



Journal of Science and Technological Education, Vol. 1 No. 2, 2022
ISSN: 2830-5043 (Print) 2830-4829 (Online)

Journal of Science and Technological Education
(META)

journal homepage: www.meta.amiin.or.id

Profile of Critical Thinking Students of Class X IPA SMA Al Hikmah Banyuwangi on Virus Material

Fayzah Aristi

Kiai Haji Ahmad Siddiq State Islamic University, Indonesia
Correspondence author, fayzaharst02@gmail.com

Nanda Harisma Zulfiana

Kiai Haji Ahmad Siddiq State Islamic University, Indonesia

Salsabila Elfirida

Kiai Haji Ahmad Siddiq State Islamic University, Indonesia

Wildatus Sya'adah

Kiai Haji Ahmad Siddiq State Islamic University, Indonesia

Abstract Critical thinking is one of the higher order thinking skills (HOTS) required to make judgements and decisions in order to solve an issue in a thoughtful and sensible manner. The purpose of critical thinking is to develop a profound knowledge that enables one to comprehend the meaning of a concept and discover the significance of an event. The research method used is a qualitative descriptive research type with data obtained objectively describing the level of critical thinking of students in class X IPA SMA Al Hikmah Banyuwangi, the subject of this research is students in class X with a total of 25 odd semester students for the 2022/2023 school year with observations using 7 questions covering 5 aspects of assessment. Making inferences/conclusions received a score of 54.66 in the sufficient category, managing strategy and tactics received a score of 50.66 in the low category, giving further explanation received a score of 46.66 in the low category, giving a simple explanation received a score of 67.33 in the sufficient category, and building basic skills received a score of 76 in the high category. These findings may serve as a resource for instructors looking for new learning innovations that help increase students' critical thinking abilities via a variety of ways, one of which is problem-based learning.

Keywords: Critical thinking, Biology learning, Viruses

INTRODUCTION

In today's reform period, the capacity to think critically is vital for pupils to be able to deal with changing conditions or obstacles in an ever-changing existence. This critical thinking skill may teach pupils to make judgments thoughtfully, completely, and rationally from diverse viewpoints. As a result, education should prepare pupils to develop critical thinking abilities. Teachers must create learning opportunities (Afriza & Nasution, 2022).

The brain influences one's capacity to think. The brain is at the center of all processes, including thought. Meanwhile, teaching critical thinking skills requires right-brain movement, such as incorporating elements that can affect emotions, such as aesthetic elements, as well as a fun and exciting learning process, as a result of which the learning process becomes more effective and efficient, making students more productive. motivated to study. According to Anderson, developing critical thinking skills allows a person to seek the truth, think divergently (being open and accepting of new ideas), evaluate situations effectively, and think autonomously. According to Splitter, pupils who can think critically will base their ideas on reasons, dare to make conclusions, and stick to those decisions. Critical thinking is one of the important skills for students (Nasution et al., 2016; Harahap et al., 2019).

The purpose of critical thinking is to develop a profound knowledge that enables one to comprehend the meaning of a concept and discover the significance of an event. The critical thinking process requires openness, humility, and patience. These characteristics aid in gaining a thorough grasp. When seeking well-considered ideas founded on strong facts and clear reasoning, critical thinkers must remain open-minded at all times.

Efforts to improve pupils' critical thinking abilities, one of which is the ability to revisit information. Explain the key aspects that must be considered while solving issues before beginning the course. Another approach is to create a learning model that is better, more effective, conducive, entertaining, or different from what is often done in schools, such as by using an effective, efficient, and fascinating learning model to increase critical thinking. Students' capacity to accept and comprehend information presented by the instructor differs in the classroom. This distinction frequently has an impact on their capacity to solve challenges. It is not necessary to think critically in the same way as every other student. These variations may result in a variety of outcomes, one of which is the capacity to accept and digest information received when learning. This skill is one of the features of pupils.

METHOD

The descriptive qualitative research approach was applied. The data acquired objectively demonstrates the degree of critical thinking of students in IPA SMA Al

Hikmah Banyuwangi class X. The study subjects were 25 students from class X at IPA SMA Al Hikmah Banyuwangi in the odd semester of the 2022/2023 academic year. The sample approach used in this research was purposive sampling. The researcher picked students in class X IPA based on their critical thinking abilities, which had never been assessed in this class. The study instrument employed was a test instrument to assess pupils' critical thinking abilities. The instrument questions are provided through Google, with a total of seven viral essay questions taken from Rouf's study (2021), which has been confirmed and modified.

Table 1. Basis for Value Categorization

Score Intervals	Value Category	Category
$X > 84$	A	Very High
$68 < X \leq 84$	B	High
$53 < X \leq 68$	C	Fair
$36 < X \leq 52$	D	Low
$X \leq 36$	E	Very Low

According to Ennis, there are five critical thinking indications that are grouped into five primary activities, namely: 1) Providing basic explanations, which include: posing questions, explaining why they are asked, asking and answering questions, characterizing and challenging questions. 2) Develop fundamental abilities, such as checking the integrity of a source and observing and considering the findings of observations. 3) Concluding, which includes: creating induce or evaluate the outcomes of induction, and make and assess the worth of choices. 4) Provide further exposure by identifying assumptions. 5) Develop strategy and tactics, which include deciding on an action.

