Journal of Educational Analytics (JEDA)
Vol. 3, No. 4, 2024 : 581 - 592

Optimizing Students' Critical Thinking Abilities through the Guided Inquiry Learning Model

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A R T I C L E I N F O

Keywords: Guided Inquiry Learning Model, Critical Thinking, Discovery Learning Model

Received : 14, October
Revised : 26, October
Accepted: 25, November

A B S T R A C T

In many schools, students' critical thinking abilities are still relatively low, reflected in their difficulty in analyzing information in depth, constructing logical arguments, and solving problems effectively. This research aims to determine the extent to which applying the Guided Inquiry learning model can improve students' critical thinking abilities. The method used in this research is an experiment with a Nonequivalent Control Group Design. The population used in this research was class XI IPS students at SMAN 6 Tasikmalaya with 198 students, and the sampling technique used was purposive sampling, where the sample was determined based on student activities. Class XI IPS 3 was chosen as the experimental class, which applied the Guided Inquiry model, while class XI IPS 4 was used as the control class, which used the discovery learning model. The instrument used is a set of 22 essay questions. The research results show a significant difference in critical thinking skills between the experimental and control classes, indicating that implementing the Guided Inquiry learning model effectively improves students' critical thinking skills. Hopefully, this research will become a reference for developing more effective strategies and learning models in schools.

DOI prefik: https://doi.org/10.55927/jeda.v3i4.12158
ISSN-E: 2830 - 0432
https://journal.formosapublisher.org/index.php/jeda

INTRODUCTION

Integrated learning is an educational approach that allows students, individually and in groups, to actively seek, understand, and apply concepts and principles holistically and realistically. Integrated learning connects various concepts, experiences, perspectives, and ideas within and across subjects. This approach emphasizes student involvement in the learning process, enabling them to gain direct experience and develop skills to discover knowledge independently (Gusmaneli et al., 2024; Ramos, 2022).

Recognizing the importance of quality in the educational process and outcomes, especially for students, teachers, as facilitators, must utilize various resources, strategies, methods, and learning models to explore students' capabilities during the teaching and learning process. However, many current learning approaches are still teacher-centered, relying heavily on lectures, question-and-answer sessions, and assignments. In lecture-based learning, the focus remains on the educator, leading to passive student participation and inadequate training of their critical thinking abilities (Qasyaf & Baharuddin, 2023; Mutia & Alberida, 2022).

Students' critical thinking skills are also quite limited, as teacher-centred instruction hinders the development of these skills. Students rarely participate actively in discussions with teachers and seldom share ideas or insights during lessons. Students with limited reading comprehension can still extract information using their own words. Additionally, when teachers pose questions, students cannot always provide explanations related to the subject matter.

Implementing effective learning models is a contingency plan to enhance teaching standards so students can better understand the material. A good learning model offers opportunities for students to participate in the learning process actively, creates positive learning experiences, and enhances their ability to think critically about their work (Ramos, 2022).

Furthermore, the researcher conducted preliminary research in class XI social studies at SMAN 6 Tasikmalaya using descriptive questions that included critical thinking indicators to assess students' initial critical thinking abilities. Data showed the percentage of critical thinking skills among class XI social studies students, as seen in Table 1.

Table 1. The level of students' critical thinking abilities in Social Studies Class

No	Critical Thinking Indicator	Precentage				
		S-1	S-2	S-3	S-4	S-5
1.	Provide a simple explanation	45,45%	56,25%	60%	37,5%	41%
2.	Build basic skills	42,42%	50,00%	37,5%	32,5%	15,3%
3.	Conclude	39,39%	46,87%	37,5%	17,5%	20,5%
4.	Make further explanations	39,39%	46,87%	22%	15%	10,2%
5.	Set strategy and tactics	30,30%	40,62%	43%	32,5%	20.5%
	Average	**39,39%**	**48,12%**	**40,0%**	**27%**	**21,5%**

Source: Pre-research data, 2024

Based on the data from the preliminary research, it can be concluded that the level of critical thinking skills is categorized as low. This means that students critical thinking abilities in class XI social studies at SMAN 6 Tasikmalaya need further improvement. Students struggle with critical thinking because they tend to accept any information the teacher provides or finds in textbooks. In class, students often exhibit passive behaviour and do not actively express themselves when the teacher asks questions, indicating their critical thinking skills have not yet developed. This is suspected to be due to students not being sufficiently involved in the learning process.

