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Implementation of physics inquiry learning in high school to improve students' conceptual understanding

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ABSTRACT

Open inquiry is a learning approach that gives students complete freedom to manage the entire investigation process independently. This study aims to investigate the implementation of inquiry-based learning in high school physics education to enhance students' conceptual understanding. The method employed is a systematic literature review, which analyzes 20 scientific articles published between 2017 and 2025, obtained from Google Scholar and the Publish or Perish databases. The analysis process was conducted using a bibliometric approach with VOSviewer software, which maps the relationships between studies, authors, and topics. The results of the review indicate that inquiry learning, whether guided, local, or technology-based, has proven effective in enhancing conceptual mastery, critical thinking skills, and promoting active student involvement in the physics learning process. The integration of formative assessment in this learning model also strengthens students' conceptual understanding by providing continuous feedback. This research concludes that inquiry learning, supported by a proper assessment strategy, can be a relevant and strategic approach to improving the quality of physics learning in high school and supporting the achievement of 21st-century competencies.

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ABSTRAK

Open inquiry merupakan pendekatan pembelajaran yang memberikan kebebasan penuh kepada peserta didik untuk mengelola seluruh proses penyelidikan secara mandiri. Penelitian ini bertujuan untuk mengkaji implementasi pembelajaran inkuiri dalam pembelajaran Fisika di tingkat SMA guna meningkatkan pemahaman konseptual peserta didik. Metode yang digunakan adalah systematic literature review dengan menganalisis 20 artikel ilmiah yang dipublikasikan antara tahun 2017 hingga 2025, diperoleh dari basis data Google Scholar dan Publish or Perish. Proses analisis dilakukan melalui pendekatan bibliometrik menggunakan perangkat lunak VOSviewer, yang memetakan keterkaitan antar studi, penulis, dan topik. Hasil tinjauan menunjukkan bahwa pembelajaran inkuiri, baik terbimbing maupun berbasis lokal dan teknologi, terbukti efektif dalam meningkatkan penguasaan konsep, keterampilan berpikir kritis, serta keterlibatan aktif peserta didik dalam proses pembelajaran Fisika. Integrasi asesmen formatif dalam model pembelajaran ini juga memperkuat pemahaman konseptual peserta didik melalui pemberian umpan balik yang berkelanjutan. Jadi, kesimpulan penelitian ini yaitu pembelajaran inkuiri yang didukung oleh strategi asesmen yang tepat dapat menjadi pendekatan yang relevan dan strategis dalam meningkatkan kualitas pembelajaran Fisika di SMA serta mendukung pencapaian kompetensi abad ke-21.

Kata Kunci: *fisika; pemahaman konseptual; pembelajaran inkuiri*

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INTRODUCTION

Efforts to develop the intellectual, moral, and skill capacities of learners in a comprehensive manner therefore make the improvement of learning quality a highly important aspect. The competencies that need to be developed in the learning process include creative thinking skills, problem-solving abilities, knowledge development, and a deep understanding of the concepts being studied (Chantika *et al.,* 2022; Widhiasti *et al.,* 2022).

Physics learning at the senior high school level often faces challenges in improving students' conceptual understanding. Many students tend to memorize formulas without grasping the fundamental concepts behind physical phenomena, making it difficult for them to apply these concepts in real-life situations (Sulistiyono, 2020). The results of the 2018 Program for International Student Assessment (PISA) survey showed that Indonesian students' science scores were below the OECD average, ranking 72nd out of 79 countries. The average science score of Indonesian students was only 396, far below the OECD average of 489. This data reflects the low ability of students to understand and apply scientific concepts, including physics.

One instructional approach believed to enhance students' conceptual understanding is inquiry-based learning (Mauritha *et al*., 2017). This approach provides opportunities for students to actively ask questions, investigate, and discover concepts through observation and experimentation (Ngilmaya *et al.,* 2021). Inquiry-based learning enables students to construct knowledge actively by encouraging direct engagement in the scientific thinking process (Iswatun *et al.,* 2017). The implementation of inquiry-based learning in physics classrooms can significantly improve students' conceptual understanding and participation compared to traditional lecture methods (Hediana & Nurita, 2022).