FINDINGS AND DISCUSSION

Someone's thinking skills are required while confronting life's obstacles. These cognitive abilities include the capacity to think critically, imaginatively, and problem solve (Kalelioglu & Gulbahar, 2014 in Nuryati, et al, 2018). Critical thinking is an essential talent for dealing with diverse difficulties in society and personal life. Critical thinking is self-regulation in making judgments about anything that includes not just interpreting, analyzing, evaluating, and reaching conclusions, but also taking into account evidence, ideas, methodologies, criteria, or contextual aspects that constitute the foundation of a decision (Facione, 2011 in Nuryanti, 2018). This critical thinking skill involves fundamental categorization abilities, the foundation for reaching a judgment, concluding, offering further explanations, integrating, and estimating, among other things (Nuryati et al, 2018).

The capacity to think critically is primarily impacted by hereditary factors, but it is also something that can be learnt (Novianti et al, 2022). The capacity to think critically varies from person to person, depending on the activities used to increase critical thinking abilities. As a result, critical thinking abilities must be cultivated and practiced by each person (Fakhriyah, 2014). In order to acquire critical thinking abilities or make decisions, the following characteristics or attributes are required:

(1) The capacity to form conclusions based on observation; (2) the ability to recognize estimations; (3) deductive reasoning abilities; (4) the ability to generate logical interpretations; and (5) the ability to assess which ideas are weak and which are strong (Desmita, 2009 in Istianah, 2013). Currently, the capacity to think critically is a highly significant skill since it may assure one's success in life, both in problem solving and decision making, and it also serves to build greater knowledge (Herliandry et al., 2018).

One endeavor undertaken to promote critical thinking abilities is studying biology, which may be utilized as a platform for empowering human resources, particularly in the development of critical thinking skills. Making inferences/conclusions, defining strategies and tactics, offering more explanations, providing simple explanations, and strengthening fundamental abilities are the five areas of critical thinking employed in this viral material study. The questions offered consist of seven essays that have been tailored to the components of critical thinking being assessed. With an expected period of 40 minutes, this critical thinking study was done online using a Google form directed at students of class X IPA SMA Al Hikmah Banyuwangi. Data were gathered from the test results in the form of student responses, which were then examined based on the findings and the features that had been defined. The results of the following tests are shown in the table below.

Table 2. Basis for Value Categorization

No.	Aspects of Critical Thinking	Score	Category
1.	Make inferences/conclusions	54,66	Fair
2.	Set strategy and tactics	50,66	Low
3.	Provide further explanation	46,66	Low
4.	Give a simple explanation	67,33	Fair
5.	Build basic skills	76	High

The findings of assessing the overall average students' critical thinking abilities stated in the adequate category with a value of 59.06 are shown in the table above. Each aspect is assigned a separate value. The aspect of drawing conclusions received a score of 54.66 in the sufficient category, the aspect of organizing strategy and tactics received a low score of 50.66, the aspect of providing additional explanation received a value of 46.66 in the low category, and the aspect of providing a simple explanation received a value of 67.33 in the

adequate category and a score of 76 in the high category on the fundamental skill component of constructing. The average score of critical thinking students in class X IPA SMA Al Hikmah Banyuwangi remains adequate.

In the adequate category, critical thinking produces inferences/conclusions, yielding an average score of 54.66. Making inferences/conclusions demonstrates the capacity to make, examine, and conclude the outcomes of choices made. Students are asked to explain and determine if viruses are transitional animals in the first question. Some students may come to a conclusion or identify three reasons why viruses are referred to as transitory animals. Some of the other participants could only mention two or three reasons why viruses are referred to be transitional organisms, while others provided inaccurate or unsuitable responses. This demonstrates that pupils' ability to form inferences/conclusions is adequate.

Critical thinking techniques and tactics had an average score of 50.66, indicating a poor category in aspect 2. It demonstrates students' ability to identify an action to be conducted in terms of loading techniques and tactics. In the second question, students were asked about viral material that may be communicated or propagated by numerous things that we often use. Students are expected to explain why viruses may spread or be communicated via commonly used things and to devise measures to prevent transmission. The typical student response has been unable to explain why the virus may be communicated or spread via commonly used things, as well as what precautions must be done to prevent transmission.

The findings of the investigation on aspect 3 of critical thinking explain the progression, yielding an average score of 46.66 in the poor group. The capacity to detect assumptions about the situation is an important component of providing more explanation. The third question introduces students to the life cycle of viruses, which may play a significant role in shaping the character of living organisms. Students are asked to describe which viruses are useful in daily life. The average student was unable to explain why the ZIKA virus case may spread extensively, while several individuals provided erroneous or improper responses.