Critical thinking skills are essential for students because they enable them to analyze information, make logical decisions, and solve problems effectively (Basri et al., 2021). In the context of learning, this skill helps students understand concepts in depth rather than simply accepting information passively. One way to enhance critical thinking skills is through inquiry-based learning, where the teacher acts as a facilitator, guiding students in independently discovering concepts (Syofyan et al., 2019). This model encourages students to ask questions, seek information, and draw their conclusions, thereby honing their critical thinking abilities.

Inquiry-based learning is an approach that can help students develop critical thinking skills in their education (Subhan, 2021). Inquiry can be defined as a series of learning activities that emphasize critical and analytical thinking processes to seek and discover answers to questions problems. This model is also defined as learning that prepares situations for students to conduct experiments independently, with the knowledge and skills gained being the result of discovery rather than mere memorization of facts (Yumiati , 2017).

The Inquiry model has four levels, from highest to lowest. Given the issues, one effort to enhance students' critical thinking skills is through the Guided Inquiry level. Guided Inquiry suggests that the teacher only presents problems related to the economics subject while students search for the procedures and solutions independently.

Guided Inquiry is a learning model where students are actively involved in knowledge discovery through guidance and direction from the teacher (Apriliani & Unzzila, 2024). In this approach, the teacher does not provide direct answers but facilitates the learning process by posing triggering questions, offering hints, and providing relevant sources of information. This allows students to explore and discover essential concepts independently, enhancing their critical thinking skills and fostering more profound understanding. Additionally, guided Inquiry allows students to develop curiosity, analytical abilities, and problem-solving skills, thus building confidence and promoting active and reflective learning attitudes (Pertiwi, 2023).

LITERATURE REVIEW

Critical Thinking Skill

Critical thinking is an intellectual process where individuals intentionally assess the quality of their thinking (Nurhikmayati, I., & Jatisunda, 2019). Critical thinking is the ability to discuss all sides, consider all facts, decide what is

relevant and irrelevant, and make wise decisions (Facione, 2011). According to (Indah Pratiwi & Alfarisi, 2014), a person is said to think critically when they can acquire knowledge carefully, not easily accept opinions, but consider reasoning so that the conclusions are trustworthy and accountable.

Critical thinking is a dynamic learning process; students become more critical through regular practice and dynamic transitions between stages (Rivers,C., 2019). According to (Efendi, D., Sumarmi, S., & Utomo, 2020), critical thinking can increase intelligence, help complete tasks, and find alternative solutions to root problems. A person with critical thinking skills will be able to distinguish between facts and opinions and identify and analyze incongruent issues to draw conclusions.

Critical thinking has several indicators that can be used to measure a person's ability to think critically. According to Ennis (Dr. Maulana, 2017), there are 12 critical thinking indicators grouped into five main activations as follows: Providing simple explanations, including focusing on questions, analyzing questions, and asking and answering questions about an explanation or question; Building basic skills involves considering whether sources are trustworthy, observing, and considering a report of an observation; Making inferences/conclusions, which involves activities of educating or considering inductive results; Providing further explanations, which includes identifying terms and definitions, as well as identifying assumptions; and Organizing strategies and tactics includes determining actions and interacting with others.

Critical thinking can occur at any time because every individual can generate different thinking ideas from one another. Some characteristics of critical thinking ability, according to Lau (Dewi et al., 2019), are as follows: understand the logical relationship between ideas, express ideas concisely and accurately, identify, construct, and evaluate arguments, evaluate decisions, and evaluate evidence and formulate hypotheses.

Inquiry Learning Method

According to (A Khoirul, 2015), the term inquiry comes from the English word inquiry, which means investigation or asking for information; a free translation of this concept is "students are asked to search and find out for themselves." In the context of using inquiry as a teaching method, students are positioned as the subjects of learning, meaning that students have a significant role in determining the atmosphere and model of learning. In this method, each student is encouraged to actively participate in the learning process by actively asking good questions about each topic presented. These questions do not always have to be answered by the teacher, as all students have the same opportunity to provide answers to the questions raised.

According to (Faberta et al., 2019), the Inquiry model is a learning model focused on the process, which includes activities such as observing, formulating relevant questions, critically evaluating books and other sources of information, planning investigations or inquiries, reviewing what has been known, conducting experiments using tools to obtain data, analyzing and interpreting data, as well as making predictions and communicating the results.

