

Analysis of Junior High School student's critical thinking skills integrated with the local potential of eremerasa nature tourism

I Suryani¹, Senam² and I Wilujeng¹

¹Science Education, Universitas Negeri Yogyakarta, Sleman, Indonesia

²Chemistry Education, Universitas Negeri Yogyakarta, Sleman, Indonesia

Corresponding author: irmasuryani.2018@student.uny.ac.id

Abstract. This study aims to determine the critical thinking skills of junior high school students integrated with the local potential of Eremerasa nature tourism. This research used survey method with samples determined by the purposive sampling technique. The research subjects were 70 students of class VIII junior high school students. The instrument used to measure students' critical thinking skills is 5 items of critical thinking skills test about the interaction of living things with the environment that is integrated with the local potential of Eremerasa natural tourism, the instruments have been developed by researchers and have been validated by experts. Data analysis was performed in quantitative descriptive percentages. The results of the analysis showed that students' critical thinking skills on indicators finding problems of 38.43%, make hypotheses of 37.30%, solve problems of 36.30%, evaluation of 38.71%, and make conclusions of 34.29%, overall the average of critical thinking skills indicators of junior high school students is 37.06%. The results of this study indicate that the critical thinking skills of junior high school students about the interaction of living things with the environment are integrated with the local potential of Eremerasa nature tourism in the low category.

Keywords: *critical thinking skills, eremerasa nature tourism, local potential*

1. Introduction

The era of globalization has quite a wide impact in various aspects of life, including demands in the administration of education. One of the real challenges is that education should be able to produce competent human resources, known as 21st century skills. 21st Century skills are the main competency that students must have to be able to take part in real life in the 21st century [1]. The quality of human resources is needed to overcome challenges in competition in the era of globalization to be competent to compete with the wider community, especially in the world of work. One of the challenges in the global competition in the 21st century requires every individual to have skills derived from them in the form of hard skills and soft skills.

There are 18 kinds of 21st-century skills that need to be given to every individual, one of which is learning and innovation skills in which there are 4 aspects, that is critical thinking, communication, collaboration and creativity [2]. Learning and innovation skills 4Cs can be mastered by the nation's next-generation through education, which is the main alternative in preparing the next generation who are ready and competent to compete in the 21st century, so improving the quality of education is



needed to face challenges and competition in the rapidly developing globalization era. One of the roles of the government in improving the quality of education is to improve and perfect the applicable education curriculum.

In accordance with the demands of the 2013 curriculum, science learning is learned in an integrated manner meaning it is not separated between physics, biology, and chemistry [3]. Integrated learning in science material can be packaged with a theme, discussed according to various disciplines not just from one perspective. Science learning activities in Junior High School (JHS) are essentially a way to find out about nature systematically, so that science learning is not only about knowledge in the form of facts, concepts or principles but also is a process of discovery in the daily lives of students. Integrated science learning with local potential is one of the valuable assets in learning because it is nearby to the daily lives of students so that the learning and teaching process of science becomes more meaningful. Local potential should be utilized to support the decentralization of education. The local potential is a characteristic of the region that discusses aspects of the economy, culture, information, and communication technology and ecological aspects developed from the potential of the region [4]. Therefore, students are approved to be able to find their own concepts that are fully learned (holistic), approved, verified and active. Science learning is directed at creating an active, critical, analytical, and creative atmosphere in problem-solving using critical thinking skills [5].

Critical thinking skills help students prepare for a complex global society [6] to be able to compete globally in facing 21st-century challenges [7]. This causes critical thinking skills to become a priority in educational goals [8] and be considered to be developed in a new basic curriculum [9]. Critical thinking refers to higher-order thinking [10], [11] with high order thinking skills that are essential for absorbing knowledge and performance, students will become effective communicators, dynamic and critical thinking, able problem solving, and become career experts [6]. Critical thinking skills are seen as an intellectual process of application, analysis, synthesis, conceptualization and evaluation of information. The information collected through observation, experience, reflection, reasoning and communication, which are discovered by means of actions based on universal intellectual values such as clarity, precision, consistency, relevance and justice [12]. All of these are found as elements of thought that are implied in all types of judgments, problems, concepts, conclusions, implications and consequences [13]. Critical thinking skills can also be said as a person's ability to distinguish between facts and opinions so that they can draw correct conclusions [14], so critical thinking is seen as a process of independent judgment, an interactive and reflective reasoning process [13].

