Implementation of the Science Learning Model on Critical Thinking Abilities of Middle School Students: A Review

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Abstract: Critical thinking skills are one of the skills that students really need. This analysis is an analysis that aims to determine effective learning models to improve students' critical thinking skills in science learning. The search results obtained were 25 articles that were relevant for analysis. The results of the analysis show that one effective learning model is used to improve critical thinking skills, namely the discovery learning model with a score of 92.56. So, it can be concluded that the critical thinking scores are low at 54.82, medium at 61.88 to 83.75, and high at 92.56. This is caused by students' learning motivation factors and the use of the learning models used. by the teacher. And one effective learning model used to improve critical thinking skills is the discovery learning model.

Keywords: Critical Thinking; Review; Science Learning

Introduction

Education is all efforts made to educate humans so that they can grow and develop and have the potential or abilities as they should (Hamdani, 2022). The government is making various efforts to improve the quality of learning by improving the curriculum (Ervin, 2022). Poor quality learning can be attributed to the lack of trained teachers who are trained in accordance with the main goals and principles of National Education (Khanmaz, 2022).

Industrial Revolution 4.0 brought many changes (Fikriyati, 2022). changes that expect students to have creative and innovative competencies, critical thinking in solving problems, communication and collaboration, technological development literacy, contextual learning skills and media and information literacy (Wulandari, 2022). In the 2013 Curriculum (K-13), science education is an important sector in producing critical skills and highly competitive human resources (Santuthi, 2020). Science learning, especially biology, has material content that requires students to be able to solve problems contextually. Therefore, science teachers are required to have personality, pedagogical, social and professional

abilities so that the teaching and learning process is more effective. Learning through a contextual approach can improve students' critical thinking skills by connecting material with the real world (Yustina, 2021).

Critical thinking skills are one of the skills that students really need. According to Syuballi & Suyata, the peak of critical thinking for students is that they are able to make a decision where what works in the student's brain must determine what is best (Anggiasari, 2018). Critical thinking in the learning process is one of the skills that introduces generalization thinking, which ideally means getting students accustomed to having a willingness to know relevant information, thinking flexibly and fairly when evaluating (Ulfiana, 2019).

According to Ennis in (Lkorucu) defines critical thinking as reflective and logical thinking that focuses on belief and practice. According to Ennis, what is thought and practiced here includes practical activities such as asking questions, looking for alternatives, and hypothesizing and designing experiments (Sirin, 2022). In another definition, critical thinking consists of questioning, examining, evaluating, and making judgments based on certain criteria, not accepting information that is seen, read, or obtained as it is without

questioning (khanmaz, 2022). The quality of arguments is an important feature of critical thinking (Lin, 2014). However, according to Halpern, critical thinking is more focused on cognitive skills (Nurkhairo Khidayati, 2022).

Method

The type of research used is analytical research with descriptive methods. This analysis is research by summarizing researcher data, reviewing and analyzing research data from several previously existing research results that are relevant to critical thinking skills. This analysis can be used to analyze previously existing empirical research, quantitative research results, research results that can be compared, for example the average of research results. Descriptive method, namely describing articles that discuss the science critical thinking skills of junior high school students. The results of the research are used as material to determine the influence of learning models on students' critical thinking abilities. Research data was collected using library research by searching for articles in online journals via Google Scholar, Cendekia, and Garuda. With the keywords "critical thinking skills, science, learning models" articles were then selected that met the criteria, namely articles that were relevant to students' critical thinking abilities. The population of this research is articles that have been published. The sample used is a journal that discusses learning models and media that can improve students' critical thinking skills. The articles used were 25 articles on the critical thinking skills of junior high school students. Then the articles are analyzed and the average results of each article are found and concluded. The articles used in this research are articles published from 2018 to 2023.
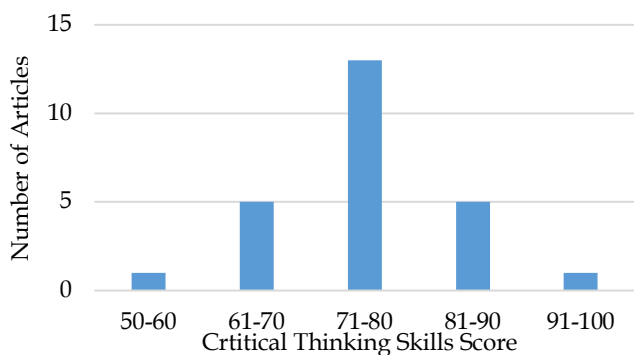
Result and Discussion

The articles analyzed are articles that discuss science learning which can improve critical thinking skills. Based on the search results, researchers found 25 journals that were relevant to critical thinking skills. All researchers' search results are summarized in the table below.

