Improving Student Learning Outcomes and Critical Thinking Skills Using the Inquiry Learning Model

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Abstract

This study aims to implement the Inquiry Learning model to enhance learning outcomes and critical thinking skills among students in Phase D of Class VIII at Assisi Medan Catholic Private Junior High School. The research process utilized the classroom action research (CAR) method involving 26 eighth-grade students in Phase D during the academic year 2023/2023. The analysis results indicate a significant improvement in applying the Inquiry Learning model across various cycles. For instance, during the orientation phase, the percentage increased from 62.5% in Cycl 58.33% in the subsequent cycle, representing a 10% increase. Similarly, there was a notable enhancement in students' critical thinking abilities, particularly in providing explanations, building basic skills, making inferences, offering further explanations, and devising strategies and tactics. For example, in the stage of providing further explanations, the percentage rose from an initial 38.46% of successful students to 60.25% in the following cycle, marking a 56.65% increase. However, there was a significant decrease in students' eloquence skills and criteria for eligibility. For instance, in eloquence skills, the percentage of students dropped drastically from 65% in the first cycle to 15.38% in the subsequent cycle, experiencing a decline of -49.62%. Research recommendations include facilitating teachers in implementing effective Inquiry Learning models and expanding project-based and interactive learning approaches.

Keywords: Learning Outcomes; Critical Thinking Skills; Inquiry Learning; Students

Introduction

Education is an essential need for individuals because through education, one gains knowledge, experiences, and crucial skills (Renna, 2022). Education is also crucial in enhancing intelligence, developing skills, strengthening moral values, and shaping personality (Agustin I. N. N. & Supriyono A, 2021). In the digital era, technological advancements influence education, requiring teachers to adapt to support this development (Etistika Yuni Wijaya et al., 2020). The 21st-century learning process focuses on critical thinking and problem-solving, Communication, Collaboration, Creativity, and Innovation. 21st-century education aims to provide students with skills relevant to the demands of society and the evolving job market (Septikasari, 2022). Critical thinking skills reflect the learning outcomes that involve understanding, applying knowledge, skills, and attitudes (Rachmantika & Wardono, 2019). Critical thinking also involves evaluating the thinking process and the reasoning that went into the conclusion

we've arrived at or the kinds of factors considered in making a decision. Critical thinking is sometimes called directed thinking because it focuses on obtaining a desired outcome.(Ermina, n.d.)

Improving critical thinking skills is a necessity for students to become more skilled and active (Cahyono, 2021). The Inquiry Learning model can help enhance students' critical thinking skills through interactive learning experiences (Sutarningsih, 2022). It also increases the relevance of content and student learning motivation (Afrom, 2019). Low teacher competencies, student grades, and 21st-century student skills pose challenges in education (Leonard, 2020). Teachers need to master effective teaching methods to achieve student learning outcomes (Setyosari, 2020). Evaluating student learning outcomes is essential for improving the learning process (Daud, 2020). The Inquiry Learning model has proven effective in improving student learning outcomes and critical thinking skills (Tasya & Abadi, 2019). This significantly contributes to improving the overall quality of education (Nisa' et al., 2020).

Learning outcomes encompass individual achievements in mastering knowledge, skills, attitudes, or values that are the learning objectives (Magister & Pendidikan, 2020). Assessment of learning outcomes aims to evaluate students' understanding of the learning material and their ability to apply that knowledge(Arfan Delar et al., 2022). Knowledge, attitudes, and skills are forms of learning outcomes (Arfan Delar et al., 2022), which are divided into three national education domains: cognitive, affective, and psychomotor. The cognitive domain emphasizes students' abilities in analytical thinking, remembering information, and problem-solving (Yulianto, 2021). Student academic achievement is reflected in numerical or letter grades in report cards, covering cognitive aspects, which greatly influence student achievement because it involves the thinking process that occurs in the brain (Zakiah & Khairi, 2019). The levels of cognitive competence according to Bloom's taxonomy range from remembering to creating. It includes mental activities such as knowledge, understanding, application, analysis, synthesis, and evaluation (Sondak, 2019). The revised Bloom's taxonomy includes levels of remembering, understanding, applying, analyzing, evaluating, and creating (Zakiah & Khairi, 2019).

