

ARTIKEL ILMIAH_INSECTA

by Nur Afdila

Submission date: 16-Sep-2020 05:51PM (UTC+0700)

Submission ID: 1388447405

File name: ARTIKEL_AFDILA_INSECTA_2020.doc (189K)

Word count: 3115

Character count: 17713

Available online at

INSECTA**Integrative Science Education and Teaching Activity Journal**Journal homepage : <https://jurnal.iainponorogo.ac.id/index.php/insecta>

Article

**A secondary School Student's Critical Thinking Ability Profile
in Natural Science Subject Matters Based on Learning Style**Nur Afdila^{1*}, Septi Budi Sartika²^{1,2}Natural Science Education Programs, Psychology and Education Faculty, Universitas Muhammadiyah Sidoarjo, Sidoarjo*Corresponding Address: nurafdila97@gmail.com septibudi1@umsida.ac.id**Article Info**

Article history:

Received: Month XX, 20XX

Accepted: Month XX, 20XX

Published: Month XX, 20XX

(Times New Roman 9)

Keywords:Critical thinking ability
Secondary school student's
Natural Science
Learning Style**ABSTRACT**

This research aims to describe students' critical thinking ability in science subjects based on learning style. The research method uses qualitative research with phenomenological approaches. The research site was conducted at SMP Muhammadiyah 5 Tulangan Sidoarjo. Data retrieval techniques using tests, questionnaires, and interviews. Data analysis techniques using the Miles & Huberman (2014) model include data reduction, data presentation, verification and conclusions. There are 6 indicators of critical thinking abilities revealed that include interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione, 2013). The study only used 5 indicators of critical thinking ability without self-regulation, this is because they cannot be revealed in a short time. The results of the study found that (1) indicators achieved in visual learning styles include interpretation, evaluation, and inference, (2) indicators achieved in auditory learning styles namely interpretation, analysis, evaluation, and explanation, and (3) indicators achieved in kinesthetic learning styles namely: interpretation and evaluation. All subjects achieved not same indicators, while the all subjects also did not achieve all indicators of critical thinking ability. Further research is expected to be the efforts of natural science teachers in achieving all indicators of critical thinking ability, among others by doing habituation and consistent in training critical thinking ability.

© 2020 Tadris Ilmu Pengetahuan Alam Department, IAIN Ponorogo, Indonesia.

INTRODUCTION

The globalization era is also called the age of knowledge. In the age of knowledge, several skills must be possessed, including technological literacy and communication skills, critical thinking skills, problem solving skills, effective communication skills, and collaborating skills (Sholikah and Ismail, 2018). The globalization era has a considerable impact in various aspects of life, one of which is in the field of education.

In education, students are required to have critical thinking ability and solve problems. Critical thinking ability is an intellectual process that involves thinking analysis for the purpose of evaluating information obtained from observations, experiences, reflections, reasoning, or communication that is ultimately used to make a decision. Critical thinking

ability are also needed in people's lives, because in life in the community is always faced with problems that require resolution. Students are required to use their knowledge by practicing reasoning and developing cognitive strategies to be able to find solutions or problems faced so that their intellectuals will also improve (Kuswana, 2011). Thus, given the importance of critical thinking ability, curriculum-2013 has now been implemented as an improvement of the Tingkat Satuan Pendidikan-Curriculum. Learning in the classroom, it is expected that teachers only facilitate students in developing thought processes and encourage reflecting on their abilities (Manfaati, 2017).

In the ability to solve problems, each student has different thoughts. These different thoughts will result in students getting different conclusions or solutions. The difference is due to different learning styles. In line with slavin's opinion (2006) that each student has a different style of solving problems and when students study.

