomes attributable to the origins of the schools, specifically between SDN Batujajar 3 and SDN Sukamaju, SDN Batujajar 3 and SDS Yayasan Beribu, as well as SDN Sukamaju and SDS Yayasan Beribu, are striking. This suggests that factors such as the learning environment, resource availability, and the quality of instruction can differ markedly among these institutions, consequently impacting students' academic achievements. Moreover, it can be posited that variations in student mathematics learning outcomes, when analyzed through the lens of initial mathematical abilities classified as high versus medium, high versus low, and medium versus low, are subject to empirical validation. This provides substantial evidence that students' prior knowledge and cognitive preparedness serve as significant indicators of their future achievements in mathematics education. The findings indicate that students possessing elevated initial mathematical skills at SDS Yayasan Beribu display enhanced performance relative to their counterparts at SDN Batujajar 3 and SDN Sukamaju. Furthermore, their capabilities align closely with those of students categorized as having medium and low initial mathematical skills, implying that specific educational settings may enhance or maintain high levels of student achievement irrespective of ability classification. The results highlight the significance of tailored instructional approaches and the necessity for teaching strategies that are responsive to the specific contexts, accommodating the varying initial proficiencies and institutional disparities among students.

REFERENCES

Al Ayyubi, I. I., & Rohmatulloh, R. (2023). Penerapan Pendekatan Model-Eliciting Activities untuk Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Siswa. *Jurnal El-Audi*, *4*(1), 1–12. https://doi.org/https://doi.org/10.56223/elaudi.v4i1.70

Anggraena, Y., Felicia, N., Eprijum, D., Pratiwi, I., Utama, B., Alhapip, L., & Widiaswati, D. (2022). *Kajian akademik kurikulum untuk pemulihan pembelajaran*.

Auliya, A. R., Junaedi, I., & Susilo, B. E. (2022). Students' Mathematical Problem Solving Ability in terms of Independent Learning in the Eliciting Activities Model (MEAs). *Journal of Medives: Journal of Mathematics Education IKIP Veteran Semarang*, *6*(2), 58–64. https://doi.org/https://doi.org/10.31331/medivesveteran.v6i2.2140

Cai, J., & Leikin, R. (2020). Affect in mathematical problem posing: Conceptualization, advances, and future directions for research. *Educational Studies in Mathematics*, *105*, 287–301.

Chamberlin, S. (2021). *Statistics for Kids: Model Eliciting Activities to Investigate Concepts in Statistics (Grades 4-6)*. Routledge.

Chytry, V., & Kubiatko, M. (2021). Pupils' Summative Assessments in Mathematics as Dependent on Selected Factors. *EURASIA Journal of Mathematics, Science and Technology Education*, *17*(8).

Hamilton, E., Lesh, R., Lester, F., & Brilleslyper, M. (2008). Model-eliciting activities (MEAs) as a bridge between engineering education research and mathematics education research.

Advances in Engineering Education, *1*(2), n2.

Lailiyah, N. N., & Mardliyah, S. Z. (2021). Problematika Pemanfaatan Media Pembelajaran Berbasis TIK di Madrasah Ibtidaiyah. *Bidayatuna Jurnal Pendidikan Guru Mandrasah Ibtidaiyah*, *4*(1), 89–92. https://doi.org/https://doi.org/10.54471/bidayatuna.v4i1.868

Lestari, D. P. A., & Sundi, V. H. (2021). Pelatihan Penggunaan Aplikasi GeoGebra untuk Mempermudah Pembelajaran Materi Program Linear. *Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ*, *1*(1).

Lovanti, O. S., & Setiawan, D. (2023). Profile Implementation Pancasila Students in the Independent Curriculum in Mathematics. *Jurnal Penelitian Pendidikan*, *40*(2), 62–68. https://doi.org/10.15294/jpp.v40i2.46476

Maryati, I., & Monica, V. (2021). Pembelajaran Berbasis Masalah dan Inkuiri dalam Kemampuan Representasi Matematis. *Mosharafa: Jurnal Pendidikan Matematika*, *10*(2), 333–344.

Meisya, S., & Arnawa, I. M. (2021). The development of mathematical learning devices based on model-eliciting activities and geogebra. *Journal of Physics: Conference Series*, *1742*(1), 12034. https://doi.org/10.1088/1742-6596/1742/1/012034

Nisa, K., Sridana, N., Salsabila, N. H., & Hayati, L. (2023). Deskripsi Kemampuan Pemecahan Masalah Siswa Ditinjau Kemampuan Awal Matematis. *Journal of Classroom Action Research*, *5*(3), 17–24.

Niss, M., & Blum, W. (2020). *The learning and teaching of mathematical modelling*. Routledge.

Nugraha, T. (2024). *Menelusuri Polemik Pendidikan Dasar: Perdebatan, Isu, dan Kebermaknaan Pendidikan Dasar*. Indonesia Emas Group.