The affective domain in learning outcomes includes students' abilities to understand, remember, and apply knowledge in various learning contexts. Assessment of this aspect involves the use of scales such as Likert Scale, Multiple Choice Scale, and others to obtain information about students' attitudes (Inayatun, 2021). Examples of positive student behaviors include discipline, responsibility, enthusiasm, and appreciation for others. Students' affective abilities can be identified through stages of acceptance, response, appreciation, deep understanding, and application (Nafiati, 2021). The psychomotor domain is related to movement, sensorimotor skills, and motor activities (Arsyad & Saleh, 2022). Assessment in this domain evaluates students' action abilities after learning, including physical activities reflected in actual actions (Arsyad & Saleh, 2022). Motor development begins at birth and includes body movement control (Rizqia et al., 2019). The principles of assessment in the psychomotor domain include continuity, integrity, objectivity, and cooperation (Putra & Hefni, 2022). Methods of evaluating learning outcomes include written tests, projects, presentations, and performance assessments (Wicaksono & Iswan, 2019). Factors affecting learning outcomes include health, interests, talents, motivation, family, school, and community influences (Putra & Hefni, 2022).

Critical Thinking Skills are mental abilities to process, analyze, and evaluate information carefully and deeply, involving reflective attitudes and the ability to identify strengths and weaknesses from various perspectives (Rusda Elsabrina et al., 2022). It includes analysis, evaluation, inference, explanation, and skepticism. These skills help avoid shallow thinking, recognize biases, make better decisions, and shape character while facilitating growth. Internal factors such as cognitive and metacognitive abilities, interest, motivation, argumentation, analysis, communication, and self-confidence influence critical thinking skills (Amalia et al., 2021). External factors such as family, school, and community environments also play a role in student learning outcomes (Amalia et al., 2021).

Developing critical thinking skills involves continuous reflection and learning processes, as well as active engagement in analytical and reflective thinking processes in various contexts (Rusda Elsabrina

et al., 2022). This is essential for making good decisions and essential skills for understanding the world, participating in meaningful dialogues, and solving problems in various aspects of life. The goal of critical thinking skills is to maintain an objective position by considering all perspectives of an argument and evaluating its strengths and weaknesses. The importance of these skills lies in the ability to present arguments objectively, without bias, and with careful evaluation of the presented claims. Highlighting the broad benefits of critical thinking skills, including improved academic performance, workplace well-being, and the ability to face challenges in everyday life. Academic performance is improved through understanding others' perspectives, critically evaluating arguments, and the ability to build and maintain personal arguments. In the workplace, these skills support deeper understanding of decisions, flexibility of thinking, and analytical abilities in problem-solving. Meanwhile, in everyday life, critical thinking skills prevent unwise decision-making, support the formation of knowledgeable and caring communities, and play a role in shaping independent thinkers who can evaluate their own assumptions, dogmas, and prejudices.

Critical thinking skills include clarification, foundation, inference, and interaction. Clarification involves identifying focus, analyzing arguments, and defining terms. Foundation relates to supporting inferences and assessing evidence, including evaluating the credibility of sources and observation reports. Inference involves deduction, induction, judgment, and decision-making about values. Interaction focuses on collaboration with others and decision-making, including activities such as defining problems, selecting solution criteria, formulating alternatives, deciding actions, checking the overall situation, and monitoring implementation (Nafiati, 2021).

The Inquiry Learning Model is a learning approach that emphasizes the development of critical thinking skills, investigative abilities, and active student participation in understanding and solving problems (Fahmi & Wiguna, 2020). Teachers act as facilitators in the process of exploration, discovery, and construction of knowledge by students. Students are encouraged to ask questions, develop hypotheses, conduct experiments, and analyze results to understand concepts deeply. Learning is student-centered, where they are active in formulating questions, identifying resources, and taking responsibility for their learning. This model creates a learning environment that promotes student engagement, the development of critical thinking skills, and solid concept understanding. It enables students to become independent, creative, and critical learners, ready to face real-world challenges.

The Inquiry Learning Model involves a series of steps that encourage students to be active in learning, from formulating questions to producing learning products. The steps include orientation to create a responsive learning climate, formulating problems to evoke puzzles, formulating hypotheses as temporary answers, collecting data to test hypotheses, testing hypotheses to determine acceptable answers, and formulating conclusions to describe findings. This approach involves teachers as guides who support students at each stage, creating a collaborative learning environment and stimulating student interest in knowledge exploration. This model is effective because it gives students the opportunity to work independently in solving problems and makes learning more interactive and engaging.

This research aims to address the following questions: 1) How does the Inquiry Learning model enhance learning outcomes and critical thinking skills of students in Class VIII D Phase at Assisi Medan Catholic Private Junior High School?, 2) Does the improvement of students' critical thinking skills in PAK learning using the Inquiry Learning model in Class VIII D Phase at Assisi Medan Catholic Private Junior High School?, 3) Can students' learning outcomes be improved using the Inquiry Learning model in PAK learning in Class VIII D Phase at Assisi Medan Catholic Private Junior High School.