Characteristics of critical thinking consist of active, free, open-minded, consider the evidence, and organization [15]. In addition, critical thinking skills are characterized by rational and high order thinking skills such as analysis, synthesis, problem recognition and problem-solving, conclusions and evaluations [11]. Critical thinking skills component consists of (1) gathering and searching for information; (2) questioning and refuting; (3) analyzing, concluding and making conclusions; and (4) problem solving and applying theories [16] therefore, critical thinking skills must be instilled and developed starting from the first step up to education (elementary school) to secondary school [17], [18] [19] and even to collage, in order to have a critical perspective on social, individual, and cultural events [20].

2. Research method

This research is a qualitative descriptive study used to determine the value of independent variables without making comparisons or relating to other variables. This study uses a survey method with samples determined by purposive sampling technique. The research subjects of the study were 70 students of class VIII Junior High School 2019/2020. The instrument used a question of critical thinking skills about the interaction of living things with the environment that integrated the local potential of Eremerasa natural tourism. The instruments consist of 5 items developed based on 5 indicators of critical thinking skills consisting of indicators finding problems, determined a hypothesis, solve the problem, evaluating, and making conclusions, then validated by experts. Assessment results of analysis students' critical thinking skills test are obtained from the students' answers using an

assessment rubric for each question item then categorized. Critical thinking skills scores obtained by students are then converted to percentage form using the formula:

$$X^- = \frac{\Sigma X}{n} \times 100\%$$

where X^- = expected percentage value, ΣX = raw value obtained, dan n = maximum score. The percentage of students' critical thinking skills analysis results are converted into categories [21] according in table 1.

Table 1. Assessment limitation criteria.

Score limit (%)	Criteria
0 – 20	Very Low
21 – 40	Low
41 – 60	Medium
61 – 80	High
81 – 100	Very High

3. Result and Discussion

The research was conducted to analyze students' critical thinking skills about the interaction of living things with their environment integrated the local potential of Eremerasa natural tourism. The local potential is the specific resources possessed by an area including natural, human, technological and cultural resources [22], [23] to be able recognize local potential in learning, teachers must have a sensitivity to the symptoms that appear in the environment (nature) self-sensitivity must be trained because it is important and complex, but because it is not accustomed to paying attention to the natural surroundings, so most teachers are less aware that nature provides all the problems that can be used in learning through the symptoms that arise, for example about the interaction of living things with their environment.

Critical thinking skills of students in this study are based on 5 indicators, finding a problem, determined a hypothesis, solve the problem, evaluating and making conclusions. Questions used to measure students' critical thinking skills in the form of essays consisting of 5 items, which are answered based on the concept of the local potential of Eremerasa natural tourism. The item represents each indicator of students' critical thinking skills. Characteristics of learning that promote critical thinking skills, namely: increasing interaction between students as students, asking questions open-ended, give adequate time to students to reflect on questions and teaching for transfer [24].

The result of the analysis data of students' critical thinking skills test about the interaction of living things with their environment integrated the local potential of Eremerasa natural tourism can be seen in Figure 1.

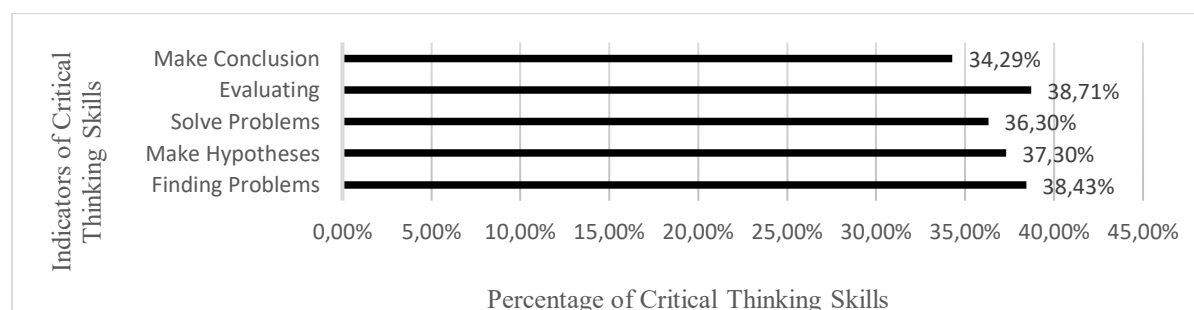


Figure 1. Chart result of the analysis of students' critical thinking skills tests about the interaction of living things with their environment integrated the local potential of Eremerasa natural tourism.

