Systematic Literature Review: The Influence of Discovery Learning Model on Students' Mathematical Representation Ability

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Abstract
The purpose of this Systematic Literature Review (SLR) is to highlight the effectiveness of the Discovery Learning model in improving students' mathematical representation ability. The research process involves the following stages: formulating research objectives, article collection using Publish or Perish 8, article sreening with the inclusion criteria used, and data evaluation where the article that selected were reviewed in depth. The review encompassed studies from various educational settings and consistently demonstrated the positive impact of Discovery Learning on students' ability to represent mathematical concepts and solve problems. The findings underscore the potential of the discovery learning model as a valuable approach to enhance students' mathematical representation ability and pave the way for further research and implementation in educational settings
Keywords: discovery learning, mathematical representation ability, SLR.

Introduction

Education makes the biggest contribution as a support for national development and is expected to produce human resources that can improve the welfare of the country in the future. Through education, a person's skills and abilities can be improved in dealing with life (Hadi Saputra et al., 2021). This statement is in accordance with the objectives of national education, which functions to develop abilities and shape the character and civilisation of a dignified nation in order to educate the nation's life, aiming to develop the potential of students to become human beings who are faithful and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. Through education, humans can develop their mindset, which forms the foundation for further innovations. As Rismawati (2016) stated, with the basis of thinking, humans develop various ways to change the state of nature for the benefit of their lives. Mathematics as a part of education, plays a pivotal role in education by fostering students' thinking skills and significantly shaping their character development (Fauzan & Anshari, 2024; Mardiati et al., 2024).

Maths is a part of education that is needed by humans in the era of the industrial revolution 4.0. According to Mardiati et al. (2024), in this era of globalization, mathematics is one of the keys to academic and career success in various fields. This is because learning

mathematics provides experience in solving problems that are often related to real life. In accordance with Anwar (2018) which states that mathematics is one of the basic sciences that has an important role, both in everyday life and the development of science and technology. If individuals do not master mathematics, there will certainly be challenges for these individuals to carry out their daily lives.

One of the abilities expected to emerge in students in learning mathematics is mathematical representation ability. This mathematical representation is the ability of students to express or interpret mathematical symbols, images, statements and questions. According to Huda et al. (2019) mathematical representation ability is the ability of students to convey mathematical ideas, this involves the use of strategies developed from their thinking in an effort to find solutions based on the problem at hand. Similar to the statement of Sholehah et al. (2023) Students' interpretations can be in the form of spoken words, writing, pictures, tables, graphs, concrete objects, mathematical symbols, and so on. In line with Murtafi'ah et al. (2022) who stated that mathematical representation ability are needed by students to be able to help students in expressing abstract ideas to be concrete.

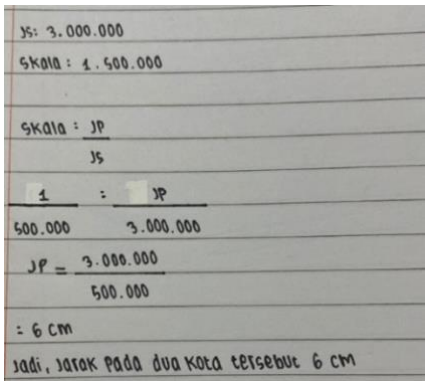
However, the latest PISA result (2023) the mathematics learning achievement of Indonesian students has decreased compared to the previous year. In its implementation, PISA uses contextual problems with everyday life, where these problems also measure students' mathematics representation ability (Rahmatika & Rafianti, 2022; Sugiarti et al., 2022; Umaroh & Pujiastuti, 2020). The average score of Indonesian students in mathematics in 2018 was 379, while in 2022 the average score decreased to 366. This decline in PISA scores shows the challenges faced by the education system and the quality of teaching in various regions in Indonesia. The low PISA score also indicates that Indonesian students' ability to solve maths problems is still very low. In Indonesia, only 18% of students were able to achieve mathematics proficiency at level 2, significantly less than the average of OECD countries which is 69%. It can be concluded that the low PISA test results of Indonesian students also show that the students' mathematical representation ability are also low.

