



Study on Implementation of Inkuiri Learning Model Guided to Students' Critical Thinking Ability

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Abstract

This study aims to explore information about the implementation of guided inquiry learning models on students' critical thinking skills. This research uses a qualitative approach with the type of literature study research. The sampling technique in this study used secondary data sources, using data analysis techniques, namely reduction, exposure, and conclusion. The result of this research is that guided inquiry learning model can improve students' critical thinking skills. Science as a subject that is often associated with current issues is very suitable for fostering critical thinking skills and one of them is to increase student motivation. The inquiry learning model is designed as a contributive learning model for students. Inquiry learning model with stages: (1) planning; (2) preparation; (3) group division; (4) discussion; and (5) exposure, those steps are able to make learning meaningful, motivate students, and students can reconstruct knowledge independently, and foster critical thinking skills. The use of the guided inquiry model also contributes to students' critical thinking skills which consist of inference, interpretation, evaluation, and self-regulation.

Keywords: *Learning Model; Guided Inquiry; Students' Critical Thinking; Literature Study; Science*

Introduction

Science learning for learners is useful for studying the environment and its development applied in everyday life. Rizema (2013) states that science is a knowledge that learns, explains, and investigates natural phenomena with all aspects that are empirical. Through science learning, learners can have a broad understanding of science and technology so as to contribute to the surrounding environment. Science education is directed to find out and act, so as to help students gain a better understanding of the environment (Putra, 2013).

The process of science learning has a strategic role in improving the quality of human resources. As part of the world community, we can not be separated from the influence of development and science

products in the form of technology that is increasingly extraordinary. A science product that makes everyone need scientific knowledge and thinking about science. Thus, science-laden thinking activities can be a vehicle to improve the quality of human resources to build thinking skills. Science learning models should be developed at a high level of thinking skills.

Fachrurazi (2011) argues that by critical thinking students also make it possible to formulate and evaluate their own beliefs and opinions. Similarly, Hal Parker (2009) stated that critical thinking skills are an organized process by involving mental activities through problem solving, formulating conclusions, gathering possibilities and making decisions where this way of thinking develops cohesive, logical, trustworthy, concise, and convincing reasoning.

According to Santrock (2007) critical thinking is involving instropeksi and productive ways of thinking as well as evaluating events. Robert Ennis (Fisher, 2008) defines critical thinking as sensible and reflective thinking that focuses on deciding what to believe or do. A person who has the ability to think critically well can analyze, identify, evaluate, consider, re-develop all ideas or ideas for the better. Science learning leads learners to be literate towards science, so students are required to have critical thinking skills and can solve problems.

Science is a discipline that studies the symptoms of nature such as living things and living things (Rahayu, 2012). Science learning emphasizes learners to be actively involved in learning on concepts, skills and principles. Through this learning, students can find the concepts and principles that exist in him. Science learning basically consists of four main elements, namely attitudes, processes, products and applications (Ekapti, 2016). Based on this, it can be known that the process of studying science not only presents theories, facts and concepts but can be proven scientifically. Therefore, students need to be given space to improve their critical thinking skills in solving problems in the surrounding environment related to science learning materials. Learners who have critical thinking skills will try to understand the cause of a situation or event they are experiencing, they will question about the truth, they will be told the truth what they see, read and hear and seek a solution to solve the problem they are facing then solved effectively (Synder LG & Synder M, 2008).

Students can foster success in learning through critical thinking, because the quality of science learning still needs to be improved. One way to improve the quality of science learning can be implemented by improving the learning process in order to foster students' scientific attitude to science concepts such as using learning models and methods that can improve students' critical thinking ability. Slavin (2009) states that the key goal in learning is to awaken students' ability to think critically and make national decisions related to their work or trust.

The problem that often occurs in science learning is the lack of connection between the theory obtained in learning and daily life. As a result, students cannot think critically to solve problems that will arise in their environment.