However, in practice, the implementation of inquiry-based learning in schools still faces various obstacles (Wahid, 2023). According to a report from the Ministry of Education and Culture, only around 38% of senior high school physics teachers consistently apply inquiry based learning approaches. Common challenges include limited instructional time, lack of laboratory facilities, and insufficient teacher training in implementing inquiry strategies. This indicates the need for systematic support and continuous professional development to ensure optimal implementation of this method (Wandira *et al.,* 2023).

Conceptual understanding is a crucial aspect of physics learning as it is directly related to critical thinking and problem solving skills (Nasution & Suliyanah, 2022). Students with strong conceptual understanding tend to be more capable of solving application-based problems and demonstrating higher order thinking skills (Khaira *et al*., 2023; Sudiatmika, 2022). Therefore, learning that is able to foster a deep understanding of Physics concepts is an urgent need in the 21st century education era (Andhayani, 2024).

Based on this background, this study aims to explore the implementation of Physics inquiry learning at the high school level and its impact on improving students' conceptual understanding.

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LITERATURE REVIEW

Guided Inquiry

Guided inquiry is a learning approach in which teachers play a dominant role in designing and directing the investigation process, starting from determining topics, preparing questions, to determining procedures that must be followed by students (Rohmantika & Pratiwi, 2022). Teachers also provide structured worksheets to help learners organize information and draw conclusions (Hidayat *et al.*, 2022). Although students are still trained to think critically, the learning process takes place under strict direction from the teacher. This approach is effective in the early stages for students who are not used to conducting independent research, as it helps them understand the scientific thinking process systematically.

Open Inquiry

In this approach, the role of the teacher is limited as a facilitator who provides assistance only when needed. *Open inquiry* is a learning approach that gives students complete freedom to manage the entire investigation process independently, starting from formulating problems, designing methods, collecting and analyzing data, to drawing conclusions (Dah & Noor, 2021). *Open inquiry* is suitable for students who already have basic skills in research and are familiar with scientific approaches, because it is able to encourage independence, creativity, and critical thinking skills through initiatives that come entirely from students (Ratela, 2020).

Application of *Inquiry-Based Learning* (IBL)

The implementation *of Inquiry-Based Learning* consists of six main stages designed to guide students to be active in the inquiry-based learning process (Susilowati, 2020). The first stage is to explain the goals and prepare the students, where the teacher conveys the learning objectives and motivates the students to be mentally and emotionally prepared to participate in the investigative process. The second stage, orienting students to problems, is carried out by introducing relevant problems to arouse curiosity and encourage further exploration. In the third stage, students formulate a hypothesis as an initial conjecture for the solution to the problem they face. In the fourth stage, carrying out discovery activities, students collect data through experiments or other scientific methods to test hypotheses. After that, students present the results of the activity in the form of written reports, oral presentations, or other media to train scientific communication skills. The final stage is to evaluate the discovery activity, which involves reflection on the process and results of the investigation, as well as the provision of feedback by teachers to strengthen students' understanding.

Advantages and Disadvantages *of Inquiry-Based Learning* (IBL)

Inquiry-Based Learning has several advantages that make it relevant in 21st century learning. This method is able to develop students' knowledge, attitudes, and skills in a

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balanced manner (Millenia & Sunarti, 2022). Not only emphasizing the cognitive aspect, this approach also fosters scientific attitudes and science process skills, resulting in holistic learning. In addition, *Inquiry-Based Learning* supports a diversity of learning styles by providing flexibility for students to explore material according to their respective preferences, either visually, auditorily, kinesthetic, or a combination of the three. This method is also very beneficial for highly capable learners because it offers greater intellectual challenges and allows for optimal development of potential (Nzomo *et al.,* 2023). Furthermore, this approach is in line with the principles of constructivistic learning and the development of students' psychology, as it encourages them to learn through experience, exploration, and reflection on the successes and failures experienced during the investigation process.