In line with the PISA results, students' ability to solve mathematical problems is also low in one of the public junior high schools in Bandar Lampung. This can be seen from the results of daily or formative tests on ratio and comparison materials. In this test, students were tasked with determining map distances through descriptive questions, requiring them to represent the given comparison as an equation.

The scale of a map is written as 1:500.000. The actual distance between the two cities is 30 km. What is the distance between the two cities on the map in cm?

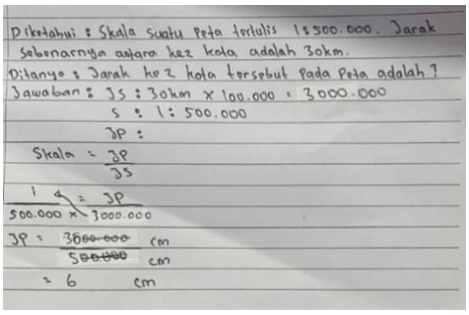
Picture 1. Formative Test Questions

The following are the results of students' answers:



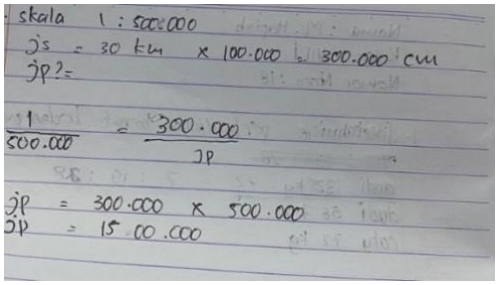
Picture 2. Student 1's Correct Answer

In Picture 2, students can represent the problem into a form of mathematical solution correctly.



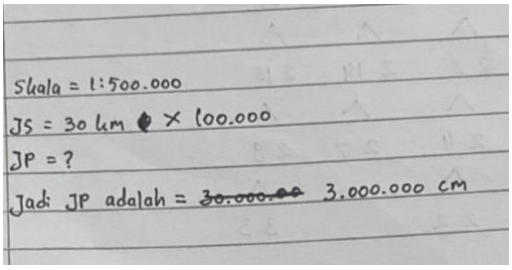
Picture 3. Student 2's Correct Answer

Picture 3 shows that students have been able to represent their answers into the form of mathematical solutions, but there are still improper use of operation symbols such as the use of the equal symbol (=) using a colon (:) attached to the division operation.



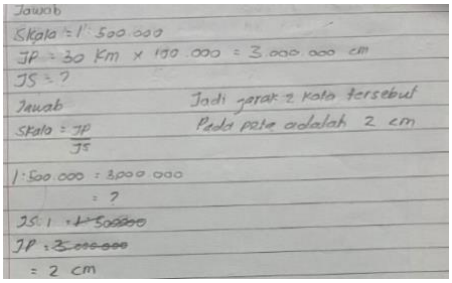
Picture 4. Student 3's Wrong Answer

Picture 4 shows that students misrepresented the use of the equal symbol (=) between the two comparisons, so students made mistakes in performing arithmetic operations in the solution.



Picture 5. Student 4's Wrong Answer

In picture 5, it can be seen that students have not been able to represent the problem into a form of mathematical solution properly, so students do the solution incorrectly.



Picture 6. Student 5's Wrong Answer

Picture 6 shows that students are still unable to represent the problem into mathematical solutions properly and represent the comparison symbol on a scale of 1:500,000 which is a comparison, so students make calculation errors in the solution section, where students instead assume that 1:500,000 is 1,500,000 so that the answer becomes wrong.

The passivity of students in learning is one of the factors that cause students in schools to get unsatisfactory learning results, student involvement in learning is certainly the most influential factor in learning. Darozatun et al. (2021) stated that students' low mathematical representation ability are caused by ineffective learning, where students tend to be passive so that they are unable to develop these ability optimally. The lack of satisfactory student learning outcomes is likely to be overcome by the Discovery Learning model (Kamaluddin & Widjajanti, 2019), a learning method rooted in the principles of constructivism (Bruner, 1961). This approach explores students' potential in an active way, facilitating their direct interaction with mathematical concepts through exploration, physical manipulation and problem resolution. The use of discovery learning is a way of teaching that involves students in the process of mental activity through the exchange of opinions, with discussions, seminars,

independent reading, and self-testing, so that children can learn on their own (Kistian et al., 2017).