Figure 1 shows the students' critical thinking skills on the first indicator, which is finding problems by 38.43%, this shows that the students' skills in finding problems based on the science concept integrated with Eremerasa nature tourism are still in the low category. That can be seen from the answers of students who still do not understand the concepts presented so that students have difficulty in determining the problem. Critical thinking skills on indicators make hypotheses are still in the lower category, this can be seen from the percentage of students' answers to the indicators determining hypotheses obtained by 37.30%, from the results it can be seen that students have difficulty in making hypotheses based on the concepts that have been described.

The percentage of students' answers to indicator solve problems by 36.30%. This shows that the students' skill to solve problems based on investigation or research is still in the low category. Students cannot analyze problems correctly because they do not find relationships between concepts that can be used in problems solving. Critical thinking is related to the ability to make decisions in complex situations or find solutions to weakly structured problems [25]. Critical thinking skills on indicators of evaluating obtain the percentage of 38.71% shows that the ability of students to evaluate based on relevant sources to be able to connect the cause and effect of a problem is still low. The students' skills are also still lacking in identifying or quickly rejecting-accepting strong and relevant opinions. There are still many students who are wrong in completing tests about problems and difficulties working on them, so students cannot evaluate the problems exactly if students cannot reproduce the statement to conclude. The evaluation aspect is used to assess the credibility of questions or other presentations by assessing or describing preparation, experiences, situations, decisions, beliefs, and assesses the logical power of expected inferential relationships or actual inferential relationships between statements, descriptions, questions or representation of others [26].

The percentage of students' answers on the indicator of making a conclusion of 34.29% shows that the students' skills in making conclusions based on information that has been obtained are still in the low category. Student answers indicate that students' skills in making conclusions are still limited to basic conclusions. Students are still less able to explore deeper conclusions based on the results that have been observed and analyzed in the learning process. There are several things that significantly influence one's critical thinking skills including metacognition skills [27], [10] selection of the type of content or assignments given by the teacher, the interaction between learning models and students' academic abilities [28], [29]. Based on the results of the study, the average test of students' critical thinking skills for all indicators obtains percentage by 37.006%, it can be seen that critical thinking skills of indicators finding problems, make hypotheses, solve problems, evaluating and make conclusions of students in the low category. This shows that each indicator of critical thinking skills is not fulfilled because students are less able to solve problems that are explained based on scientific concepts about the interaction of living things with their environment integrated with the local potential of Eremerasa natural tourism.

Educators can develop instructional pedagogics with learning activities that encourage critical thinking skills [18], but to encourage students' critical thinking, not only the structural arrangements of different studies such as working with small groups and the more dominant role of the teacher but also require different focus in terms of knowledge transfer oriented to the communication perspective [30]. There are several studies that mention that a person's critical thinking skills can be developed by applying methods or discussion activities [31], [32] applying approach SWH [33] inquiry-based learning [34], [36] environment based learning [7], [36], [37] and cooperative learning [38] by use the technology facilities that have developed rapidly in the form of e-learning teaching materials such as e-modules, web-based simulations [39], [40]. Critical thinking skills students' can be measured using a number of assessment instruments such as the Higher Order Thinking Multiple Choice Test [41] Portfolio Based Assessment Multiple Intelligence [42].

