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A LITERATURE REVIEW: CHOOSING THE RIGHT LEARNING MODEL FOR MATHEMATICS LEARNING

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Abstrak

Penelitian ini dilatarbelakangi oleh kebutuhan untuk menemukan model pembelajaran matematika yang paling tepat guna meningkatkan efektivitas dan kualitas proses belajar. Tujuan penelitian ini adalah untuk mengidentifikasi dan menganalisis keunggulan serta keterbatasan berbagai model pembelajaran matematika melalui studi literatur. Jenis penelitian yang digunakan adalah *literature review* dengan sumber data berupa 17 artikel jurnal. Data dikumpulkan melalui teknik dokumentasi dan dianalisis dengan meninjau kesamaan dan perbedaan temuan dari tiap artikel. Hasil penelitian menunjukkan bahwa setiap model pembelajaran memiliki efektivitas berbeda sesuai tujuan dan konteks penerapannya. Model PBL dan PjBL efektif untuk pengembangan kemampuan berpikir tingkat tinggi, sedangkan Discovery Learning dan RME unggul dalam membangun pemahaman konsep, dan Cooperative Learning meningkatkan kolaborasi siswa. Penelitian ini menyarankan penerapan model secara kombinatif dan adaptif.

Kata Kunci: *Pembelajaran matematika; model pembelajaran; studi literatur*

Abstract

This research is motivated by the need to find the most appropriate mathematics learning model to improve the effectiveness and quality of the learning process. The purpose of this study is to identify and analyze the advantages and limitations of various mathematics learning models through literature studies. The type of research used is a literature review with data sources in the form of 17 journal articles. Data were collected through documentation techniques and analyzed descriptively-comparatively by reviewing the similarities and differences in the findings of each article. The results show that each learning model has different effectiveness according to the purpose and context of its application. PBL and PjBL models are effective for developing higher-order thinking skills, while Discovery Learning and RME excel in building conceptual understanding, and Cooperative Learning improves student collaboration. This study suggests the application of models in a combinative and adaptive manner.

Keywords: *Mathematics learning; learning models; literature review*

A. Introduction

Mathematics is known as the "queen of sciences" because it forms the basis for other sciences. It is the foundation upon which sciences such as physics, chemistry, biology, and others have developed. Mathematics can abstract the phenomena studied in other sciences into consistent symbols. Unlike other sciences, which have physical objects, mathematics studies abstract concepts that cannot be directly observed in the real world. Therefore, mathematics uses symbols to represent these abstract concepts.

The abstract nature of mathematics makes it difficult for most people to understand, especially students in both elementary and secondary schools. This abstract nature also lowers student motivation to learn mathematics, resulting in suboptimal learning outcomes. According to PISA 2022 data, Indonesian students' mathematics scores were below average, ranking 70th out of 81 countries (OECD, 2023). The difficulties students experience in learning mathematics strongly support the need for appropriate strategies in the learning process. Inappropriate learning strategies are ineffective in helping students understand abstract concepts and are one of the reasons why students perceive mathematics as difficult and intimidating.

In the 21st century, mathematics in schools is not just about learning abstract concepts or memorizing formulas, but also using mathematics as a science to solve problems in other disciplines and everyday life. Consequently, students are expected to possess the 4C skills (creative thinking, critical thinking and problem solving, communication, and collaboration). In addition to the 4C skills, numeracy literacy is also an important aspect that must be developed in mathematics learning. The 4C skills and numeracy literacy skills need attention because they can have a positive impact on mathematics learning outcomes (Harsono et al., 2023). With the 4C skills and numeracy literacy, it is hoped that students will not view mathematics solely as abstract concepts, but can instead use it as a provision for life skills needed in the 21st century.

The Independent Curriculum provides mathematics teachers with greater flexibility in designing teaching methods tailored to student characteristics and the school environment. In this regard, several mathematics learning models are relevant and can be adopted to provide more meaningful learning experiences for students (Pane, 2023). Therefore, teachers are required not only to master the material but also to be able to choose a learning model that aligns with their students' interests and the mathematics material being taught. However, most teachers in Indonesia still rely on the lecture method when teaching mathematics. Not all mathematics material is suitable for teaching through the lecture method. In fact, not all students are suited to learning through the lecture method. According to Meliyani (2021), one factor that causes problems in mathematics learning is a lack of mastery of

appropriate learning methods and approaches for each class. This situation requires teachers to be able to determine the appropriate learning model. Therefore, it is crucial for teachers to master various approaches, models, techniques, methods, and learning strategies that are appropriate to the material and students' abilities.