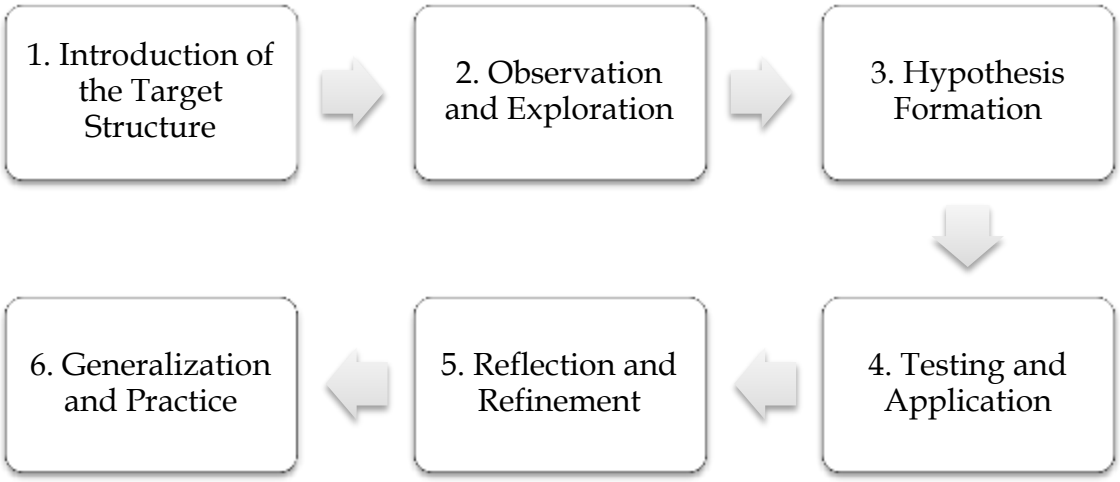

Figure 1. Steps in Syntax Guided Inquiry

The theory underlying the Guided Inquiry and Discovery Learning models is the constructivist theory developed by Piaget. Constructivism is based on the idea that knowledge is not something purely derived from nature, but rather, knowledge is the result of an active construction by the individual (Asrori, 2020). One of the learning models that can help enhance critical thinking skills is the Inquiry and Discovery Learning model because these models emphasize student-centred learning. These models not only aim to train thinking skills but also to foster communication and analytical skills.

Based on the explanation above, the constructivist theory supports both the Guided Inquiry and Discovery Learning models because, in the learning process, students are expected to construct their own knowledge actively. Students do not solely rely on the teacher as the primary source of knowledge and information. Instead, students can independently search for the information they need based on their interactions and experiences, which will help develop their critical thinking skills.

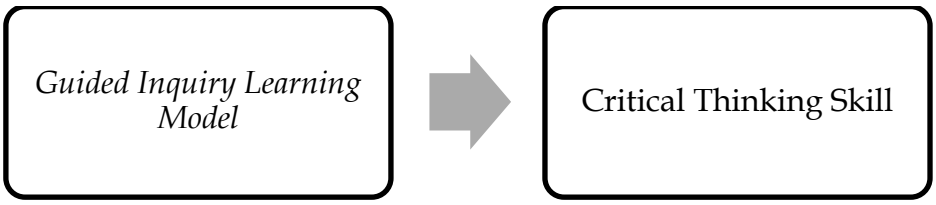

Figure 2. Conceptual Framework

METHODOLOGY

The research method employed in this study is Quasi-Experimental, a type of research design used to investigate cause-and-effect relationships between variables without randomizing the assignment of subjects to experimental and control groups. In contrast to true experimental research, quasi-experiments do not allow researchers to fully control the random assignment of subjects to the experimental and control groups. This study is designed using a Nonequivalent Control Group Design with pretest and posttest measurements, as further detailed in Figure 3 :

Eksperimen	pre-test	X1	post-test
control	pre-test	-	post-test

Figure 3. Reserach Desgin

The research was conducted at SMAN 6 Tasikmalaya, involving a population of 198 students in the eleventh grade. Sample selection was carried out using purposive sampling, a non-probability sampling technique. This approach was not random; instead, participants were chosen based on specific characteristics that were deemed relevant to the research objectives. The researchers selected participants whom they believed would provide the most pertinent information to address the research questions. This technique was chosen because the population under study was specific and limited, and the researchers required a group with particular characteristics to obtain more in-depth and relevant data.

