

Increasing Students' Critical Thinking Skills Through The Inquiry Learning Model

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ABSTRACT

Critical thinking skills are essential skills that students must have in solving the diverse challenges they will face. The reality found is that students have low critical thinking skills. Students need to be trained to analyze and solve problems. One alternative is using the inquiry learning model. This research is Classroom Action Research, which aims to see the increase of students' critical thinking skills. The research subject was class X E.5 at SMAN 7 Padang. It was carried out over 2 cycles, with the design of the research being the Kemmis and McTaggart model. The data collection techniques used were observation, interviews, and written tests. The research instruments used were critical thinking skills observation sheets and written test questions. The average value of students' critical thinking skills in the pre-cycle was 50.6% with low criteria, the results in cycle 1 with a percentage value of 66.98% in the medium category, and cycle 2 increased to 73.30% in the skills category high critical thinking. From these results, it can be inferred that the inquiry learning model can be used in the learning process to increase student's critical thinking skills.



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INTRODUCTION

The development of science and technology in the 21st century is currently increasingly rapid. It must be balanced with improving the quality of learning (Ashel & Lestari, 2023). This requires education to be able to prepare and form a generation that can master skills, innovate, and master technology to be ready to compete in the era of globalization (Parwati et al., 2020). Students are prepared to be able to master 21st-century skills, including collaboration and communication skills, the ability to increase creative and relevant learning, and the ability to think fundamentally and understand problems (Hastuti et al, 2024). The ability to understand problems and think fundamentally is also called critical thinking skills. Critical thinking skills are recognized as one of the most important thinking skills (Alsaleh, 2020). Critical thinking skills are one of the indicators of the quality of student learning that students must possess.

Critical thinking is the human ability to think logically and relevantly to solve all problems (Wahyuni et al, 2023). Critical thinking means thinking broadly to see conditions

and identify problems (Mujiyono, 2018). Critical thinking skills can also be interpreted as the ability to think structured to be able to identify and understand problems, examine and assess the truth of arguments, and be able to solve and provide solutions to problems (Nurfithriyah, 2020).

Critical thinking skills are abilities that are influenced by the competencies that have been obtained in learning. This skill is a focused and clear process such as making decisions, analyzing assumptions, and conducting scientific research. Critical thinking means focusing on what is believed by involving standard and reasonable thinking. Critical thinking is used to achieve a deep understanding of the results of interpretation, analysis, evaluation, and concluding a concept so that students obtain the correct concept (Rositawati, 2019). According to Ennis, there are several indicators of critical thinking, namely clarification, decision-making, inference, and further clarification (Rahmi et al., 2019). According to Facione, critical thinking skills are the ability to interpret, analyze, evaluate, make inferences, explain, and self-regulate (Zamriani et al., 2023).

Critical thinking is used as an ideal goal and indicator in education. Students are prepared to become individuals who can face future challenges, so teachers also have an important role in preparing and helping develop students' critical thinking skills (Simbolon et al., 2021). Students will be directed to analyze an idea and identify and develop knowledge in a specific and perfect direction. This will be an opportunity and provide satisfaction for students to implement their knowledge and increase and develop that knowledge (Permana & Sujana, 2021).

Critical thinking skills are abilities needed in learning science, especially physics. Physics is a learning that requires innovative and creative reasoning, apart from that, Physics is also a learning with various problem-solving exercises (Nurhumairah & Handayani, 2024). Critical thinking skills are used to carry out analysis, reasoning, solving problems, and also the ability to filter and prevent inappropriate information (Hikmah et al., 2023). If students have good critical thinking skills, then they are able to analyze and examine problems and determine the right solution to solve them.

Critical thinking skills are abilities that are needed not only as a student but also as an individual both in school, work, and in the community. These skills will make someone a quality human being. Critical thinking means someone has the ability to think rationally and make logical conclusions in dealing with problems. Someone who has the ability to think critically can face the challenges they encounter in everyday life (Yolida & Marpaung, 2023).

