
The Effect of Innovative Teaching Methods on Elementary School Students' Academic Achievement in Indonesia: A Meta-Analysis

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Article History

Received : June 27th, 2026

Revised : July 23th, 2026

Accepted : August 03th, 2026

Abstract: Innovative learning models such as Project-Based Learning, Problem-Based Learning, and Discovery Learning have been widely promoted in Indonesian elementary schools to improve student engagement, yet their overall effect on academic achievement remains scattered across individual, small-scale studies. This study aims to examine the effect of innovative learning on student academic achievement in Indonesia using a meta-analysis approach. Research data were obtained from 20 articles that met the inclusion criteria, namely, quantitative studies with complete data including sample size, mean scores, and standard deviations, published between 2012 and 2021. Data analysis was conducted using a random-effects model with the assistance of JASP software to calculate effect sizes, heterogeneity, and publication bias. The results indicate a high level of heterogeneity ($I^2 = 90.5\%$), suggesting variations across studies, such as differences in the innovative learning models used (e.g., PjBL, PBL, and others), sample characteristics, grade levels, and learning contexts. The Forest Plot analysis results showed a summary effect size of 0.68 with a 95% confidence interval of 0.55 to 0.81, indicating that innovative learning has a positive effect on student academic achievement. Additionally, the Funnel Plot results using the Trim and Fill method showed no publication bias, so the findings of this study can be considered valid and reliable. Thus, innovative learning has been proven effective in improving student academic achievement in Indonesia.

Keywords: academic achievement, effect size, elementary education, innovative learning, meta-analysis.

INTRODUCTION

Elementary schools (SD) are formal educational institutions that play a crucial role in enhancing human resource quality from an early age (Dr. Pawan Kumar, 2025). Therefore, elementary schools are expected to adapt and align with various dynamics and contemporary developments, including technological utilization, improvements in human resource quality (such as teachers and students), and innovations in the learning process (Khalawati et al., 2023). In the context of elementary schools, learning is a teaching-and-learning process that emphasizes active, positive, and enjoyable interaction between teachers and students. This interaction aims to help students understand basic concepts, develop skills, and shape attitudes and character in accordance with established learning objectives (Andini et al., 2024). This is stated in Law of the Republic of Indonesia No. 20 of 2003 on the National Education System, which defines

learning as the process of interaction between students, educators, and learning resources within a learning environment (Winatha & Setiawan, 2020).

Elementary schools, as educational institutions, are also required to adapt to various changes, one of which is the evolving curriculum that continuously develops to meet the needs of the times (Fitrianti, 2024). These curriculum changes demand adjustments in the learning process to make it more student-centered and capable of developing 21st-century skills (Dasar et al., 2024). One effort to improve student achievement in elementary schools is by enhancing their learning motivation. Such learning motivation is greatly influenced by the use of engaging and enjoyable learning models as supporting factors in the learning process (Ningrum, 2023). Therefore, teachers' skills in classroom management are crucial to ensure students maintain high learning enthusiasm and achieve optimal learning outcomes.

In the 21st century, elementary school teachers are not only expected to be able to utilize technology but must also be capable of implementing various innovations in teaching and learning. One such innovation is the application of innovative learning models in classroom teaching and learning activities (Dasar et al., 2024). Innovative learning models need to be understood and implemented by teachers as a means to improve student achievement and learning outcomes, which is, of course, supported by teachers' skills in effectively designing, implementing, and evaluating learning (Nordian, 2024). With the changes in the Indonesian curriculum, such as the implementation of the 2013 Curriculum and the Merdeka Curriculum, elementary school teachers are required to be more creative and flexible in designing learning activities. The new curriculum emphasizes more contextual and differentiated learning, as well as learning centered on students' needs and characteristics (Parade et al., 2025). Therefore, teachers need to use a variety of innovative learning strategies and models to make the learning process more effective and meaningful, and to improve the quality of student learning outcomes (Antonius et al., 2022). This certainly poses a challenge for teachers as it must be conducted in-person (face-to-face), particularly in efforts to enhance student motivation and academic achievement in the classroom.

Academic achievement is the outcome students attain as a result of their efforts during the learning process (Achdiyat & Siti Warhamni, 2018) . One approach to improving student academic achievement is by fostering learning motivation, which is influenced by the use of engaging and enjoyable learning models that support the success of the learning process. Therefore, teachers' skills in classroom management are crucial to ensure students have the drive to learn actively and achieve optimal learning outcomes. In the 21st century, teachers are not only expected to be able to utilize technology but must also be able to introduce various innovations in learning. One form of such innovation is the implementation of innovative learning models in classroom teaching and learning activities(Rahayu et al., 2024) . Innovative learning models need to be understood by teachers as strategies to improve student achievement and learning outcomes. Additionally, teachers are expected to possess the skills to master and effectively utilize these various learning models in a manner appropriate

to students' characteristics and learning objectives(Samuel Slamet Santosa, 2020).