The Inquiry Learning Model is an effective and beneficial learning approach for students (Faujiah et al., 2022). Some of its advantages include emphasis on the balanced development of cognitive, affective, and psychomotor aspects, flexibility in learning according to each student's learning style, suitability with modern learning psychology development, and the ability to accommodate students with above-average abilities. The importance of the Inquiry Learning Model is influenced by factors such as

teacher support, learning design, and resource availability. These advantages indicate the positive contribution of the Inquiry Learning Model to student learning.


Research Methods

This study is a Classroom Action Research (CAR) conducted at Assisi Medan Private Junior High School in Phase D of Class VIII during the Second Semester of the Academic Year 2023/2024. The research subjects consist of 26 students, including 11 females and 15 males, selected through census from all eighth-grade students in Phase D. The aim of this research is to improve students' learning outcomes and critical thinking skills through the implementation of the Inquiry Learning model (Azizah, 2021).

Classroom Action Research (CAR) is a research method conducted within the classroom with the aim of evaluating the effects or outcomes of actions applied to research subjects within the classroom environment. This research process involves four main interconnected activities: planning, implementing actions, observation or observation, and reflection. This process is often repeated continuously to achieve a better understanding of the impact of the actions taken. The reference mentioned (Azizah, 2021) refers to the source of information used to support the description.

Qualitative descriptive analysis steps include comparing data from various sources, data categorization, presenting data in tables and diagrams, and drawing conclusions inductively. The criteria for the success of actions consist of process and product success criteria, which are important for measuring the effectiveness of learning in action research.


Results And Discussion

The results of Cycle I Action Research indicate that in implementing the Inquiry Learning model, the Orientation aspect achieved exellent results with a score of 40 and good results with a score of 12, each with percentages of 62.5% and 18.75%, respectively. The Problem Formulation stage had scores of 28 for good and 15 for exellent, with percentages of 58.33% and 31.25%. Formulating hypotheses was marked by scores of 16 for good and 12 for exellent, reaching percentages of 44.44% and 37.50%. Data collection showed scores of 32 for good and 12 for exellent, resulting in percentages of 68.75% and 25%. Hypothesis testing indicated scores of 40 for exellent and 6 for good, with percentages of 83.3% and 12.5%. Finally, formulating conclusions had scores of 20 for good and 15 for exellent, with percentages of 41.66% and 31.25%.
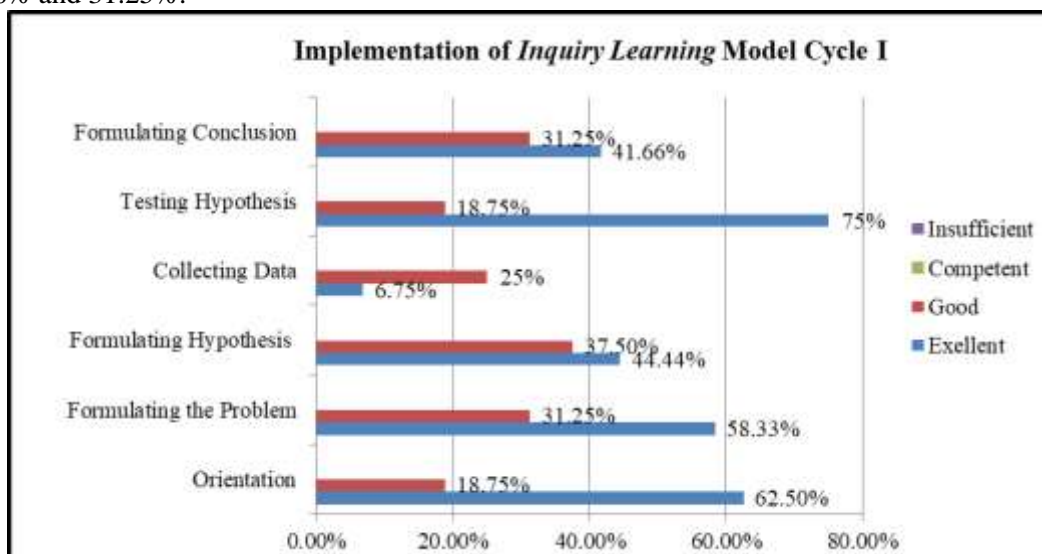

