



Efforts to Improve Students' Critical Thinking Skills through Guided Inquiry Learning Models on Momentum and Impulse Material for Class XI of SMA Negeri 8 Muaro Jambi

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Abstrak

Tujuan pada penelitian ini adalah untuk mengetahui peningkatan kemampuan berpikir kritis melalui model pembelajaran inkuiri terbimbing pada materi momentum dan impuls kelas XI SMA Negeri 8 Muaro Jambi. Penelitian ini menggunakan metode penelitian tindakan kelas (PTK). Pada penelitian ini terdapat 2 jenis data yaitu data kualitatif dan data kuantitatif. Data kualitatif pada penelitian ini berupa lembar observasi dan dokumentasi. Data kuantitatif pada penelitian ini adalah tes untuk mengetahui kemampuan berpikir kritis. Penelitian ini dilaksanakan di SMA Negeri 8 Muaro Jambi. Subjek pada penelitian ini adalah seluruh siswa kelas XI F1 tahun ajaran 2024/2025. Penelitian ini terdiri dari empat tahapan utama yaitu perencanaan, tindakan, observasi dan refleksi yang dilaksanakan secara berulang dalam bentuk siklus. Indikator yang menjadi acuan keberhasilan pada penelitian tindakan kelas ini yaitu mengalami peningkatan pada kemampuan berpikir kritis dengan presentase >75% dari keseluruhan siswa telah mencapai KKTP. Hasil penelitian tindakan kelas yang telah dilakukan menunjukkan bahwa penerapan model pembelajaran inkuiri terbimbing mampu meningkatkan kemampuan berpikir kritis siswa kelas XI F1 di SMA Negeri 8 Muaro Jambi. Peningkatan ini terlihat dari persentase ketuntasan klasikal yang terus meningkat pada setiap siklus. Pada siklus I, sebanyak 45,71% siswa mencapai ketuntasan. Persentase ini meningkat menjadi 68,57% pada siklus II, dan terus bertambah hingga 77,14% pada siklus III. Hasil ini membuktikan bahwa model inkuiri terbimbing efektif dalam meningkatkan kemampuan berpikir kritis siswa.

Kata Kunci: Kemampuan berpikir kritis, Inkuiri Terbimbing

Abstract

The purpose of this study was to determine the increase in critical thinking skills through the guided inquiry learning model on momentum and impulse material for class XI of SMA Negeri 8 Muaro Jambi. This study uses the classroom action research (CAR) method. In this study, there are 2 types of data, namely qualitative data and quantitative data. Qualitative data in this study are in the form of observation sheets and documentation. Quantitative data in this study is a test to determine critical thinking skills. This research was conducted at SMA Negeri 8 Muaro Jambi. The subjects in this study were all students of class XI F1 in the 2024/2025 academic year. This study consists of four main stages, namely planning, action, observation and reflection which are carried out repeatedly in the form of a cycle. The indicator that is the reference for success in this classroom research action is an increase in critical thinking skills with a percentage of >75% of all students having achieved KKTP. The results of the classroom action research that has been carried out show that the application of the guided inquiry learning model is able to improve the critical thinking skills of class XI F1 students at SMA Negeri 8 Muaro Jambi. This increase can be seen from the percentage of classical completeness which continues to increase in each cycle. In cycle I, 45.71% of students achieved completion. This percentage increased to 68.57% in cycle II, and continued to increase to 77.14% in cycle III. These results prove that the guided inquiry model is effective in improving students' critical thinking skills.

Keywords: *Critical thinking skills, guided inquiry*

Introduction

If we look at Indonesian education, it has experienced ups and downs, where currently various kinds of educational problems in Indonesia are the biggest challenges in realizing quality education. (Diki Maulansyah et al., 2023). Education is often associated with the curriculum as a container to accommodate a planned and directed design. The 21st century era has seen periodic curriculum development that is developed by adjusting to the development of science, information, and technology (Salma & Yuli, 2023). Currently, the curriculum is being modified or further refined with a new curriculum, namely the independent curriculum. (Indarta et al., 2022). The independent curriculum program is actually to respond to the challenges of education in the 21st century. Learning is required to be able to develop students' critical thinking, creative, communication, and collaboration skills (Angga & Iskandar, 2022). However, it cannot be denied that although the independent curriculum demands the development of students' critical thinking skills, this is different from the problems that occurred in class XI F1 of SMA Negeri 8 Muaro Jambi.

The problems complained about based on the results of observations in class XI F1 of SMA Negeri 8 Muaro Jambi include several problems, namely the lack of student activity in asking questions during the physics learning process, many students are still not focused when carrying out teaching and learning activities, and practicums are rarely carried out due to limited practicum tools. In addition, students have not been able to interpret the learning process, for example providing an argument/opinion so that students cannot reflect on their own thoughts.