The ability to think critically is important and necessary for students to face problems or various life problems that they will encounter in the future. In general, real problems in the world are not simple, so students' critical thinking skills need to be developed and trained (Perdani et al., 2019). Students' critical thinking skills can be trained in learning, one of which is learning Physics. In Physics learning, students are trained to use reasoning, analyze problems thoroughly, and argue from different perspectives. Students can analyze problems systematically, logically, analytically, and critically as an application of critical thinking in learning (Fitriyah et al., 2021)

Based on observations and interviews with one of the class X Physics teachers at SMA Negeri 7 Padang, information was obtained that students' thinking skills in learning Physics were still low. This is shown by how students answer and complete questions given by the teacher. Of the 36 students, only 5 people could answer the description questions well,

where the questions contained critical thinking analysis questions. The range of scores obtained by students ranges from 20-75. This proves that the skills of class X.E 5 students at SMAN 7 Padang are still low.

In the learning process, students also appear less active in answering the teacher's questions. Students mostly listen and take notes on what the teacher explains without understanding the learning material, even though what is expected is that students can learn actively, creatively, and can analyze physics questions given by the teacher. The results of previous research conducted by Kharisma (2018) show that at the vocational school level, students' critical thinking abilities on average are still low. Students need to get used to solving questions to improve their ability to think critically.

In line with this research, Nuryanti et al (2018) concluded the results of their research that students' low critical thinking abilities were caused by students who were not used to and adapted to learning which required them to be active in learning to think optimally. Thus it can be concluded that students' critical thinking skills are still low, so efforts are needed to overcome this. The solution that can be applied in training and improving students' critical thinking skills is designing learning using learning models.

Learning models have an important role in educational success. The use of an appropriate model will determine the effectiveness and efficiency of a learning process. The inquiry learning model is one of the appropriate learning models to improve students' critical thinking skills, where students can learn actively, designing investigations to discover the concepts they are learning for themselves. (Siahaan & Pane, 2021). The inquiry learning model encourages students to take the initiative to ask questions when observing a given problem, propose explanations, design and conduct experiments, analyze data, and draw conclusions from data obtained from experiments (Affilia et al., 2023).

The inquiry learning model is also an effective model that teachers can use to help train students' critical thinking skills. The syntax in this learning model, helps students develop curiosity, and self-confidence and also develop their potential and utilize their potential. Training provided continuously will improve students' critical thinking patterns (Salamah et al., 2023). In inquiry model learning, learning is more centered on students and teachers as facilitators. In its implementation, the inquiry learning model will encourage students to actively discover concepts independently by thinking critically and analytically, so that this can train and improve students' thinking abilities in learning based on the problems they face (Nurmawati & Novita, 2022).

Several previous studies have proven that the inquiry learning model can be a solution for improving critical thinking skills. Research by Priyanti & Warmansyah (2021) concluded that the inquiry model can be used as an effort to improve critical thinking skills in students. Research conducted by Cahyani & Azizah (2019) found that improving critical thinking skills can use the inquiry learning model.

Murni (2020) concluded that critical thinking skills can be developed using the inquiry learning model. The inquiry learning model aims to enable students to actively discover their knowledge independently so that they can understand physics concepts well. In research conducted by Nulhakim et al (2022), it is also stated that the inquiry learning process can improve science skills such as critical thinking skills. Based on this, research was conducted with the title "Increasing Students' Critical Thinking Skills Through Inquiry Learning Model".

METHODE

This research was conducted at SMA Negeri 7 Padang, academic year 2023/2024. The research subjects were 36 class X. E5 students. The research carried out was Classroom Action Research. Classroom action research plays a role in efforts to improve the quality of learning so that it is better, improving the function of teachers, and also the quality of students (Suharti, 2021). The research design used according to Kemmis and McTaggart consists of 4 stages that form a cycle. These stages include Planning, Action, Observation, And Reflection (Gustriyono, 2019). The research was carried out over 2 cycles, namely cycle I and cycle II. Before carrying out the two cycles, a pre-cycle is carried out first to determine the student's initial abilities.

The first thing to do in classroom action research is to carry out pre-cycle activities. This activity is to carry out initial observations to see the problems that occur in the class. At this stage a pre-test is also held, to obtain initial data from students and serve as a reference in making plans for the first cycle. Next, carry out the first stage of classroom action research is Planning. Activities carried out at this planning stage include preparing a learning plan, determining appropriate learning steps and techniques that are appropriate to the material to be delivered, and preparing the necessary data collection instruments.