Based on different ways of learning students, students' thinking abilities also vary. It has been observed by researchers that students in solving individual questions have differences. The characteristics of different students sometimes make it difficult for teachers to convey materials. The results of interviews with teachers and principals that the demands of learning using curriculum update namely Curriculum-2013, as well as teachers of SMP Muhammadiyah 5 Tulangan Sidoarjo have trained critical thinking skills, namely by building basic skills such as considering how students can be trusted, training students to always express their opinions to take attitudes and decisions, and always build open discussions with students. It also helps students be trained and accustomed to asking for something from every information they get.

Based on different ways of learning students, students' thinking abilities also vary. It has been observed by researchers that students in solving individual questions have differences. The characteristics of different students sometimes make it difficult for teachers to convey materials. The results of interviews with teachers and principals that the demands of learning using the curriculum update namely the achievement of critical thinking skills can affect the learning process of teaching. One of the factors that influences academic success or student success in the classroom is the learning style. Tiffani's research (2015) states that learning styles affect students' critical thought processes. According to Nurbaeti (2015) shows that there is a positive or interfluencing relationship between learning styles and critical thinking skills. According to Grasha (in Urals, et al 2015) states that learning styles are personal traits that affect a student's ability to absorb information, a student's relationship with a friend and the teacher's involvement in the learning experience.

Students' learning styles are known to vary, this is important in the progress of education and its success (Deporter, 2002). When developing a student's critical thinking skills, each teacher is confronted with students who have different characteristics between each other. One of the things that teachers should pay attention to in teaching is to know their protégé, know his skills, his interests and limitations, and his learning style, so that the given and how the achievement of the subject matter can be adapted to the characteristics of his students. Thus, the student can be more motivated in learning so that it is expected that the learning results will be better.

Thus it can be said that critical thinking skills and learning styles have a connection to each other to solve problems effectively. Researchers are interested in uncovering the facts that occur about the critical thinking ability profile of secondary school students in solving of natural science subject questions based on learning style.

METHODS

The research method uses qualitative research with phenomenological approaches. The data sources in this study are primary data sources and secondary data sources (Sugiyono,

2019). The primary data source is the data source in a study that is researched to obtain data by providing tests of critical thinking ability, questionnaires, and interviews. In this study, there were 3 students with different learning styles, consisting of visual, auditorial, and kinetic learning styles. The secondary data sources are data obtained from various sources, are journals, articles, books, and so on. The data collection techniques in these researchers use tests, questionnaires, and interviews. The data analysis techniques using the Miles & Huberman model (2014), namely data reduction, data display, verification and conclusions. Checking the validity of data using triangulation techniques, namely tests, questionnaires, and interviews. According to Meleong (2016), triangulation is an examination technique of validity, in which the results of research can be accounted for, then it is necessary to check the data so that the data presented is valid or not. For the research stages there are 4 namely: (1) pre-field stage, (2) field activity stage, (3) data analysis stage, and (4) report writing stage (Arikunto, 2019).

RESULTS AND DISCUSSION

The following data will be presented:

1. Critical Thinking Ability Student's with Visual Learning Style

Table 1. Data of Visual Learning Style

Indicator	Numb. of Test	Test Score	Quest. Result	Interviews Result	Description
Interpretation	1	5	Agree	√	Credible
	2	5	Disagree	-	Not Credible
	3	1	Disagree	-	Not Credible
Analysis	4	1	Agree	-	Not Credible
	5	5	Agree	√	Credible
	6	2	Agree	-	Not Credible
Evaluation	7	3	Very Agreeable	-	Not Credible
	8	5	Agree	√	Credible
	9	2	Agree	-	Not Credible
Inference	10	3	Agree	√	Credible
	11	3	Agree	√	Credible
Explanation	12	1	Disagree	√	Credible
	13	2	Agree	-	Not Credible
	14	5	Agree	√	Credible

Based on Table 1, it can be described as follows: in interpretation indicators, students with a visual learning style are sufficiently capable of determining the information contained in the question. This is because students with a visual learning style are slightly less complete in writing the problems asked, especially the completeness of the information obtained from the question that has been given. It is according to Depoter & Mike (2001) that someone with a visual learning style sometimes loses concentration when wanting to pay attention to something. When students with a visual learning style begin to focus on the problem, sometimes they lose concentration causing some information to be left behind during the problem-solving process.

