



Thematic Learning Analysis *Selalu Berhemat Energi* in Grade IV Students Viewed from Critical Thinking Skills

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Abstract. Content of Natural Science (Indonesian: Ilmu Pengetahuan Alam, thereafter called IPA) always involves invention process in the attempt of mastering its knowledge concept. Therefore, IPA learning outcome is inseparable from students' critical thinking skill dimension. It is this critical thinking skill that decides students' understanding on the concept of surrounding natural science surrounding. This research aims to analyze thematic learning of "always saving energy". The research method used was descriptive qualitative one. Techniques of collecting data employed were test, documentation, and interview. Data validation was carried out using source, method, and theory triangulations. Milles & Huberman's interactive analysis technique was used to analyze the data of research. The result of research shows that firstly, thematic learning of "always saving energy" in the fourth graders in this school has not met the indicator of critical thinking skill and thereby affects the achievement of learning outcome. Secondly, 67% of teachers have not ever used digital technology in material delivery. Although 33% of learning is carried out using digital technology, thematic learning of "always saving energy" does not get full attention and has not met the indicator of students' critical thinking skill. Further researches should be conducted on deciding innovation in thematic learning considered effective particularly in the theme of "selalu berhemat energi".

Keywords: Critical thinking, natural science, thematic learning

1 Introduction

Education in Indonesia is always attempted to create smart generation with adequate supply to face the time's challenges. Through Ministry of Education and Culture, education system in Indonesia has changed considerably. It is intended merely to be the manifestation of evaluation and correction over previous curriculum. Moreover, the learning challenge becomes more obvious in 21st century. Akbay revealed that in the 21st-Century learning students are expected to have high self management, self control, independent learning, and collaborative ability abilities [1].

In facing this 21st-learning, Indonesia applies the curriculum of 2013 based on integrated thematic learning for elementary school. This thematic learning integrates

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attitude (affective), knowledge (cognitive), and skill (psychomotor) aspects of various subjects connected to each other in order to strengthen the students' ability of connecting subject to surrounding environment [2]. Thematic learning also encourages the students to learn independently and actively in the process of inventing and acquiring knowledge [3]. Therefore, thematic learning involves high-order thinking skill, such as critical thinking skill.

Considering the elaboration above, thematic learning emphasizes students' critical thinking skill in acquiring knowledge and skill. Sundahry, Fitria, and Rakimahwati said that critical thinking is a problem solving skill with critical characteristic and talent, curiosity and courage to take risk in the processes of finding, acquiring, evaluating, analyzing, balancing, and conceptualizing information as the guidance for self-development [4]. Thus, critical thinking skill is not the one easily acquired by an individual, as it involves an individual's ability of processing any thing. Therefore, thematic learning implemented in elementary school should emphasize critical thinking skill. Moreover, elementary school students have concrete operational characteristics and therefore they have been able to think scientifically, either deductively or inductively [5]. Thus, thematic learning applied should contain components in such way that the students can acquire critical thinking skill.

Thematic learning in elementary school consists of various themes in one school year, in both lower and higher grades. The author took thematic learning of always saving energy as the material of analytical study because this theme emphasizes students' scientific attitude, particularly in Natural Science (IPA) learning. As known, Indonesia has faced crisis endangering human safety since a long time ago. The threat is non-military one, energy crisis [6]. Hence, environmental education should be emphasized earlier necessarily, one way of which is through the learning in elementary school, thematic learning of always saving energy. This theme is developed to enable the students to have scientific attitude and critical thinking skill in dealing with energy crisis, in order to be able to face this energy crisis wisely. The inculcation of scientific attitude and basic skill is reflected on Natural Science learning content. Although thematic learning packages a variety of learning content, Natural Science has typical characteristics that can gather the components of scientific attitude and critical thinking skill more deeply, particularly to keep saving energy. As suggested by Aisah, the essence of Natural Science consists of process, product, and attitude [7], and thereby can represent the components existing in other learning contents.

According to the curriculum of 2013, thematic learning of always saving energy involves three material components taught to the fourth graders of elementary school: energy source, benefit, and alternative [8]. So, the thematic learning implemented is relevant to the essence of Natural Science. In addition, thematic learning is implemented to consider the aspects to be fulfilled to give the students the whole meaning. Priyanto revealed that in organizing thematic learning, learning material mastery, learning material analysis, annual program and semester program learning preparation and learning plan are required [9]. Meanwhile, basic content of Natural science includes fact, concept, and principle acquired from experience and as a result of a series of processes through investigation, arrangement, and presentation of ideas

[10]. Therefore, the concentration of Natural Science content is relevant to thematic learning of always saving energy.