Graph 1. Implementation of the *Inquiry Learning* Model in Cycle I

Based on the chart below, it can be observed that the Critical Thinking Skills of students in Phase D Class VIII-4 at Assisi Medan Catholic Private Junior High School highlight students' proficiency in various learning aspects. The majority of students demonstrate a good level of proficiency, with most falling into the proficient category (57%), followed by competent (31%) and adequate (16%). Building foundational skills is also a strength for students, with the majority showing a high level of proficiency (69.23%), especially in the proficient category (54%) compared to competent (22%). In making inferences, the majority of students demonstrate good ability (61.53%), particularly in the proficient (32.69%) and competent (32%) categories. However, there is room for improvement, especially in the adequate category (16.66%), although proficiency (38.46%) and competence (44.87%) are also quite balanced. Finally, students show good ability in organizing strategies and tactics, with the majority falling into the proficient category (66.66%) and the remainder competent (20%).
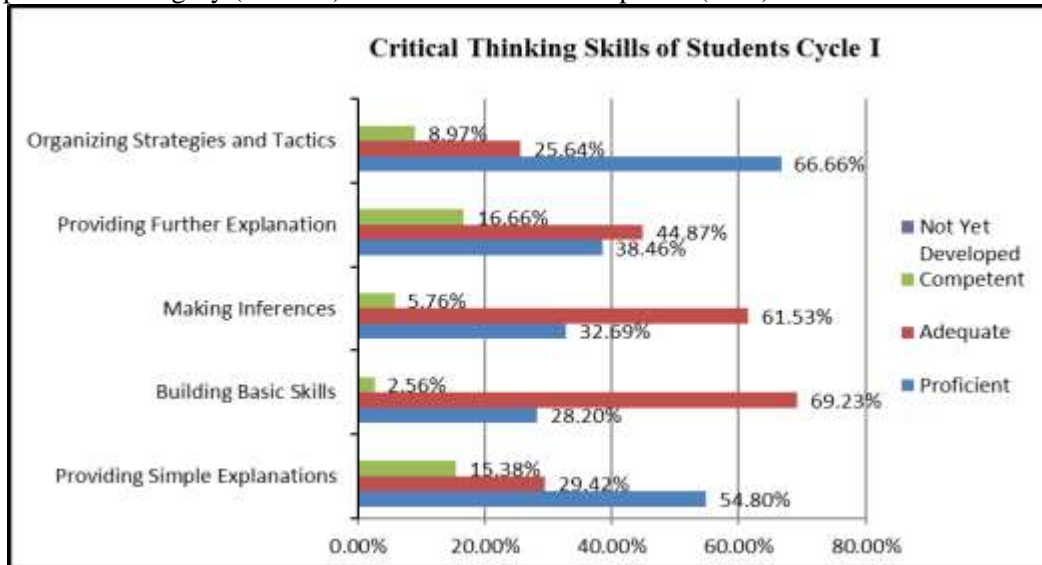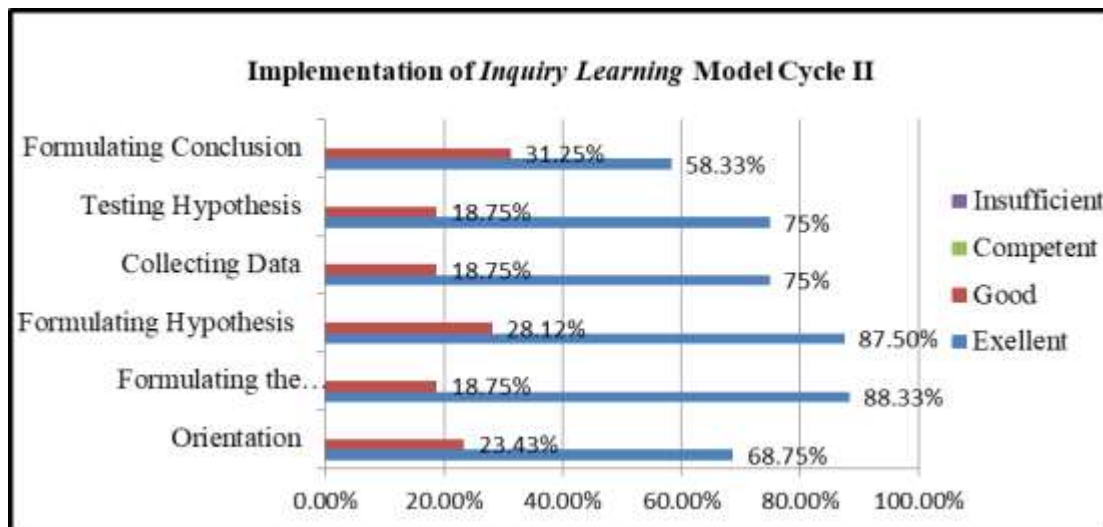