In the world of education, learning models are no longer a foreign concept. A learning model is the entire series of presentations of teaching materials, encompassing all aspects before, during, and after the teacher's teaching, as well as all related facilities used directly or indirectly in the teaching and learning process. Many learning models are known in the teaching and learning process, particularly in mathematics. Various learning models that can be and have been applied in learning include Realistic Mathematics Education (RME), Problem-Based Learning (PBL), Project-Based Learning (PjBL), Discovery Learning, and so on. These learning models certainly have their own advantages and disadvantages. With various learning models available, teachers often choose a model solely based on curriculum demands or trends without considering the suitability of the learning model to the material or student abilities.

Numerous studies have examined the effectiveness of each existing learning model in mathematics instruction. Although numerous studies have demonstrated the effectiveness of learning models, teachers still face challenges in deciding which learning model to use. Research that comprehensively compares existing learning models to determine the most appropriate model for mathematics instruction is rare.

This study aims to analyze and compare research findings related to mathematics learning models, identify the advantages and disadvantages of each model, and suggest the most appropriate model for use in mathematics instruction. This article not only summarizes existing learning models but also compares and synthesizes learning models from previous studies, so that the results can assist in selecting an appropriate learning model for mathematics.

B. Research Method

This study employed a literature review approach, analyzing various relevant research findings related to mathematics learning models. This approach was chosen because it aligns with the research objectives: to collect, review, and synthesize the results of previous research to gain a comprehensive understanding of the effectiveness of each learning model in the context of mathematics education.

The research stages consist of four main steps, namely: (1) source identification, (2) literature selection, (3) content analysis, and (4) synthesis of research results. In the identification stage, researchers searched for scientific articles through online databases such as Google Scholar, DOAJ, Garuda, and Sinta using the keywords mathematics learning models, Problem-Based Learning,

Project-Based Learning, Discovery Learning, Cooperative Learning, and Realistic Mathematics Education.

The selection stage was conducted by determining inclusion criteria, namely that the research focused on the context of mathematics learning and that the research results contained empirical data on the effectiveness or influence of learning models. Articles that did not meet these criteria were excluded from the analysis. From the initial selection of more than 100 articles, 17 journal articles were identified that met the criteria and were relevant to the research topic.

The analysis stage was conducted by reading each article in depth to extract core information, including: author name, article title, the learning model studied, the learning outcome variables measured, and key findings. Next, the synthesis stage was conducted by identifying patterns of effectiveness, advantages, limitations, and the most appropriate application situations for each model.

The analysis approach was descriptive-comparative, comparing the effectiveness of different models based on learning outcome indicators, critical thinking skills, problem-solving, motivation, and conceptual understanding. The validity of the study was strengthened by citing sources directly and presenting interpretations based on similarities and differences in findings between studies. Thus, this literature review method provides a conceptual and empirical synthesis of the mathematics learning models most relevant to the needs of 21st-century education.

C. Research Results and Discussion

Based on a search of journal articles using several keywords related to the issues discussed, 17 journal articles were selected from hundreds of journal articles. Details of each article, including author name, year of publication, journal title, article title, and key findings, are presented below:

1) Author: (Irawati et al., 2025)

Journal name: *Jurnal Studi Guru dan Pembelajaran*

Title: *Pengaruh Problem-Based Learning terhadap Hasil Belajar ditinjau dari Kemampuan Berpikir Kritis Siswa Kelas V di Kecamatan Cibinon*

Findings: Problem-Based Learning (PBL) has been proven to be more effective in improving fifth-grade elementary school students' learning outcomes compared to conventional methods. This study also showed no significant interaction between the PBL model and critical thinking skills on mathematics learning outcomes. Overall, the PBL model significantly improved learning outcomes across all student groups.

2) Author: (Sihaloho & Saragih, 2024)

Journal name: *JOHME: Journal of Holistic Mathematics Education*

Title: *Implementation of The Problem Based Learning Model to Improve Students' Critical Thinking Skills in Mathematics Learning*

Findings: Problem-Based Learning (PBL) can help develop students' critical thinking skills, as demonstrated by an

average increase from 33% to 64%. This improvement occurred across various critical thinking indicators, including interpretation, analysis, evaluation, and inference. PBL learning activities, which begin with the presentation of contextual problems, encourage students to conduct in-depth analysis, evaluate information, and critically reflect on the problem-solving process.

