An analysis of digital teaching material in increasing the critical thinking skill of elementary school students

Anita Purbawati*
Een Yayah Haenilah
Siti Samhati

Master of Primary School Teacher, University Lampung, Lampung, Indonesia

ABSTRACT
The low critical thinking of students at MI Muhammadiyah Banjarsari Metro in 2013 Curriculum learning creates teaching materials to be very important for learning activities in the classroom, from developing teaching materials can make it easier for students in understanding the material and more active to know more about the material being taught. The aim of this study was to find out the analysis of digital teaching materials on the critical thinking skills of elementary school students. This study was a qualitative descriptive with data collection using observation and interview techniques to 5 teachers and 46 students. This data analysis was data reduction, data presentation, and verification. The results of this study indicated students of MI Muhammadiyah Banjarsari Metro Class III still used student books or teacher books, then the teaching materials developed have not shown elements of critical thinking skills, and were not digital-based in the learning process, thus, the alternative solution requires digital teaching materials to improve skills. Students’ critical thinking in elementary school thematic learning.

KEYWORDS
Digital teaching materials; critical thinking

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Introduction
The learning carried out should be able to prepare graduates to be able to face the 21st century well. Education graduates should have adequate abilities to exist in the 21st century. There are at least four abilities that education graduates need to possess in the 21st century, namely: ways of thinking, ways of working, tools for work, and skills to live in a world. For this reason, the learning carried out by teachers should be able to equip students with the four skills needed in the 21st century (Paige, 2016).

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Curriculum 2013 learning requires mastery of 21st century skills, namely literate learning, character, skills for critical, collaborative, communicative, creative, and information technology skills. Permendiknas Number 41 of 2007 concerning Process Standards for Primary and Secondary Education Units mandates teachers to be able to apply Information and Communication Technology (ICT) in the preparation of learning implementation plans. Therefore, teachers must be able to use computers and the internet. (Alperi, 2020).

The competence to develop teaching materials ideally has been mastered by the teacher well, however in reality, there are still many teachers who have not mastered it, so that in carrying out the learning process, there are still many that are conventional. The impact of conventional learning is that the teacher's activities are more dominant and on the other hand students are less active because they are more likely to be listeners. Besides, the learning he does is also less interesting because the learning is less varied. Through this short article, it will be explained about how to develop module teaching materials and their use in the learning process. According to Widodo and Jasmadi in the book (Lestari, 2013) that teaching materials are a set of learning tools or tools that contain learning materials, methods, limitations, and ways of evaluating which are designed systematically and attractively in order to achieve the expected goals, namely achieving competence. and subcompetencies in all their
complexities. It asserts that in the manufacture of teaching materials is very much in need of books as a reference which is seen and expanded again with its own style that is more interesting however it still sees the expected goals.

Ideally, teacher has the ability to develop teaching materials that can be accessed through digital devices, where these teaching materials present several types of media (text, images, audio, animation, and video), and provide flexibility for students to interact with the material in the teaching materials. The development of this teaching material uses a scientific approach because its effective understanding in the 2013 curriculum emphasizes the individual experiences of students. Teaching materials with a scientific approach are learning designed in such a way that students can find facts, build concepts and theories with the students’ own scientific process skills and attitudes. Thus, it can increase intellectual potential to improve the ability of students to realize, understand, and master a series of forms and increase the ability of scientific thinking patterns. The development of teaching materials must pay attention to the suitability of the material with the level of students.

The development of an increasingly advanced era in various fields, especially in the field of education as a teacher must be able to make new innovations in the learning process so that cognitive abilities and the potential that exists in students can increase. The quality of learning becomes low when teachers are only fixated on conventional teaching materials without any creativity to develop these teaching materials innovatively. Digital teaching materials are teaching materials whose content is contained in electronic or digital form, which can be in the form of audio, audio-visual, or in the form of interactive multimedia. Referring to the previous understanding of teaching materials, digital teaching materials are a set of materials that are arranged in a sequential and systematic manner and display the needs of the competencies that will be mastered by students in the learning process that is included in interactive multimedia. (Sriwahyuni et al., 2019). The findings of previous research found that digital teaching materials were a combination of images and text. A good combination of pictures and text is needed in order to convey the message in the book (Handayani et al., 2020). Story books given to children are usually equipped with pictures so that they can attract children’s attention to see or read the book (Sumiati & Tirtayani, 2021) Picture story books can attract children's attention to learn and understand faster if they are given interesting visualizations and have many colors, because children like creative things. The presence of picture story books has become something that is very liked by children and also as a source of learning (Kurniaawati & Koeswanti, 2020) Another finding also argues that this audio-visual-based digital picture book is a teaching material that is packaged for independent learning and can replace the teacher’s role in providing learning to children in shaping and stimulating children’s empathetic abilities (Misnawan et al., 2020) Learning or telling stories the teacher will use this media and be accompanied by sound or music that supports the messages or information to be conveyed in learning.