From several literature studies, the Discovery Learning model plays an important role in stimulating students' motivation and interest in mathematics. A study (Ramadhani et al., 2023) assessed the effectiveness of Discovery Learning-based mathematics learning modules in increasing students' interest in the subject. The study involved grade V students from SDN Ngijo 02, with a total of 28 students. Using a questionnaire to measure learning interest, the results showed that after the implementation of the Discovery Learning-based learning module, students' learning interest significantly increased compared to before. Statistical analysis showed a significance value of 0.00. Other international studies, such as the one conducted by Hmelo-Silver et al. (2024), also corroborate these findings by showing that Discovery Learning helps students in developing more precise and diverse mathematical representations.

Based on the background described above, this study aims to collect data related to the effectiveness of the discovery learning model in improving students' mathematical representation skills at the high school and university level, which has not yet been studied. Whether in its application the discovery learning model can overcome the problems that occur. The results of this study are expected to be a reference for the application of the discovery learning model in learning and support further research.

Method

This research uses the Systematic Literature Review (SLR) method, which is a research methodology conducted to collect and evaluate research related to a particular topic focus. SLR is an attempt to make literature studies that are often subjective more objective to reduce researcher bias (Priharsari, 2022). Articles are collected through the Publish or Perish 8 application with the Google Scholar database. The keywords for searching articles are "Discovery Learning Model" and "Mathematical Representation Ability". To achieve maximum results, the criteria for selecting articles to be used are determined. From the search results in the Publish or Perish 8 application, 200 articles related to the Discovery Learning Model were obtained with the Google Scholar base, and 400 articles for mathematical representation skills. The following table are the criteria for selecting journal articles in this study:

Table 1. Journal Criteria

No.	Inclusion	Exclusion
1.	Related to discovery learning model and mathematical representation ability	Research not conducted on students (teachers & staff)
2.	High school student and college student research samples	Research under 2019
3.	Research conducted in 2019-2024	Literature review and meta-analysis research
4.	Quantitative research and RnD	

After screening, 10 articles were obtained that matched the inclusion criteria. Then the selected articles were reviewed in depth to illustrate the impact of the application of the discovery learning model on students' mathematical representation skills.

Results and Discussion

This study aims to determine how students' representation skills after the application of the Discovery Learning learning model. The articles used in this article are presented in the following table:

Table 2. List of used article

No.	Researcher (Year)	Journal Name (year, vol , no, pp)	Article Title
1.	Sandy et al, (2019)	Jurnal Pendidikan Matematika Unila (2019, 7, 2, 209)	Pengaruh *Discovery Learning* Terhadap Kemampuan Representasi Matematis Siswa
2.	Maharani et al. (2019)	Jurnal Pendidikan Matematika Unila (2019, 7, 6, 717-727)	Pengaruh Model *Discovery Learning* Terhadap Kemampuan Representasi Matematis Siswa
3.	Alawiyah & Dahlan (2019)	PELITA: Jurnal Penelitian dan Karya Ilmiah (2019, 1, Januari-Juni, 38-46)	Peningkatan Kemampuan Representasi Matematis Siswa Kelas IX-G SMP Negeri 2 Bandung Pada Materi Persamaan Kuadrat Dengan *Discovery Learning Model*
4.	Sundawan & Nopriana (2019)	JNPM: Jurnal Nasional Pendidikan Matematika (2019, 3, 1, 123-134)	*Guided-Discovery Learning*, Representasi Matematis dan Konsep Diri Mahasiswa pada Materi Geometri
5.	Hafni et al. (2021)	PARADIKMA Jurnal Pendidikan Matematika (2021, 14, 1, 10-15)	Pengembangan Pembelajaran Interaktif Berbasis *Discovery Learning* Untuk Meningkatkan Kemampuan Representasi Matematis Siswa MAN 1 Medan
6.	Rahayu et al. (2021)	AXIOM: Jurnal Pendidikan dan Matematika (2021, 10, 1, 47-60)	Pengembangan Perangkat Pembelajaran *Discovery Learning* Pada Materi Segiempat dan Segitiga Untuk Memfasilitasi Kemampuan Representasi Matematis Siswa Kelas VII SMP/MTs
7.	Salma & Sumartini (2022)	Plus Minus Jurnal Pendidikan Matematika (2022, 2, 2, 265-274)	Kemampuan Representasi Matematis Siswa antara yang Mendapatkan Pembelajaran *Contextual Teaching and Learning* dan *Discovery Learning*
8.	Putra, Imam Setiadi (2022)	JPMI: Jurnal Pembelajaran Matematika Inovatif (2022, 5, 5, 1435-1446)	Model Pembelajaran Inkuiri dan *Discovery Dalam* Kemampuan Representasi Matematis Siswa