3) Author: (Faisal et al., 2024)

Journal name: *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*

Title: *Pengaruh Model Pembelajaran Problem Based Learning Terhadap Peningkatan Kemampuan Literasi Matematika*

Findings: The implementation of the Problem-Based Learning (PBL) model has a positive impact on students' mathematical literacy skills. PBL can help students develop skills in understanding, interpreting, and using mathematical concepts in real-world contexts. This study recommends that further research further test the effectiveness of PBL implementation and integrate ICT or other learning media.

4) Author: (Brahim et al., 2023)

Journal name: *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*

Title: *Pengaruh Model Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Matematika Ditinjau dari Self Confidence Siswa*

Findings: Problem-Based Learning (PBL) influences students' mathematical problem-solving abilities, and self-confidence influences each student's mathematical problem-solving abilities. Students with high and moderate self-confidence perform better than those with low self-confidence. The PBL model is also more effective than conventional learning models in improving mathematical problem-solving abilities.

5) Author: (Fitri et al., 2024)

Journal name: *Jurnal Pendidikan Matematika Unpatti*

Title: *Peningkatan Minat dan Hasil Belajar Matematika Siswa dengan Penerapan Model Project-Based Learning Melalui Lesson Study*

Findings: Project Based Learning (PjBL) with the lesson study method significantly increased the interest and achievement of mathematics learning of class X.6 students of SMAN 1 Labuhan Haji. Students were more motivated in learning because they played the main role in the learning process and learning that brought everyday life problems made it easier for students to understand the material. The success of this PjBL implementation is highly dependent on the professionalism of teachers in directing and accompanying students.

6) Author: (Pilawinata et al., 2024)

Journal name: *Paedagoria: Jurnal Kajian, Penelitian dan Pengembangan Kependidikan*

Title: *Peningkatan Pemahaman Konsep Matematika Melalui Model Project Based Learning*

Findings: Project Based Learning (PjBL) is effective in improving learning outcomes and understanding of

mathematical concepts of fourth grade elementary school students, as indicated by an increase in the N-Gain score from the low category (0.29) in cycle I to the high category (0.77) in cycle II. The implementation of PjBL helps students understand concepts, although the success of its implementation is influenced by time management factors, the availability of supporting teaching materials, and teacher strategies in maintaining student motivation during learning.

7) Author: (Amin et al., 2023)

Journal name: *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*

Title: *Peningkatan Kemampuan Penalaran Matematis Siswa dengan Metode Pembelajaran Project-Based Learning*

Findings: Project-Based Learning (PjBL) has been shown to be more effective than direct instruction in improving students' mathematical reasoning skills. This research strengthens the theory that PjBL can optimize students' mathematical reasoning and provides practical implications for teachers in using it to improve the quality of mathematics learning.

8) Author: (Yestina et al., 2024)

Journal name: *FONDATIA*

Title: *Meta-Analisis Model Project Based Learning terhadap Kemampuan Pemecahan Masalah dalam Pembelajaran Matematika*

Findings: Research on the Project Based Learning (PjBL) model, using a meta-analysis of 24 studies, has proven to have a significant effect on mathematical problem-solving skills, with an overall effect size of 0.973. This finding indicates that PjBL is consistently effective in improving mathematical problem-solving, although its effectiveness varies according to educational level.

9) Author: (Syam et al., 2023)

Journal name: *Jurnal Pendidikan Matematika*

Title: *The Effectiveness of The Discovery Learning Model on Mathematical Concepts Understanding of Junior High School Students*

Findings: Discovery Learning is more effective than conventional learning in improving students' understanding of mathematical concepts, especially in the Two-Variable Linear Equation System (SPLDV) material for class VIII of SMP Negeri 1 Lambuya. Students in the experimental class who used Discovery Learning obtained a higher average learning outcome (72.16) than the control class (63.80).