The condition of the physics learning process that occurs in class XI F1 of SMA Negeri 8 Muaro Jambi can be classified as low critical thinking skills of students. This is reinforced by Wihartanti et al (2019) One of the indicators of critical thinking is being able to interpret material in the learning process. Students' critical thinking skills are very important to help them solve problems and make the right decisions. One of the indicators of critical thinking is being able to interpret material in the learning process. Students' critical thinking skills are very important to help them solve problems and make

the right decisions (Rohmah et al., 2023). Based on the Decree of the Head of BSKAP No.009/H/KR/2022 of 2022 concerning the Dimensions, Elements, and Sub-Elements of the Pancasila Student Profile in the Independent Curriculum, the Pancasila student profile prioritizes six dimensions, namely: 1) faith, devotion to God Almighty, and noble character, 2) independence, 3) mutual cooperation, 4) global diversity, 5) critical thinking, and 6) creativity. So, in the learning process, students' critical thinking skills need to be considered.

Critical thinking skills are evidence of high cognitive/knowledge abilities, good work attitudes (empathy, sympathy, and agility), and the ability to make decisions quickly and accurately (Rahyani, N, Y. Hakimi, 2021). One of the efforts that can be done to improve students' critical thinking skills is to use a guided inquiry learning model. The guided inquiry model provides an opportunity for students to work in groups and exchange ideas with peers (Wulandari et al., 2022). Teachers need to use learning models that are able to direct students to be able to build or support knowledge through argumentation and be able to assess and respond to other people's arguments (Dwi Wulandari et al., 2023). The goal of learning physics is to master the concepts and principles of physics and be able to use critical thinking skills based on a scientific attitude to solve the problems faced (Sevtia et al., 2022).

The application of the guided inquiry model is very suitable for improving students' critical thinking skills in physics subjects. (Wahyuni, 2018). The guided inquiry learning model is a learning activity that maximally involves all students' abilities to search for and find something systematically, logically, chronologically and analytically so that they can formulate their own discoveries with full confidence (Lovisia, 2018). According to Wartini (2021) The application of guided inquiry learning models can improve students' critical thinking skills. However, in reality, teachers have not been able to maximize practical activities in the learning process. Practical activities are one of the learning activities for students to develop critical thinking skills, analyze, solve problems, prove and draw conclusions about an object from the material being studied (Royani et al., 2018). Therefore, the researcher tried to apply a guided inquiry learning model to improve students'

critical thinking skills using the classroom action research (CAR) method.

Classroom Action Research (CAR) is research conducted in class by teachers/researchers to identify problems in class and provide solutions to the problems (Azizah, 2021). According to Aqib & Amrullah (2019:16) states that there are 4 stages of PTK, namely preparing a plan, implementing actions, observation and reflection. (1) The planning stage should be prepared based on the results of initial reflective observations of classroom learning and then supplemented with indicators to be achieved, (2) The action stage is guided by the plan that has been made from the previous stage, (3) The observation stage is carried out simultaneously with the implementation of the action. At this stage, the teacher observes and records all activities that occur during the learning action. (4) The reflection stage or evaluation stage of the results of the observations that have been carried out. The teacher reflects on the effectiveness of the actions implemented and determines whether the identified problems have been resolved or not.

Iman et al (2017) said the guided inquiry learning model can significantly improve students' critical thinking skills, thus, students who are given the opportunity to first guess things that will happen, prove the assumptions submitted through group experimental activities, communicate the results of experiments obtained by each group, solve problems by deciding on experimental results that are relevant to the problems submitted, resulting in students' critical thinking skills being able to increase. Therefore, this study aims to improve students' critical thinking skills in momentum and impulse materials. This is in accordance with the description above and is related to the teaching and learning process carried out. Researchers are interested in conducting research entitled "Efforts to Improve Critical Thinking Skills through Guided Inquiry Learning Models on Momentum and Impulse Materials for Class XI at SMA Negeri 8 Muaro Jambi". The purpose of this study was to determine the improvement in critical thinking skills through guided inquiry learning models on momentum and impulse materials for class XI at SMA Negeri 8 Muaro Jambi.

Method

This study uses the classroom action research (CAR) method. Classroom action research is a systematic study that aims to improve educational practices. In this study, teachers take various actions in the learning process and reflect on the results in order to improve and develop more effective learning models. The types of research data used are quantitative and qualitative.