9.	Margareta et al. (2022)	Jurnal Pendidikan Matematika Undiksha (2022, 13, 2, 61-68)	Model Pembelajaran *Discovery Learning* Terhadap Kemampuan Representasi dan Kemampuan Pemahaman Konsep Matematis Siswa
10.	Listyotami et al, (2024)	Journal Trigonometri (2024, 1, 1, 6-12)	Efektivitas Model *Discovery Learning* Berbasis Kemampuan Koneksi Matematika, Berpikir Reflektif, dan Representasi Matematis Mahasiswa dalam Pembelajaran Online

Research from Sandy et al. (2019). The research was conducted on all seventh grade students of one of junior high school in Bandar Lampung by the 2018/2019 school year. From all students, two sample classes were selected by cluster random sampling, namely class VII B 30 students and VII C 30 students. The research was conducted with the static-group pretest-posttest design. The research was conducted in three stages, the preparation stage (observation, determining the sample, determining the material, compiling a research proposal, making devices, testing instruments, and developing instruments). The second stage is the implementation of research by carrying out learning with the discovery learning model in the experimental class and conventional learning in the control class. The third stage is collecting data, processing and analysing, and compiling research reports. The indicators used by the author on the achievement of mathematical representation ability for this study are:

1. Answer questions using written words or text
2. Create equations or mathematical expressions from other given representations
3. Solve problems involving mathematical expressions.
4. Write down the steps of mathematical problem solving in words

Based on the results of Mann-Whitney U test and descriptive statistics, it is found that the data of mathematical representation ability of students with discovery learning is higher than the data of mathematical representation ability of students with conventional learning.

Research from Maharani et al. (2019), this research was conducted on all VII grade students of one of junior high school in Bandar Lampung by the 2018/2019 school year, with purposive sampling technique selected two classes with consideration taught by the same teacher, namely VII C and VII D. This research is a quasi experiment and is conducted with a pretest-posttest control group research design. The indicators of mathematical representation ability used in this study are:

1. Draw geometric figures to clarify the problem and facilitate its solution
2. Create equations or mathematical expressions from other given representations
3. Solve problems involving mathematical expressions

4. Write the steps of mathematical problem solving in words

Based on the results of data analysis, the improvement of mathematical representation ability of students who followed discovery learning was higher than the improvement of mathematical representation ability of students who followed conventional learning.

In research conducted by Alawiyah & Dahlan (2019) in class IX students of one of junior high school in Bandung by the 2018/2019 school year. This research is a classroom action research conducted collaboratively between researchers and classroom teachers. The research object chosen by the researcher was class IX G SMP Negeri 2 Bandung. The data collection techniques were data analysis technique of class absorption, observation, and questionnaire. Data collection instruments were written test sheets, observation sheets and student response questionnaires. This research was conducted in two cycles out of three planned cycles. The results of classroom action research consisting of cycle I and cycle II when learning mathematics with discovery learning model showed an increase in students' mathematical representation in learning mathematics. This can be seen from the data analysis of students' mathematical representations in learning mathematics in cycle 1 and cycle 2 has increased.

Research conducted Sundawan & Nopriana (2019) conducted on students who take analytical geometry courses, with an experimental method with one group pretest-posttest. The results showed that guided-discovery learning had a significant effect on students' mathematical representation skills. This can be seen in the average results of students' representation ability which reached a value of 74.19. In addition, the results of the study explained the findings that student activities during guided-discovery learning contributed to the development of students' representation skills.