The research instrument consisted of a 22-item essay based on learning outcome indicators from Anderson and Krathwohl, utilizing cognitive markers from the revised Bloom's Taxonomy. The learning model applied in the experimental group was guided inquiry learning, while the control group followed discovery learning models. Data for the research were gathered from pretest and posttest results, as well as classroom observations. The data were then analyzed using both descriptive and inferential statistical methods, with a significance level set at 5%. The reliability coefficient of the instrument was 0.686, indicating a high level of reliability.

RESEARCH RESULT

The research data were analyzed statistically, beginning with the classic assumption tests, which included tests for normality and homogeneity. The results of the normality test for the experimental group showed values of 0.095 (pretest) and 0.140 (posttest), indicating that the data are normally distributed with a significance level greater than 5%. Similarly, for the control group, the normality test yielded values of 0.094 (pretest) and 0.138 (posttest), also suggesting that the data are normally distributed with a significance level greater than 5%.

Furthermore, the results of the homogeneity test were 0.896 for the experimental group and 0.618 for the control group, indicating that the data from both groups are homogeneous. Table 2 presents the pretest and posttest scores, which indicate that the experimental group, using the guided inquiry learning model, falls within the high category. In contrast, the pretest and posttest scores for the control group, which employed the Discovery Learning model, are in the medium category.

Table 2. Average score in Experimental Class and Control Class

Type Class	Student Total	Average Score		N Gain	Interpretasi
		Pretest	Postest		
Experimen	40	47,22	92,28	0,90	High
Control	40	36,18	83,50	0,64	Medium

Hypothesis testing used a significance level of 5%, in table 3 shows that the existence of an experimental class with a guided inquiry learning model was able to improve students' critical thinking skills with an increase of 45.04 points based on the results of the pretest and posttest. Meanwhile, the control class with the inquiry learning model also increased students' critical thinking by 50.32 points based on the results of the pretest and posttest.

Table 3. Results of Paired Samples T-Test

Type Class	Learning Outcome	Mean	Paired Samples T-test		Sig. (2-Tailed)
			t	df	
Experimen	Pre test	47,24	-32,454	39	0,000
	Post test	92,28			
Control	Pre test	36,18	-44,571	39	0,000
	Post test	83,50			

DISCUSSION

H1: Critical Thinking Skills of Students in the Experimental Class

Based on the research results and analysis of the first hypothesis test, it was concluded that there was a difference in the critical thinking skills of students in the experimental class using the guided inquiry learning model before and after the treatment. This aligns with studies by (Kumar, R., & Bhandari, 2024; O'Reilly et al., 2022; Rambe et al., 2020), which state that the Guided Inquiry learning model significantly impacts students' critical thinking skills.

This is further supported by statements from (Hazel Marian, 2019; Wang, Y., & Wu, 2021), indicating that students' critical thinking skills are influenced by learning methods and strategies (learning models). Therefore, teachers should select appropriate learning models to enhance students' critical thinking abilities. The guided inquiry learning model is one approach that can improve students' critical thinking skills, consistent with (Krissandi,2022), who states that inquiry strategies emphasize critical and analytical thinking for students to

seek and discover answers to existing problems. This aligns with constructivist theory, which posits that knowledge is not merely transmitted from teacher to student; students must construct or build their own knowledge based on their experiences.

Before conducting this experimental research, the teacher often taught using discovery learning models with lecture methods. The application of discovery learning models is generally authoritarian and teacher-centred, leading to student boredom and passivity, thus restricting their freedom to express opinions. During the research in the experimental class, the author administered a pretest to determine the initial level of students' critical thinking skills, which was found to be relatively low. Subsequently, the author conducted treatment using the Guided Inquiry learning model with a discussion method. In this Guided Inquiry model, students can construct their findings while the teacher guides them in constructing that knowledge.

During the treatment, students were divided into several groups and presented with problems in the form of Student Worksheets (LKPD). They were tasked with solving issues the teacher posed regarding economics, specifically economic growth and development. Students then collected and analyzed data to resolve the problems and presented their findings and conclusions.

In the first meeting, students were still confused about the guided inquiry learning model and the problems presented, struggling to resolve the issues posed by the teacher. By the second treatment, students began to understand the flow of the guided inquiry learning model and how to find solutions to the problems presented by the teacher. Students could follow the learning procedures and solve problems by the third treatment. After three treatments, a post-test was administered to assess the level of students' critical thinking skills after the treatment to determine whether their critical thinking abilities had improved.