The second stage is Action. At this stage, the inquiry learning model is applied in the learning process by the learning design that was created previously. Students will experience learning using learning models, learning methods, and techniques that have been previously designed. The hope is that students can improve their critical thinking skills during learning using the design that has been determined by the teacher. The next stage is carrying out Observations during the learning activities. The teacher observes, sees, and records all events in the ongoing learning process and summarizes the data obtained during the learning process. In this activity, the teacher is also assisted by an observer. Observers are tasked with helping to observe the treatment given by the teacher. The results of these observations will be seen and analyzed how the treatment affects the results obtained, or problems that may arise that can be overcome and continued at the next stage.

The final stage of the cycle is Reflection. Reflection is evaluating the treatment that has been carried out. This is done to see the results of the implementation and to find out the strengths and weaknesses of the learning process so that it can then be improved in the learning plan in the next cycle to get maximum results.

In this research, data collection techniques were used, namely observation, interviews, and written tests. The research instruments used were critical thinking skills observation sheets and written test questions. The data that has been obtained will be analyzed using data analysis techniques by converting scores into values and then interpreted based on the percentage criteria shown in Table 1 below.

Table 1. The Percentage of Critical Thinking Skills Criteria

Percentage	Criteria
81,25%-100%	Very High
71,50%-81,25%	High
62,50%-71,50%	Medium
43,75%-62,50%	Low
0%-43,75%	Very Low

(Ermayanti & Sulisworo, 2016).

RESULTS AND DISCUSSION

Results

Classroom Action Research activities were carried out on 36 students in class X.E5 at SMAN 7 Padang. This research lasted for 2 cycles by applying a learning model to improve students' critical thinking skills. The results obtained from the initial research observations were data in the form of written test results from students to see how students' critical thinking skills were before the treatment was carried out. From these results, the average value of students' critical thinking skills is 51%. If we look at the critical thinking skills presentation criteria from Ermayanti & Sulisworo (2016) in Table 1, the average critical thinking skills possessed by students are still categorized as low.

Students' critical thinking skills can be seen from assessments using critical thinking skills observation sheets. There are 4 indicators of critical thinking skills used including, Interpretation, Analysis, Evaluation, and Inference. The results of assessing students' critical thinking skills based on each indicator of critical thinking skills can be seen in Figure 1 below.

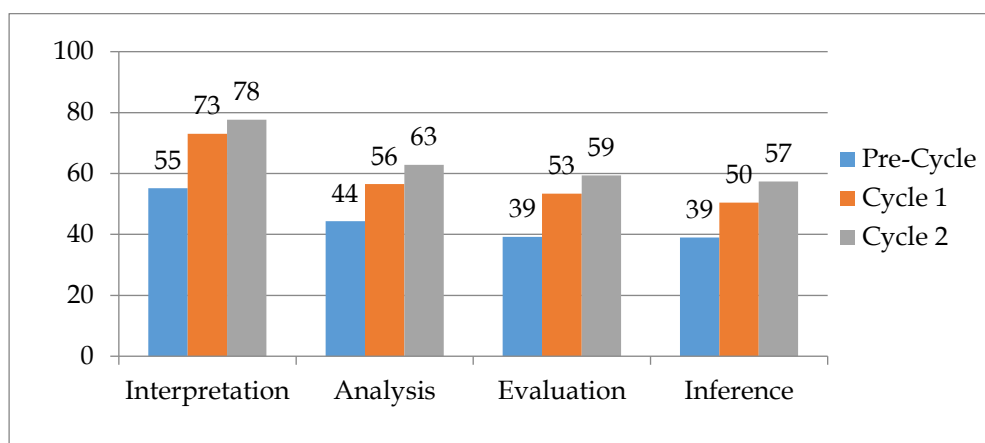


Figure 1. The Percentage of Students' Critical Thinking Skills Based on Critical Thinking Skills Indicators

The Figure above explains how students' critical thinking skills starting from pre-cycle, cycle 1 and cycle 2 have been carried out. In the Pre-Cycle test, the results of students' critical thinking skills were Interpretation 55%, Analysis 44%, Evaluation 39%, Inference 39%. If seen from the presentation criteria for critical thinking skills, the results obtained from students' critical thinking skills in the Pre-Cycle are still very low. From the results of the Pre-Cycle data, learning was designed using the inquiry learning model, by applying each syntax in the learning process for cycle 1 learning.