Graph 2. Students' Critical Thinking Skills in Cycle I

Based on the chart below, it can be seen that the Learning Outcomes of students in Phase D Class VIII-4 at Assisi Medan Catholic Private Junior High School are as follows: 1) Proficient in Cycle I, 20% with 5 students; 2) Competent in Cycle I, 65% with 17 students; Adequate, 15% with 4 students; and Starting to Develop in Cycle I, 0% with an average learning outcome of 82.88%. With a total number of students being 26 students.
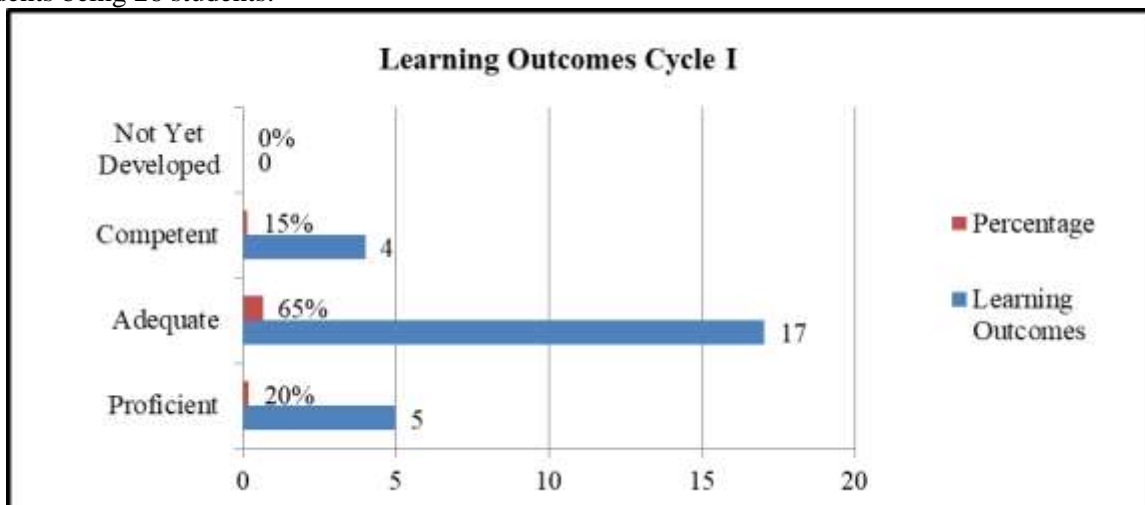
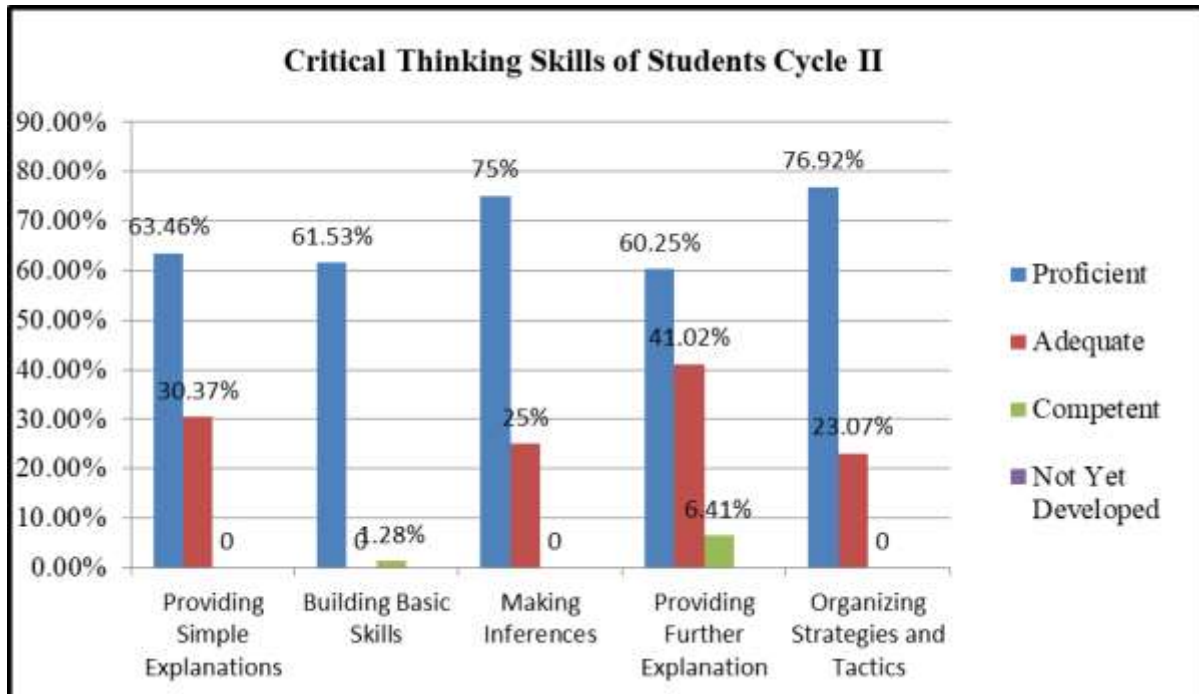Graph 3. Students' Learning Outcomes in Cycle I

