Analysis Student's Critical Thinking Ability through the Application of the RADEC Model in Elementary School

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Abstract. Critical thinking skills in students are a challenge that must be faced in the 21st century. In line with that, the government and education practitioners develop innovative learning to anticipate the needs and problems in the 21st century, the RADEC learning model can improve the quality of learning processes and outcomes that can encourage students to active, productive, and have critical thinking skills, this study aims to illustrate whether the RADEC learning model can improve the critical thinking skills of 5th graders at SDN Sukatinggal Kab Bandung, as many as 21 people. Data were analyzed using the qualitative descriptive method. Based on data analysis, the average critical thinking skill of students is 75.25%, in the high category, the interpretation aspect of 70.25% is in the medium category, the analytical aspect of 75.25% is in the high category, the input aspect is 80.00 % is in the high category, the evaluation aspect is 71.25% is in the high category, the explanation aspect is 73.20% is in the high category, and finally, the regulatory aspect is 80.25% is in the high category. The results of this study provide an overview of how the RADEC learning model can be used as a learning model that can improve the critical thinking skills of students at SDN Sukatinggal, Bandung Regency.

Keywords: Analysis, Critical Thinking, RADEC Model.

INTRODUCTION ~ Information and communication technology is very developed and changes human lifestyles, in work, social life, playing activities and in the learning and teaching process. Technological advances in the 21st century affect all aspects of life, one of which is in the field of education. So the teaching and learning abilities of educators and students must be adapted to developments in the 21st century. In life that is entering the age of knowledge in today's information age, students and teachers must be able to face opportunities and challenges (Abidin, 2014), 21st century learning is known and developed by various countries and emphasizes the competence of students and has the ability to reason logically as well as analytically, the pedagogy focuses on developing creativity. These competencies are to deal with and solve problems that arise due to local, national and global environmental influences (Nana & Neni, 2020). There are 7 types of life skills needed in the 21st Century, namely (1) being able to think critically and solving problems, (2) being able to lead and working together (3) dexterity and adaptability (4) being able to take the initiative and have the spirit of an entrepreneur, (5) able to communicate effectively, (6) able to make access to and investigate information, (7) have curiosity and imagination (Wagner in Triling & Fadel, 2009), A different view was put forward by Frydenberg & Andone (2011), that in In the 21st century, every human being must have several skills including digital literacy knowledge and skills, critical thinking, media and information literacy skills and being able

to master ICT (information and communication technology).

It is even more complex to face the 21st century stated by the US-based Apollo Education Group, which identifies the skills needed in the 21st century to do work, namely being able to communicate, be able to work together, adapt well, critical thinking skills, the ability to produce something. and responsible, innovative, being a global citizen, the ability to do business, and the ability to access, synthesize information and investigate information (Zakiah & Lestari, 2019). This is in line with the strengthening of character education implemented in Indonesia, regarding the Pancasila Student Profile that students want to achieve, namely: (1) Faith and Taqwa to God Almighty and with noble character, (2) Global diversity, (3) Independent, (4) Critical Reasoning, (5) Creative, (6) Mutual Cooperation (*Https://Cerdasberkarakter.Kemdikbud.Go.Id/Profil Pelajar Pancasila*, 2021).

From the four views stated above, it can be concluded that the necessities of life in the 21st century are that a person must have critical thinking skills. So that in the world of education, critical thinking skills are a necessity for students and educators in learning who can develop students' thinking skills. However, the reality on the ground does not show life skills in the 21st century programmed by the government. This is based on the 2018 PISA (Program for International Student Assessment) report, Indonesia is ranked 72 out of 77 countries in reading scores, math scores is ranked 72 out of 78 countries, and science scores is ranked 70 out of 78 countries. The three scores were compactly decreased from the 2015 PISA test. At that time, Indonesia's reading score was ranked 65, the science score was ranked 64, and the mathematics score was ranked 66. This means that learning in Indonesia is still at the low-ability level. and there is a decrease when viewed from the cognitive aspect (knowing, applying, and reasoning).