The learning model used by science teachers in several schools in science learning today is a face-to-face learning model with lecture methods, where students only get information in the form of knowledge from teachers only (Adim et al., 2020). Students are only required to passively absorb information and then remember it when taking the test. The learning process carried out in schools emphasizes more on aspects of knowledge and understanding, while the application, analysis, synthesis, and evaluation aspects are only a small part of the learning carried out. This kind of learning does not give students the experience of practicing critical thinking skills so that students cannot improve students' critical thinking abilities which has an impact on students' low critical thinking skills. Teachers have not provided space for students to be able to construct their own knowledge to solve reality problems given without any engineering from the teacher. Therefore, there needs to be an alternative learning model that provides space for students to find solutions to the reality problems provided to improve students' critical thinking skills in science learning. The solution to solve problems related to students' critical thinking ability is learning related to how to find out and emphasize the learning experience, obtained through the process by practicing students' thinking skills (Masitoh, 2017).

Learning criteria that can improve students' critical thinking ability is learning that stimulates students' minds to acquire all learning abilities that are non-sacred by applying constructivism learning models that are not teacher centered but are student centered (Abidin, 2014).

There are several alternative models of constructivism learning that can improve students' critical thinking skills, namely problem solving, scientific, discovery, and inkuiri (Masitoh, 2017; Abidin, 2014; Kuhlthau, Maniotes, & Caspari, 2007; Sund, 1973). In its application, these learning models should be likened to the characteristics of subjects and the characteristics of learners. This aims to make learning effective and efficient in addition to improving students' critical thinking skills. The characteristics of problem solving models are that teachers provide sufficient information about problems, and students clarify, interpret, and try to construct solutions (Jonassen, 2011). The characteristics of scientific models involve potential cognitive processes in stimulating intellectual development, especially students' high-level thinking skills through observation, explanation/explanation, and tests/experiments (Carey, 2011). The characteristics of the discovery model is that the problem faced by the student is a problem engineered by the teacher and then the student discovers the concept studied, organizes, and forms it independently (Sund, 1973). Characteristics of the inkuiri model is that the problem given to students is not the result of engineering from the teacher so that students think creatively to find solutions to the reality problems that occur (Kuhlthau et al., 2007; Sund 1973).

Through the model of inkuiri learning, it is expected that learners can easily interact with the lesson materials that have been prepared, namely utilizing the environment as a learning resource, so that the teaching and learning process will be more meaningful because students are faced with events and circumstances that are naturally natural both through teacher guidance and independently in the environment around the students.

Learning science by utilizing the environment as a learning resource is very helpful for a teacher in delivering learning materials. As the main purpose of the learning process by utilizing the environment as a learning resource is to develop curiosity and critical thinking of students against a problem. Learning materials that involve the surrounding environment facilitate interaction with learners so that they are more comfortable and active in the learning process. According to Ramawati (2016) by utilizing the surrounding environment through effective irrigated methods in achieving informative learning outcomes, facts and concepts, students' critical thinking ability is also increasing, this is because students are trained to look for factual problems, solve the problem and then analyze the problem to find a solution.

Guided inkuiri learning models make the learning atmosphere meaningful. This is because by using the term inkuiri model can train students' critical thinking skills. The implementation of the guided inkuiri model in science learning is expected to improve students' critical thinking ability. Guided inkuiri is one of the effective ways to create variations in the atmosphere of classroom learning patterns. Kuhlthau *et al.* (2007), seeing the use of guided inquiry in science learning is very appropriate as a learning model to improve students' critical thinking skills which gives students the freedom to solve problems but needs teacher guidance.

In addition, learning using inquiry models helps students to develop their critical thinking skills and allows students to build their knowledge as scientists do (Corlu & Corlu, 2015).

The role of inkuiri learning model is guided in the science learning process, especially to foster critical thinking ability, it is necessary to conduct an analysis on the study of the implementation of the inkuiri learning model guided in improving students' critical thinking ability.

Method

This research is literature study research or library research with qualitative approach. Literature studies are research conducted by collecting data or some scientific papers that are literature with certain

research objects relevant from previous research as a data source. According to Zed (2014), the collection of the data obtained was used to obtain new research data as a first step in preparing the research framework. The sample of this study is 10 relevant national and international journal articles. Selection of journal samples based on inclusion criteria, namely: (1) journals that discuss the guided inkuiri model and critical thinking ability; (2) journals published in the last 5 years (2015-2020).

The sampling techniques in this study used secondary data sources. The source of the data is a scientific article derived from Google Sholar. Stages in the collection of samples include: (1) search for scientific articles on Google Scholar using guided keywords and critical thinking skills; (2) grouping based on each variable for further analysis; (3) select as many as 10 scientific articles; (4) prepare to conduct a content analysis for further review.