Inquiry-Based Learning also has a number of limitations. Teachers often have difficulty controlling the learning process, especially in large classrooms that have different group work dynamics (Lewis *et al.,* 2021). In addition, the application of this approach faces challenges in changing the learning habits of students who are accustomed to passive learning methods (Palupi & Subiyantoro, 2020). The model also takes a relatively longer time to complete the investigation activities, making it difficult to adjust to the dense curriculum and limited learning time (Darmuki *et al.,* 2023). On the other hand, this approach is less aligned with conventional assessment systems that still focus on mastering factual material, whereas *Inquiry-Based Learning* emphasizes more on the process of thinking, analysis, and scientific skills.

METHODS

The method used in this study is *Systematic Literature Review (SLR)* literature research. This method was chosen because it is to produce new theories on research topics by conducting a study of previous research results based on theories that can be accounted for. *Systematic Literature Review (SLR)* research is carried out to produce a new, more up-to-date understanding, thought, or theory about a problem that is being researched through the study of the results of previous studies and research based on theories that can be accounted for, so it is not an assumption, argument, or idea from the researcher. The purpose of *the Systematic Literature Review (SLR)* is to provide an explanation of the reader's choice and reasoning by comparing the results of the most powerful research with the other (Ramadhani, 2021).

The selection of the population into a sample uses inclusion, exclusion, and criteria of inclusion, exclusion, and applies *Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA).* Inclusion criteria, namely the article that is reviewed is a research article on Physics inquiry learning in improving students' conceptual understanding. Data collection was carried out using primary data sources in the form of similar articles with research titles and have been published. By searching articles with keywords such as "*inquiry-based learning", "physics learning",* and *"conceptual understanding",* analyzing the findings, and writing a literature review. Articles were collected from the Google Scholar and Publish or Perish databases, with a range of 2017-2025. Data from similar research results are processed through analysis and interpretation to produce conclusions as new theories.

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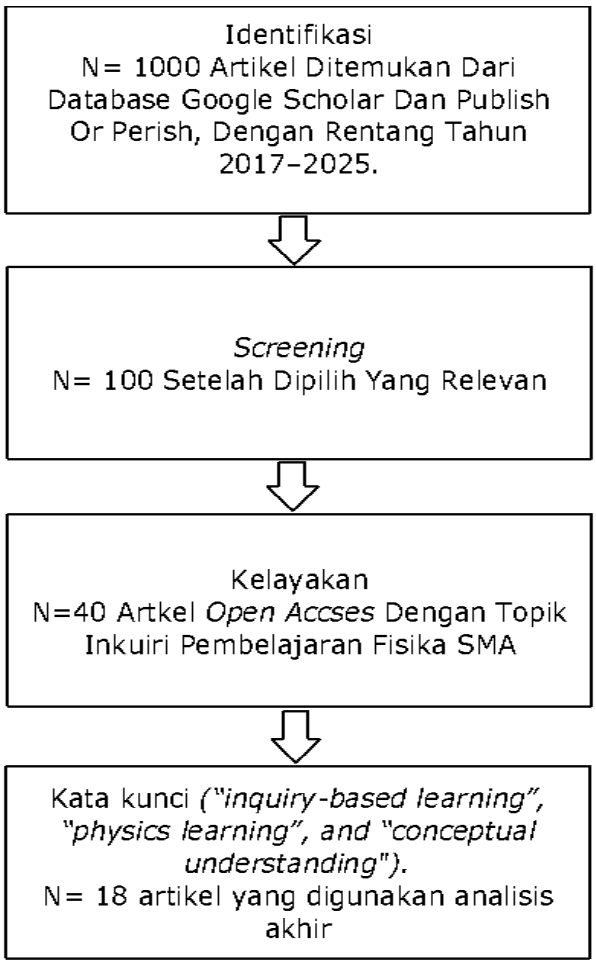

Figure 1. PRISMA Filtration Method
Source: Author Documentation 2025

This study adopts a systematic approach to identify and analyze relevant literature on Physics inquiry learning, guided by the PRISMA Screening Method **(Figure 1).** This process began with the comprehensive identification of 1,000 articles from various leading academic databases such as Google Scholar and Publish or Perish. Through the elimination of duplication and initial screening by relevance, the number of articles is reduced to 100. Furthermore, 40 articles were carefully selected based on the feasibility of access and the suitability of the topic with the research focus, namely inquiry learning in the context of Physics. From the results of this rigorous screening, a total of 18 articles were declared to meet the inclusion criteria and subsequently integrated in the final analysis. This methodical and transparent approach ensures that the sources used are of high quality and relevance, supporting the integrity of the findings. The data analyzed covers the period 2017-2025, reflecting the latest developments in this field.