Table 1. Results of searching for learning models, approaches, methods and/or strategies in improving critical thinking skills

Writer	Title	Score Of Critical Thinking Skills
Ardia Tita Kartika, 2020	Profil Kemampuan Berpikir Kritis Siswa Kelas VIII SMP Pada Mata Pelajaran IPA	66.00
Fitria Novita Sari, 2022	Pengaruh Model Pembelajaran Learning Cycle 7e Terhadap Keterampilan Kolaborasi Dan Kemampuan Berpikir Kritis Siswa Ipa Smp	73.92
Bahtiar, 2022	Pengaruh Model Discovery Learning Melalui Kegiatan Praktikum IPA Terpadu Terhadap Kemampuan Berpikir Kritis Siswa	92.56
Tri Wulandari, 2020	Pengaruh Model Problem Based Learning Berbasis Multimedia Terhadap Kemampuan Berpikir Kritis dan Hasil Belajar IPA	77.08
Lidia Herawati, 2019	Pengaruh Model Pembelajaran Kooperatif Tipe Jigsaw Terhadap Hasil Belajar dan Berpikir Kritis Siswa Pada Mata Pelajaran IPA di SMP Negeri 09 Lebong	78.32
Rini Indayani, 2021	Pengaruh Videoscribe Terhadap Keterampilan Berpikir Kritis Peserta Didik Pada Pembelajaran Ipa	69.47
A. Wahyudin Murhadi, 2021	Pengaruh Model Pembelajaran Inkuiri Terbimbing Terhadap Kemampuan Berpikir Kritis Dan Hasil Belajar Ipa Biologi Siswa Kelas Vii Smpn 1 Bulukumba	61.88
Ediawati Kusuma Devi, 2019	Pengaruh Model Pembelajaran Process Oriented Guided Inquiry Learning (Pogil) Terhadap Kemampuan Berpikir Kritis Siswa Pada Materi Hukum Archimedes	76.60
Siti Jazilatul Fitriyyah, 2019	Pengaruh Model Pembelajaran Problem Based Learning terhadap Berpikir Kritis Siswa SMP pada Pembelajaran Biologi Materi Pemanasan Global	83.60
I.A.P.Febby Wulandari, 2019	Pengaruh Model Pembelajaran Problem Based Learning Berbantuan Information And Communication Technologies Terhadap Keterampilan Berpikir Kritis Siswa	77.33
Cahyani Elvira, 2021	Pengaruh Model Pembelajaran Learning Cycle 7E terhadap Keterampilan Berpikir Kritis Peserta Didik di SMPN 1 Kampar Kiri Tengah	71.99
Humaira, Mohammad Jamhari, 2020	Pengaruh Model Problem Based Learning (PBL) Terhadap Kemampuan Berpikir Kritis Siswa pada Mata Pelajaran IPA Biologi di SMP Negeri 7 Palu	82.97
Hasmi Syahputra Harahap, 2020	Pengaruh Metode Inkuiri Terbimbing Dan Proyek Terhadap Kemampuan Berpikir Kritis Biologi Siswa Di Smp Swasta Hkbp Simantin Pane	79.32
Siti Nurjannah, 2023	Pengaruh Model Problem Based Learning Terhadap Keterampilan Berpikir Kritis Siswa Smp Materi Tekanan Hidrostatis	75.30
Rizki Intan Rahmawati, 2018	Pengaruh Implementasi Model Problem Based Learning (PBL) terhadap Kemampuan Berfikir Kritis IPA Siswa SMPN 1 Pakusari	75.85