This research was conducted at SMA Negeri 8 Muaro Jambi. The subjects of this study were all students of class XI F1 in the 2024/2025 academic year. Meanwhile, the object of the research was efforts to improve the critical thinking skills of class XI F1 students of SMA Negeri 8 Muaro Jambi. This classroom action research was conducted to see the improvement of students' critical thinking skills through a guided inquiry learning model on the momentum and impulse material of class XI F1 SMA Negeri 8 Muaro Jambi.

This research consists of four main stages that are carried out repeatedly in the form of a cycle. The cycle will continue to be carried out until the problems faced can be resolved. Each cycle includes two meetings and consists of the stages of planning, action, observation, and reflection.

In this study there are 2 types of data, namely qualitative data and quantitative data. Qualitative data in this study are in the form of observation sheets and documentation. Observation sheets are used to observe student and teacher activities during the learning process using a guided inquiry model. Then the documentation data as supporting evidence of research activities in the form of photos of teacher and student activities during teaching and learning by implementing a guided inquiry learning model according to its indicators. Quantitative data in this study is a test to determine critical thinking skills. The results of the critical thinking ability test function to determine the increase in student learning outcomes in having critical thinking skills in class XI F1 physics subjects. The instruments used were first validated to ensure that the instruments were truly feasible and in accordance with what should be measured.

The indicator that is the reference for success in this classroom action research is an increase in critical thinking skills with a percentage of >75% of all students having

achieved the Learning Objective Achievement Criteria (KKTP) which is considered complete with a score of 70. This research cycle will stop when the learning process and learning outcomes have reached the target.

Result and Discussion

This research was conducted starting from cycle I and ending in cycle III. Each cycle in the learning process observed teacher activities, student activities, and conducted tests to measure students' critical thinking skills using a guided inquiry learning model. This study aims to describe the learning process and improve critical thinking skills in class XI F1 students of SMA Negeri 8 Muaro Jambi. In conducting classroom action research, researchers have gone through research stages systematically starting from data processing, data evaluation and reflection on research data. Based on the research that has been conducted, it is proven that the application of the guided inquiry learning model on momentum and impulse material can improve the critical thinking skills of class XI F1 students at SMA 8 Muaro Jambi. The guided inquiry learning model can be applied to improve students' critical thinking skills because in the learning model there are activities that train students to think. The action design carried out in this study consists of 4 stages, namely: 1) Planning, 2) Action, 3) Observation and 4) Reflection. Every deficiency and weakness in the action in each cycle is gradually corrected, because each action result is evaluated, reflected, revised and refined to improve critical thinking skills through actions in the next cycle. The improvement in critical thinking skills obtained through the application of the guided inquiry learning model in each cycle can be seen in the following table:

Table 1. *Improving Students' Critical Thinking Skills in Each Cycle*

Aspect	Cycle			Percentage (%)		
	I	II	III	I	II	III
number of students completed	16	24	27	45,71	68,57	77,14
Number of students who did not complete	19	11	8	54,29	31,43	22,86

Based on the table above, it shows that students have achieved the expected classical completeness, which is $>75\%$. The increase in the average value of students' critical thinking skills is because students carry out learning in accordance with the syntax of the guided inquiry learning model well. The table above shows that in cycle 1 the classical completeness value is 45.71%, there are only 16 students who have successfully completed it and 19 other students have not succeeded in completing it. In this situation, students are still said to have not experienced an increase in critical thinking skills and must be improved again in the next cycle. In cycle 2, the classical completeness value is 68.57%, there are 24 students who have successfully completed it and 11 students have not succeeded in completing it. The classical completeness value of cycle 2 still does not meet the indicators of success in students' critical thinking skills. Then in cycle 3, the classical completeness value is 77.14%, there are 27 students who have successfully completed it and 8 other students have not succeeded in completing it. From the previous cycles, the number of students who completed always increased and in cycle 3 the classical completion value had met the PTK success indicator, namely $>75\%$.

From several cycles carried out, it can be concluded that each cycle always experiences an increase in the results of critical thinking skills. From cycle 1 to cycle 3, there is a significant increase until the classical completion value reaches more than 75%. This condition proves that the application of the guided inquiry learning model on momentum and impulse material can improve students' critical thinking skills. One way to improve critical thinking skills is by choosing the right learning model. The guided inquiry learning model is one of the effective learning models in improving critical thinking skills (Fitriyah et al., 2021). According of Sarifah & Nurita (2023) This increase occurs because in the learning process in the guided inquiry model, students are given various problems that allow them to formulate problems and provide answers with explanations based on theory. Providing these problems will encourage students to think critically in finding and formulating answers to the questions asked. From the existing theories, researchers can conclude that the application of the guided inquiry learning model can increase student learning activities.