The conclusion from the results of the study is that the thinking ability of Indonesian students is still in the low category. One of the reasons is the learning process that has not developed the aspects tested in the comparative study test. The learning can be seen from a teacher who uses the lecture method. As a result, students who study in the 21st century still experience the learning process in the same way as students in the previous century. In fact, various innovative learning models have been created to anticipate the needs and problems of the 21st century, these learning models include the Inquiry learning model, Project Based Learning (PjBL), and problem based learning (PBL). This innovative learning model has been tested in various studies and has proven to be a solution to the problem of higher order thinking skills in the 21st century. However, in the context of the field, this innovative learning model does not necessarily improve the quality of education in Indonesia today. This is because it is very likely that teachers in the field have problems implementing these innovative learning models so that it can be said that there are problems in educational practice in Indonesia (Sopandi, 2019).

In general, learning only focuses on the cognitive development of students, namely the ability to "remember" (C1). According to Bloom (in Hestiningsih & Sugiharsono, 2015), that "remembering" is the lowest level in the level of thinking

development. There are 6 levels of knowledge according to Bloom including (C1) knowledge, (C2) understanding, (C3) application, (C4) analysis, (C5) synthesis, and (C6) evaluation. Learning will be more meaningful if higher order thinking skills are trained, because in addition to remembering facts, it also trains children's ability to understand, analyze, synthesize, and evaluate.

Problem solving skills are indispensable in everyday life. Meanwhile, in problem solving one needs the ability to think critically. By providing critical thinking exercises in learning, it is hoped that students can face their lives with critical thinking.

For this reason, teachers need to train students' critical thinking skills in the learning process. According to Lipman (Hestiningsih & Sugiharsono, 2015), thinking skills consist of the ability to think critically, think creatively, and care. So we need appropriate learning methods in training students in critical and creative thinking to find knowledge. Several preliminary studies have shown that the Read-Answer-Discuss-Explain-And-Create learning model which is abbreviated as RADEC can improve the quality of learning processes and outcomes in situations and conditions in Indonesia. The successful implementation of this learning model is still in a limited

scope, testing is still needed in a wider scope and at various levels of education. However, these tests can only be carried out when teachers already know and have the ability and willingness to implement the RADEC learning model for learning in schools. With the selection of the right method is expected to provide a successful and meaningful learning process.

In this study the researchers used questions that had been developed referring to the indicators of critical thinking skills from Fasciona and also considered the number of studies that had used indicators according to Fasciona including the study of Zhou, Huang and Tian (2013) "Developing Students' Critical Thinking Skills by Task-Based Learning in Chemistry Experiment Teaching, Fitriyani, Supriatna, Sari (2020) "Critical Thinking Skills Through Problem Based Learning Model", Hestiningtias, Sugiharsono, (2015) "Improving Students' Critical Thinking Ability in Social Studies Learning Through Problem Solving Methods Assisted by Information Media" , Suilowati, Sajidan, Murni (2017), "Analysis of Critical Thinking Skills of State Madrasah Aliyah Students in Magetan Regency" The six indicators of critical thinking skills developed by Fasciona are as shown in the table:

Table 1. Core Skills and Sub-Skills of Critical Thinking

Number	Skills	Sub-Skills	Description
1.	Interpretation	Categorization Coding Clarification of meaning	Understanding and Expressing the meaning or meaning of various experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria, which are broad.
2.	Analysis	Review of Ideas Argument	Identify inferential relationships between statements, statements, concepts,

No.			descriptions, data or other forms of representation intended to express.
3.	Evaluation	Assessing Claims Judging arguments	Assessing Credibility, statements or representations that provide an explanation or description of a person's perceptions, experiences, situations, considerations, beliefs, or opinions and to assess the logical strength of actual or intended inferential relationships including statements or other forms of representation.
4.	Inference	Questioning the evidence Guess the alternative Draw a conclusion	Identify and define the elements needed to draw reasonable conclusions, formulate assumptions and hypotheses, consider relevant information and derive consequences that flow from data, reports, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions or other forms of representation.
5.	Explanation	Declare results Giving Procedure Presenting Arguments Self correction	Stating the results of reasoning, justifying the reasoning based on considerations of evidence, concepts, methodology, criteria and context, presenting reasoning in the form of convincing arguments.
6.	Self Setting	Self-assessment Self correction	Consciousness helps one's own cognitive activities, the elements involved in these activities, the results obtained, especially by applying self-analyzing and self-evaluating skills.