Teachers are expected to introduce more engaging learning innovations through their creativity. This aligns with Regulation of the Minister of National Education of the Republic of Indonesia No. 41 of 2007 on Educational Process Standards, which emphasizes that in the implementation of learning, teachers must foster students' potential and creativity(Pemendiknas Nomor 41 Tahun 2007, 2007). Such efforts can be achieved through the application of innovative learning models (Achdiyat & Siti Warhamni, 2018) . Furthermore, the regulation also emphasizes that teachers must be able to develop students' potential, creativity, and innovation in the learning process.

Meanwhile, based on Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 65 of 2013, the characteristics of the learning process at each level of education are closely related to content standards, which include a conceptual framework for learning in accordance with students' abilities and the characteristics of the material being taught. To achieve these objectives, teachers need to understand and be able to design and implement various appropriate learning models (Menteri Pendidikan dan Kebudayaan Indonesia, 2013).

However, in practice, there are still challenges in implementing innovative learning models. Not all teachers have a sufficient understanding of various learning models, so the learning conducted tends to remain conventional. This situation can lead to low student interest and motivation to learn (Khalawati et al., 2023). Therefore, teachers need to have the drive to engage in lifelong learning as professional educators. With the motivation to innovate through the understanding and application of appropriate learning models, it is hoped that teachers can serve as role models for students. The enthusiasm and creativity demonstrated by teachers in the classroom will rub off on students, thereby enhancing their motivation to learn and ultimately leading to improved academic performance.

Examples of innovative learning approaches have been implemented based on several studies examining the impact of learning on student achievement, using widely developed instructional models. The following are eight innovative learning models: Project-Based Learning (PjBL), Problem-Based Learning (PBL), Inquiry-Based Learning, Blended

Learning, Discovery Learning, Cooperative Learning, Flipped Classroom, and Contextual Teaching and Learning. In this study, these eight innovative learning models served as the basis for a meta-analysis of innovative learning. Innovative learning is a critical issue in the education system. Regulations in Indonesia guide the learning process to ensure it focuses on maximizing student development through innovative learning models. In fact, innovative learning is not only used in Indonesia's education system but has also been widely adopted abroad. Consequently, various innovative learning models have been implemented in numerous countries. This is, of course, aimed at a single objective: improving the quality of learning.

Although various studies have demonstrated the positive impact of innovative learning approaches such as Project-Based Learning (PjBL), Problem-Based Learning (PBL), and others on student achievement, a significant research gap persists. First, most studies are primary and limited to local contexts or single subjects, lacking a comprehensive synthesis of multiple studies in Indonesia. Second, the high heterogeneity among studies (such as variations in methods and samples) has not been analyzed in aggregate, making it difficult to generalize effects nationally. Third, the lack of meta-analyses focusing on the 2012–2021 period using a random-effects model has resulted in a lack of robust effect size estimates and the detection of publication bias. These gaps necessitate a meta-analytic approach to integrate 20 selected studies to fill these voids.

The novelty of this study lies in the first meta-analytic synthesis to aggregate the effects of innovative learning approaches (8 models: PjBL, PBL, Inquiry-Based Learning, Blended Learning, Discovery Learning, Cooperative Learning, Flipped Classroom, and Contextual Teaching and Learning) on the academic achievement of elementary school students in Indonesia, using JASP software for a random-effects model with high heterogeneity ($I^2=90.5\%$). Unlike previous studies that were merely descriptive or limited to a single model, this study provides a summary effect estimate (0.68), a confidence interval (0.55–0.81), and bias-free validation via Trim and Fill, offering evidence-based recommendations for the Merdeka Curriculum policy. This novelty also includes complete sample demographics from 20 articles (a significant total N), which are not yet available in the current literature.

Based on this description, the researchers were interested in conducting a meta-analysis aimed at examining and describing the influence of innovative learning on student achievement. This study is expected to provide a comprehensive overview and strengthen understanding for policymakers as a reference in formulating educational policies, as well as for teachers as educational practitioners regarding the importance of implementing innovation in the classroom learning process. Thus, the results of this study can be utilized as one of the efforts to increase elementary school students' interest in learning.

METHODS

Research Design

This study employs a *meta-analysis* approach to synthesize findings from similar studies and draw general conclusions from these findings (Antonius et al., 2022). The focus of this study is the impact of innovative learning on student academic achievement in Indonesia. The analyzed data encompass various studies comparing learning outcomes with the implementation of innovative methods, such as *Project-Based Learning (PBL)*, *Problem-Based Learning (PBL)*, *Inquiry-Based Learning*, *Blended Learning*, *Discovery Learning*, *Cooperative Learning*, *Flipped Classroom*, and *Contextual Teaching and Learning*. The data sources consist of articles published in journals in Indonesia during the period from 2014 to 2021. Articles were collected through online searches using *Google Scholar*, *Scopus*, *Web of Science*, *DOAJ*, *Core*, *ScienceDirect*, and *JSTOR*, which are linked to various journal portals and indexing institutions. This strategy aims to collect data broadly to comprehensively represent the research theme and minimize potential bias.