Furthermore, the results of action research in cycle II can be described as follows. Based on the chart below, students' ability in material orientation shows excellent results, with 68.75% achieving a exellent level and 23.43% showing a good level. In the problem formulation stage, the majority of students demonstrate good ability, with 88.33% achieving a good level. The same occurs when formulating hypotheses, where 87.50% of students show good ability. In collecting data and testing hypotheses, 75% of students demonstrate good ability. Finally, in formulating conclusions, the majority of students show good ability, with 58.33% achieving a good level and 31.25% achieving a fairly good level. No students achieve a low level in all aspects evaluated.

Implementation of _Inquiry Learning_ Model Cycle II

Formulating Conclusion	31.25% / 58.33%
Testing Hypothesis	18.75% / 75%
Collecting Data	18.75% / 75%
Formulating Hypothesis	28.12% / 87.50%
Formulating the...	18.75% / 88.33%
Orientation	23.43% / 68.75%

Legend: ■ Insufficient ■ Competent ■ Good ■ Exellent

Graph 4. Implementation of the Inquiry Learning Model in Cycle II

Based on the chart below, students' abilities indicate that the majority of them have good proficiency in several learning aspects. Specifically, in the proficiency category, the percentage of proficient students reaches 63.46%, while competent students reach 30.37%, and adequate students reach 5.76%. In building foundational skills, the majority of students, amounting to 61.53%, demonstrate good proficiency, followed by competent students with a percentage of 37.17%, and students with basic skills amounting to 1.28%. In making inferences, 75% of students demonstrate good proficiency, while 25% of students are not fully capable yet. In providing further explanations, the percentage of proficient students reaches 60.25%, while competent students reach 41.02%, and adequate students reach 6.41%. Finally, in organizing strategies and tactics, 76.92% of students demonstrate good proficiency, while competent students reach 23.07%. There are no students who are unable to organize strategies and tactics.

Graph 5. Students' Critical Thinking Skills in Cycle II

Based on the chart below, it can be observed that the Learning Outcomes of students in Phase D Class VIII-4 at Assisi Medan Catholic Private Junior High School are as follows: 1) Proficient in Cycle I, 76.92% totaling 20 students; 2) Competent in Cycle I, 7.70% totaling 2 students. Adequate, 0% totaling 0 students, and Starting to Develop in Cycle I, 0% with an average learning outcome of 90.8%. With a total number of students being 26 students.
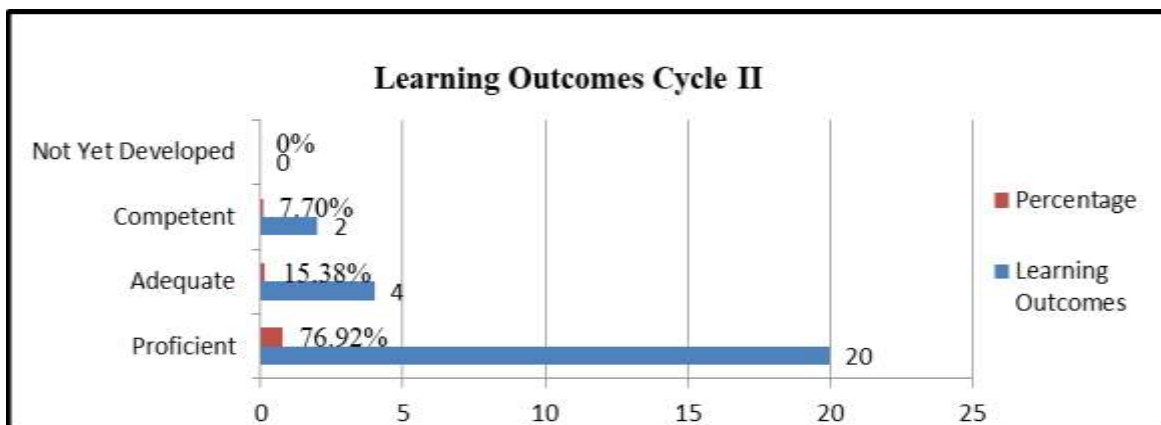
Graph 6. Students' Learning Outcomes in Cycle II