RESULTS AND DISCUSSION

A total of 18 articles were selected through a screening process based on the PRISMA method **(Table 1).** Of the 1,000 articles identified through *databases* such as *Google Scholar* and *Publish or Perish,* as many as 100 articles were filtered after removing duplicates and irrelevant ones. Furthermore, 40 articles were selected based on accessibility and relevance

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to the Physics inquiry learning topic. Of these, 18 articles were declared to meet the criteria and included in the final analysis. This process involves a rigorous and transparent selection of literature to ensure the quality and relevance of the sources used. The following are the results of data for 2017-2025:

Table 1. Data from 2017-2025

Cities	Authors	Title	Year	GSRank	CitesPer Year	CitesPer Author
2	S Purnamasari, R Wardah, T Diah	The Effectiveness of the Implementation of Local Wisdom-Based Inquiry Learning on Student Learning Outcomes	2022	1	0.67	1
4	D Annisha	Implementation of Guided Inquiry Learning Based on Local Potential as an Effort to Improve Students' Environmental Care Attitudes	2023	2	2.00	4
6	LE Kertiasih	Implementation of Wenning Inquiry-Based Learning Assisted by e-UKBM to Improve Students' Scientific Skills	2018	3	0.86	6
36	M Hajrin, IW Sadia, IGA Gunadi	The influence of the guided inquiry learning model on students' critical thinking skills in Physics learning class X science at State High School	2019	4	6.00	12
1	N.Y. Scott, N.Y.	Implementation of Guided Inquiry Learning to Improve Physics Learning Motivation and Learning Achievement of Class XI Students ...	2018	5	0.14	0
1	A febriant, a pratidhina, a vijaya...	Development of Student Worksheets with PhET-Assisted Guided Inquiry Model to Support Science Learning in Junior High School	2024	6	1.00	0
0	S Safrijal	Internalized Inquiry Learning Model of Qur'an Verses to Improve Students' Understanding of the Concept of Buffer Solutions and Islamic Character	2017	8	0.00	0
0	N Sari, H Saputra, D Mustika	Analysis of Inquiry Skills of Physics Teachers of Langsa City High School	2024	9	0.00	0
0	FN Nisa, W Widodo...	Guided Inquiry Learning to Improve Student Learning Outcomes on Environmental Pollution Materials	2024	10	0.00	0

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Cities	Authors	Title	Year	GSRank	CitesPer Year	CitesPer Author
1	S Sunarmi, MS Sari, ES Sulasmi...	Strengthening plantae materials for high school teachers lab um and mgmp throughout Malang Raya	2019	11	0.17	0
1	D Annisha	The Effectiveness of Guided Inquiry Learning Integrated Local Potential to Improve Students' Critical Thinking Skills	2023	12	0.50	1
0	IW Nurmertayasa, IPO Suardana...	The Use of the Inquiry Learning Model to Improve Poetry Writing Skills in Grade V Students at SDN 3 Sulahan	2024	13	0.00	0
0	At Elvada, A Sahrina...	The Influence of the Guided Inquiry Learning Model on the Geography Skills of Class X Students of Panjura Malang High School	2025	15	0.00	0
37	D Septiani, S Susanti	The urgency of inquiry learning in the 21st century: a literature review	2021	16	9.25	19
4	D Milda, LP Anggreiny, A Simanjuntak…	Literature Study of The Application of The Inquiry Learning Model Towards 21st Century Skills in Physics Subjects in High School	2024	17	4.00	1
4	MBT Laksono, D Novita	Implementation of Online Inquiry Learning with Electronic Learner Worksheets (e-LKPD) to Train Critical Thinking Skills of Rate Factor Material ...	2022	18	1.33	2
0	ELF Ahsani	Implementation of Local Wisdom Education-Based Guided Inquiry Learning Model to Improve Student Learning Outcomes on Theme 6 Grade III ...	2023	19	0.00	0
0	MN Hudha, A Wahyuningtyas, DF Nurilyasari...	Inquiry in Physics Education: A Systematic Literature	2023	20	0.00	0

Source: Research 2025

Based on **Table 1**, it is known that the implementation of inquiry learning consistently has a positive impact on students' conceptual understanding. The most widely used inquiry models are *guided inquiry* and *structured inquiry*, which provide a balance between teacher direction and student exploration.