Previous research on the RADEC model was conducted by Wahyu Sopandi, Yoga Adi Pratama, Hany Handayani. Research conducted on 92 teachers (SD, SMP, SMA) from a number of cities in West Java, that (1) the syntax of the RADEC learning model is easy to remember and understand; (2) the RADEC learning model can train 21st century skills; and (3) they are interested in researching the implementation of the RADEC learning model, there are five steps that are emphasized in the implementation of the RADEC model learning proposed by Sopandi (2017), namely Read (Read), Answer (Answer), Discuss (Discussion), Explain (Explain) , and Create. This research is an initial observational research. This study aims to analyze students' critical thinking skills and mastery of concepts through the RADEC model at the Sukatinggal State Elementary School, Bandung Regency. After obtaining the initial research results, it is hoped that the application of the RADEC model in learning can

empower students' critical thinking skills so that students' critical thinking skills and mastery of concepts increase.

METHOD

This research is a descriptive research with a qualitative approach. This study intends to describe students' conceptual understanding and critical thinking skills using the RADEC model and this is in line with Nazir's opinion (2005:55) that descriptive research aims to create a description of situations or events so that they wish to carry out mere accumulation of basic data. Qualitative research is a research that is intended to understand the phenomenon of what is experienced by research subjects, holistically by means of descriptions in the form of words and language in a special natural context by utilizing various scientific methods (Maleong, 2013:6). Descriptive research is research that describes what it is about a variable, symptom or situation (Arikunto, 2000:309).

The sample in this study was grade 5 students at SDN Sukatinggal Kab. Bandung Research procedures in this study include conducting preliminary activities, compiling tests of critical thinking questions, collecting data, analyzing data, and drawing conclusions. The instruments used to obtain, process, and analyze the data are tests of students'

critical thinking skills and test assessment rubrics. In qualitative research, researchers can act as planners, collectors, analyzers, interpreters and finally report the results of research. In accordance with the opinion of Maleong (2001:4) which states that in qualitative research, researchers alone or with the help of others are the main data collection tools.

In this study, test questions were used which consisted of 3 essay questions that were adjusted to six critical thinking indicators and distributed them to 21 students in class 5 SDN Sukatinggal. In addition to the test questions used, the test assessment rubric is also prepared based on the sub-skills developed by the researcher according to the indicators of critical thinking ability. Based on the rubric, researchers can determine whether students meet each of the indicators of critical thinking ability or not in solving the problems contained in the questions. The method for calculating the percentage value is as follows:

Percentage value $= \frac{\text{Earning Score}}{\text{Maximum Score}} \times 100\%$

The percentage value of critical thinking skills obtained from the calculation is then categorized according to the table.2

**Table 2** Percentage Categories of Critical Thinking Skills

Interpretation (%)	Category
81,25 < X ≤ 100	Very high
71,50 < X ≤ 81,25	High
62,50 < X ≤ 71,50	Currently
43,75 < X ≤ 62,50	Low
0 < X ≤ 43,75	Very Low

Adaptation (Susilowati, 2017)

RESULT AND DISCUSSION

Based on the results of the test analysis, data obtained that the average critical thinking ability of students using the RADEC model is high. The data obtained by the students' critical thinking skills at .