10) Author: (Dewi, 2023)

Journal name: *Jurnal Lebesgue : Jurnal Ilmiah Pendidikan Matematika, Matematika dan Statistika*

Title: *Peningkatan Hasil Belajar Matematika Menggunakan Model Pembelajaran Discovery Learning pada Siswa Kelas VII SMP Negeri 5 Abiansemal*

Findings: Discovery Learning can improve the mathematics learning outcomes of seventh-grade students at SMP Negeri 5 Abiansemal. Learning outcomes increased from 57.14% in the pre-cycle to 75% in the first cycle, and reached 89.29% in the second

cycle, with the average score also increasing from 76.39 to 84.79.

11) Author: (Novianty et al., 2023)

Journal name: *Lebesgue: Jurnal Ilmiah Pendidikan Matematika, Matematika dan Statistika*

Title: *Pengaruh Pembelajaran Matematika Model Problem Based Learning dan Discovery Learning Terhadap Kemampuan Berpikir Kritis Siswa Kelas VIII*

Findings: The conclusion of this study is that students' critical thinking skills using PBL are better than those taught using DL. Furthermore, critical thinking skills with PBL have achieved better completion than classes with DL.

12) Author: (Anjani & Jailani, 2023)

Journal name: *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*

Title: *Pengaruh Cooperative Learning Tipe NHT Terhadap Kemampuan Berpikir Kritis, Kolaborasi dan Komunikasi Matematis Siswa*

Findings: The Cooperative Learning learning model (with the NHT type) implemented at SMP Negeri 1 Padangsidimpuan showed significant changes between before and after using this learning model and was proven to be effective in aspects of critical thinking skills, collaboration, and mathematical communication.

13) Author: (Marlisa & Jailani, 2023)

Journal name: *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*

Title: *Pembelajaran Model Kooperatif Tipe Group Investigation untuk Meningkatkan Komunikasi Matematis, Kolaborasi, dan Berpikir Kritis Siswa*

Findings: Learning using the Group Investigation cooperative learning model can improve students' mathematics learning outcomes and support the improvement of students' mathematical communication, collaboration, and critical thinking skills. The implementation of the Group Investigation cooperative learning model supports students' mathematical abilities to communicate mathematical ideas both independently and in groups, think critically, and collaborate.

14) Author: (Farohi & Ihsanudin, 2023)

Journal name: *Lebesgue: Jurnal Ilmiah Pendidikan Matematika, Matematika dan Statistika*

Title: *Pengaruh Penerapan Model Pembelajaran Kooperatif Terhadap Hasil Belajar Matematika Siswa Kelas X pada Materi SPtLDV*

Findings: The implementation of the cooperative learning model in the mathematics learning process for SPtLDV material has an impact on student learning outcomes. This can also be seen from the average scores before (pretest) and after (posttest) implementing the cooperative learning model: the average score in the pretest was 59.5, while the average score in the posttest was 72.5.

15) Author: (Anzani et al., 2024)

Journal name: *Jurnal Konatif: Jurnal Ilmiah Pendidikan*

Title: *Apakah Realistic Mathematics Education Berpengaruh Terhadap Kemampuan Berpikir Kreatif Matematis?*

Findings: Realistic Mathematics Education (RME) has a positive effect on students' mathematical creative thinking skills, with a moderate effect, based on a meta-analysis of various studies. Demographic factors such as school location (urban or rural), sample size, and educational level do not significantly affect the effectiveness of RME. This indicates that the RME approach can be widely applied across various educational contexts and remains consistent in enhancing students' mathematical creativity.

16) Author: (Khudlori & Widyaningrum, 2024)

Journal name: *Jurnal Ibriez: Jurnal Kependidikan Dasar Islam Berbasis Sains*

Title: *Pendekatan Realistic Mathematics Education (RME) untuk Meningkatkan Kemampuan Pemecahan Masalah Matematika*

Findings: Realistic Mathematics Education (RME) has been proven effective in improving elementary school students' mathematical problem-solving abilities. The implementation of RME showed excellent results (83% in the first meeting and 91% in the second meeting) and a significant increase in students' average scores, from 70.79 (pretest) to 89.43 (posttest). The results of the t-test and n-gain showed a significant difference between the experimental and control classes, with an n-gain of 64% (moderately effective category) for the experimental class.