Considering the elaboration above, the author is interested in analyzing thematic learning of always saving energy in the fourth graders, viewed from critical thinking skill. Energy crisis faced by the world is very important to consider in education, particularly in the learning in elementary school. Natural Science content also includes all concepts about surrounding nature and essence of Natural Science emphasizing the scientific characteristic enabling this thematic learning analysis to expectedly give a comprehensive description on the extent to which the students achieve the learning outcome following the implementation of thematic learning by teachers, viewed from attitude, process, and end value gain in the theme of always saving energy.

2 Method

This study was a descriptive qualitative research using case study method. Sugiyono explains that this research method aims to describe the facts and the relationship between phenomenon and the subject studied systematically, factually, and accurately [11]. Case study approach was used to comprehend a certain problem or situation in-depth by connecting a variety of evidence, including document, interview, observation, and other data collecting instruments [12].

This research was conducted on fourth grade students of SDN 1 Ngabeyan, Sidoharjo District, Wonogiri Regency, Central Java Province. The school was chosen as a research site because accreditation or ranking based on the ministry of education and culture is included in the good category so that it can be an illustration of thematic learning that takes place. Data collection techniques were carried out by questionnaires, documents, interviews, and observations. The researcher used an instrument in the form of a questionnaire which also served as signs for the interview and observation instrument to explore the thematic learning carried out. The questionnaire refers to Pane and Dasopang's opinion that learning includes learning models and media, learning resources/materials, and learning environment [13]. Meanwhile, documentation is carried out to explore the readiness of teachers in carrying out thematic learning. Observations were made when the thematic learning to save energy was taking place. Interviews were conducted with teachers and students about asking questions about thematic learning to always save energy, especially about the content of science learning in it.

After all the data was collected, the researcher tested the validity of the data by triangulating sources, methods, and theories. Milles & Huberman's interactive analysis technique was used as research data analysis consisting of data collection, data reduction, data presentation, and conclusion drawing [11].

3 Results and Discussion

The implementation of thematic learning requires teachers' skill of gathering material to be delivered to the students. In addition, teachers also should have skill to develop

integrated thematic learning planning [14] to make it not rigid following the teachers' and students' handbooks only. Moreover, in the integrated thematic learning, there are four competencies to be achieved by students: spiritual, attitude (affective), knowledge (cognitive), and skill (psychomotor). Therefore, teachers should design learning experience that will affect the students' learning significance [15]. It is this learning experience that is also reflected on science process skill of Natural Science subject content. This acquisition of science process skill directly involves students to pose question in informal circumstance, to test hypothesis, and to construct explanation [16]. Thus, thematic learning circumstance fulfills students' critical thinking skill. The results of analysis on the thematic learning of *selalu berhemat energi* in the 4th graders viewed from critical thinking skill presented as follows.

Firstly, teachers' ability of implementing thematic learning of always saving energy. Teacher has packaged thematic learning implementation plan, but an innovative learning model is found within it, particularly in supporting students' critical thinking skill. Considering the observation conducted, the implementation of thematic learning of always saving energy is dominated by lecturing method. If there is a debriefing, it will be conducted using closed-ended questions and thereby will encourage the students to think critically. Considering the document existing there is a proportion of learning media used by teachers in thematic learning for one semester, as shown in the figure below.

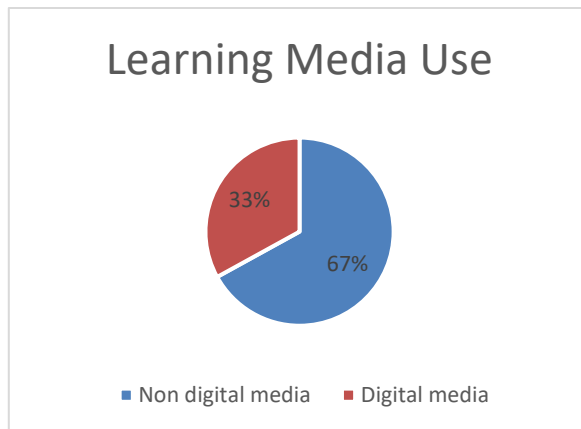


Fig. 1. The proportion of media use in thematic learning

Figure 1 shows that 67% of learning media used by teachers have not been digital based. However, 33% of learning media have used digital technology like power point, video youtube, google sites, google form, kahoot, or quiziz use. However, the use of digital technology-based media has not appeared yet in implementing thematic learning of always saving energy. The results of the teacher interview revealed that the capabilities of digital technology possessed are only these applications and there is no new technology that directly represents the material in thematic learning. Here's a snippet of the interview:

Untuk membuat terobosan media berbasis teknologi yang langsung mengarah ke materi ataupun tema membutuhkan kompetensi digital yang memadai. Sedangkan saya tidak mampu membuat terobosan tersebut.