The data analysis techniques after the sample and data collected are as follows: (1) data reduction that is to discard various unnecessary things and focus on the important things; (2) data exposure, i.e. presenting data presented based on certain subsections; and (3) draw conclusions from new findings that have never existed before.

Results and Discussion

This study discusses several journals related to guided inkuiri learning models and students' critical thinking abilities. The results of several journals that have been compiled are listed in Table 1 below and their presentation:

Table 1. Collection of Articles/Journals to Analyze

No	Research Title	Years
1	The Influence of Problem Based Learning Strategies and Guided Inkuiri on Metacognitive Skills, Critical Thinking, and Cognitive Learning Outcomes of High School Students	2015
2	The Influence of Guided Inkuiri Learning Models on Students' Critical Thinking Ability on Sound Energy Materials	2016
3	The Influence of Interactive Multimedia-Assisted Inkuiri Learning Model on Critical Thinking of Grade XI Students of Sma Negeri in Bojonegoro	2016
4	The Influence of Inkuiri Guided Learning Model on Students' Critical Thinking Ability in Learning Environmental Management Materials at SMP Negeri 2 Tanjung Lago, Banyuasin Regency	2016
5	<i>The Effect of The Inquiry-Based Learning Approach on Student's Critical-Thinking Skills</i>	2016
6	<i>Impact of Guided-Inquiry-Based Instruction with A Writing and Reflection Emphasis on Chemistry Students' Critical Thinking Abilities</i>	2015
7	<i>The Impact of Inquiry-Based Learning on The Critical Thinking Dispositions of Pre-Service Science Teachers</i>	2017
8	The Influence of Guided Inkuiri Learning Models on The Critical Thinking Ability of High School Students	2018
9	The Influence of Guided Inkuiri Learning Models on Learning Outcomes and Critical Thinking Ability of Learners	2018
10	The Influence of Guided Inkuiri Learning Model on The Critical Thinking Ability of Elementary Science	2020

Based on Table 1, some of these journals are then reviewed for content analysis. The results of the analysis are as follows.

The research conducted by Fitriyani et.al (2015) entitled "The Influence of Problem Based Learning Strategies and Guided Inkuiri on Metacognitive Skills, Critical Thinking, and Cognitive Learning Outcomes of High School Students". Based on the research, it is said that there is an influence of guided inkuiri learning models on students' kiritis thinking, as well as metacognitive skills and cognitive learning outcomes of students. The design of the research was carried out using pretest-posttest consisting of experimental and control classes. The results were also supported by an analysis of anakova with a significance of 0.05. v

Furthermore, Azizah et.al (2016) research entitled "The Influence of Inkuiri Learning Model Guided to Students' Critical Thinking Ability on Sound Energy Materials". The result of this study is that students who learn using inkuiri learning model are significantly better guided in critical thinking ability especially in science subjects on sound material. In addition, students can positively respond well during class study. Implementari guided inkuiri learning model is able to improve more optimal learning with a note that is a factor that supports the implementation of the inkuiri learning model can be achieved well, namely: planning, preparation, group sharing, providing opportunities for students to discuss, presenting each group of students, and presenting meaningful learning.

The third study titled "The Influence of Inkuiri Guided Learning Model Assisted by Interactive Multimedia Towards Critical Thinking of Grade XI Students of Sma Negeri in Bojonegoro" was conducted by Retnosari et.al (2016). The result is that students' critical thinking skills are influenced by the application of learning with guided inkuiri models. This is evidenced by LSD test data, namely students' critical thinking ability increased by 400.2% for guided inkuiri classes and 416.8% for media-assisted inkuiri classes. Thus, it can be concluded that the learning model using the inkuiri is guided effectively to improve students' critical thinking ability, and will be more effective if with the innovation of learning media in the form of multimedia.

In the research conducted by Falahudin et.al (2016) explored information about the influence of learning models on critical thinking ability in environmental management materials at junior high level. The result of the study was that the guided inkuiri learning model received a positive response from students and had a significant influence on critical thinking ability, especially in environmental management materials. The findings were evidenced by the existence of data that is the class that learns using the guided inkuiri learning model obtained 77% higher results in critical thinking ability when compared to control classes only by 68%. Another finding of this research is that in the implementation of guided inkuiri learning models, students are able to easily create definition forms (the highest student response) and the lowest student response is to draw conclusions from the results.