In developing teaching materials, there are several aspects that can be used as references, including: (1) Concepts are ideas or ideas. (2) Principles are basic truths as a starting point for thinking or guidelines for doing or implementing something. (3) An event is something that happened or is being done or experienced. (4) The process is a series of changes, developmental movements. (5) Value is pattern, size, or type or pattern. (6) Ability is the ability to do good. These benefits are divided into two types, namely teacher benefits and student benefits (Harjanto, 2008).

The teaching materials are also unique and specific. Unique implies that teaching materials only are used for certain purposes and in certain learning processes, and special means that the content of teaching materials is designed in such a way that only certain competencies are achieved by certain goals. Teaching materials are not only presented in the form of books or modules, but can also be in other forms. According to Bernd Weidenmann, 1994 in his book Learning with visual media (Ati, 2017) grouping into three main groups, first radio, cassette (sound cassette), LP (recording). The second is visual (visual), which includes flip charts, pictures (murals), silent films, silent videos, computer programs (computer tutorials), written materials with and without pictures (tutorial text, with and without pictures), without illustrations). Third, audio-visual (audio-visual), which relates to speaking with images (speech with images), presentation of images and sound (sound slide show) and film/video. From this solution, there are three theoretical studies that need to be done. The first theoretical study is teaching materials. Teaching materials is a generic term used to describes the use of learning resources by teachers to deliver learning.

In this way, teaching materials can support student learning and increase his or her success. Teaching materials can be defined as a description of a set of materials that are systematically arranged both written and unwritten so as to create an environment or atmosphere that allows students to learn (Wahyuni, 2015). Another understanding of teaching materials is all forms of materials or materials that are systematically arranged that are used to assist teachers or instructors in carrying out teaching and learning activities so as to create an environment or atmosphere that allows students to learn (Aditia, 2013).

Teaching materials are essential and important learning resources that are needed for learning from subjects in schools to encourage teacher efficiency and improve student performance. With teaching materials make learning more interesting, practical, and realistic. Besides, the use of teaching materials in learning allows both teachers and students to participate actively and make learning more effective (Olayinka, 2016).

The use of teaching materials in learning can provide benefits to students. There are several advantages of using teaching materials, namely: 1) make students participate creatively and think analytically when they are involved in learning, 2) the concepts learned using teaching materials become clearer to students because the
concepts are taught through learning activities, 3) encourage a systematic integration of a variety of sources in a learning experience, 4) being actively involved in improvisation, working principles are learned and in this way students acquire problem solving skills, attitudes and scientific knowledge required in scientific and technological problem solving (Akani, 2016).

The ability to use interesting and innovative teaching materials is something that must be owned by a professional educator. This is because work is a must for educators. This research was carried out at MI Muhammadiyah Banjarsari Metro as a whole with media facilities and relevant textbooks. Textbooks are very sufficient for all students, the level of creativity of teachers is lacking in carrying out the learning process, not all teachers use innovative teaching materials, observations were carried out on Monday, March 28, 2022 which took place at MI Muhammadiyah Banjarsari Metro, with the results of interviews with Class Teachers III as follows:

1. Teaching materials that have been used in learning are student books or teacher books.
2. Not all teachers use their own teaching materials. Apart from student books or teacher books, the teaching materials used are those at school.
3. The teaching materials developed have not shown the Higher Order Thinking Skill (HOTS) element.
4. Teachers do not use digital teaching materials in the learning process.

Dealing with field conditions and the importance of teaching materials, it is very important to develop a teaching material to support student learning resources in a level of education. Activities to launch a teaching material must be in accordance with the needs of students, it is expected that the innovation of teaching materials can increase students' reading interest, especially in Theme 6 Sub-Theme 2 Energy changes occur in students' real life in everyday life. Based on the conditions and problems above, the researcher feels the need to conduct research which entitled Analysis of Scientific-Based Digital Teaching Materials to Improve Critical Thinking Class III at Elementary School.