The interview footage shows that the use of digital-based media does require the digital competence of teachers. Moreover, there are teachers who admit that to create digital-based media requires longer and more careful preparation so that they choose digital learning media which is considered easier from planning to use. The results of the questionnaire also show the percentage of use of digital technology as follows:

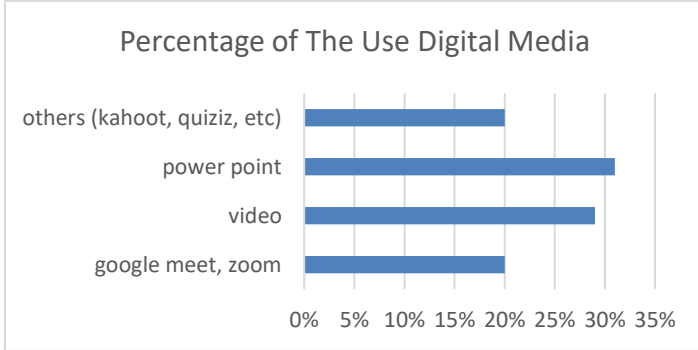


Fig. 2. Questionnaire Results on the Use of Digital Media

The results of the questionnaire show that the digital media used has not directly led to the material in thematic learning. Even if you use digital media, it is only limited to using power points and videos, which percentage of use in the classroom is more frequent. The observations also showed that in implementing thematic learning *selalu berhemat energi*, teachers rely on images existing in students' book only. Meanwhile, this theme is closely related to global issue affecting the world, energy crisis. Therefore, as an educator, teachers should create learning circumstance supporting ecological policy and can create the character of love-to-environment [17]. It is this character that is also reflected on attitude and essential process of Natural Science. As suggested by Matsubara, basic science has some criteria: comprehension on natural event/phenomenon, interest, motivation, and attitude to the natural event/phenomenon [18].

Meanwhile, the learning relying on the images existing in students' book only makes the students' thinking exploring ability narrow because they are stuck only into the book existing. Meanwhile, the presence of learning media is very important for students to learn and to explore new things [19]. Moreover, the materials contained in students' book are still narrow because they contain inadequate explanation and supporting figures (images) that can make the students not ready to learn [20]. Hence, teachers need to consider various factors to improve their pedagogic skill [21].

Secondly, the form of questions given by teachers as the value of Natural Science evaluation. Critical thinking skill is getting more invisible in Natural Science question sheet given to students. The questions have not meet the indicator of critical thinking

skill, and majority questions given need simple answers. The example of questions given is as follows:

1. Ibu sedang menjemur pakaian yang sudah dicuci, agar pakaian yang dijemur itu menjadi kering dibutuhkan sumber energi yang berasal dari
2. Di Indonesia memiliki sumber daya alam yang sangat melimpah. Laut Indonesia terkenal karena ikannya. Lahan yang subur menghasilkan padi, jagung serta tumbuhan lainnya yang sangat berguna bagi penduduk. Gas bumi, minyak serta logam banyak memberikan manfaat bagi masyarakat. Minyak bumi, emas, besi dan berbagai tambang termasuk ke dalam kelompok sumber daya alam.....
3. Contoh sumber daya alam yang dapat diperbaharui yaitu

Fig. 3. Example of Question

From the example of question shown in Figure 3, it can be seen that the questions given by teachers are still in basic thinking skill. Meanwhile, students' pattern should be developed, particularly high-order thinking skill in order to practice cognitive ability to connect the facts in the processes of analyzing, evaluating clearly and even creating creatively [22]. Moreover, students highly need critical thinking skill to face the challenge of 21st century. Therefore, teachers should educate the students to be critical thinkers and creative, innovative, communicative, and collaborative problem solvers [23]. Thus, it is the teacher that stimulates students' critical thinking skill. As suggested by Liu and Pásztor, there are some factors affecting critical thinking skill: various learning or teaching strategies, environment, and scaffolding, and problem scenario-based rather than curriculum-based assignment [24].