Time and Place of Research

This study does not involve a physical research site, as it is a literature-based meta-analysis. The literature search, screening, and data extraction were conducted between March and April 2026, using online academic databases, namely *Google Scholar*, *Scopus*, *Web of Science*, *DOAJ*, *Core*, *ScienceDirect*, and *JSTOR*.

Population and Sample

The population of this study consisted of all articles on innovative learning and elementary school student achievement identified through the

literature search, while the sample comprised the articles that met the inclusion criteria described below. Inclusion and exclusion criteria were used to determine which articles from the population qualified as the study sample.

The inclusion criteria for this study were established based on articles published between 2012 and 2021, namely: (a) articles examining the impact of innovative learning on student academic achievement in Indonesia; (b) articles employing quantitative analysis; (c) articles with an experimental research design; (d) articles presenting data in the form of sample size, standard deviation, and mean scores; (e) published in journals indexed in *Google Scholar*, *Scopus*, *Web of Science*, *DOAJ*, *Core*, *ScienceDirect*, and *JSTOR*; (f) written in Indonesian; and (g) using a rating scale with a range of 0–100. Articles that did not meet all eight of these criteria were then placed in the exclusion category.

The exclusion criteria themselves are provisions indicating that an article does not meet the inclusion criteria and is therefore not included in the meta-analysis process. From the search results, the researchers identified 76 articles relevant to the research topic. However, only 20 articles contained complete data—specifically, sample size, standard deviation, and mean values—that could serve as the basis for drawing conclusions. Articles that did not provide this information in full were excluded from the analyzed sample.

Research Procedure

The literature search was conducted between March and April 2026. Overall, the search using specific keywords yielded 76 articles available online. The keywords used included innovative learning (such as *Project-Based Learning (PBL)*, *Problem-Based Learning (PBL)*, *Inquiry-Based Learning*, *Blended Learning*, *Discovery Learning*, *Cooperative Learning*, *Flipped Classroom*, *Contextual Teaching and Learning*, student achievement, and student learning outcomes.

Subsequently, the identified articles were downloaded and screened based on pre-established inclusion criteria, resulting in 36 eligible articles. The next step involved verifying the completeness of data in these articles, particularly regarding sample size (N), mean (M), and standard deviation (S). Thus, the final number of articles used in this study was 20. Demographic characteristics, including the type of innovative

learning, research location, and year of study, for the articles meeting the inclusion criteria are presented in Figure 1.

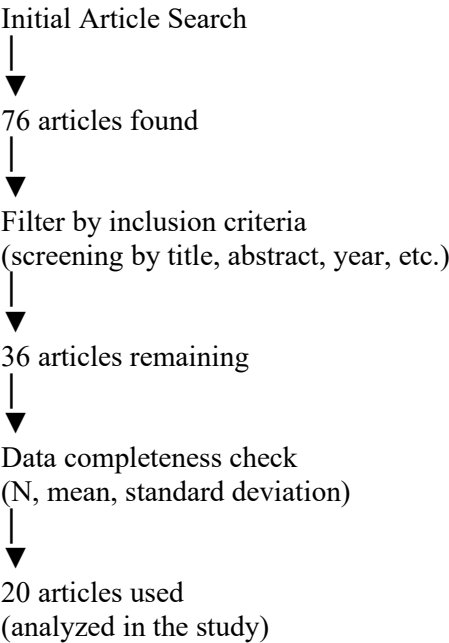


Figure 1. Research Procedure

Data Analysis Technique

This study employed a *random effects model* to ensure that the results could be generalized to a broader population, rather than being limited to the findings within the study sample, following the meta-analysis procedures outlined by Borenstein et al. (2009). The selection of this model was based on heterogeneity, with a criterion of $I^2 > 25\%$. The type of meta-analysis used was a mean-difference analysis to examine the impact of innovative learning on student achievement.

The data analyzed has a range from 0 to 100, so no standardization process is required. Effect size calculations were performed using a weighted average that incorporates the standard deviation of each data point (x) and the sample size (N). The data analysis process was assisted by the JASP software (JASP Team, 2024) to calculate the level of heterogeneity and detect publication bias via a *funnel plot*.

Based on these analysis results, it can be concluded that innovative learning has an impact on student achievement in Indonesia. The data used in the analysis included *standard error (SE)* and *effect size (ES)* as the basis for constructing the *forest plot*, with the estimation method used being *Restricted Maximum Likelihood* (random effects).

This section should be clearly and concisely written. It provides practical information concerning the research methods, procedures, tools, materials, or instruments. Authors may provide the blue-print of the instrument or the materials used in the study if necessary. Commonly used statistical formula is not necessarily written in this section. Specific criteria used or established by researchers in the data collection and analyses may be described in this section. This section should not exceed 10% (for qualitative research) or 15% (for quantitative research) of the manuscript.

RESULTS AND DISCUSSION

This study reviewed 20 research findings selected from a total of 76 articles. The academic achievement examined encompasses student performance across various domains, subjects, and educational levels. Data were obtained from the experimental group following the intervention, specifically through students’ *post-test* scores. Based on information regarding sample size, mean values, and standard deviations, the researcher then calculated the

effect sizes and standard errors presented in Table 2.