17) Author: (Alim et al., 2024)

Journal name: *Primary: Jurnal Pendidikan Guru Sekolah Dasar*

Title: *The Effectiveness of Realistic Mathematics Education to Enhance Elementary Students' Learning outcomes and Motivation*

Findings: Realistic Mathematics Education (RME) has a significant impact on improving student learning outcomes and motivation in mathematics. Based on the N-gain results, the effectiveness of RME implementation is in the moderate category, indicating that this approach is quite effective in helping students understand the material and increasing their engagement in the learning process.

The synthesis of 17 journal articles shows that various learning models are often applied in mathematics learning, namely Problem-Based Learning (PBL), Project-Based Learning (PjBL), Discovery Learning, Cooperative Learning, and Realistic Mathematics Education (RME). These five learning models have different effectiveness in developing aspects of students' mathematical competence such as critical thinking and creativity, conceptual understanding, reasoning, mathematical literacy, and learning motivation. These results emphasize the importance of mathematics teachers to choose the learning model that best suits the learning objectives, material characteristics, and student needs.

1. Problem Based Learning (PBL)

Based on several analyzed articles, PBL is consistently effective in improving critical thinking skills, problem-solving, mathematical literacy, and learning outcomes compared to conventional learning (Irawati et al., 2025; Sihaloho &

Saragih, 2024; Faisal et al., 2024; Brahim et al., 2023). PBL helps improve cognitive skills through systematic problem analysis, inquiry, and reflection. Although some studies highlight aspects of learning outcomes, mathematical literacy, and problem-solving, all are related to higher-order thinking skills. These results indicate a strong link between the PBL model and improvements in students' higher-order thinking skills, particularly critical thinking. Therefore, students can develop better critical thinking skills (interpretation, analysis, evaluation, and inference) after using the PBL model (Sihaloho & Saragih, 2024).

The advantages of the PBL model are that it can foster independent learning, critical thinking, and mathematical connection skills, suitable for learning objectives that require HOTS. The limitations of PBL include its longer implementation time, high-quality problem design, and teacher professionalism. Without adequate scaffolding, low-ability students can struggle with PBL (Irawati et al., 2025; Brahim et al., 2023). PBL can be used when the primary learning objective is to develop problem-solving skills, critical thinking, or mathematical literacy on topics easily expressed in real-world problems. PBL is effective in classrooms with ample time available or when students already possess independent learning skills.

2. Project Based Learning (PjBL)

Research shows that PjBL is effective in increasing learning interest, achievement, mathematical reasoning, and problem-solving skills. Meta-analyses also show a large effect size for PjBL on problem-solving (Yestina et al., 2024; Fitri et al., 2024; Pilawinata et al., 2024; Amin et al., 2023). The characteristics of the PjBL model are the products generated from projects that motivate students and encourage the application of mathematical concepts to real-world contexts. Inter-cycle improvements (e.g., an increase in N-Gain from 0.29 to 0.77) confirm that project design and continuous reflection enhance effectiveness (Pilawinata et al., 2024).

The advantages of the PjBL model are its suitability for motivation, collaboration, creativity, and real-world applications, as well as the development of the 4Cs (critical thinking, creativity, collaboration, and communication). Limitations of PjBL include the need for resources (such as time, tools, materials, facilities, or technology), the teacher's project management skills, and the risk of over-focusing on the product, resulting in concepts not being fully understood by students if the teacher provides insufficient guidance. Effectiveness also varies by level (highest in elementary and college, moderate in high school) according to a meta-analysis (Yestina et al., 2024). PjBL is suitable for use when the topic is applicable and there is sufficient time allocated for the project.

3. Discovery Learning

Research shows that the Discovery Learning model is effective in improving conceptual understanding and mathematics

learning outcomes (Syam et al., 2023; Dewi, 2023), as evidenced by increases in average grades and completion percentages after each learning cycle. However, direct comparisons show that PBL is superior in developing critical thinking skills (Novianty et al., 2023). Discovery Learning can facilitate the discovery process through exploration, enabling students to understand the "why" rather than simply the "how."

The advantages of the Discovery Learning model are its effectiveness in building conceptual understanding, fostering curiosity, and strengthening mastery of initial concepts. A limitation of the Discovery Learning model is that it requires guidance (e.g., worksheets) to ensure a directed discovery process. Without proper guidance, students can become lost or experience misconceptions. Furthermore, the Discovery Learning model is also more time-consuming. The Discovery Learning model is suitable for introducing new concepts or when the goal is to build a fundamental understanding before moving on to more advanced material or applications.