In cycle 1, the value of students' critical thinking skills obtained from each indicator increased in the Interpretation indicator, namely 73%, Analysis 56%, Evaluation 53%, Inference 50%. This shows that there is an increase in each indicator of students' critical thinking skills after carrying out cycle 1. Then learning will continue in cycle 2. In cycle 2, the value of students' critical thinking skills has increased from the previous cycle, namely the Interpretation indicator was 78%, Analysis 63%, Evaluation 59%, and Inference 57%.

From this data, we can analyze based on each indicator. The Interpretation indicator from Pre-cycle to cycle 2 experienced a good increase, if you look at the presentation students' interpretation abilities increased from low to high category up to 78%. Likewise, the Analysis indicator starts from 44% in the low category to the medium category at 63%.

The evaluation and inference indicators also experienced an increase during treatment during the cycle even though they had not yet reached the high category presentation criteria.

Based on the analysis of students' answers using written questions, it can be seen from the graph that the students' highest abilities lie in interpretation and the lowest lie in inference. During treatment, students' interpretation indicators showed an improvement. When taking the written test, students can understand what the problem means. Students can write down what they know and what is asked from the questions given by the teacher. In the inference indicator, although there has been an increase, students' inference skills are still low regarding the problems given by the teacher. The main thing that makes the inference indicator lower than other indicators is that students still have not mastered the relevant information related to the questions given, so students have not been able to master the concept and make conclusions correctly. The tendency of students to only receive knowledge from teachers not read enough related information, and not look for sources from various media and other sources, means that it can be concluded that student literacy is still low.

Tests carried out in the Pre-Cycle showed that only 3 students had high critical thinking skills, 7 of whom were in the medium category, and the others were in the low and very low categories out of a total of 36 students. However, after being given treatment using the inquiry learning model that had been applied by the teacher during learning in cycle 1 and continuing until cycle 2, the number of students who experienced an increase in critical thinking skills in the very high category became 9 people and 17 people were in the high category, so the data obtained It was obtained that around 72% of students already had high category critical thinking skills. Overall, the critical thinking ability of class X.E5 students can be seen from the average value of critical thinking ability in Figure 2 below.

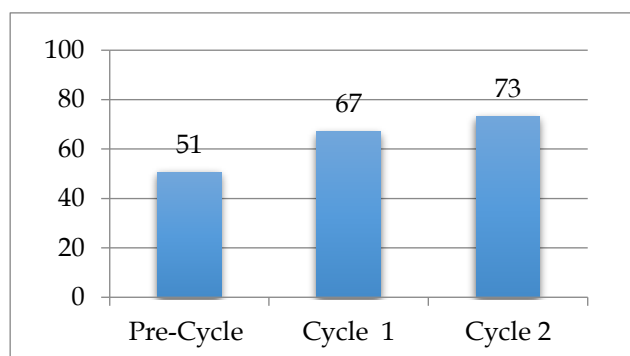


Figure 2. The Percentage of Average Value of Students' Critical Thinking Skills

From Figure 2 it can be seen that, during the Pre-Cycle, students' critical thinking skills results were still low, it is 51% of all students. After being given treatment using the inquiry learning model in the learning process in cycle 1, the results of students' critical thinking skills increased to 67% with medium criteria. Next, corrections were made by the teacher from errors and deficiencies in cycle 1 and re-applied to learning using the inquiry learning model in cycle 2. The results of cycle 2 showed that the average critical thinking skills score of class X. E5 students at SMAN 7 Padang was 73%. If you look at the percentage criteria, these results mean that the learning outcomes to increasing student's critical thinking skills at the end of cycle 2 are high or increasing.

Discussion

The results of the analysis of the data obtained showed that, after undergoing a learning process for 2 cycles using the inquiry learning model, there was an increase in critical thinking skills in class X E5 students. This can be seen from the results of the average value of students' critical thinking skills from Pre-Cycle with 50.6% to Cycle 2 increasing to 73.30% in the high category. Critical thinking skills are measured using 4 indicators, interpretation, analysis, evaluation, and inference. From the results of the data analysis carried out, there was also an increase in critical thinking skills in students in each indicator of critical thinking skills. The inquiry learning model is considered appropriate to use in the learning process. Students can participate actively by discovering their knowledge by learning using this model. This is in line with research conducted by Giovani & Novita (2022) at Al-Islam Krian Sidoarjo High School which states that the application of the inquiry learning model can improve students' critical thinking abilities. This can be seen from the results of the data analysis carried out which obtained a percentage of 99.29% with very good criteria.