Referring to the data in Table 2, a heterogeneity test was conducted to assess the model’s fit with the analyzed data. This study employs a random effects model using the *Restricted Maximum Likelihood (Restricted ML)* approach, thus requiring the fulfillment of the heterogeneity assumption—specifically, the presence of differences in true effect sizes across studies. The level of heterogeneity was identified through the residual heterogeneity estimate (I^2), which indicates the proportion of variation in effect sizes ranging from 0% to 100%.

Effect size is used to reduce measurement errors and various artifacts in research(Samuel Slamet Santosa, 2020), while also producing statistical standardization so that the obtained values can be interpreted consistently across various variables and measures under study(Samuel Slamet Santosa, 2020). The data collected in this study are presented in Table 2, with an I^2 value of 90.5% (>25%), indicating high heterogeneity. This indicates that the effect sizes across studies are not uniform, making the use of a random-effects model appropriate for this analysis.

Table 2. Summary of Research Data, *Effect Size*, and Standard Error

No	Study	Author	Year	N	Average	SD	SE	ES
1	Study 1	Jayanegara et al. (Jayanegara et al., 2024)	2024	47	85.1	3.7	0.68	0.61
2	Study 2	Fahmi & Retnawati (Salkind, 2012)	2014	35	80.5	4.2	0.71	0.8
3	Study 3	Laila et al. (Farhin et al., 2023)	2016	24	86.7	5.3	1.08	0.86
4	Study 4	Suparjan et al. (Suparjan et al., 2024)	2024	35	85.6	4.8	0.88	0.71
5	Study 5	Pegem J. (Net et al., 2023)	2023	60	71.3	1.9	0.24	0.35
6	Study 6	Mulu et al. (Zulkarnain, 2024)	2022	12	80.8	7.3	2.11	0.93
7	Study 7	Khotimah (Kurniawan et al., 2023)	2019	22	79	5.7	0.77	1.22
8	Study 8	Putri (Mareta Nugraha Putri, 2019)	2021	15	86.4	6.2	1.6	0.89
9	Study 9	Utami et al. (Utami, 2020)	2021	30	84.7	6	0.68	1.09
10	Study 10	Warman & Ristiani (Enjang Warman & Iis Ristiani, 2023)	2023	76	77.4	8.9	1.02	0.77
11	Study 11	Setiawan & Sudana (Setiawan & Sudana, 2021)	2021	31	85.2	3.1	0.56	1.04
12	Study 12	Wahyu et al. (Elsa Setianing Wahyu et al., 2024)	2024	47	81.6	4.6	0.67	0.86
13	Study 13	Bahari et al. (Pratama et al., 2025)	2019	32	80.4	7.2	1.27	1.02
14	Study 14	Arni et al. (Rifka Alkhilyatul Ma’rifat, I Made Suraharta, 2024)	2024	36	78.4	8.1	1.35	0.79
15	Study 15	Azmi & Rahayu (Irwan & Kamarudin, 2021)	2016	40	79.3	6.2	0.98	0.73
16	Study 16	Widoyo et al. (Widoyo et al., 2023)	2023	24	80.2	1.3	0.27	0.84
17	Study 17	Erdawati & Sartika (Rachmadtullah et al., 2024)	2022	32	84.7	3.8	0.82	0.67
18	Study 18	Nursida et al. (Naja Nursida1)*, Nining Kurniawati1), Kamarudin1), Syahriani Yulianci1), 2025)	2024	30	77.6	8.4	1.53	0.95

No	Study	Author	Year	N	Average	SD	SE	ES
19	Study 19	Paramartha (Paramartha, 2021)	2021	36	79.1	1.7	0.74	0.28
20	Study 20	Elvadola et al.(Elvadola et al., 2022)	2022	36	78.3	4.5	0.75	0.71