Research conducted by Hafni et al. (2021) was conducted on grade X students at one of the MANs in Medan city. The research conducted was a development research conducted with the 4-D model. The research sample was given a pretest-posttest to determine the effectiveness of the developed learning device. This study found that the learning tool with the discovery learning model can improve students' mathematical representation skills, in terms of pretest completeness of 68.75% increased in the posttest to 87.50%.

Research by Rahayu et al. (2021) in one of the junior high schools/MTs in Pekanbaru city, which developed discovery learning-based learning tools on quadrilateral and triangle material for grade 7 students. This study found that the learning tools developed were valid and practical with a percentage of 87%. With these results, it was also found that discovery

learning-based learning tools were able to improve students' mathematical representation skills.

Research conducted by Salma & Sumartini (2022) in one of the public junior high schools in Garut district. This quasi-experimental study aims to analyse the differences in students' mathematical representation skills with the CTL (Contextual Teaching and Learning) model with Discovery learning in grade 8 students. In this study, it was found that the representation ability of students who received the discovery learning model was slightly more improved than students who received CTL learning, although the comparison was not significant enough. In increasing the ability of mathematical representation that gets CTL learning has an average of 0.518 and the interpretation of the increase is classified as moderate. While the average increase in mathematical representation ability who get Discovery Learning learning is 0.643 and the interpretation of the increase is classified as moderate.

In research by Putra (2022) who wanted to know the use of inquiry and discovery learning models to improve students' mathematical representation skills in one of Bima district high schools. It was found that the use of the discovery learning model was better than the inquiry learning model in improving students' mathematical representation skills. This can be seen from the normality test, homogeneity and N-Gain test obtained from the pretest and posttest of class X students.

Margareta et al. (2022) conducted a study that aims to identify the discovery learning model on students' mathematical representation ability and mathematical concept understanding. The research was conducted at one of the public junior high schools in Singkawang district with experimental quantitative methods and research design Nonequivalent control group design. The results of the Effect Size calculation show that learning with the Discovery learning model has a positive effect on students' mathematical representation skills.

Research conducted by Listyotami et al. (2024) related to the effectiveness of discovery learning model based on mathematical connection ability, reflective thinking, and metamatic representation ability of students in online learning. This research is a pre-experiment one group pretest-posttest design using one group of subjects. The results obtained, the application of Discovery Learning to help students develop mathematical representation, reflective thinking, and connection skills is part of the improvement with moderate criteria, with an average gain index for the control class of 0.56.

Based on the ten articles that have been reviewed, it is found that the discovery learning model can improve one's mathematical representation ability on highschool' student, this can be proven from each trial conducted there is an increase in the learning outcomes shown by students. These student learning outcomes are of course based on indicators related to mathematical representation ability. The exploration process in discovery learning allows students to understand mathematical concepts deeply, which in turn helps them to make more accurate and meaningful representations (Van de Walle et al., 2019).

Conclusion and Suggestion

Discovery learning emphasises children's learning experiences in finding knowledge independently. In conclusion, the systematic literature review reveals the effectiveness of the Discovery Learning model in improving students' mathematical representation ability. The review encompassed studies from various educational settings and consistently demonstrated the positive impact of Discovery Learning on students' ability to represent mathematical concepts and solve problems. These findings underscore the potential of Discovery Learning as a valuable approach to enhance students' mathematical skills and pave the way for further research and implementation in educational settings. Future research might explore the integration of Discovery Learning with learning technologies, such as digital-based applications or e-learning, to improve students' mathematical representations.

References

Alawiyah, S. T., & Dahlan, J. A. (2019). PENINGKATAN KEMAMPUAN REPRESENTASI MATEMATIS SISWA KELAS IX-G SMP NEGERI 2 BANDUNG PADA MATERI PERSAMAAN KUADRAT DENGAN DISCOVERY LEARNING MODEL. *JURNAL PENELITIAN DAN KARYA ILMIAH*, *19*(1), 38–46. https://doi.org/10.33592/pelita.vol19.iss1.72

Anwar, N. T. (2018). Peran Kemampuan Literasi Matematis pada Pembelajaran Matematika Abad-21. *PRISMA: Prosiding Seminar Nasional Matematika*, 364–370. https://journal.unnes.ac.id/sju/index.php/prisma/

Bruner, J. S. (1961). *The Act of Discovery*. Harvard Educational Review.