This research aligns with the intended goals, which are to improve Student Learning Outcomes and Critical Thinking Skills in Phase D Class VIII-4 of Assisi Medan Catholic Private Junior High School. Based on the table below, it can be observed that there is an improvement in the success of implementing the Inquiry Learning Model for Students in Phase D Class VII-2 of Assisi Medan Catholic Private Junior High School, namely: 1) Orientation in cycle I increased from 62.5% to 58.33% with an increase of 10%; 2) Problem Formulation in cycle I increased from 58.33% to 88.33% with an increase of 51.43%. Formulating Hypotheses increased from 44.44% in cycle I to 87.50% with an increase of 96.89%. Data Collection in cycle I increased from 68.75% to 75% with an increase of 9.01%. Hypothesis

Testing in cycle I increased from 75% to 83.3% with an increase of 11.06%. Formulating Conclusions in cycle I increased from 41.66% to 58.33% with an increase of 40.01%.

Table 1: Improvement in the Implementation of the *Inquiry Learning* Model

ASPECT	AVERAGE SCORE ACQUISITION		IMPROVEMENT (FROM CYCLE I TO CYCLE II)
	Cycle I	Cycle II	
Orientation	62,5 %	68,75 %	10%
Formulating the Problem	58,33 %	88,33 %	51,43%
Formulating Hypothesis	44,44 %	87,50 %	96,89%
Collecting Data	68,75 %	75 %	9,01%
Testing Hypothesis	75 %	83,3%	11,06%
Formulating Conclusion	41,66 %	58,33 %	40,01%

Based on the table below, it can be seen that there is an improvement in the Critical Thinking Skills of students in Phase D Class VIII-4 at Assisi Medan Catholic Private Junior High School, namely: 1) Providing Simple Explanations in cycle I increased from 54.80% to 63.46% with an increase of 15.80%; 2) Building Foundational Skills in cycle I increased from 28.20% to 61.53% with an increase of 100%. 3) Making Inferences increased from 32.69% in cycle I to 75% with an increase of 100%. 4) Providing Further Explanations in cycle I increased from 38.46% to 60.25% with an increase of 56.65%. 5) Organizing Strategies and Tactics in cycle I increased from 66.66% to 76.92% with an increase of 15.39%.

Table 2: Improvement in Students' Critical Thinking Skills

ASPECT	AVERAGE SCORE ACQUISITION		IMPROVEMENT (FROM CYCLE I TO CYCLE II)
	Cycle I	Cycle II	
Providing Simple Explanations	54,80%	63,46%	15,80%
Building Basic Skills	28,20 %	61,53 %	100%
Making Inferences	32,69 %	75%	100%
Providing Further Explanation	38,46%	60,25%	56,65%
Oranizing Strategies and Tactics	66,66 %	76,92%	15,39%

Based on the table below, it can be observed that there is an improvement in the Learning Outcomes of students in Phase D Class VIII-4 at Assisi Medan Catholic Private Junior High School, namely: 1) Proficient in cycle I increased from 20% to 76.92% with an increase of 56.92%; 2) Competent in cycle I decreased from 65% to 15.38% with a decrease of -49.62%. 3) Adequate from 15% in cycle I increased to 7.70% with a decrease of -7.30%.

Table 3: Improvement in Learning Outcomes

ASPECT	AVERAGE SCORE ACQUISITION		IMPROVEMENT (FROM CYCLE I TO CYCLE II)
	Cycle I	Cycle II	
Proficient	20%	76,92%	56.92 %
Adequate	65%	15,38%	-49,62%
Competent	15%	7,70%	-7,30%
Not Yet Developed	0%	0%	0%

The implementation of the Inquiry Learning model among students in Phase D, Class VIII-4 at Assisi Medan Catholic Private Junior High School shows interesting research outcomes. Teachers play a crucial role in guiding students to creatively identify and solve problems. This has been proven to enhance student engagement in the learning process as well as their ability to generate innovative solutions . Teachers also formulate intriguing problems for students to solve, increasing their interest and motivation (TA'DUNGAN, 2021). Forming small groups and promoting collaboration enhances students' self-confidence and strengthens their social relationships (Syahnaz et al., 2023). Teachers assist students in developing problem identification skills and teamwork abilities, thereby enhancing their analytical skills (Hanaris, 2023). In formulating problems, teachers provide space for students to actively participate, formulate relevant hypotheses, and prioritize hypotheses for further investigation (Kasi, 2022). Teachers also guide students in devising experimental steps and carefully collecting data. In hypothesis testing, teachers encourage active student participation, support inclusive presentations, and create a collaborative learning environment. Finally, teachers guide students in formulating logical conclusions supported by data. All of these efforts are aimed at enhancing students' understanding of the subject matter and developing their skills holistically.