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Discussion

The results of the identification carried out by the researcher from 18 articles obtained through literature studies, the main journals obtained in this study amounted to 5 journals. The results of the reviewed research show that the inquiry learning model, both in the form of guided inquiry and *argument driven inquiry,* has a significant impact on improving the quality of learning (Elath *et al.,* 2022). This model has been proven to encourage more meaningful learning activities, strengthen student involvement in the learning process, and improve conceptual understanding in depth. The application of inquiry learning strongly supports the development of 21st-century skills, such as critical thinking, creativity, collaboration, and communication (Nidda *et al.,* 2022). The importance of integrated formative assessments in the inquiry approach, as it provides continuous feedback and facilitates learners' involvement in the learning reflection process (Benben & Bug-os, 2022).

Through a phenomenon-based inquiry approach and concept exploration, students not only understand Physics procedurally, but also internalize concepts more logically and contextually (Mariana *et al.,* 2023; Ramadhanti & Jatmiko, 2023). This has a direct impact on increasing students' reasoning, analysis, and scientific attitude in solving physics problems. The inquiry model is also effective in developing 21st-century skills, such as critical thinking, creativity, collaboration, and communication (Martatis, 2023). Formative assessments that are integrated into inquiry learning are an important factor in strengthening students' understanding (Najwa *et al.,* 2022). Feedback provided on a regular basis helps students reflect and correct misunderstandings of concepts.

CONCLUSION

Based on the analysis of the implementation of inquiry learning in the context of Physics education at the high school level, inquiry learning, both guided and based on local potential, consistently has a positive impact on improving students' conceptual understanding in Physics lessons. This is reflected in the improvement of mastery of concepts, science process skills, and student learning outcomes. Thus, the integration of inquiry models with formative assessments is an effective and relevant strategic approach in facing the challenges of 21st century learning, especially to improve the conceptual understanding and scientific skills of high school students in the subject of Physics. Inquiry learning supported by the right assessment strategy can be a relevant and strategic approach in improving the quality of Physics learning in high school and supporting the achievement of 21st century competencies.

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REFERENCES

Ahsani, E. L. F. (2023). Implementasi model pembelajaran inkuiri terbimbing berbasis local wisdom education untuk meningkatkan hasil belajar siswa kelas III. *Ibtida'i: Jurnal Kependidikan Dasar, 10*(1), 1-12.

Andhayani, D. (2024). Efektivitas penerapan model pembelajaran inkuiri terbimbing berbantuan video terhadap hasil belajar Fisika peserta didik kelas X ATP 3 SMK Negeri 1 Gelumbang. *Jurnal Pendidikan dan Kebudayaan (Jurdikbud), 4*(1), 77-93.

Annisha, D. (2023). Efektivitas pembelajaran inkuiri terbimbing terintegrasi potensi lokal untuk meningkatkan keterampilan berpikir kritis siswa. *Biologi Edukasi: Jurnal Ilmiah Pendidikan Biologi, 15*(2), 135-142.

Annisha, D. (2023). Implementasi pembelajaran inkuiri terbimbing berbasis potensi lokal sebagai upaya meningkatkan sikap peduli lingkungan siswa. *Pendekar: Jurnal Pendidikan Berkarakter, 1*(4), 396-405.

Benben, V. Y., & Bug-os, M. A. A. C. (2022). Physics students' academic achievement and motivation in a gamified formative assessment. *American Journal of Educational Research, 10*(6), 385-390.

Chantika, A., Wahyuni, N. F., Alamsyah, S. S., & Rifai, T. (2022). Use of direct practice as an active learning innovation. *Curricula: Journal of Curriculum Development, 1*(2), 205-218.