Darozatun, D., Eva Zakiah, N., & Nuraida, I. (2021). MENINGKATKAN KEMAMPUAN REPRESENTASI MATEMATIS SISWA MENGGUNAKAN MODEL PEMBELAJARAN CONNECTING, ORGANIZING, REFLECTING, EXTENDING (CORE). *Jurnal Keguruan Dan Ilmu Pendidikan)*, *2*(1).

Fauzan, H., & Anshari, K. (2024). Studi Literatur: Peran Pembelajaran Matematika Dalam Pembentukan Karakter Siswa. *JURNAL RISET RUMPUN ILMU PENDIDIKAN*, *3*(1), 163–175. https://doi.org/10.55606/jurripen.v3i1.2802

Hadi Saputra, H., Setiawan, H., & Studi Pendidikan Guru Sekolah Dasar, P. (2021). Hubungan Antara Kemampuan Membaca Pemahaman Dengan Kemampuan Memahami Soal Cerita

Matematika Siswa Kelas V Sekolah Dasar. *PENDAGOGIA: Jurnal Pendidikan Dasar*, *1*(2), 57–65. https://jurnal.educ3.org/index.php

Hafni, M., Syahputra, E., & Khairani, N. (2021). *PENGEMBANGAN PEMBELAJARAN INTERAKTIF BERBASIS DISCOVERY LEARNING UNTUK MENINGKATKAN KEMAMPUAN REPRESENTASI MATEMATIS SISWA MAN 1 MEDAN*.

Hmelo-Silver, C., Tu, X., Danish, J., Ryan, Z., Vickery, M., Rogers, M. P., & Philips, A. (2024). Teaching with Representations: How Teachers' Perception Shift Their Science Teaching. *ISLS: Internasional Society of The Learning Sciences*.

Huda, U., Musdi, E., & Nari, N. (2019). Analisis Kemampuan Representasi Matematis Siswa dalam Menyelesaikan Soal Pemecahan Masalah Matematika *) Corresponding Author. *JURNAL TA'DIB*, *22*(1). http://ecampus.iainbatusangkar.ac.id/ojs/index.php/takdib/index

Kamaluddin, M., & Widjajanti, D. B. (2019). The Impact of Discovery Learning on Students' Mathematics Learning Outcomes. *Journal of Physics: Conference Series*, *1320*(1). https://doi.org/10.1088/1742-6596/1320/1/012038

Kistian, A., Armanto, D., & Sudrajat, A. (2017). THE EFFECT OF DISCOVERY LEARNING METHOD ON THE MATH LEARNING OF THE V SDN 18 STUDENTS OF BANDA ACEH, INDONESIA. In *British Journal of Education* (Vol. 5, Issue 11). www.eajournals.org

Listyotami, M. K., Anwar, Y., Bramana, S. M., Tinggi, S., Ekonomi, I., & Sakti Baturaja, D. (2024). Efektivitas Model Discovery Learning Berbasis Kemampuan Koneksi Matematika, Berpikir Reflektif, dan Representasi Matematis Mahasiswa dalam Pembelajaran Online. In *JOURNAL TRIGONOMETRI* (Vol. 1, Issue 1).

Maharani, D., Gunowibowo, P., Putra Wijaya, A., & Lampung Jl Soemantri Brodjonegoro No, U. (2019). *PENGARUH MODEL DISCOVERY LEARNING TERHADAP KEMAMPUAN REPRESENTASI MATEMATIS SISWA* (Vol. 7, Issue 6). http://jurnal.fkip.unila.ac.id/index.php/MTK

Mardiati, D. C., Alorgbey, B., & Zarogi, A. B. (2024). The Relationship between Educational Level and the Role of Parents with Learning Achievement in Mathematics. *Interval: Indonesian Journal of Mathematical Education*, *2*(1), 22–27. https://doi.org/10.37251/ijome.v2i1.983

Margareta, S., Citroresmi Prihatiningtyas, N., Husna, N., Studi Pendidikan Matematika, P., & Singkawang, S. (2022). MODEL PEMBELAJARAN DISCOVERY LEARNING TERHADAP KEMAMPUAN REPRESENTASI DAN KEMAMPUAN PEMAHAMAN KONSEP MATEMATIS SISWA. In *Jurnal Pendidikan Matematika Undiksha* (Vol. 13, Issue 2).