4. Cooperative Learning

The use of the cooperative learning model has shown significant improvements in critical thinking, mathematical communication, collaboration, and learning outcomes (Anjani & Jailani, 2023; Marlisa & Jailani, 2023; Farohi & Ihsanudin, 2023). Cooperative learning allows for peer tutoring and scaffolding, making it effective in heterogeneous classes.

The advantages of the cooperative learning model include increased engagement, communication, collaborative problem-solving, and the support of weaker students through peer assistance. Limitations of this model include the potential for free-riding (passive members), imbalanced contributions, and the need for teacher supervision to ensure the involvement of each individual in the group. Cooperative learning is suitable for reinforcing concepts after introductions, problem discussions, or review activities and is effective for topics that lend themselves to group assignments.

5. Realistic Mathematics Education (RME)

Research shows that the Realistic Mathematics Education (RME) model has a positive effect on creative thinking, problem-solving, and learning motivation (Anzani et al., 2024; Khudlori & Widyaningrum, 2024; Alim et al., 2024). RME places real-world contexts as the starting point and encourages guided reinvention, enabling students to construct formal representations from concrete experiences. Research results show consistent effectiveness across demographics and levels (moderate to sufficient effects), and an increase in N-Gain in elementary school students.

The advantages of the RME model are its ability to make abstract concepts tangible, helping students who struggle with abstract concepts, increasing student motivation,

and enhancing learning relevance. Limitations of the RME model include the need for teacher creativity in designing appropriate real-world contexts, the difficulty of creating concrete contexts for some abstract topics, and the lack of facilities that can hinder its use. The RME model is suitable for introducing and reinforcing basic concepts and is also useful when learning objectives are to increase motivation and relevance.

6. Choosing The Right Learning Model

From the discussion of all learning models, it is clear that no single model can meet all objectives. PBL and PjBL excel when the goal is HOTS development, problem-solving, and real-world application, especially when time and resources are available. Discovery learning and RME are more efficient for building conceptual understanding early in learning (RME is particularly effective for increasing motivation through authentic contexts). Cooperative learning excels in strengthening communication, collaboration, and peer-learning reinforcement after concepts are introduced. Therefore, the most rational strategy is an adaptive combination: using RME or discovery learning for concept introduction, followed by PBL/PjBL for in-depth study and application, and using cooperative learning for reinforcement, reflection, and formative assessment.

Furthermore, the choice of model must also consider implementation factors such as teacher readiness, instructional time, access to resources/ICT, class size, and student characteristics (e.g., self-confidence, prior abilities), which several studies have shown moderate the effectiveness of interventions (Brahim et al., 2023; Yestina et al., 2024).

Although most studies show positive results, there are several methodological limitations that need to be considered. Many studies are still in the form of CAR or quasi-experiments with limited samples in one region, making the results difficult to generalize to a broader context. Furthermore, differences in research design, measurement instruments, duration of implementation, and consistency of model implementation are present, making them difficult to combine in a single quantitative analysis, except in some meta-analyses of PjBL or RME. Therefore, future research is recommended to use experimental designs with randomized control groups, report the level of fidelity of model implementation, and include moderator analyses such as educational level, school context (urban or rural), and teacher preparedness. Furthermore, qualitative research that observes the interaction between teachers and students during the scaffolding stage is also important for understanding how and why certain learning models are successful in practice.

D. Conclusion

Based on the results of a review of 17 journal articles analyzed, it can be concluded that each mathematics learning model has its own effectiveness, advantages, and

limitations depending on the context of its application. Problem-Based Learning (PBL) and Project-Based Learning (PjBL) have proven most effective in developing higher-order thinking skills (HOTS), including critical thinking, creativity, and problem-solving. Discovery Learning and Realistic Mathematics Education (RME) play a crucial role in building understanding of basic concepts and increasing student motivation through contextual and meaningful learning experiences. Meanwhile, Cooperative Learning excels in developing mathematical communication skills, collaboration, and social interaction among students.

No single model is ideal for all mathematics learning situations. Model selection must consider factors such as learning objectives, student characteristics, teacher readiness, learning time, and resource availability. The recommended strategy is a combinatory and adaptive approach, namely by sequentially integrating several learning models: RME or Discovery Learning for concept introduction, PBL or PjBL for deepening and application, and Cooperative Learning for reinforcement and reflection.

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