Dah, N. M., & Noor, M. S. A. M. (2021). The development of an Investigable Questions Formulation Technique (IQFT) in open inquiry learning. *Jurnal Pendidikan Sains dan Matematik Malaysia, 11*(1), 103-120.

Darmuki, A., Nugrahani, F., Fathurohman, I., Kanzunnudin, M., & Hidayati, N. A. (2023). The impact of inquiry collaboration project based learning model of Indonesian language course achievement. *International Journal of Instruction, 16*(2), 247-266.

Elath, A., Taunaumang, H., & Silangen, P. M. (2022). Pengaruh penggunaan model pembelajaran inkuiri terbimbing terhadap hasil belajar Fisika materi gerak lurus pada siswa kelas VIII SMP Kristen Tomohon. *Charm Sains: Jurnal Pendidikan Fisika, 3*(1), 1-8.

Elvada, E., Sahrina, A., & Wulandari, S. (2025). Pengaruh model pembelajaran inkuiri terbimbing terhadap keterampilan Geografi siswa kelas X SMA Panjura Malang. *Cetta: Jurnal Ilmu Pendidikan, 8*(1), 1-14.

Febriant, A., Pratidhina, E., Wijaya, A., & Herwinarso, H. (2024). Pengembangan lembar kerja peserta didik dengan model inkuiri terbimbing berbantuan PhET untuk mendukung pembelajaran Sains di SMP. *Jurnal Ilmiah Profesi Pendidikan, 9*(4), 2655-2660.

Hajrin, M., Sadia, I. W., & Gunadi, I. G. A. (2019). Pengaruh model pembelajaran inkuiri terbimbing terhadap keterampilan berpikir kritis siswa pada pembelajaran Fisika kelas X IPA SMA Negeri. *Jurnal Pendidikan Fisika Undiksha, 9*(1), 63-74.

https://doi.org/10.17509/curricula.v4i1.84481

Hediana, P. P., & Nurita, T. (2022). Analisis penggunaan model pembelajaran inkuiri terbimbing dalam meningkatkan keterampilan proses Sains siswa SMP. *Pensa: E-Jurnal Pendidikan Sains, 10*(2), 167-171.

Hidayat, R. K., Sahidu, H., & Gunada, I. W. (2022). Pengembangan perangkat pembelajaran berbasis inkuiri terbimbing terintegritas dengan karakter untuk meningkatkan pemahaman konsep Fisika peserta didik. *Jurnal Ilmiah Profesi Pendidikan, 7*(2), 285-291.

Hudha, M. N., Wahyuningtyas, A., Nurilyasari, D. F., Prastiyan, R., & Ayu, H. D. (2023). Inkuiri dalam pendidikan Fisika: Sistematika literatur review. *Kappa Journal, 7*(2), 217-227.

Iswatun, I., Mosik, M., & Subali, B. (2017). Penerapan model pembelajaran inkuiri terbimbing untuk meningkatkan KPS dan hasil belajar siswa SMP kelas VIII. *Jurnal Inovasi Pendidikan IPA, 3*(2), 150-160.

Kertiasih, L. E. (2018). Implementasi pembelajaran berbasis inkuiri wenning berbantuan e-UKBM untuk meningkatkan keterampilan ilmiah peserta didik. *Journal of Education Action Research, 2*(4), 363-369.

Khaira, H. S., Al Hafizh, M. F., Darmansyah, P. S. A., Nugraha, H., & Komara, D. A. (2023). Analysis of needs and teachers' perception towards business teaching materials at SMA Labschool UPI. *Curricula: Journal of Curriculum Development*, *2*(2), 299-314.

Laksono, M. B. T., & Novita, D. (2022). Implementasi pembelajaran inkuiri online dengan lembar kerja peserta didik elektronik (E-LKPD) untuk melatihkan keterampilan berpikir kritis materi faktor laju reaksi. *Konstruktivisme: Jurnal Pendidikan dan Pembelajaran, 14*(1), 38-48.

Lewis, D., Clontz, S., & Estis, J. (2021). Team-based inquiry learning. *Primus, 31*(2), 223-238.