In the analysis indicator, students with visual learning styles have not been able to identify the relationship of the information contained in the problem. This is in accordance with Jaenudin (2017) saying that students with visual learning styles have not been able to identify the formulas or concepts used.

In the evaluation indicator, students with a visual learning style are quite able to explain a concept or theory on the given question. This is in accordance with Jaenudin (2017) saying that visual students give incomplete answers and incorrect answers and do not provide analogies.

In the inference indicator, students with a visual learning style are able to identify a problem in the test question and make conclusions that match the reasonable test results. It is also supported by Tiffani (2015) showing that students with a visual learning style are able to process information and store information by writing on the answer sheet.

In the exhibition indicator, students with a visual learning style are quite capable in explaining and stating the results of their thinking based on the evidence disputed. It is also supported by Tiffani (2015) that students with visual learning styles do not write down what is known according to the question. According to Zahroh (2017) stated that at this stage of understanding the problem of visual subjects is only able to read information without writing down what information it obtains.

2. Critical Thinking Ability Student's with Auditorial Learning Style

Table 2. Data of Auditorial Learning Style

Indicator	Numb. of Test	Test Score	Quest. Result	Interviews Result	Description
Interpretation	1	5	Agree	√	Credible
	2	5	Disagree	-	Not Credible
	3	1	Disagree	-	Not Credible
Analysis	4	1	Agree	-	Not Credible
	5	5	Agree	√	Credible
	6	2	Agree	-	Not Credible
Evaluation	7	3	Very Agreeable	-	Not Credible
	8	5	Agree	√	Credible
	9	2	Agree	-	Not Credible
Inference	10	3	Agree	√	Credible
	11	3	Agree	√	Credible
Explanation	12	1	Disagree	√	Credible
	13	2	Agree	-	Not Credible
	14	5	Agree	√	Credible

Based on Table 2, it can be described as follows: on interpretation indicators, students with auditorial learning styles are able to determine the information contained in the question. It is according to Depoter & Mike (2015) that someone with auditorial learning style find it difficult to write, but great at storytelling. At this stage of clarification students with auditorial learning style can mention the information obtained in the question during the interview.

In the analysis indicator, students with auditorial learning styles are sufficiently able to identify the relationship of the information contained in the question. It is in accordance with Tiffani (2015) that auditorial subjects perform inappropriate information processes resulting in incorrect end results.

In the evaluation indicator, students with auditorial learning style are quite able to explain a concept or theory on the question that has been given. It is also in accordance with Amir (2015), someone with an auditorial learning style in the critical thought process in solving problems quite able to write down what is asked of the question.

In the inference indicator, students with auditorial learning styles of students with auditorial learning styles are less able to identify a problem that exists in the test question and make conclusions that correspond to reasonable test results. This is in accordance with the results of Tiffani's research (2015) showing that students with auditorial learning styles are less able to reach the final conclusion to answer the requested question.

In the exhibition indicator, students with auditorial learning styles are less able to explain and express thought results based on the evidence processed. Zahroh (2017) says that students with auditory learning styles are slightly less able to complete plans quickly and appropriately.