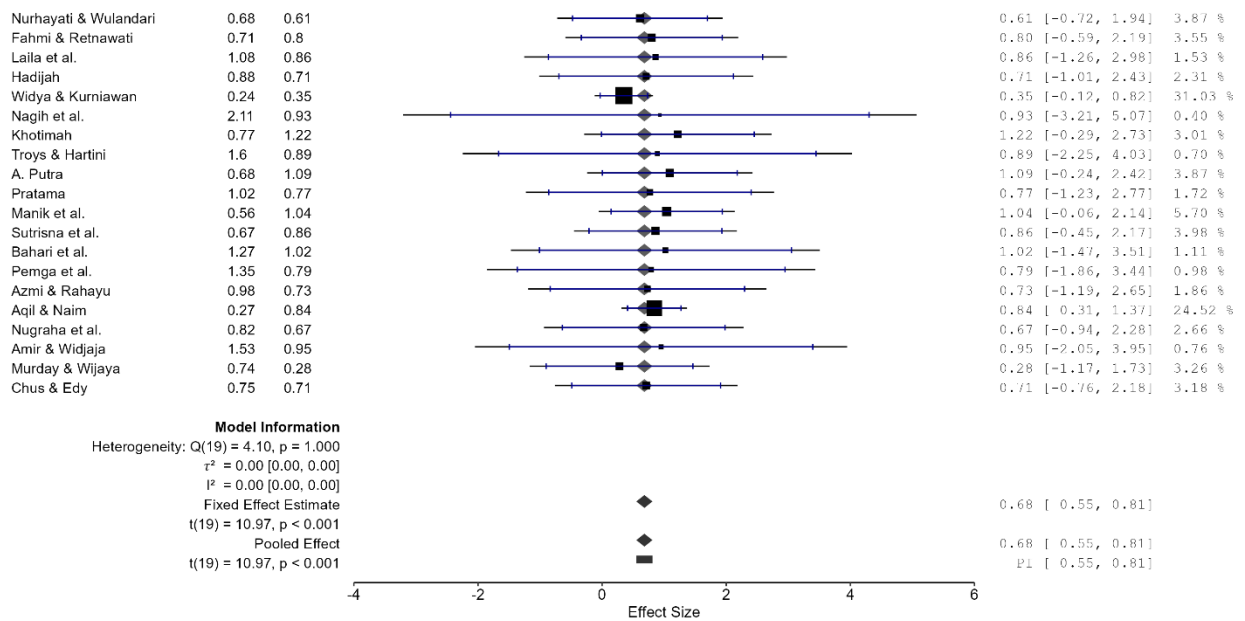


Figure 2. Forest Plot

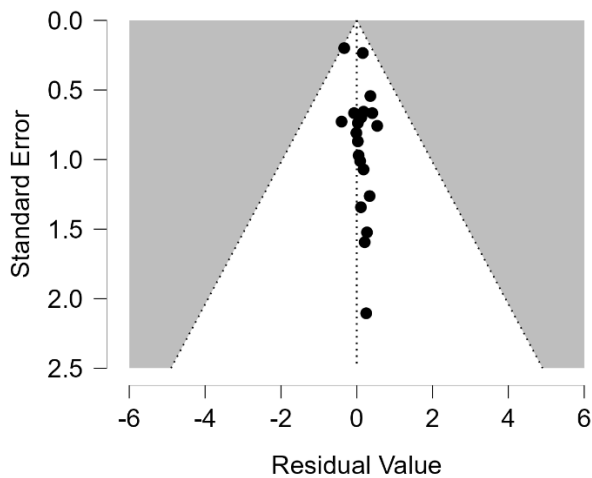


Figure 3. Funnel Plot and Fill Method

Based on the results of the analysis conducted, the aggregate or overall effect can be seen in the Forest Plot in Figure 2. This Forest Plot presents the effect sizes from the 20 studies analyzed in this research. The data in the Forest Plot indicate that the summary effect is 68. This can be interpreted to mean that the implementation of innovative learning yields an average student learning outcome of 68 on a scale of 0–100. In other words, innovative learning has been proven to make a positive contribution to improving the academic performance of elementary school students in Indonesia.

Additionally, at a 95% confidence level, a confidence interval of 55 to 81 was obtained. This range indicates that the true average student learning outcome lies within this interval. Thus, the results of this analysis have a high level of confidence and can be generalized.

Furthermore, to ensure the validity of the meta-analysis results, a publication bias detection was conducted. This detection is crucial to determine whether there is a tendency to publish only studies with specific outcomes. In this study, publication bias detection was performed using the Funnel Plot method with the Trim and Fill approach, processed using the JASP software.

The analysis results in Figure 2 show that there are no open points (*missing studies*) in the Trim and Fill Funnel Plot. This indicates that no publication bias was found in this study. Thus, the distribution of the data obtained is symmetrical, and the research results can be considered valid and not distorted by bias.

These findings are further supported by the consistency between the results of the forest plot in Figure 1 and the funnel plot in Figure 3. Both indicate that the effect of innovative learning on student achievement is stable and reliable.

The analysis in this study employed a meta-analysis approach conducted through several stages. The first stage involved testing the heterogeneity of effect sizes and standard errors to assess the model's fit with the data. The test results showed an I^2 value of 90.5% (>25%), indicating high heterogeneity, meaning effect sizes across studies were not homogeneous. Therefore, the use of a random-effects model was deemed appropriate for the data characteristics. Based on the analysis of the Forest Plot, a summary effect size of 68 was obtained. This indicates that the implementation of innovative learning resulted in an average student achievement of 68.

The next step is to detect publication bias. In this study, the method used was *Trim and Fill*. This method produces a *funnel* plot that includes both observed studies and imputed studies, allowing researchers to observe changes in effect sizes as additional studies are incorporated. A result is considered valid if the shift in effect size is relatively small or narrow. Thus, this method aids in identifying potential bias resulting from unpublished research.

The articles analyzed in this meta-analysis are studies on the impact of innovative learning on student achievement in Indonesia, conducted across various temporal and spatial contexts. This diversity provides a strong basis for the good generalizability of these research results. Therefore, the findings from this meta-analysis can be considered relevant general conclusions with the potential for broader application, both by teachers in Indonesia and in other countries.