Methods

The aim of this study was to digital teaching materials to improve critical thinking of third grade elementary school students. This study used a qualitative descriptive and it obtained from data collection with observation and interview techniques. This study was undertaken at MI Muhammadiyah Banjarsari Metro class III 2022 with 5 teachers and 46 students as subjects. There were three stages of this data analysis technique, namely data reduction, data presentation, and data reduction verification. The goal was to simplify abstract data into a clear and detailed summary, then the data was presented in a simpler form in the form of narrative exposure and arranged to reveal the development of teaching materials.

In this data collection technique, the data can be analyzed by calculating the average of each answer based on the score obtained, using the following assessment criteria:

<table>
<thead>
<tr>
<th>Final Score</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>81 % - 100 %</td>
<td>Excellent</td>
</tr>
<tr>
<td>61 % - 80 %</td>
<td>Good</td>
</tr>
<tr>
<td>41 % - 60 %</td>
<td>Medium</td>
</tr>
<tr>
<td>21 % - 40 %</td>
<td>Fair</td>
</tr>
<tr>
<td>0 % - 20 %</td>
<td>Poor</td>
</tr>
</tbody>
</table>

(Riduwan, 2012)

Results and Discussion

The results of student interviews revealed that 85% of students had other handbooks for studying both at school and at home, 52% of students had difficulty understanding the material, through the methods applied by the teacher, and 58% of students had difficulty in learning material from books provided at school. As well as books/other learning resources that are used by students, 85% of students have never made observations and experiments regarding energy and its changes both in the classroom and outside the classroom. learning methods. Thus, it can be concluded that the teaching materials that have been used in learning are student books or teacher books, the teaching materials developed have not shown the Higher Order Thinking Skill (HOTS) element, and the teacher does not use digital teaching materials in the learning process. Further, the teacher has problems in teaching teaching materials so that students do not understand the material for Theme 6 energy and its changes well. Students still hesitate and feel shy in asking questions. Confidence, especially in terms of communication, is an attitude that must be instilled in students from an early age (Faizah et al., 2013).

Individual learning, teaching materials can be used as the main media and monitoring and evaluation tools for students. One of the important problems that teachers often face in learning activities is the selection or determination of appropriate teaching aids or learning materials to help students acquire knowledge. This is because in the curriculum or study plan, teaching materials are only written in outline form as the main material. The teacher’s task is to describe the subject in such a way that it becomes a complete teaching material. Teaching materials, or teaching materials, broadly consist of knowledge, skills, and attitudes that students must learn to
achieve the given competency standards. More specifically, the types of teaching materials consist of knowledge (facts, concepts, principles, procedures), skills, and attitudes or values.

The development of science and technology allows all parties to obtain information abundantly, quickly and easily from various sources and places in the world (Maharan, 2017). Thus, students need to be equipped with the ability to acquire, select, and manage information to survive in an ever-changing, uncertain, and competitive situation. One of the uses of developments in the world of education is the development of digital-based teaching materials. Digital-based teaching materials are teaching materials that use technology as a tool in processing data, including processing, obtaining, compiling, storing, manipulating data in various ways to produce quality information. In learning activities, the use of digital teaching materials allows students to learn a basic competency (KD) in a coherent, systematic, interactive and innovative manner so that all competencies are expected to be achieved in a complete and integrated manner.

The existence of teaching materials can assist students in learning and it is also very helpful for teachers. With the teaching materials, the teacher is more flexible in developing the subject matter. In addition, teaching materials must contain material that is arranged systematically and gradually. The material is presented using methods and means that can arouse interest in reading. Teaching materials must include assessment tools that allow students to know the skills they have acquired.

The aim of creating teaching materials is: 1) to provide teaching materials that are in accordance with the demands of the curriculum by considering the needs of students, schools, and regions; 2) assisting students in obtaining alternative teaching materials; and 3) make it easier for teachers to carry out learning. Broadly speaking, the function of teaching materials for teachers is to direct all their activities in the learning process as well as a substance of competence that should be taught to students. The function of teaching materials for students is to be a guide in the learning process and is a substance of competence that should be studied. Teaching materials also function as a tool for evaluating the achievement of learning outcomes. The use of teaching materials functions as follows: (1) a guide for teachers who will direct all their activities in the learning process, as well as a substance of competence that should be taught to students, (2) guidelines for students who will direct all their activities in the learning process, as well as a substance competency that should be learned or mastered, (3) evaluation tools for achievement or mastery of learning outcomes (Guntur & Muchyidin, 2017). He also argued that the purpose of creating teaching materials is as follows: (1) Helping students in learning something, (2) Providing various types of teaching material choices, thus, it can prevent students from feeling bored, (3) Making it easier for students to carry out learning, and (4) Learning activities are more interesting (Guntur & Muchyidin, 2017).