4. Conclusion

Based on the results of the study it can be concluded that the students' critical thinking skills about the interaction of living creatures with their environment integrated the local potential of Eremerasa

natural tourism is still in the low category. Lack of understanding of students of the learning material causes students' critical thinking skills not to develop. As educators, teachers are expected to create a learning process that can train students' critical thinking skills to achieve every indicator of critical thinking skills to the maximum, so that students' critical thinking skills can be improved to be able to challenges confront and competition in the rapidly developing globalization era in 21st-century

References

- [1] Wijaya E Y, Sudjimat D A, Nyoto A and Malan U N 2016 *Proc. Seminar Nasional Matematika (Malang)* vol 1 (Malang: Universitas Kanjuruhan Malang) p 263.
- [2] National Education Association 2002 *21st Century Skills* (U.S: Deel Press) pp 3.
- [3] Kemendikbud 2013 *Buku peserta didik IPA SMP kelas 7 semester 2* (Jakarta: Pusat Kurikulum dan Perbukuan, Balitbang) pp iii.
- [4] Prasetyo Z K 2013 *Konsep Dasar Pendidikan IPA* (Yogyakarta: Universitas Negeri Yogyakarta) pp 14 – 20.
- [5] Sudarisman S and Studi P 2015 *Jurnal Florea* **2** 29.
- [6] Zivkovic S 2016 *Proc. Int. Conf. on Teaching and Learning English as an Additional Language (Antalya)* vol 232 (Amsterdam: Elsevier) p 102.
<http://dx.doi.org/10.1016/j.sbspro.2016.10.034>
- [7] Anisa A 2017 *JUPI* **3** 9 <http://dx.doi.org/10.21831/jupi.v3i1.8607>
- [8] Utami B, Saputro S, Ashadi, Masykuri M and Widoretno S 2017 *International Journal of Science and Applied Science: Conference Series* **2** 124.
<http://doi.org/10.20961/ijsascs.v1i2.5134>
- [9] Bahatheg R O 2019 *International Education Studies* **12** 221.
<https://doi.org/10.5539/ies.v12n4p217>
- [10] Akkaya N 2012 *Proc. CY-ICER (Northern Cyprus)* vol 47 (Amsterdam: Elsevier) p 797.
<http://doi.org/10.1016/j.sbspro.2012.06.737>
- [11] Balencina R R, and Ocampo J M 2018 *EDUCARE: International Journal for Educational Studies* **10** 109.
- [12] Dinuta N 2015 *Proc. Int. Conf. Edu World (Pitesti)* vol 180 (Amsterdam: Elsevier) p 789.
<http://dx.doi.org/10.1016/j.sbspro.2015.02.205>
- [13] Yuldirim B and Ozkahraman S 2011 *International Journal of Humanities and Social Science* **1** 256
- [14] Rahimi A and Sajed M A 2014 *Proc. LINELT (Antalya)* vol 136 (Amsterdam: Elsevier) 43.
<http://dx.doi.org/10.1016/j.sbspro.2014.05.284>
- [15] Azar A 2009 *Journal of Turkish Science Education* **7** 68 - 9
- [16] Chan Z C Y 2013 *Nurse Education Today* **33** 240 <http://dx.doi.org/10.1016/j.nedt.2013.01.007>
- [17] Kirmizi F Z, Saygi C and Yurdakal I H 2015 *Proc. WCES (Malta)* vol 191 (Amsterdam: Elsevier) p 660. <http://dx.doi.org/10.1016/j.sbspro.2015.04.719>
- [18] Sarigoz O 2012 *Proc. WCES (Barcelona)* vol 46 (Amsterdam: Elsevier) p 5319.
<http://dx.doi.org/10.1016/j.sbspro.2012.06.430>
- [19] Haseli Z and Rezaii F 2013 *European Online Journal of Natural and Social Sciences* **2** 174
- [20] Cascio T V 2017 *Journal Society for the teaching of psychology* **44** 4.
<http://doi.org/10.1177/0098628317712753>
- [21] Mardapi D 2008 *Teknik penyusunan instrument tes dan non tes* (Yogyakarta: Mitra Cendekia) pp 88.
- [22] Sarah S and Maryono 2014 *Jurnal Pendidikan IPA* **2** 37
<http://doi.org/10.26714/jps.2.1.2014.36-42>
- [23] Widowati A 2012 *Optimalisasi Potensi Lokal Sekolah dalam Pembelajaran Biologi Berbasis Konstruktivisme* (Universitas Negeri Yogyakarta: Yogyakarta) pp 1.
- [24] Suharti, Bintari S H, and Sumadi 2016 *Pengembangan modul integrated lan work pada materi archaeobacteria dan eubacteria untuk menumbuhkan kemampuan berpikir kritis* (Semarang:

- Fakultas MIPA Universitas Negeri Semarang) pp 209.
- [25] Taber K S 2013 *Modeling students and learning in Science Education: developing representation of concepts, conceptual structure and conceptual change to inform teaching and research* (New York: Springer) pp 156.
 - [26] Facione P A 2011 *Critical Thinking: What is and why it counts* (San Jose: Insight Assessment) pp 6.
 - [27] Samsudin D and Hardini T I 2019 *International Journal of Education* **11** 122. <http://doi.org/10.17509/ije.v11i2.14750>
 - [28] Maricca S and Spijunovicb K 2015 *Proc. Int. Conf. Edu World (Pitesti)* vol 180 (Amsterdam: Elsevier) p 658. <http://dx.doi.org/10.1016/j.sbspro.2015.02.174>
 - [29] Mahanal S, Zubaidah S, Sumiati I K , Sari T M and Ismirawati N 2019 *International Journal of Instruction* **12** 428 <https://doi.org/10.29333/iji.2019.12227a>
 - [30] Gojkob G, Stojanović A and Rajić A G 2015 *Proc. WCES (Malta)* vol 191 (Amsterdam: Elsevier) p 959. <http://doi.org/10.1016/j.sbspro.2015.04.501>
 - [31] Duran M and Dokme I 2016 *Eurasia Journal of Mathematics, Science & Technology Education* **12** 2887 <http://doi.org/10.12973/eurasia.2016.02311a>
 - [32] Burderl R L, Tangalakis K, and Haryciw D H 2014 *Journal of Curriculum and Teaching* **3** 1. <http://dx.doi.org/10.5430/jct.v3n1p1>
 - [33] Hand B, Shelley M C, Fostvedt M L L and Therrien W 2018 *Science Education* **2** 1-14 <https://doi.org/10.1002/sce.21341>
 - [34] Uswatun D A and Rohaeti E 2015 *Jurnal Inovasi Pendidikan IPA* **1** 149 <http://doi.org/10.21831/jpii.v1i2.7498>
 - [35] Firdaus M and Wilujeng I 2018 *Jurnal Inovasi Pendidikan IPA* **4** 38. <http://dx.doi.org/10.21831/jipi.v4i1.5574>
 - [36] Arslan S 2012 *Proc. Int. Conf. on New Horizons in Education (Prague)* vol 55 (Amsterdam: Elsevier) p 907. <http://dx.doi.org/10.1016/j.sbspro.2012.09.579>
 - [37] Dewi I P M, Suryadarma I G P, Wilujeng I and Wahyuningsih S 2017 *JPPI*. **6** 108. <http://doi.org/10.15294/jpii.v6i1.9598>
 - [38] Khoiri A and Supriyanti 2017 *Jurnal Pendidikan IPA* **1** 62. <http://doi.org/10.21070/sej.v1i2.1183>
 - [39] Suarsana I M and Mahayukti G A 2013 *Jurnal Pendidikan Indonesia* **2** 274. <http://dx.doi.org/10.23887/jpi-undiksha.v2i2.2171>
 - [40] Hagparast M, Nasaruddin F H, Abdullah N 2014 *Proc. ICIMTR (Malaysia)* vol 129 (Amsterdam: Elsevier) 534 <http://dx.doi.org/10.1016/j.sbspro.2014.03.710>
 - [41] Hartini and Sukardjo 2015 *JUPI*. **1** 99 <http://doi.org/10.21831/jipi.v1i1.4535>
 - [42] Mediakartika N, Aznam N 2018 *JUPI*. **4** 61. <http://dx.doi.org/10.21831/jipi.v4i1.9973>

Acknowledgment

The researcher would like to thank Yogyakarta State University and MTsN Bantaeng for the research allowed so that the researcher can make an article; the teachers and students involved in this study. Researchers hope this research will be useful for readers and can be used as a challenge for further research