Murtafi'ah, W., Delia, R. C., & Suprapto, E. (2022). Analysis of student representation ability in solving HOTS questions review from self efficacy. *AIP Conference Proceedings*, *2633*(September), 030003. https://doi.org/10.1063/5.0102165

OECD. (2023). *PISA 2022 Results Factsheets Indonesia PUBE*. https://oecdch.art/a40de1dbaf/C108.

Priharsari, D. (2022). *SYSTEMATIC LITERATURE REVIEW DI BIDANG SISTEM INFORMASI DAN ILMU KOMPUTER*. *9*(2), 263–268. https://doi.org/10.25126/jtiik.202293884

Putra, I. S. (2022). MODEL PEMBELAJARAN INKUIRI DAN DISCOVERY DALAM KEMAMPUAN REPRESENTASI MATEMATIS SISWA. *Jurnal Pembelajaran Matematika Inovatif*, *5*(5). https://doi.org/10.22460/jpmi.v5i5.1435-1446

Rahayu, D., Kartini, K., & Yuanita, P. (2021). PENGEMBANGAN PERANGKAT PEMBELAJARAN DISCOVERY LEARNING PADA MATERI SEGIEMPAT DAN

SEGITIGA UNTUK MEMFASILITASI KEMAMPUAN REPRESENTASI MATEMATIS SISWA KELAS VII SMP/MTs. *AXIOM : Jurnal Pendidikan Dan Matematika*, *10*(1), 47. https://doi.org/10.30821/axiom.v10i1.8482

Rahmatika, T., & Rafianti, I. (2022). *Kemampuan Representasi Matematis Siswa dalam Menyelesaikan Soal Pisa Berdasarkan Gaya Kognitif Reflektif-Impulsif*. *06*(01), 248–258.

Ramadhani, M. H., . K., & Haryani, S. (2023). The Effect of Using Discovery Learning-Based Mathematics Learning Modules on Students' Interest in Learning Mathematics. *International Journal of Research and Review*, *10*(4), 476–480. https://doi.org/10.52403/ijrr.20230458

Rismawati, M. (2016). MENGEMBANGKAN PERAN MATEMATIKA SEBAGAI ALAT BERPIKIR ILMIAH MELALUI PEMBELAJARAN BERBASIS LESSON STUDY. *Vox Edukasi*, *7*(2), 203–215.

Salma, F. A., & Sumartini, T. S. (2022). *Kemampuan Representasi Matematis Siswa antara yang Mendapatkan Pembelajaran Contextual Teaching and Learning dan Discovery Learning*.

Sholehah, N. A., Yulianti, K., Gulvara, M. A., Kurniawan, S., Rofi'ah, N., & History, A. (2023). KEMAMPUAN REPRESENTASI MATEMATIS SISWA: SYSTEMATIC LITERATURE REVIEW ARTICLE INFO ABSTRACT. *Jurnal Pembelajaran Matematika Inovatif*, *6*(4). https://doi.org/10.22460/jpmi.v6i4.17821

Sugiarti, T., Suwito, A., & Ummah, F. R. (2022). Representasi Matematis Siswa dalam Menyelesaikan PISA Konten Space and Shape ditinjau dari Adversity Quotient. *PYTHAGORAS Jurnal Pendidikan Matematika*, *17*(2). https://doi.org/10.21831/pythagoras.v17i2.47686

Sundawan, M. D., & Nopriana, T. (2019). Guided-Discovery Learning, Representasi Matematis dan Konsep Diri Mahasiswa pada Materi Geometri. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *3*(1), 123. https://doi.org/10.33603/jnpm.v3i1.1868

Umaroh, U., & Pujiastuti, H. (2020). Analisis Kemampuan Representasi Matematis Siswa dalam Mengerjakan Soal PISA Ditinjau dari Perbedaan Gender. *Jurnal Pendidikan Matematika Raflesia*, *05*(02). https://ejournal.unib.ac.id/index.php/jpmr

Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2019). *Elementary and Middle School Mathematics: Teaching Developmentally, Global Edition*. Pearson Education.