Discussion

Innovation is a form of change undertaken to achieve better conditions, while learning is a series of activities designed to help students achieve predetermined goals. Thus, learning innovation can be understood as the process of creatively designing, developing, and managing

learning activities through the application of various more effective methods, thereby creating a learning environment that is beneficial and meaningful for students (College et al., n.d.). Teachers are required to continuously innovate in learning because this plays a crucial role in enhancing the impact of the teaching-learning process, for both teachers and students. The application of innovation in learning can make the learning process more meaningful and engaging. In this regard, teachers play a very important role in developing and managing learning activities (Rahayu et al., 2024). Therefore, teachers need to have the willingness and ability to create various innovations so that learning becomes more optimal.

Through educational innovation, teachers will also gain a broader understanding of the latest teaching methods and strategies, instructional techniques, and approaches to working with students. This will ultimately enhance the quality of teachers' professionalism (Situmorang et al., 2022). Teachers are the primary agents in the educational process as well as drivers of change and innovation. Failure in the field of education can occur if teachers are unable to implement innovation in learning (Harris & Jones, 2019). There are several methods included in innovative learning, including *Project-Based Learning* (PjBL), *Problem-Based Learning* (PBL), *Inquiry-Based Learning*, *Blended Learning*, *Discovery Learning*, *Cooperative Learning*, the *Flipped Classroom*, and *Contextual Teaching and Learning*. This study focuses on these various methods and their impact on student academic achievement.

CONCLUSION

The research results indicate a significant improvement in student academic achievement through the implementation of innovative learning, leading to the conclusion that innovative learning influences student academic achievement in Indonesia. This is evident from the *forest plot* results at a 5% significance level, which show an aggregate value of 68 with a summary effect range between 55 and 81. These findings indicate that the use of innovative learning methods results in an average student learning achievement of 68. In addition, this study was found to be free of potential bias, as demonstrated by the results of the *forest plot* and the *funnel plot* comparison using the *Trim and Fill* method. Thus, various methods included in

innovative learning, such as *Project-Based Learning (PBL)*, *Problem-Based Learning (PBL)*, *Inquiry-Based Learning*, *Blended Learning*, *Discovery Learning*, *Cooperative Learning*, *Flipped Classroom*, and *Contextual Teaching and Learning*, have been proven to improve the academic performance of elementary school students in Indonesia.

These findings provide comprehensive insights for elementary school teachers to develop and implement innovative teaching methods in the classroom learning process. The application of these methods not only has the potential to improve student achievement but also hones critical thinking skills, optimally taps into students' potential, and creates a more engaging and less monotonous learning environment.

ACKNOWLEDGMENT

The authors would like to thank PGRI University of Yogyakarta and, in particular, Dr. Rina Dyah Rahmawati, S.Si., M.Pd., for her support in conducting this research. Additionally, the authors express their appreciation to all parties who assisted in the data collection, analysis, and preparation of this article. Thanks are also extended to the previous researchers whose works served as data sources for this meta-analysis.

REFERENCES

- Achdiyat, M., & Siti Warhamni, D. (2018). Sikap Cara Belajar Dan Prestasi Belajar. *Faktor Jurnal Ilmiah Kependidikan*, 5(1), 49–58.
- Andini, M., Ramdhani, S., Suriansyah, A., & Cinantya, C. (2024). Peran Guru dalam Menciptakan Proses Belajar yang Menyenangkan. *MARAS: Jurnal Penelitian Multidisiplin*, 2(4), 2298–2305. <https://doi.org/10.60126/maras.v2i4.637>
- Antonius, H., Biologi, J. P., Keguruan, F., Ilmu, D. A. N., & Tarakan, U. B. (2022). *Meta Analysis Penelitian Pengembangan Media Bidang Pendidikan Biologo Di Indonesia*.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to Meta-Analysis*. John Wiley & Sons.
- College, A., Sattam, P., & Abdulaziz, B. (n.d.). *The Knowledge-Innovation Pathway: How Organizational Culture, Structure, and Technology Drive Process Improvement and Product Innovation*.
- Dasar, D. S., Saleh, M., & Smith, M. Bin. (2024). *Implementasi Model-Model Pembelajaran Inovatif Abad 21*. 04(1), 35–44.
- Dr. Pawan Kumar. (2025). Importance of Early Childhood Education and Its Impact on Children's Cognitive and Social Development. *International Journal of Scientific Research in Science and Technology*, 12(3), 1082–1086. <https://doi.org/10.32628/ijrst25123119>
- Elsa Setianing Wahyu, Novita Erliana Sari, & Fitriana Novarina. (2024). Peningkatan Hasil Belajar Pendidikan Pancasila melalui Penerapan Media Inovatif Berbasis Model Pembelajaran Problem Based Learning bagi Siswa Sekolah Dasar Kelas 4. *Jurnal Pustaka Cendekia Pendidikan*, 2(3), 291–299. <https://doi.org/10.70292/jpcp.v2i3.92>
- Elvadola, C., Lestari, Y. D., & Kurniasih, T. I. (2022). Penggunaan Model Pembelajaran Discovery Learning dalam Meningkatkan Hasil Belajar Siswa Sekolah Dasar. *Pedagogia: Jurnal Ilmiah Pendidikan Dasar Indonesia*, 4(1), 31–38. <https://doi.org/10.52217/pedagogia.v4i1.732>
- Enjang Warman, & Iis Ristiani. (2023). Pembelajaran Inovatif Dengan Pendekatan Model Pembelajaran Quantum Learning Di Sekolah Dasar Dalam Peningkatan Kreativitas Berpikir Dan Hasil Belajar Siswa. *Jurnal Pendidikan, Bahasa Dan Budaya*, 2(4), 47–56. <https://doi.org/10.55606/jpbb.v2i4.2204>
- Farhin, N., Setiawan, D., & Waluyo, E. (2023). Meningkatkan Hasil Belajar Siswa SD melalui Pembelajaran Berbasis Proyek. *Jurnal Penelitian Tindakan Kelas*, 1(2), 132–136.
- Fitrianti, E. (2024). Journal of Education and Culture. *Revolusi Industri 4.0: Inovasi Dan Tantangan Dalam Pendidikan Di Indonesia*, 4(1), 28–35.
- Harris, A., & Jones, M. (2019). Teacher leadership and educational change. *School Leadership and Management*, 39(2), 123–126. <https://doi.org/10.1080/13632434.2019.1574964>
- Irwan, & Kamarudin. (2021). Jurnal basicedu. *Jurnal Basicedu*, 5(5), 3(2), 524–532. <https://journal.uin.ac.id/ajie/article/view/971>
- JASP Team. (2024). *JASP (Version 0.18.3) [Computer software]*. <https://jasp-stats.org/>
- Jayanegara, A., Mukhtarom, A., & Marzuki, I.