Similar research conducted by Rahmi (2019), stated that the application of the inquiry learning model had a positive influence on improving students' critical thinking skills. The inquiry learning model used by teachers can train students' critical thinking skills and create more active and enjoyable learning activities during the learning process. The inquiry model can encourage students to develop the potential of their minds, encouraging them to search for and discover concepts from the results of in-depth thinking and analysis. Maryam (2019) in her research stated that students who learned using this model received higher grades than students who were always directed or dictated by the teacher.

Agreeing with this research, Affilia (2023) concluded that the critical thinking abilities of class X Man 1 Samarinda students increased after using the inquiry learning model. Sucilestari and Arizona (2020) in a similar study, concluded that there was a difference in increasing critical thinking skills in students who used the inquiry model and those who did not use the inquiry learning model. The research results show that the inquiry learning model can improve cognitive learning outcomes and higher-order thinking skills, namely critical thinking skills. Sukini (2019) also believes that using the inquiry model is appropriate for improving students' critical thinking skills because students will be actively and critically involved during the learning process.

In research conducted by Amizera (2023) on improving critical thinking skills using the results of practical reports on the inquiry learning model, it was stated that inquiry learning can be an alternative learning that supports students' critical thinking abilities. Students can connect phenomena found in the field with the concepts studied. The syntax of conducting experiments on the inquiry learning model can encourage students to build basic skills, provide explanations, and convey conclusions from analysis and the results of in-depth thinking.

Sari & Mukhlis (2022) in their research found an increase in students' critical thinking skills based on the N-gain value obtained. Students' activities and responses also increase during learning using the inquiry learning model. Musyawwir (2023) with his research at SDN 9 West Bangkala, Jeneponto Regency on science learning, also explained that the use of the inquiry learning model influences learning outcomes and improves students' critical thinking skills.

Likewise, research conducted by Nulhakim (2022), and research by Cahyani and Azizah (2019) with similar research found that the inquiry learning process can improve science skills such as critical thinking skills. So we can conclude that efforts to improve critical thinking skills can be done using the inquiry learning model. From this explanation, it can be said that the inquiry learning model is appropriate to use in improving the critical thinking skills of class X. E5 students at SMAN 7 Padang.

CONCLUSION

From the data that has been obtained and the data analysis that has been carried out, it can be seen that there has been an increase in critical thinking skills in students. This is evidenced by the increase in each indicator of critical thinking skills from the treatment during the 2 cycles of the learning process that has been carried out. From this, it can be concluded that the use of the inquiry learning model in the learning process can improve the critical thinking skills of students in class X. E5 at SMAN 7 Padang, especially in physics learning. Increasing critical thinking skills in the research conducted will help students to further improve their learning outcomes in other learning and make them more qualified individuals in developing thought patterns.

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REFERENCES

- Affilia, R., Komariyah, L., & Efwinda, S. (2023). Critical thinking skills improvement of students through guided inquiry learning model with scientific approach. *Jurnal Ilmiah Pendidikan Fisika*, 7(1), 91-99.
- Alsaleh, N. J. (2020). Teaching Critical Thinking Skills: Literature Review. *Turkish Online Journal of Educational Technology-TOJET*, 19(1), 21-39.
- Amizera, S., Santri, D. J., Arifin, Z., & Santoso, L. M. (2023, March). Students' Critical Thinking Skills Through the Reports of Practicum-Based Guided Inquiry Learning. In *Fifth Sriwijaya University Learning and Education International Conference (SULE-IC 2022)* (pp. 3-10). Atlantis Press.
- Ashel, H., & Lestari, W. Y. (2023). Case Analysis of Learning Physics in Improving 21st-Century Skills. *Jurnal Penelitian Pembelajaran Fisika*, 9(1), 32-42.
- Cahyani, N. I., & Azizah, U. (2019). Penerapan model pembelajaran inkuiri terbimbing untuk melatih keterampilan berpikir kritis siswa pada materi laju reaksi kelas XI SMA. *UNESA Journal of Chemical Education*, 8(3).
- Fitriyah, I. J., Affriyenni, Y., & Hamimi, E. (2021). Efektifitas Model Pembelajaran Inkuiri Terbimbing untuk Meningkatkan Kemampuan Berpikir Kritis Mahasiswa. *BiomatikaL Jurnal ilmiah fakultas keguruan dan ilmu pendidikan Vol. 7 No. 2*, 122-129
- Gustriyono, G. (2019). Upaya Peningkatan Kemampuan Berpikir Kritis Siswa Melalui Model Inquiry Di Kelas V. *Jurnal Perseda: Jurnal Pendidikan Guru Sekolah Dasar*, 2(3), 231-242.
- Hastuti, S. F., Sari, S. Y., Mufit, F., & Amir, H. (2024). The Impact of Discovery Learning Model on Students' Collaboration Ability. *Jurnal Penelitian Pembelajaran Fisika*, 10(1), 22-31.