The implementation of the guided inquiry learning model in each meeting provides an opportunity for students to practice and develop their critical thinking skills. The results of observations of teacher and student activities in the learning process using the guided inquiry model can be presented in the following table.

Table 2. *Teacher and Student Activities in the Implementation of the Guided Inquiry Model in Each Cycle*

Observed Aspects	Percentage (%)			
	Teacher		Student	
	P1	P2	P1	P2
I	84,29	82,86	64,82	70,24
Category	Very good	Very good	Good	Good
Cycle II	90	88,57	81,95	90,12
Category	Very good	Very good	Very good	Very good
Cycle III	92,45	95,71	88,29	95,16
Category	Very good	Very good	Very good	Very good

From the table above, it shows that the activities of teachers and students in implementing the guided inquiry learning model always experience a significant increase. Students are expected to follow every activity instructed by the teacher, starting from orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses and drawing conclusions. Cycle 1 of teacher activities at meeting 1 was 84.29% in the very good category and meeting 2 was 82.86% in the very good category. Then student activities at meeting 1 were 64.82% in the good category and meeting 2 was 70.24% in the good category. Cycle 1 shows several teacher and student activities when implementing the guided inquiry model that are expected to be improved again in the next cycle. Cycle 2 of teacher activities at meeting 1 was 90% in the very good category and meeting 2 was 88.57% in the very good category. Then student activities at meeting 1 were 81.95% in the very good category and meeting 2 was 90.12% in the very good category. Cycle 2 has shown good improvement but there are some indicators that should still be maximized in the next cycle. Cycle 3 of teacher activity at meeting 1 was 92.45% in the very good category and meeting 2 was 95.71% in the very good category. Then student activity at meeting 1 was 88.29% in the very good category and meeting 2 was

95.16% in the very good category. In cycle 3, all indicators have been maximized well through reflection from the previous cycle so that learning activities can improve.

The guided inquiry learning model activities in each cycle are always improved through reflection. So that the shortcomings in the previous cycle can be evaluated and become improvements for the next cycle. In the guided inquiry learning model, students are encouraged to build understanding and concepts based on real problems they encounter in everyday life. Through the process of investigation and critical thinking, students learn to identify and solve problems. The teacher plays a role in guiding students to realize that the concept is relevant, real, and directly related to the student's experience (Supratiknyo, 2021). The advantage of the guided inquiry learning model is that it can utilize problems that are contextual to students' lives so that the problems raised are related to students' lives (Jundu et al., 2020).

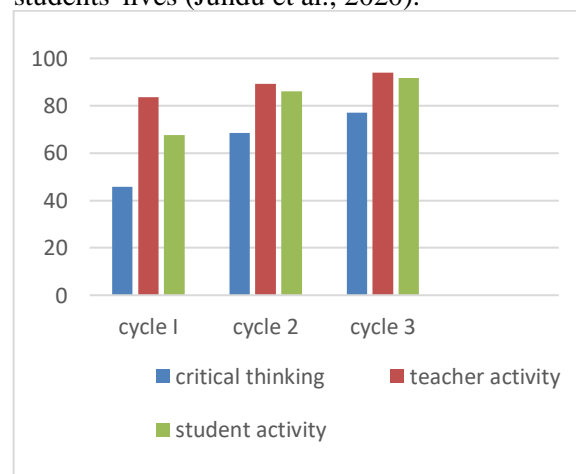


Figure 1. *Critical Thinking Skills Improvement Graph and Guided Inquiry Model Activities*

From the picture, it can be seen that there is a significant increase in the activity of the guided inquiry learning model, both carried out by teachers and students and the results of students' critical thinking skills in each cycle. This is comparable to research Wartini (2021) the application of guided inquiry learning models can improve students' critical thinking skills. With the existence of this guided inquiry model, it will certainly have a positive impact on the learning process because guided inquiry learning provides students with the opportunity to learn actively through discovery. This is also comparable to research Wulandari *et al* (2022) The use of

guided inquiry learning models provides a good contribution to students' critical thinking skills. With guided inquiry models, students can play an active role, learn independently to solve a problem, so students' critical thinking skills can increase.

Conclusion

The results of the classroom action research that has been conducted show that the application of the guided inquiry learning model

is able to improve the critical thinking skills of class XI F1 students at SMA Negeri 8 Muaro Jambi. This increase can be seen from the percentage of classical completion which continues to increase in each cycle. In cycle I, as many as 45.71% of students achieved completion. This percentage increased to 68.57% in cycle II, and continued to increase to 77.14% in cycle III. These results prove that the guided inquiry model is effective in improving students' critical thinking skills.

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