- (2024). Innovative learning methods of Islamic education subject in Indonesia: a meta-analysis. *International Journal of Evaluation and Research in Education*, 13(2), 1148–1158. <https://doi.org/10.11591/ijere.v13i2.26364>
- Khalawati, F. N., Prasetyawati, D., & Hariyanti, D. (2023). Urgensi Persiapan Anak Dalam Masa Transisi PAUD Ke SD. *Transisi Paud Ke Sd Yang Menyenangkan*, (20).
- Kurniawan, E., Muslim, S., Joko, & Rijanto, T. (2023). Meningkatkan Tingkat Kemandirian Belajar Siswa dengan Menggunakan Model Pembelajaran Flipped Classroom. *JARTIKA: Jurna Riset Teknologi Dan Inovasi Pendidikan*, 6(1), 53–64. <https://journal.rekarta.co.id/index.php/jartika>
- Mareta Nugraha Putri. (2019). *The Application of Problem Based Learning Model To Increase Students Achievement In Indonesian Subject*. 1(4), 105–112.
- Menteri Pendidikan dan Kebudayaan Indonesia. (2013). Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 65 Tahun 2013 Tentang Standar Proses Pendidikan Dasar dan Menengah. *Kementerian Pendidikan Dan Kebudayaan, 2011*, 1–16.
- Naja Nursidal)*, Nining Kurniawati1), Kamarudin1), Syahriani Yulianci1), N. (2025). Efektivitas Model Pembelajaran Picture and picture terhadap Hasil Belajar IPA Siswa di Sekolah Dasar. *Bima Journal of Elementary Education*, 3(1), 1–9. ejournal.tsb.ac.id/index.php/bijee%0AEfektivitas
- Net, W. W. W. P., Nurhayati, R., Suranto, S., Irene, S., Dwiningrum, A., Retnawati, H., & Herwin, H. (2023). The Effect of Innovative Learning on Student Achievement in Indonesia: A Meta-Analysis. *Pegem Journal of Education and Instruction*, 13(3), 159–167. <https://doi.org/10.47750/pegegog.13.03.17>
- Ningrum, D. S. (2023). Perubahan Kurikulum Dan Implementasi Kurikulum Merdeka Di Sdn 15 Pulau Anak Air Bukittinggi. *Benchmarking*, 7(1), 29. <https://doi.org/10.30821/benchmarking.v7i1.14406>
- Nordian, A. (2024). *UNIVERSAL EXPLORATIONS IN RESEARCH VOLUME 1 NOMOR 1 JUNI (2024)*
- Peran Guru dalam Meningkatkan Prestasi Belajar Siswa melalui Metode Pengajaran yang Inovatif dan Inspiratif UNIVERSAL EXPLORATIONS IN RESEARCH*. 1, 53–75. <https://barkah-ilmifiddunya.my.id/ojs/index.php/uer/article/download/66/64>
- Parade, S. A. B., Amelia, S., Fitriani, Oktavia, S., & Afriantoni. (2025). Comparative Study of Curriculum 2013 and the Merdeka Curriculum Implementation in Indonesian Elementary Schools: Insights From Descriptive-Analytical Research. *AL-ADABIYAH: Jurnal Pendidikan Agama Islam*, 6(3), 242–252. <https://doi.org/10.35719/adabiyah.v6i3.1134>
- Paramartha, I. M. D. (2021). Pengaruh Implementasi Model Pembelajaran Group Investigation Dan Learning Cycle 5E Terhadap Prestasi Belajar Agama Hindu Dan Kreativitas Bermain Mind Mapping Siswa Kelas V Sekolah Dasar Negeri 17 Dauh Puri. *Cetta: Jurnal Ilmu Pendidikan*, 4(3), 492–497. <https://doi.org/10.37329/cetta.v4i3.1471>
- Permendiknas Nomor 41 Tahun 2007. (2007). *Permendiknas Nomor 41 Tahun 2007*. (235), 245. [http://digilib.unila.ac.id/4949/15/BAB II.pdf](http://digilib.unila.ac.id/4949/15/BAB%0AII.pdf)
- Pratama, A. I., Yunus, M., & Agusniati, A. (2025). Perbandingan Model Project Based Learning dan Problem Based Learning dalam Meningkatkan Kemampuan Pemecahan Masalah IPAS Siswa UPT SPF SD Inpres Mandai Kota Makassar. *Bosowa Journal of Education*, 6(1), 106–117. <https://doi.org/10.35965/bje.v6i1.6230>
- Rachmadtullah, R., Tanod, M. J., Irawan, N., Mcneilly, A., Bogor, U. D., & Kingdom, U. (2024). *Pengaruh E-Learning Terhadap Hasil Belajar Siswa Sekolah Dasar*. 4(1), 71–82.
- Rahayu, T., Watini, S., Hotijah, H., Mardiyanti, E., & Hakim, A. (2024). Kreativitas dan inovasi guru dalam pembelajaran berbasis digital. *Jurnal Syntax Idea*, 6(2), 110–120.
- Rifka Alkhilyatul Ma'rifat, I Made Suraharta, I. I. J. (2024). *Pengaruh Model Pembelajaran Contextual Teaching and Learning Terhadap Prestasi Belajar IPA Pada Siswa Sekolah Dasar Negri 17 Makarti Jaya*. 2(1), 306–312.
- Salkind, N. (2012). Software, Free. In