Writer	Title	Score Of Critical Thinking Skills
Firdhania Wulandari, 2022	Pengaruh Model Pembelajaran Inkuiri Terbimbing (Guide Inquiry)Berbantuan Media Power PointTerhadap Kemampuan Berpikir Kritis Siswa	72.00
Nurhayati, 2019	Pengaruh Model Pembelajaran Susan Loucks Horsley Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa	83.25
Angriani Nofita Djepy, 2022	Pengaruh Penerapan Model Pembelajaran Discovery Learning Berbantuan Video Pembelajaran Terhadap Kemampuan Berpikir Kritis Dan Pemahaman Konsep Ipa Siswa Smp Negeri 44 Halmahera Barat	83.75
Henik Nur Khofiyah, 2019	Pengaruh Model Discovery Learning Berbantuan Media Benda Nyata terhadap Kemampuan Berpikir Kritis dan Pemahaman Konsep IPA	80.50
Rizki Intan Rahmawati, 2018	Pengaruh Implementasi Model Problem Based Learning (PBL) terhadap Kemampuan Berfikir Kritis IPA Siswa SMPN 1 Pakusari	75.85
Rini Indayani, 2021	Pengaruh Videoscribe Terhadap Keterampilan Berpikir Kritis Peserta Didik Pada Pembelajaran Ipa	69.47
Riana Astuti, 2018	Pengaruh Model Pembelajaran Auditory Intellectually Repetition (Air) Terhadap Kemampuan Berpikir Kritis Siswa Pada Materi Kemagnetan Kelas Ix Smp N 1 Penengahan Lampung Selatan	70.64
Lili Pramuji, 2018	Multimedia Interaktif Berbasis Stem Pada Konsep Pencemaran Lingkungan Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa	54.82
Lia Nurmayani, 2018	Pengaruh Model Pembelajaran Inkuiri Terbimbing Terhadap Kemampuan Berpikir Kritis Peserta Didik	62.94
Asrina Amalia, 2018	Pengaruh Model Pembelajaran Contextual Teaching and Learning Terhadap Keterampilan Berpikir Kritis Siswa Smp	73.63

Based on Table 1 above, it can be seen that the critical thinking score is very low, namely 54.82. The low critical thinking ability of students is caused by the use of the learning model chosen by the teacher which does not encourage students to be active in learning activities, resulting in students tending to be passive and students tending to have low critical thinking abilities. because the model used in learning is less interesting and even boring for students. Then, research results from Sa'diyah and Dwikurnaningsih (2019) show that students' low critical thinking abilities are caused by the inappropriate learning model used, so that students' activities in learning activities tend to be passive and students' critical thinking abilities tend to be low. Very high critical thinking abilities can be seen in the table above with a value of 92.56, using the discovery learning model, the use of the discovery learning model is very effective in improving students' critical thinking abilities. For more details, see Figure 1.

Figure 1. Results of analysis of science critical thinking skills of junior high school student.

Based on Figure 1 above, it can be seen that students' low critical thinking abilities range between 50-60, medium 60-90, high 90-100. Students' low critical thinking abilities are caused by students' interest in learning. Students' low interest in learning is caused by the learning model used by teachers during the teaching and learning process. according to Benyamin (2021) that teaching staff (teachers) need to develop learning models to improve students' critical thinking abilities, and teachers need to always provide questions that describe students' critical thinking abilities which can familiarize students with improving their critical thinking abilities.

High critical thinking ability scores are caused by learning motivation, in line with the opinion of (Fridayani, 2022) A person who has high learning motivation will also have high critical thinking skills and be able to solve a problem. A person who has high learning motivation also encourages him to always actively ask questions and find out about something that makes him curious so that he thinks about solving the question, this encourages him to always think critically.

The discovery learning model is an active learning model where students can discover their own concepts and students have high creativity (Andayani, 2020; Rizki et al., 2021). The discovery learning learning model makes students play a more active role when participating in the learning process and students can practice their abilities in solving problems, can improve critical thinking skills and student learning outcomes (Bahtiar, 2022).

Conclusion

Based on the results of the article analysis of the science critical thinking scores of junior high school students, it can be concluded that the critical thinking scores are low at 54.82, medium at 61.88 to 83.75, and high at 92.56. This is caused by students' learning motivation factors and the use of the learning models used. by the teacher. And one effective learning model used to improve critical thinking skills is the discovery learning model.

Author Contributions
This article was prepared by two people. The authors carried out each stage cooperatively until this article was completed.

Conflicts of Interest
The author declares no conflict of interest.

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