Mariana, E., Wardany, K., & Kinasih, A. (2023). Pengaruh model pembelajaran Fisika berbasis inkuiri terbimbing terhadap keterampilan generik Sains siswa. *Jurnal Pendidikan MIPA, 13*(1), 105-113.

Martatis, M. (2023). Pengaruh model pembelajaran inkuiri terbimbing terhadap berpikir kritis siswa pada mata pelajaran Fisika. *Journal of Educational Research and Humaniora (JERH)*,*1*(2), 24-33.

Mauritha, S., Nur, S., & Adlim, A. (2017). Pengaruh penggunaan model pembelajaran inkuiri terbimbing terhadap keterampilan proses Sains siswa MAN. *Jurnal IPA dan Pembelajaran IPA, 1*(1), 1-5.

Milda, D., Anggreiny, L. P., Simanjuntak, A., & Lubis, R. H. (2024). Literature study of the application of the inquiry learning model towards 21st century skills in Physics subjects in high school. *Eductum: Journal Research, 3*(3), 92-99.

Millenia, S. H., & Sunarti, T. (2022). Analisis riset penerapan model pembelajaran inkuiri terbimbing berbasis literasi Sains dalam pembelajaran Fisika. *Jurnal Ilmu Pendidikan, 4*(1), 1051-1064.

Najwa, N., Gunawan, G., Sahidu, H., & Harjono, A. (2022). Pengembangan perangkat pembelajaran model inkuiri terbimbing untuk meningkatkan hasil belajar Fisika peserta didik. *Jurnal Pendidikan Fisika dan Teknologi, 8*(1), 31-37.

https://doi.org/10.17509/curricula.v4i1.84481

Nasution, M. F. A. A. R., & Suliyanah, S. (2022). Penerapan model pembelajaran inkuiri terbimbing untuk meningkatkan hasil belajar peserta didik SMA pada materi elastisitas. *IPF: Inovasi Pendidikan Fisika, 11*(1), 29-34.

Ngilmaya, A. N. K., Irawan, E., & Ifariyah, F. (2021). Efektivitas model inkuiri terbimbing dalam meningkatkan kemampuan menarik kesimpulan peserta didik. *Jurnal Tadris IPA Indonesia, 1*(2), 199-209.

Nidda, I., Taufik, M., Wahyudi, W., & Doyan, A. (2022). Pengembangan perangkat pembelajaran model inkuiri terbimbing untuk meningkatkan penguasaan konsep dan kemampuan pemecahan masalah Fisika peserta didik. *Jurnal Ilmiah Profesi Pendidikan, 7*(4), 2355-2359.

Nisa, F. N., Widodo, W., & Roqobih, F. D. (2024). Pembelajaran inkuiri terbimbing untuk meningkatkan hasil belajar siswa pada materi pencemaran lingkungan. *Biochephy: Journal of Science Education, 4*(1), 330-336.

Nurmertayasa, I. W., Suardana, I. P. O., & Adiastiti, L. M. A. (2024). Penggunaan model pembelajaran inkuiri untuk meningkatkan keterampilan menulis puisi pada peserta didik kelas V di SDN 3 Sulahan. *Alfabeta: Jurnal Bahasa, Sastra, dan Pembelajarannya, 7*(2), 572-579.

Nzomo, C., Rugano, P., Njoroge Mungai, J., & Gitonga Muriithi, C. (2023). Inquiry-based learning and students' self-efficacy in Chemistry among secondary schools in Kenya. *Heliyon, 9*(1), 1-10.

Palupi, B. S., & Subiyantoro, S. (2020). The effectiveness of Guided Inquiry Learning (GIL) and Problem-Based Learning (PBL) for explanatory writing skill. *International Journal of Instruction, 13*(1), 713-730.

Purnamasari, S., Wardah, R., & Diah, T. (2022). Efektivitas implementasi pembelajaran inkuiri berbasis kearifan lokal terhadap hasil belajar siswa. *Jurnal PGSD Uniga, 1*(2), 53-60.