In the adequate category, aspect 4 critical thinking with the element of presenting a straightforward explanation has an average rating of 67.33. The act of examining arguments, narrowing questions, asking and answering questions, and clarifying inquiries by exploring reasons to determine the true situation is a part of providing simple explanations. In the fourth and fifth questions, students discussed the ZIKA virus, which has been a global worry since WHO designated it a Public Health Emergency Concerned by the World on February 1. (PHEIC). Students were requested to provide further reasons for why ZIKA virus cases may spread extensively, even to other countries, and to offer information on the transmission of the HIV virus. Students were asked to describe how dangerous living with an HIV positive individual is. On

average, students can describe why the transmission of the ZIKA virus is possible, as well as how serious the danger is if living with someone who is HIV positive.

The findings of the most recent critical thinking study, particularly components of developing fundamental abilities, yielded an average score of 76 in the high group. The component of developing fundamental skills consists of evaluating the authenticity of sources as well as observing and evaluating the outcomes of observations. Students seek information by comprehending events connected to their experiences, linking them with sources gained, and predicting knowledge by using excellent methods of thinking, maximizing direct and indirect observations, and carefully considering the outcomes of observations. to create an opinion. In the sixth and seventh questions, students were given information about the distribution of monkeypox cases in Asia and asked to explain how to prevent the spread of the monkeypox virus. They were also given an overview of when the virus attacked their respective areas and asked to explain what steps should be taken if this occurred. On average, students are considered capable of explaining things related to the questions presented.

Students in class X IPA SMA Al Hikmah Banyuwangi are identified as adequate based on the findings of the total accumulation connected to observation via a questionnaire. However, the responsibility of the teacher as an educator is required to be more imaginative in generating learning designs that may be utilized to increase critical thinking abilities. Because the response demonstrates that the typical student provides accurate answers, but the explanation is insufficient, efforts are required to strengthen students' methods of thinking in learning. Teachers may use an Issue Based Learning method in which there is a problem that students must solve, which will develop students' thinking abilities in order to discover answers to these challenges.

CONCLUSION

The results showed that the aspect of making inferences/conclusions received a score of 54.66 in the sufficient category, the aspect of managing strategy and tactics received a score of 50.66 in the low category, the aspect of providing further explanation received a score of 46.66 in the low category, the aspect of giving a simple explanation received a score of 67.33 in the sufficient category, and the aspect of building basic skills received a score of 76 in the high category. With these findings, instructors may use them to explore for new learning innovations that might increase students' critical thinking abilities via a variety of ways, one of which is problem-based learning.

REFERENCES

Afriza, D. A., & Nasution, N. E. A. (2022). Comparison of The Learning Outcomes of Junior High School Students Utilizing Audio-Visual and Chart Learning Media

- to Study Ecosystem. *META: Journal of Science and Technological Education*, 1(1), 46–57. Retrieved from <https://meta.amiin.or.id/index.php/meta/article/view/4>.
- Fakhriyah, F. (2014). Penerapan Problem Based Learning Dalam Upaya Mengembangkan Kemampuan Berpikir Kritis Mahasiswa. *Jurnal Pendidikan IPA Indonesia*, 3(1).
- Harahap, F., Nasution, N.E.A., & Manurung, B. (2019). The Effect of Blended Learning on Student's Learning Achievement and Science Process Skills in Plant Tissue Culture Course. *International Journal of Instruction*, 12(1), 521-538. <https://doi.org/10.29333/iji.2019.12134a>.
- Herliandry, L. D., & Harjono, A. (2019). Kemampuan Berpikir Kritis Fisika Peserta Didik Kelas X Dengan Model Brain Based Learning. *Jurnal Penelitian Pendidikan IPA*, 5(1).
- Istianah, E. (2013). Meningkatkan Kemampuan Berpikir Kritis Dan Kreatif Matematik Dengan Pendekatan Model Eliciting Activities (MEAs) Pada Siswa SMA. *Infinity Journal*, 2(1), 43-54.
- Kartimi, et al. (2012). Pengembangan Alat Ukur Berpikir Kritis Pada Konsep Senyawa Hidrokarbon Untuk Siswa SMA Di Kabupaten Kuningan. Universitas Lampung, *Jurnal Pendidikan MIPA*, 24.
- Nasution, N.E.A., Harahap, F. and Manurung, B. (2016). The Effect of Blended Learning on Student's Critical Thinking Skills in Plant Tissue Culture Course. *International Journal of Science and Research (IJSR)*, 6(11), 1469-147.
- Nofianti, E., Nurhidayanti, A., Handayani, N. A., Rosana, D., & Wilujeng, I. (2022). Profil Berpikir Kritis Peserta Didik SMP pada Materi Sistem Ekskresi Manusia. *Jurnal Pendidikan Sains Indonesia*, 10(3), 479-491.
- Nuryanti, L., Zubaidah, S., & Diantoro, M. (2018). Analisis Kemampuan Berpikir Kritis Siswa SMP. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 3(2), 155-158.
- Supriyati, E., Setyawati, O. E., Purwati, D. Y., Salsabila, L. S., & Prayitno, B. A. (2018). Profil Keterampilan Berpikir Kritis Siswa Salah Satu SMA Swasta di Sragen pada Materi Sistem Reproduksi. *Bioedukasi UNS*, 11(2), 72-78.