Good teaching materials at least include learning instructions, competencies to be achieved, lesson content, supporting information, exercises, work instructions, evaluations and responses to evaluation results (Ika Lestari, 2011). The design of teaching materials is very important in the learning process. The teaching materials developed must be able to increase the motivation and effectiveness of its users. Widodo "revealed that there are five characteristics of teaching materials, namely 1) self-instructional, 2) self-contained, 3) stand alone, 4) adaptive, and 5) user friendly (Ika Lestari, 2011).

Teaching materials are also a form of education unit service to students. Individual service can occur with teaching materials. Learners deal with documented material. It deals with consistent (principles) information. Participants who are fast learners will be able to optimize their abilities by studying teaching materials. Students who are slow learners will be able to study the teaching materials continuously. Thus, the optimization of learning services for students can occur with teaching materials.

The development of a teaching material must be based on an analysis of student needs. There are a number of reasons why it is necessary to develop teaching materials, as stated by the Directorate of High School Development (2008: 8-9) as follows:

1. Availability of teaching materials in accordance with curriculum requirements, namely teaching materials developed must be in accordance with the curriculum.
2. The characteristics of goal setting, namely the teaching materials developed can be adapted to the characteristics of students as goals, these characteristics include the social, cultural, geographical, and developmental levels of students.
3. Development of teaching materials must be able to overcome or solve problems or learning difficulties. Therefore, the development of teaching materials in schools must pay attention to the characteristics of students and the needs of students in accordance with the curriculum that demands greater participation and activation of students in learning. Making student activity sheets is one of the alternative teaching materials that are useful for students to master certain skills because student activity sheets can help students to add information about the material to be studied through systematic learning activities.
4. The description of the four characteristics of the teaching materials is as follows:
   1. First, self-study teaching materials can allow students to learn on their own with the developed teaching materials. Therefore, teaching materials must have clear objectives and provide teaching materials that are packaged into more specific units or activities.
   2. Characteristics of Self-Contained Teaching Materials, namely all subjects covered in one unit of competence or part of the competence contained in the complete didactic material.3. The nature of teaching materials
that stand alone, namely teaching materials that are developed do not depend on other teaching materials or do not need to be used in conjunction with other teaching materials.

3. The nature of adaptive materials, namely teaching materials must have a high adaptability to the development of science and technology.

4. Characteristics of User-Friendly Materials, namely every instruction and information presentation that appears is helpful and friendly to the wearer, including the ease of the user in responding and accessing as desired.

Seeing this, to be able to realize the ideal education, various preparations must be undertaken by educators, one of which is teaching materials to strengthen their understanding. According to Djamarah & Zain (2013) which states that teaching materials are substances that will be delivered in the teaching and learning process.

Teaching materials are an something important and must exist in the learning process, because if there are no teaching materials then nothing can be conveyed to students as subjects as well as objects of education, besides that student also have no resources to learn. This can be interpreted that the success or failure of achieving educational goals is quite dependent on the teaching materials used.

Based on the problems at the analysis stage that have been described in the research results, it is known that in the mathematics learning process teachers and students have not been supported by teaching materials that can help students in reviewing the material that has been received in accordance with the learning characteristics of each individual, the authors develop products in the form of materials digital-based teaching, the determination of titles and indicators is adjusted to the relevant competencies based on the syllabus. The explanation of the needs analysis carried out by the researcher is in accordance with the steps, namely: 1) determining the competencies that have been formulated in the syllabus; 2) identify and determine the scope of the competency unit or part of the main competency; 3) identify and determine the required knowledge, skills and attitudes; and 4) determine the title of the module to be compiled (Asyhar, 2012). Thus, it is necessary to do several things as an effort to further utilize the product, namely the analysis of digital teaching materials to improve the critical thinking skills of elementary school students.

**Conclusion**

Regarding to research and discussion analyzing the development of teaching materials in elementary schools, it is concluded that the development of teaching materials is very useful and affects many things, starting from students who are more active, making it easier for students to understand them. Then the impact of developing teaching materials for teachers, teachers become more creative in developing teaching materials. Because the development of teaching materials is not only about development, but also about the teacher as a teacher who follows the development of his students and is actively and creatively looking for something that can be used in the classroom. Based on the research results, it is necessary to do several strategies to further utilize the product, namely the development of digital teaching materials to improve the critical thinking skills of elementary school students.

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