3. Critical Thinking Sbility Student's with Kinesthetic Learning Style

Table 3. Data of Kinesthetic Learning Style

Indicator	Numb. of Test	Test Score	Quest. Result	Interviews Result	Description
Interpretation	1	4	Agree	√	Credible
	2	4	Agree	√	Credible
	3	1	Disagree	√	Credible
Analysis	4	2	Agree	√	Credible
	5	2	Agree	-	Not Credible
	6	1	Disagree	√	Credible
Evaluation	7	3	Disagree	-	Not Credible
	8	1	Agree	-	Not Credible
	9	1	Disagree	-	Not Credible
Inference	10	3	Agree	-	Not Credible
	11	1	Disagree	-	Not Credible
Explantion	12	1	Agree	-	Not Credible
	13	1	Agre	-	Not Credible
	14	1	Agree	-	Not Credible

Based on Table 3, it can be described as follows: in interpretation indicators, students with a kinetic learning style are slightly less able to determine the information contained in the question. This is in line with the results of Safitri's research, et al (2018) that students with kinetic learning styles seem less able to provide a simple explanation for not writing what is known.

In the analysis indicator, students with kinetic learning styles have not been able to identify the relationship of the information contained in the question. This is similar to the results of Zahroh research (2017) which stated that kinetic students are unable to sit still for a long time resulting in an inability to associate information acquisition to the form of writing.

In evaluation indicators, students with kinetic learning styles have not been able to explain a concept or theory on the given question. This is in accordance with the results of Jaenudin research (2017) said that students with kinetic learning styles have not been able to identify the formulas or concepts used.

In the inference indicator, students with a kinetic learning style have not been able to identify a problem that exists in the test question and make conclusions that correspond to reasonable test results. This is in accordance with Rosmasyiadi research results (2017) said that students with kinetic learning style are less able in terms of making final decisions.

In the indicator of explanation, students with a kinetic learning style have not been able to explain and state the results of thought based on the evidence processed. This is in accordance with the results of Amaliah's research, et al (2016) said that students with a kinesthetic learning style are less able to set strategies and provide a simple explanation because almost all answers to kinetic subjects do not write down assumptions in the question.

CONCLUSION

Based on result and discussion, critical thinking ability of secondary school student's at SMP Muhammadiyah 5 Tulangan Sidoarjo in natural science subjects based on:

1. For visual learning style the indicator achieved are interpretation, evaluation, and inference.
2. For auditory learning style the indicator achieved are interpretation, analysis, evaluation, and explanation.
3. For kinesthetic learning style the indicator achieved are interpretation and evaluation

For the next researchers are expected to conduct the research by taking the data directly so that the data is valid, because in the current study using triangulation techniques with

techniques: tests, questionnaires, and interviews researchers find it a little difficult when retrieving data because in the event of a pandemic covid-19 outbreak so that researchers by taking data online, but on test techniques, and interviews researchers take data directly / face to face, so that the phenomenon is revealed more deeply.

ACKNOWLEDGMENT (If any)

The authors thanked both parents who had provided support both materially and spiritually, guidance lecturers and thesis testers who had taken the time to provide input and advice in the research, friends of the natural science education programs of Universitas Muhammadiyah Sidoarjo as well as all the non-mentionable parties who contributed to the completion of this research.