- Hikmah, N., Febriya, D., & Daulay, H. (2023). The Impact of Blended Learning on Students' Critical and Creative Thinking Skills in Science Learning: A Meta-Analysis. *Jurnal Penelitian Pendidikan IPA*, 9(11), 1060-1068.
- Kharisma, E. N. (2018). Analisis kemampuan berpikir kritis matematis siswa SMK pada materi barisan dan deret. *JRPM (Jurnal Review Pembelajaran Matematika)*, 3(1), 62-75.
- Maryam, M., Kusmiyati, K., Merta, I. W., & Artayasa, I. P. (2019). Pengaruh model pembelajaran inkuiri terhadap keterampilan berpikir kritis siswa kelas xi mia man 2 mataram. *Jurnal Pijar Mipa*, 14(3), 154-161.
- Murni, S. (2020). Penerapan Model Pembelajaran Inkuiri Terbimbing untuk Meningkatkan Hasil Belajar Fisika dan Kemampuan Berpikir Kritis Peserta Didik. *Journal of Classroom Action Research*, 2(1), 57-62.
- Musyawwir, M., Kune, S., & Rahmawati, R. (2023). The Effect of Guided Inquiry Learning Model on Critical Thinking Skills and Science Learning Outcomes of Elementary School Students. *Pedagogik Journal of Islamic Elementary School*, 6(1), 27-38.
- Mujiyono, M. (2018). Penerapan Model Pembelajaran Project Based Learning Sebagai Upaya Meningkatkan Kemampuan Berpikir Kritis Siswa SDN 3 Makarti Jaya. *JS (JURNAL SEKOLAH)*, 2(3), 156-159.
- Nulhakim, L., Berlian, L., Rakhmawan, A., Saefullah, A., Rohimah, R. B., Firdaus, B. F., ... & Sari, I. J. (2022). Syntax of the Guided Inquiry Learning Model Based on Local Wisdom of Baduy's Society Towards Scientific Literacy on Environmental Conservation Theme. *Gagasan Pendidikan Indonesia*, 3(1), 31-36.
- Nurfithriyah, A. R. (2020). Model Pembelajaran dalam Upaya Meningkatkan Kemampuan Berpikir Kritis Matematis Siswa. *Jurnal Riset Pendidikan Matematika Jakarta*, 2(1), 94-102.
- Nurhumairah, A. S., & Handayani, P. (2024). Increasing Student Activity Through The Implementation Of Limited-Time Practice Questions In Physics Learning. *Jurnal Penelitian Pembelajaran Fisika*, 10(1), 56-65.
- Nurmawati, L., & Novita, D. (2022). Application of A Guided Inquiry Learning Model Assisted by A Student Worksheet to Improve High School Students' Analytical Skills. *Jurnal Pijar Mipa*, 17(1), 106-111.
- Nuryanti, L., Zubaidah, S., & Diantoro, M. (2018). Analisis kemampuan berpikir kritis siswa SMP. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 3(2), 155-158.
- Parwati, G. A. P. U., Rapi, N. K., & Rachmawati, D. O. (2020). Penerapan model pembelajaran inkuiri terbimbing untuk meningkatkan kemampuan berpikir kritis dan sikap ilmiah siswa SMA. *Jurnal Pendidikan Fisika Undiksha*, 10(1), 49-60.
- Perdani, W. S. R., Santosa, S., & Ramli, M. (2019). Peningkatan Kemampuan Berpikir Kritis Siswa SMA dengan Model Inkuiri pada Materi Sistem Indera. *Bio-Pedagogi: Jurnal Pembelajaran Biologi*, 8(1), 52-55.
- Permana, I. M. J., & Sujana, I. W. (2021). Aplikasi Pembelajaran IPS Berbasis Pendekatan Kontesktual. *Jurnal Penelitian Dan Pengembangan Pendidikan*, 5(1), 1-9.
- Priyanti, N., & Warmansyah, J. (2021). Improving critical thinking skills of early childhood through inquiry learning method. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 5(2), 2241-2249.
- Rahmi, Y. L., Alberida, H., & Astuti, M. Y. (2019, October). Enhancing students' critical thinking skills through inquiry-based learning model. In *Journal of Physics: Conference Series* (Vol. 1317, No. 1, p. 012193). IOP Publishing.
- Rositawati, D. N. (2019). Kajian berpikir kritis pada metode inkuiri. In *Prosiding SNFA (Seminar Nasional Fisika Dan Aplikasinya)* (Vol. 3, pp. 74-84).
- Salamah, S., Aprianti, D., Pramudyo, A., & Novianto, V. (2023). Improving Critical Thinking Skills and Learning Outcomes through the Implementation of the Inquiry Learning Model in Social Studies. *Research and Innovation in Social Science Education Journal (RISSEJ)*, 1(2), 47-53.
- Sari, M. M., & Muchlis, M. (2022). Improving critical thinking skills of high school students through guided inquiry implementation for learning reaction rate concept in chemistry. *Jurnal Pijar Mipa*, 17(2), 169-174.
- Siahaan, F. E., & Pane, E. P. (2021). Penerapan pendekatan saintifik berbasis model pembelajaran guided inquiry untuk meningkatkan soft skills mahasiswa pendidikan fisika. *Jurnal*