Meanwhile, students accustomed with doing the exercises contained in the supplement only have not had indicator of critical thinking skill yet. Aufa et al found that students have lower critical thinking skill because they still use teaching material emphasizing more content dimension than process and context dimension [25]. Therefore, teachers play an important role in connecting concept, process, and context to make the students' scientific comprehension more meaningful on the natural phenomenon [26]. So, it is teacher competency that becomes precondition to the acquisition of student competency [27].

Thirdly, the students' lower learning outcome in Natural Science subject content with minimum mastery criteria (MMC) of 67. The detail of students' learning outcome is presented in Table 1.

Table 1. Students' learning outcome in thematic learning of *selalu berhemat energi*

Value Interval	Number of Student	Percentage
50-60	5	56%
61-66	-	-
≥ 67	4	44%

Table 1 shows that more than a half of students cannot achieved the standard of minimum mastery criteria. *Students recognize that thematic learning selalu berhemat energi* requires deep thinking skills whereas the media used by teachers does not support their thinking skills. Here's a snippet of an interview with one of the incoming students at the 50-60 grade interval:

Materi pembelajaran tematik selalu berhemat energi sulit dipahami karena Bu Guru hanya menggunakan buku yang kami punya.

Although not all students have high critical thinking skills, the highest score that students can achieve is only able to achieve a maximum score of no more than 80. That is, they are only able to catch up with the standard limits of the crystallry of minimal completeness, 80% of the questions they can't afford to do. This can also be seen from the snippet of student interviews that are at interval scores above the minimum completion criteria as follows:

Sebagian besar soal evaluasi tidak mampu saya jawab karena saya bingung memahami konsep energi utamanya penggunaan energi untuk kehidupan sehari-hari.

The results of the study are in accordance with Azizah et al said that students belonging to low critical thinking skill category are those who have not understood yet the questions given by teachers [28]. Meanwhile, the questions given have not involved indicator of critical thinking skill. Critical thinking skill will affect the learning outcome. It is the learning outcome that is manifested into writing or behavior [29]. Moreover, Natural Science contains many concepts related to daily life; thus it is very important for them to understand any relevant subjects within it [30]. This result of competency integration adjusted with curriculum will create such skills like the skill to find knowledge independently [31].

Learning involves complex process, and learning attitude also relates positively and significantly to learning outcome [32]. Therefore, teachers necessarily help students determine the good learning attitude to make the learning process and outcome optimum [33]. Moreover, elementary school students still need concrete representation in the learning. Learning activity needs to support the learning in order to improve comprehension and explicit relationship between knowledge and previous experience [34].

4 Conclusion

Considering the result of research and discussion, it can be concluded that firstly, the thematic learning of *selalu berhemat energi* in the 4th graders of elementary school has not met the indicator of critical thinking skill yet and therefore affects the learning outcome. It can be seen from 67% of teachers who have never used digital technology in delivering the material. Although 33% of learning implemented has used digital technology, the thematic learning of always saving energy does not get full attention and thereby has not met the indicator of student's critical thinking skill. Secondly, the forms of question given by teachers as the value of Natural Science evaluation have not met indicator of critical thinking skill, and majority questions given need simple answers. Thirdly, more than a half of students cannot achieve the standard of minimum mastery criteria. Critical thinking skill will affect the learning outcome.

Although there are some factors causing the students' lower critical thinking skill, teacher's pedagogic competency is the precondition to the achievement of child's ability. Considering the conclusions, the author gives the following recommendations: (1) further literature reviews are required to obtain innovative learning model/media

considered as capable of improving the students' critical thinking; (2) focus group discussion (FGD) should be held necessarily between elementary school teachers to enrich their reference by sharing experiences, particularly the experience with teaching thematic learning of always saving energy; and (3) a plan is needed to manage the thematic learning of always saving energy that can support students' critical thinking skill including planning, implementation, and evaluation, from planning, implementation, to evaluation with an instrument that meets the indicator of critical thinking skill. It is intended to enable students to face the challenge of 21st century learning in which scientific skill is desirable such as critical thinking skill. The role of teachers in education in 21st century changes from merely implementing teaching-learning process to facilitating and involving students in all learning activities [36].

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