Develop A Wordless Picture Book to Improve Critical Thinking Skills in Elementary School

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Abstract

The purpose of this development research is to look at the making of a wordless picture book to determine the level of validity, practicality, and effectiveness of the development of a wordless picture book. The research method used is Research and Development (R&D) with the ADDIE development model. Three experts carried out the validation of this wordless picture book. The results are 92,5% material expert, 92,5% linguist, and 92,5% media expert. The research subjects were fourth-grade students, totaling 20 students. The results of the research on the development of a wordless picture book show that the practicality level of the teacher is 91,6%, and the students are 88,6% based on the given instrument. Meanwhile, the effectiveness level of a wordless picture book is that the average post-test value is greater than the pre-test score (79,5 > 30,5). Based on the results of the t-test, tcount (14,41) > ttable (2,09), then the hypothesis (Ha) is accepted. The results of the study showed that there were differences in students' understanding of endangered animals before and after using the wordless picture book illustrations. It can be concluded that the wordless picture book has an effect on increasing students' critical thinking about endangered animals.

Keywords: Wordless Picture Book, Critical Thinking Skills, Social Studies

INTRODUCTION

Critical thinking is a necessary skill in the 21st century. Furthermore, the essence of 21st-century skills emphasizes problem-solving, creative and innovative thinking, communication and collaboration, and expertise in technology (Larson & Miller, 2012). Based on this, 21st-century skills need to be improved through a series of learning activities at various levels of Education. In addition, critical thinking also has long-term benefits, which will help students manage their learning skills. Necessary thinking skills are cultivated through the disciplined use of a question-generating language that allows students to develop greater awareness of content and self (Crenshaw et al., 2011). It is also important to note that Critical thinking is recognized with great potential for contributing to Democracy education, preparing citizens to use something responsibly, and for shared benefits and sustainable development (Santos, 2017). That's why a successful creative learning process requires support from learning the environment that can encourage students to apply the right concepts in solving problems (Darmawan, Nurani & Hilmawan, 2021).

Education itself is an important thing that can affect human life. Students' potential will develop naturally, but with guidance and Education from parents, communities, and educational institutions, the potential development will occur optimally (Siregar, 2013). Therefore, an excellent education requires the role of educational institutions and effective and efficient learning planning according to the needs of students. Learning planning includes preparing implementation plans, selecting and developing teaching materials, learning strategies, media, assessment instruments, and teacher-student interaction (Ananda, 2019).

Especially during a pandemic like this, all aspects are affected, including Education. Moreover, in the end, learning is carried out from each other's homes, commonly called knowledge from home, in which the teaching and learning process is different. The teacher must use learning media and develop teaching materials according to the needs of the participants. Students while achieving the intended indicators. Of course, distance learning tends to be forced due to the Covid-19 pandemic, especially the limited time for the teaching and learning process to be a burden for teachers in completing curriculum achievements(Iriansyah, 2020). Inevitably, teachers must innovate and creatively use media or digital teaching materials to support the learning process. The use of learning media or digital teaching materials used in distance learning is also a solution to overcome this difficulty and is also a challenge for all elements and levels of Education to keep the class active (Herliandry et al., 2020).

Technological developments change the workforce's qualifications and competencies; therefore, teachers must change learning methods from conventional to 21st-century learning, namely interactive learning with the term Information and Communication Technologies (ICT). In line with this, the Ministry of Education and Culture has formulated that the 21st-century learning paradigm emphasizes the ability of students to find out from various sources, develop problems, think analytically/critically, and collaborate or collaborate in solving problems. The main principle of 21st-century learning should be centered on students and teachers being facilitators, building the meaning of collaborative learning with friends, and respecting abilities between individuals. Then learning materials need to be linked to everyday life and provide opportunities for students to participate in various program developments. Available in the community or provided by educational institutions (Daryanto & Karim, 2017).