Ramadhani, D. P. (2021). Analisis penerapan asesmen formatif dalam pembelajaran IPA dan Fisika: Literature review. *Lensa (Lentera Sains): Jurnal Pendidikan IPA, 11*(2), 110-120.

Ramadhanti, P. R., & Jatmiko, B. (2023). Pembelajaran Fisika dengan menggunakan model inkuiri terbimbing untuk meningkatkan keterampilan proses Sains siswa. *Student Scientific Creativity Journal, 1*(5), 324-336.

Ratela, J. (2020). pengembangan panduan praktikum virtual dengan model inkuiri terbuka pada materi fluida dinamis. *Charm Sains: Jurnal Pendidikan Fisika, 1*(3), 143-149.

Rohmantika, N., & Pratiwi, U. (2022). Pengaruh metode eksperimen dengan model inkuiri terbimbing terhadap kemampuan berpikir kreatif peserta didik pada pembelajaran Fisika. *Lontar Physics Today, 1*(1), 9-17.

Safrijal, S. (2017). Model pembelajaran inkuiri terinternalisasi ayat-ayat Al-Quran untuk meningkatkan pemahaman konsep larutan penyangga dan karakter Islami siswa. *Lantanida Journal, 3*(1), 1-17.

Sari, N., Saputra, H., & Mustika, D. (2024). Analisis keterampilan inkuiri guru Fisika SMA Kota Langsa. *GRAVITASI: Jurnal Pendidikan Fisika dan Sains, 7*(1), 27-36.

https://doi.org/10.17509/curricula.v4i1.84481

Septiani, D., & Susanti, S. (2021). Urgensi pembelajaran inkuiri di abad ke 21: Kajian literatur. *SAP (Susunan Artikel Pendidikan), 6*(1), 1-8.

Sudiatmika, I. K. (2022). Penerapan model pembelajaran inkuiri terbimbing dalam meningkatkan hasil belajar Fisika pada siswa kelas X RPL 1 SMK Negeri 1 Negara pada tahun pelajaran 2021/2022. *Widyadari, 23*(1), 136-147.

Sulistiyono, S. (2020). Efektivitas model pembelajaran inkuiri terbimbing terhadap keterampilan proses Sains dan pemahaman konsep Fisika siswa MA Riyadhus Solihin. *Jurnal Pendidikan Fisika Undiksha, 10*(2), 61-73.

Sunarmi, S., Sari, M. S., Sulasmi, E. S., & Sulisetijono, S. (2019). Pemantapan materi plantae bagi guru SMA Lab UM dan MGMP se-Malang Raya. *Jurnal Pendidikan Biologi Universitas Negeri Malang, 10*(2), 51-56.

Susilowati, R. D. (2020). Efektivitas model pembelajaran inquiry dan problem based learning terhadap kemampuan pemecahan masalah pada mata pelajaran Matematika kelas IV SD. *JEMS: Jurnal Edukasi Matematika dan Sains, 8*(1), 49-59.

Unggasari, N. W., Rapi, N. K., & Rachmawati, D. O. (2018). Implementasi pembelajaran inkuiri terbimbing untuk meningkatkan motivasi belajar dan prestasi belajar Fisika siswa kelas XI MIA 2 Sma Negeri. *Jurnal Pendidikan Fisika Undiksha, 8*(2), 65-76.

Wahid, S. (2023). Pengaruh model pembelajaran inkuiri terbimbing terhadap hasil belajar Fisika ditinjau dari minat belajar peserta didik kelas XI SMAN 9 Makassar. *Jurnal Ilmiah Ecosystem, 23*(3), 774-785.

Wandira, A., Ali, L. U., & Septiana, Y. (2023). Pengembangan modul pembelajaran Fisika berbantuan phet berbasis inkuiri pada materi usaha dan energi kelas X SMA Negeri 1 Gerung Lombok Barat. *Cahaya: Journal of Research on Science Education, 1*(1), 25-41.

Widhiasti, A., Putri, A., Fanani, M. A., Salim, N., & Kurnia, Y. R. (2022). Analysis of learning components in implementation of educational process in schools. *Curricula: Journal of Curriculum Development, 1*(2), 219-234.

https://doi.org/10.17509/curricula.v4i1.84481