REFERENCES

- Amaliah, N., Ningsih, F., Indriwati, S. E., & Gofur, A. (2020). Peningkatan Keterampilan Berpikir Kritis Mahasiswa Pendidikan Biologi Melalui Penerapan Model Pembelajaran Learning Cycle 7e Berbasis Lesson Study Pada Matakuliah Fisiologi Hewan Dan Manusia. *BIOMA: Jurnal Biologi dan Pembelajarannya*, 2(1), 29-36.
- AMARATUL SHOLIKHAH, A. M. E. L. I. A. (2018). PROFIL BERPIKIR KRITIS SISWA SMP DALAM MEMECAHKAN MASALAH MATEMATIKA KONTEKSTUAL DITINJAU DARI GAYA BELAJAR VAK. *MATHEdunesa*, 7(3), 518-525.
- Amir, M. F. (2015). Proses berpikir kritis siswa sekolah dasar dalam memecahkan masalah berbentuk soal cerita matematika berdasarkan gaya belajar. *JURNAL MATH EDUCATOR NUSANTARA: Wahana Publikasi Karya Tulis Ilmiah di Bidang Pendidikan Matematika*, 1(2).
- Arikunto, S. (2019). Prosedur penelitian.
- Bobbi Deporter, Mark Reardor. “*Quantum Teaching: Mempraktikkan Quantum Learning di Ruang Kelas*. (Bandung: Kaifa, 2002)., 165.
- Bobby Deporter dan Mike Hernacki. 2001. *Quantum Learning Membiasakan Belajar Nyaman dan Menyenangkan*. (Bandung: Kaifa).
- Facione, P., & Gittens, C. A. (2015). *Think critically*. Pearson.
- Jaenudin, J., Nindiasari, H., & Pamungkas, A. S. (2017). Analisis kemampuan berpikir reflektif matematis siswa ditinjau dari gaya belajar. *Prima: Jurnal Pendidikan Matematika*, 1(1), 69-82.
- Kuswana, Wowo Sunaryo. 2011. *Taksonomi Berfikir*. Bandung : PT. Remaja Rosdakarya.
- Manfaati, K. (2017). *ANALISIS KEMAMPUAN BERPIKIR KRITIS SISWA SMP DALAM PEMBELAJARAN MATEMATIKA BERDASARKAN GAYA BELAJARNYA* (Doctoral dissertation, Universitas Negeri Semarang).
- Meleong J. Lexy, Penelitian kualitatif. (Bandung : PT Remaja Rosdakarya, 2016)hal 6.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. 3rd.
- Nurbaeti, N., Nuryanti, S., & Pursitasari, I. D. (2015). Hubungan gaya belajar dengan keterampilan berpikir kritis dan kemampuan kognitif siswa pada mata pelajaran kimia di kelas x smkn 1 bungku tengah. *Mitra Sains*, 3(2), 24-33.

- Rosmaiyadi, R. (2017). Analisis Kemampuan Berpikir Kritis Matematis Siswa Dalam Learning Cycle 7e Berdasarkan Gaya Belajar. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 6(1), 12-19.
- Safitri, N. A., Maulana, A., & Damayanti, E. (2018). PENGARUH PENERAPAN STRATEGI PEMBELAJARAN QUICK ON THE DRAW TERHADAP MOTIVASI DAN HASIL BELAJAR SISWA PADA MATERI SISTEM GERAK PADA MANUSIA KELAS VIII SMP NEGERI 3 PALLANGGA. *Jurnal Biotek*, 6(1), 43-52.
- Slavin, R. E. (2006). Educational Psychology Theory and Practice Eight Edition. In *USA: Library of congress Cataloging in Publication Data*.
- Sugiyono. 2019 *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung:Alfabeta.
- Tiffani, H. (2015). *Profil proses berpikir siswa SMP dalam menyelesaikan soal perbandingan berdasarkan gaya belajar dan gaya kognitif* (Doctoral dissertation, Universitas Muhammadiyah Surakarta).
- Ural, E., O. Ercan, & M.A. Kurtulmus. 2015. The Effects of Students' Learning Style Prefences on Their Academic Achievement in Science and Technology Class. *The Journal of Academic Social Science Studies*, 2(41): 199-206. Tersedia di http://www.jasstudies.com/Makaleler/614164403_13-
- Zahroh, H. (2017). Pengembangan Model Bahan Ajar Video Kreatif Terpimpin Edukatif (KTE) untuk Pembelajaran Menulis Karya Ilmiah Sederhana Peserta Didik Kelas IX SMP Mamba'unnur Bululawang. *JINoP (Jurnal Inovasi Pembelajaran)*, 3(1), 469-482.

ARTIKEL ILMIAH_INSECTA

ORIGINALITY REPORT

0%

SIMILARITY INDEX

%

INTERNET SOURCES

%

PUBLICATIONS

%

STUDENT PAPERS

PRIMARY SOURCES

Exclude quotes On

Exclude matches < 2%

Exclude bibliography On