The improvement in critical thinking skills among students in Phase D, Class VIII-4 at Assisi Medan Catholic Private Junior High School can be explained by significant research findings in enhancing students' ability to focus on issues. This is reflected in their ability to identify, analyze, and seek solutions deeply, driven by various factors such as project-based learning approaches, interactive teaching techniques, and continuous teacher feedback (Dr. Nanang, 2012). Improvement in the ability to analyze arguments is also noted, with students better understanding argument structures and evaluating strengths and weaknesses (Susilawati et al., 2023). Furthermore, there is progress in students' ability to ask relevant and in-depth questions, supported by learning approaches that encourage exploration and discussion (Rasiman, 2022). Students have also improved in their ability to respond to challenging questions using critical thinking, measurable solutions, and constructive teacher feedback (Studi et al., 2023). Additionally, there is an enhancement in students' ability to critically and analytically consider the credibility of information sources (Fernanda et al., 2019). This is supported by in-depth learning about information literacy and the use of case studies in class. Students have also shown improvement in observing and considering observation results, which are crucial in developing deep understanding and accurate analysis (Friska et al., n.d.).

In students' ability to make effective decisions in classroom situations, supported by learning approaches emphasizing active student engagement in real-life simulations and role-playing exercises (Rofiq et al., n.d.). Students have also improved in their ability to understand and interpret definitions carefully and deeply (Suciono, 2020). Improvement is also evident in students' ability to identify assumptions, driven by teaching methods that encourage critical thinking and discussion (Rizqia et al., 2019). Finally, there is a significant improvement in students' ability to formulate concrete actions and articulate arguments both orally and in writing. This is supported by exercises emphasizing action planning in real-life situations, the use of effective presentation techniques, and detailed teacher feedback (Ipa et al., n.d.).

Conclusion

1. Implementation of the Inquiry Learning model in Phase D, Class VIII at Assisi Private Junior High School, Medan, successfully increased students' learning outcomes and critical thinking skills. The orientation achievement rate increased from 62.5% to 58.33% in the subsequent cycle, with an improvement of 10%. The ability to formulate problems increased from 58.33% to 88.33% in the next cycle, showing an increase of 51.43%. Formulating hypotheses improved from 44.44% to 87.50% in the following cycle, with an increase of 96.89%. The ability to collect data increased from 68.75% to 75% in the next cycle, showing an improvement of 9.01%. Testing hypotheses rose from

75% to 83.3% in the subsequent cycle, showing an increase of 11.06%. Lastly, drawing conclusions increased from 41.66% to 58.33% in the following cycle, with an improvement of 40.01%.

2. The improvement in students' critical thinking skills in Phase D, Class VIII at Assisi Private Junior High School, Medan, can be seen in several aspects: the percentage of students providing simple explanations increased from 54.80% to 63.46% in the next cycle, with an improvement of 15.80%. In developing basic skills, only 28.20% of students succeeded initially, but this drastically increased to 61.53% in the following cycle, showing an improvement of 100%. The ability to make inferences increased from 32.69% to 75% in the subsequent cycle, with an improvement of 100%. The ability to provide further explanations improved from 38.46% to 60.25% in the next cycle, showing an increase of 56.65%. Lastly, in strategizing and tactics, the percentage rose from 66.66% to 76.92% in the following cycle, with an improvement of 15.39%.

3. There was an increase in learning outcomes among students in Phase D, Class VIII-4 at Assisi Catholic Private Junior High School, Medan. The percentage of students proficient in the material rose sharply from 20% to 76.92% in the next cycle, with an improvement of 56.92%. However, in skill proficiency, the percentage of students significantly decreased from 65% to 15.38% in the subsequent cycle, showing a decline of -49.62%. Additionally, in the criteria for competency, the percentage of students dropped significantly from 15% to 7.70% in the next cycle, with a decrease of -730%.

Recommendations

Based on the research results on the Improvement of Learning Outcomes and Critical Thinking Skills of students using the Inquiry Learning Model at Assisi Medan Catholic Private Junior High School, the recommendations proposed by the researchers cover several important aspects. First, Assisi Medan Catholic Private Junior High School is advised to continue supporting and facilitating teachers in implementing effective Inquiry Learning models. Additionally, expanding project-based and interactive learning approaches is also recommended. Second, for Catholic Religious Education teachers, it is important to enhance the integration of Catholic values into teaching, while paying attention to the development of students' speaking and writing skills, especially in the context of argumentation. Third, students at Assisi Medan Catholic Private Junior High School are encouraged to create a collaborative learning atmosphere and focus on developing speaking and writing skills, particularly in argumentation. Finally, for future researchers, it is suggested to expand the scope of research to examine the impact of this learning model on other aspects of student learning.

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