- Basicedu*, 5(6), 5877-5884.
- Simbolon, S., Kurniason, H. T., & Simbolon, T. N. (2021). Pengembangan instrument tes berpikir kritis Gen-Z dalam materi manusia dan cinta. *Ganaya: Jurnal Ilmu Sosial dan Humaniora*, 4(2), 607-622.
- Sucilestari, R., & Arizona, K. (2020, February). The Impact of Inquiry-Based Learning on Students' Critical Thinking Skills. In *2nd International Conference on Islam, Science and Technology (ICONIST 2019)* (pp. 172-175). Atlantis Press.
- Suharti, D. (2021). Penerapan Metode Demonstrasi Pada Pembelajaran Pendidikan Agama Islam Kelas Xi Smk Negeri 1 Balikpapan Tahun Pelajaran 2019/2020 (Studi Penelitian Tindakan Kelas dalam Upaya Peningkatan Pemahaman dan Keterampilan pada Tata Cara Penyelenggaraan Jenazah). *PENDALAS: Jurnal Penelitian Tindakan Kelas dan Pengabdian Masyarakat*, 1(1), 44-91.
- Sukini, S. (2019). Penerapan pembelajaran guided inquiry berbasis pendekatan saintifik untuk meningkatkan aktivitas dan hasil belajar kognitif biologi siswa kelas xi mipa sma negeri 3 dumai. *Journal of Natural Science and Integration*, 2(1), 105.
- Wahyuni, E. T., Mayasari, T., & Kurniadi, E. (2023). Penerapan Inkuiri Terbimbing dan Penggunaan Media Flipbook untuk Meningkatkan Kemampuan Berpikir Kritis Siswa. *Prosiding Konferensi Berbahasa Indonesia Universitas Indraprasta PGRI*, 437-445.
- Yolida, B., & Marpaung, R. R. T. (2023). The Media Puzzle Assisted Guided Inquiry Model: Its Use of Students' Critical Thinking Skills. *Futurity Education*, 3(1), 128-138.
- Zamriani, N., Sari, S. Y., & Hidayati, H. (2023). The Effect Of The Guided Inquiry Learning Model On The Critical Thinking Skill Of Students In Static And Dynamic Fluid Materials For Class XI MAN 2 Bukittinggi. *PILLAR OF PHYSICS EDUCATION*, 16(2), 135-140.