Research entitled "The Effect of the Inquiry-Based Learning Approach on Student's Critical-Thinking Skills" by Duran et.al (2019) states that students who learn using the inquiry learning model experience a significant improvement in critical thinking ability. Then this research not only focuses on science learning, but also focuses on technology-based learning or science and technology. It has the right connection because to understand the development of science and technology that is present, it is confirmed the ability to think critically. Duran et.al (2019) also stated that by learning with inkuiri capital, students are trained to reconstruct science independently based on the stages in the inkuiri learning model so as to hone critical thinking skills.

For the 5th study conducted by Aarsal (2017) obtained slightly different results when compared to some other studies that have been collected, namely the inkuiri learning model does not have a significant influence on critical thinking ability. However, this research was carried out with the research subjects of teachers who were in pre-employment programs. Nevertheless, Aarsal (2017) stated that at least teachers can take superior steps, namely hypotheses, data collection, analysis, and finally can make scientific conclusions. Thus, some of these steps can train teachers to think critically.

Gupta et.al (2017) conducted research with research subjects are students. The results of the study titled "The Impact of Inquiry-Based Learning on The Critical Thinking Dispositions of Pre-Service Science Teachers" stated that students are cognitively capable of reconstructing knowledge, organizing, understanding, and evaluating independently the knowledge they gain. This is influenced by inculcar learning. Then what is interesting about this research is that it is also carried out activities in the laboratory so that the independence of students using the model of inkuiri during learning is highly prioritized to improve critical thinking ability.

Furthermore, similar research was also conducted by Solihin et.al (2018). The results of this study are known that the guided inkuiri learning model significantly affects students' critical thinking ability by evidenced by the critical thinking ability value of students in the experimental class of 67, while in the control class of 62.5. Indicators used for critical thinking ability in this study are inference, interpretation, evaluation, and self-regulation. This research also focuses on exploring information related to students' critical thinking ability on global warming materials that are often associated with current issues so that students desperately need critical thinking skills in learning them.

Amijaya et.al (2018) conducted a study titled "Influence of Guided Inkuiri Learning Model on Learning Outcomes and Critical Thinking Ability of Learners", it was found that critical thinking ability in the learning class using guided inkuiri learning model increased by 27.49 while in the control class only increased by 18.56. Amijaya et.al (2018) mThen the data is strengthened by the existence of thitung value greater than the tttabel of $2.88 > 1.99$ so that it can be concluded that students' critical thinking ability in the experimental class is significantly better. In addition, the study also explored information related to student learning outcomes and concluded that student learning outcomes are significantly better if learning using the inkuiri model is guided by research with the title "Influence of Guided Inkuiri Learning Model on Learning Outcomes and Critical Thinking Ability of Learners", it was found that critical thinking ability in the classroom using guided inkuiri learning model increased by 27.49 while in the control class only increased by 18.56.

Furthermore, Ilhamdi et.al (2020) with the research title "Influence of Guided Inkuiri Learning Model on Critical Thinking Ability of Science SD" found that guided inkuiri learning model has a better influence on critical thinking ability based on the average pretest and posttest value obtained, namely from 48.67 increased to 77.52 from low category to medium category. The focus of this research is on elementary school level with material subject matter and changes in the nature of objects. For elementary school level, the subject matter is suitable if applied guided inkuiri learning model for elementary school age children who still need guidance during the learning process. In this study also found that learning design that motivates students during the learning process using guided inkuiri is needed so that the learning objectives are more optimal.

Conclusion

The conclusion of this research is based on several journals that have been studied with relevant research resulting in that the guided inkuiri learning model is able to improve students' critical thinking ability. This is because the inkuiri learning model is guided in its implementation through several stages of learning (planning, preparation, group division, discussion, exposure) can make learning meaningful so that students are able to reconstruct knowledge independently and foster critical thinking skills. The advice for advanced research is to develop the application of guided inkuiri as a more interesting learning model to explore other information related to science learning, for example by combining other research variables to be tested. In addition, further research can also use guided inkuiri learning models for other language themes, especially in science learning and others.

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