SDN Sukatinggal in Bandung Regency were obtained from the results of students' work on the test questions used. The average results of each aspect of the students' critical thinking indicators are as shown in picture 1
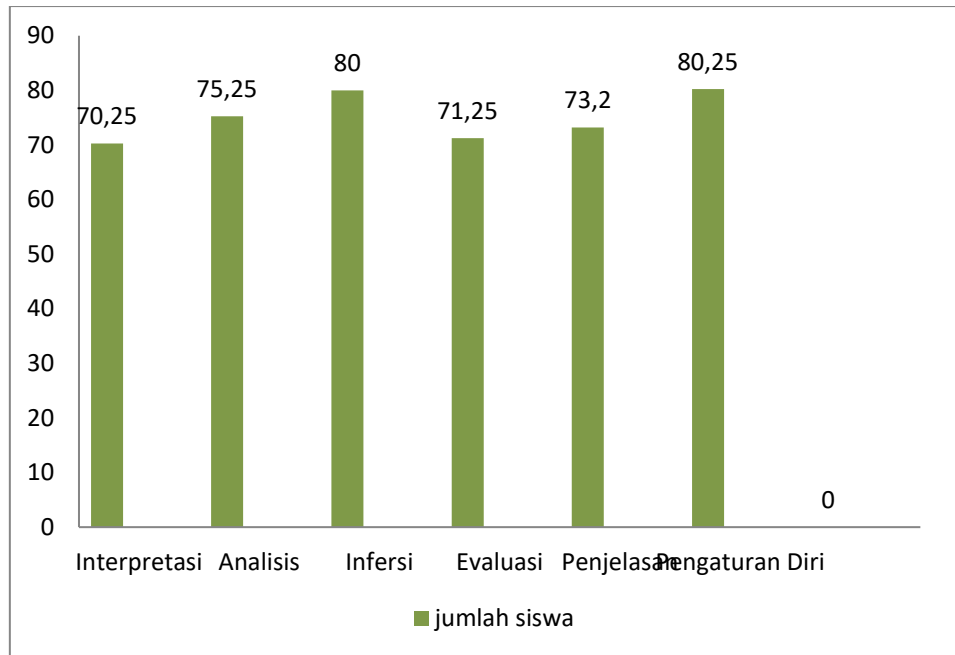
Picture 1 Percentage of Students' Critical Thinking Skills Achievement Using the RADEC Model

Results The average percentage of students' critical thinking skills of 75.03% belongs to the High category. The percentage of the interpretation aspect of 70.25% is in the medium category, 75.25% of the analytical aspect is in the High category, the inpersion aspect of 80.0% is in the high category, the evaluation aspect of 71.25% is in the high category, the explanation aspect 73.20% is in the high category, and finally the regulatory aspect is 80.25% is in the high category. Here are some questions and answers of some students and their analysis.

Picture 2 questions and answers of one student no.1

In that picture it can be seen that students are able to answer questions, are able to interpret complete and correct answer problems in categorizing the types of waste into the right groups. Based on the results of interviews, students find it helpful in taking answers through the Google application. The same thing applies to students' answers to questions 2 and 3.

Picture 3 question and answer of one of the students no.4

The picture shows the students' answers to question number 4, namely identifying and establishing the elements needed to draw reasonable conclusions, formulate conjectures and hypotheses; consider relevant information and derive consequences that flow from data, reports, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions or other forms of representation. In these answers, students are able to identify the correct

answer, formulate conjectures and hypotheses, and can determine the

elements needed to draw reasonable conclusions.

Picture 4 question and answer of one of the students number 5

In that picture 4 shows the answer to question number 5, which is about explaining, stating the results of reasoning, justifying the reasoning based on considerations of evidence, concepts, methodology, criteria and context; Presenting reasoning in the form of convincing arguments. students are able to justify reasoning and consideration of evidence, concepts / methodologies, present reasoning in the form of arguments. Students can explain in outline and convincing arguments that the same thing also happened to student answer number 6. Where students are aware of helping their own cognitive activities, the elements involved in these activities, the results obtained, especially by applying skills. -skills to analyze and evaluate oneself and several factors such as habits and the ability of infrastructure to meet them.

If you pay attention to the questions given, they are relatively not because they are related to the problems raised which

are problems in students' daily lives. Based on interviews with students, it is known that 70% of students are enthusiastic in the learning that is carried out, the material is not easy to forget and learning can be applied in students' daily lives both in the family school environment and the environment around students.

CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that critical thinking skills through the RADEC model of SDN Sukatinggal students in Bandung Regency are classified as successful. This is indicated by the test results of students' critical thinking skills. henceforth it can be tried at all levels, both elementary level 1 – grade 3 and high level grade 4 – grade 6. The results of this study can provide information to students, teachers and the school so that teachers are expected to be able to present learning activities that can empower thinking skills. student critical.

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