Nurhusain, M. (2021). Penelitian Tindakan: Peningkatan Kemampuan Berpikir Kreatif Siswa Melalui Model Eliciting Activities (MEAs). *ELIPS: Jurnal Pendidikan Matematika*, *2*(1), 16–23. https://doi.org/https://doi.org/10.47650/elips.v2i1.188

Pancawardana, H., Al Ayyubi, I. I., Rohmatulloh, R., & Murharyana, M. (2023). The Influence of Nonformal Education on Students' Cognitive Formation. *KOLOKIUM Jurnal Pendidikan Luar Sekolah*, *11*(2), 236–243. https://doi.org/https://doi.org/10.24036/kolokium.v11i2.612

Partono, P., Wardhani, H. N., Setyowati, N. I., Tsalitsa, A., & Putri, S. N. (2021). Strategi Meningkatkan Kompetensi 4C (Critical Thinking, Creativity, Communication, & Collaborative). *Jurnal Penelitian Ilmu Pendidikan*, *14*(1), 41–52. https://doi.org/10.21831/jpipfip.v14i1.35810

Pertamawati, L., & Retnowati, E. (2019). Model-Eliciting Activities: Engaging students to make sense of the world. *Journal of Physics: Conference Series*, *1200*(1), 12003.

Pohan, D., Saragih, S., & Khairani, N. (2023). Penerapan Pembelajaran Model Eliciting Activities (MEAs) dengan Pendekatan Saintifik untuk Meningkatkan Kemampuan Representasi Matematis dan Kemandirian Belajar Siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *7*(3), 3350–3363. https://doi.org/https://doi.org/10.31004/cendekia.v7i3.2752

Rosidi. (2023). Penerapan Model Pembelajaran Inkuiri Untuk Meningkatan Kemampuan Berpikir Kritis dan Aktivitas Belajar PAI. *SECONDARY: Jurnal Inovasi Pendidikan Menengah*, *3*(1), 1–23. https://doi.org/https://doi.org/10.51878/secondary.v3i1.1941

Rusliah, N., Handican, R., Deswita, R., & Oktafia, M. (2021). Mathematical problem-solving skills on relation and function through Model-Eliciting Activities (MEAs). *Journal of Physics: Conference Series*, *1778*(1), 12016. https://doi.org/10.1088/1742-6596/1778/1/012016

Safithri, R., Syaiful, S., & Huda, N. (2021). Pengaruh penerapan problem based learning dan project based learning terhadap kemampuan pemecahan masalah berdasarkan self efficacy siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *5*(1), 335–346. https://doi.org/https://doi.org/10.31004/cendekia.v5i1.539

Salafy, Y. W., & Susanah, S. (2022). Perbandingan Literasi Matematika Siswa Kelas VIII SMP Dalam Pembelajaran Model Eliciting Activities (Meas) Dan Pembelajaran Konvensional. *MATHEdunesa*, *11*(1), 302–310. https://doi.org/https://doi.org/10.26740/mathedunesa.v11n1.p302-310

Sari, N., & Surya, E. (2017). Analysis Effectiveness of Using Problem Posing Model in Mathematical Learning. *International Journal of Sciences: Basic and Applied Research (IJSBAR) International Journal of Sciences: Basic and Applied Research*, *33*(3), 13–21.

Sukarna, N., Sumarmo, U., & Kurniawan, R. (2020). the Role of Inquiry Approach and Cognitive Stage on Student'S Mathematical Critical Thinking Ability and Self Regulated Learning. *Journal Of Educational Experts (JEE)*, *3*(2), 74–86. https://doi.org/https://doi.org/10.30740/jee.v3i2p74-86

Suryani, M., Jufri, L. H., & Putri, T. A. (2020). Analisis kemampuan pemecahan masalah siswa berdasarkan kemampuan awal matematika. *Mosharafa: Jurnal Pendidikan Matematika*, *9*(1), 119–130.

Utaminingsih, R., & Subanji, S. (2021). Analisis kemampuan literasi matematika peserta didik pada materi program linear dalam pembelajaran daring. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, *4*(1), 28–37. https://doi.org/https://doi.org/10.24176/anargya.v4i1.5656

Wijayanti, S., Triyono, T., & Syaifuddin, M. W. (2021). Penggunaan Model-Eliciting Activities (MEAs) Untuk Meningkatkan Kemampuan Berpikir Reflektif Pada Pembelajaran Geometri Transformasi. *JURNAL E-DuMath*, *7*(1), 1–5. https://doi.org/https://doi.org/10.52657/je.v7i1.1330

Willis, W. K., Williamson, V. M., Chuu, E., & Dabney, A. R. (2022). The relationship between a student's success in first-semester general chemistry and their mathematics fluency, profile, and performance on common questions. *Journal of Science Education and Technology*, *31*(1), 1–15. https://doi.org/https://doi.org/10.1007/s10956-021-09927-y

Yuliani, A., Fitriani, N., Dahlan, J. A., & Sumarmo, U. (2020). Mathematical critical thinking skill and self confidence according to student's cognitive stage. *Journal of Physics: Conference Series*, *1657*(1), 12012. https://doi.org/10.1088/1742-6596/1657/1/012012