-
- Encyclopedia of Research Design*.
<https://doi.org/10.4135/9781412961288.n4>
 26
- Samuel Slamet Santosa, D. (2020). SIKIP: Jurnal Pendidikan Agama Kristen | 11. *Jurnal Pendidikan Agama Kristen*, 1(1), 11–24.
<http://sttikat.ac.id/e-journal/index.php/sikip>
- Setiawan, P., & Sudana, I. D. N. (2021). Model Pembelajaran Kontekstual Meningkatkan Hasil Belajar Matematika Siswa Kelas V Sekolah Dasar. *Jurnal Ilmiah Pendidikan Profesi Guru*, 4(1), 85–91.
<https://doi.org/10.23887/jippg.v4i1.14286>
- Situmorang, M., Gultom, S., Mansyur, A., Gultom, S., Restu, & Ritonga, W. (2022). Implementation of Learning Innovations to Improve Teacher Competence in Professional Certificate Programs for In-Service Teachers. *International Journal of Instruction*, 15(2), 675–696.
<https://doi.org/10.29333/iji.2022.15237a>
- Suparjan, S., Haryanto, H., Murjainah, M., & Ismiyani, N. (2024). The Influence of Problem-Based Learning Model to Indonesian Language Primary Classrooms: A Meta-Analysis. *Journal of Education Research*, 5(2), 1785–1791.
<https://doi.org/10.37985/jer.v5i2.977>
- Utami, S. G. (2020). *Juridikdas Pengaruh Model Pembelajaran Kooperatif Tipe Talking Stick Terhadap Hasil Belajar Siswa Pada Pembelajaran Tematik Kelas V Sekolah Dasar Negeri Kota Bengkulu*. 3(2), 162–170.
- Widoyo, H., Rofi'i, A., Jährir, A. S., Rasimin, R., Purhanudin, M. V., & Sitopu, J. W. (2023). Ayatullah, “Pembelajaran Pendidikan Agama Islam dan Budi Pekerti Di Madrasah Aliyah Palapa Nusantara,” *Bintang: Jurnal Pendidikan dan Sains* 2, no. 2 (2020): 206–229,
<https://ejournal.stitpn.ac.id/index.php/bintang>. *Journal on Education*, 6(1), 1687–1699.
- Winatha, K. R., & Setiawan, I. M. D. (2020). Pengaruh Game-Based Learning Terhadap Motivasi dan Prestasi Belajar. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 10(3), 198–206.
<https://doi.org/10.24246/j.js.2020.v10.i3.p198-206>
- Zulkarnain, I. (2024). the Effect of the Problem Based Learning Model on Mathematical Problem-Solving Ability. Tesseract:
- International Journal of Geometry and Applied Mathematics, 2(3), 299–304.
<https://doi.org/10.57254/tess.v2i3.45>