Based on the observations made during the research, it was evident that applying the guided inquiry learning model made students more active and responsive during the learning process. Students engaged in discussions with peers and interacted with the teacher. In the guided inquiry learning model, students are assigned tasks to solve problems presented by the teacher, resulting in increased activity and collaborative discussion to find solutions to those problems.

H2: Critical Thinking Skills of Students in the Control Class

Based on the second hypothesis test, it was concluded that there were differences in students' critical thinking abilities in the control class before and after treatment (Discovery learning model). This aligns with research by (Erdogan 2020) that the Discovery Learning learning model has an impact on students' thinking abilities at the high school level. Three meetings were conducted in the study of the control class. In the first meeting, students were given a pretest to assess their initial critical thinking abilities. Many students struggled with this test because the material covered had not been studied

before, resulting in less than optimal performance. From the second meeting onward, students were given treatments.

Learning in the control class began with a problem orientation activity, where students were presented with a stimulus in the form of a problem, and then they responded to this issue. Following this, students were grouped and given Student Worksheets discussed among their group members to answer the questions within the Student Worksheets, then presented their work, and finally analyzed and evaluated the results by responding to their peers during presentations.

The research findings indicated that the critical thinking skills in the control class improved, as evidenced by the pretest and post-test scores obtained by the students. This is consistent with research by (Fahmi 2019), which states that applying this learning model can enhance students' critical thinking abilities. The model used in the control class encourages students to hone and test their critical thinking skills, supported by (Faberta et al., 2019)and (Khoerunisa, 2022), who state that this model can engage students in problem-solving through various stages. This study is also supported by (Almazroi, 2023), who suggests that the learning model used in the control class positively influences students' critical thinking skills.

H3: Critical Thinking Skills in Experimental Classes vs Control Class

Based on the research findings and analysis of the third hypothesis test, it was concluded that students' critical thinking skills differ between the experimental class using the guided inquiry learning model and the control class.

In this study, implementing the Guided Inquiry learning model enhanced students' critical thinking skills more effectively. This is consistent with research conducted by (Chohan, 2022), which states that guided inquiry is more effective because, in this model, students play a role in discovering and constructing their knowledge based on their experiences. Additionally, other studies, such as those by (Kuhlthau, 2020), state that guided inquiry helps students develop a deeper understanding of the material and prepares them to think critically in real-life situations. This approach can lead to more meaningful and effective learning with proper guidance. In the Guided Inquiry model, students are encouraged to ask questions, solve problems, and explain concepts actively. This learning model involves presenting students with a problem to be solved, requiring them to address it based on data collection and analysis, thereby enabling them to construct knowledge independently. Students then communicate their findings, fostering active and responsive interactions with peers and the teacher. The teacher's role in this model is as a facilitator, helping and guiding students to construct their knowledge while keeping them focused. This aligns with (Yılmaz, 2018), who states that the structure and guidance provided in guided inquiry help students focus and engage in critical thinking processes. According to (Khoo & Chan, 2019), guided inquiry is an approach where teachers provide direction and support during students' exploration while allowing students to control their discoveries.

In contrast, the learning model used in the control class involved students facing problems without much direct guidance from the teacher. The teacher acted as a facilitator, offering encouragement or assistance when necessary. This often resulted in students not developing critical skills deeply without structural guidance. The teacher tended to grant greater freedom for students to explore independently, which could mean a lack of guidance in the students' critical thinking processes. This is consistent with research by (Lim, & Morris, 2019), which states that inquiry-based learning is more effective, including active engagement, student collaboration, and problem-oriented learning.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results regarding the critical thinking skills of students in the experimental class using the Guided Inquiry learning model and the control class using the Discovery Learning model, the following conclusions were obtained:

1 There is a difference in students' critical thinking skills in the experimental class using the Guided Inquiry learning model, both before and after the treatment, in the subject of Economics with the material on economic growth and development.
2 There is a difference in students' critical thinking skills in the control class before and after the learning process in the subject of Economics with the material on economic growth and development.
3 There is a significant difference in improving critical thinking skills between the experimental class using the Guided Inquiry learning model and the control class using the Discovery Learning model in the subject of Economics with the material on economic growth and development.

These conclusions indicate that the applied learning models improve students' critical thinking skills.

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