Based on the initial study results, the teacher provides that most students' learning outcomes are still in the minimum completeness criteria below the average—lack of illustrations or descriptions of the material results in students' lack of understanding or critical

thinking. And also and also most students do not understand why animals are becoming rare and why they must be preserved. A total of 11 students out of 20 students got an average score of 65,90. Based on this explanation, the proposed alternative uses wordless picture books as illustrations. The wordless picture book aims to help students understand why animals are becoming rare and how to preserve them through examples. Wordless picture book teaching materials can be used as an alternative for teachers to concretize learning materials, especially in social studies subject matter in elementary schools (Surista & Panjaitan, 2021).

Social Studies, or as we call it, IPS, is one of the subjects studied in elementary schools. Social Studies aims to equip students to develop their reasoning in addition to values and moral aspects (Murtiningsih, 2016). In social studies, students learn things related to society and are expected to know how to deal with phenomena in the surrounding environment. Of course, it has its pros and cons. Especially with the recent case where YouTuber Alshad Ahmad kept wild animals and made their content on various other social media platforms. Although he mentions what conservation is doing, keeping wild animals by themselves can educate people to take care of them without knowing what conservation means (Detikhot, 2022).

Based on researchers' observations during PKM at SDN Kramat Pela, the teacher needs to include illustrations on the intended material in social studies learning material on preserving endangered animals, which is taught only through WhatsApp groups. Likewise, in limited face-to-face learning in class IV, the learning process with the lecture method does not provide opportunities for students to think divergently (explore creative ideas) and convergent (focus on collecting facts from an event) in solving a problem related to the material being taught. Therefore, overcoming these problems can involve students' activeness in learning by presenting teaching materials that help students develop critical thinking. Critical thinking itself is a thinking process to process knowledge in an organized manner by criticizing facts that can be accounted for (Winoto & Prasetyo, 2020). moreover, the relationship between critical thinking and Education is very closely related, including offering students to develop abilities and skills, and values related to critical thinking which can be applied to life outside the classroom (Moseley et al., 2009).

Facione argues that critical thinking has a purpose, such as proving something, interpreting, or solving problems critically (Facione, 2015). The following are some skills that can develop critical thinking skills in learning strategies according to the consensus results from Delphi's research (Facione): (a) Interpretation which contains three sub-skills, namely categorizing, translating the meaning, and explaining the purpose, to understand and express

the sense of various experiences, situations, data, events. (b) The analysis includes the skills of assessing ideas, identifying arguments, and analyzing views. (c) The evaluation assesses the statement's credibility by examining the opinions and arguments. (d) The inference is to identify what is needed to draw reasonable conclusions by considering relevant information. (e) Explanation, namely stating results, validating procedures, and expressing arguments. (f) Self-control, self-assessment, and self-correction, the results of which are used for study and evaluation (Facione, 1990).

One of the digital teaching materials that contain illustrations to encourage students to develop ways of thinking in solving problems is a picture book/wordless picture book. There are still many abstract materials. Teachers must rely on something other than existing textbooks to improve students' critical thinking skills (Reyes, 1986). Wordless picture book teaching materials can be used as an alternative for teachers to concretize learning materials, especially in social studies subject matter in elementary schools. Wordless picture books are picture stories that do not have text, so students can compose sentences and develop them (Surista & Panjaitan, 2021). Wordless picture books are also defined as ones with one phrase/sentence through sequential visual images (Eliza, 2018; Lestari, 2018; Serafini, 2014).

Wordless picture books can also be an illustration medium for developing students' thinking. Regardless of the narrative background, wordless picture books have a variety of themes that can be raised, one of which can contain the piece of particular interactions between humans and their environment, and with the reader's interpretation actions arranged by a sequence of pictures so that the hypothesis can be validly confirmed (Ramos & Ramos, 2011). Wordless picture books also have their characteristics, including being rich with detailed pictures. The genre can also be intended for pedagogical purposes and measuring student competence (Nurhasanah et al., 2019; Ramos & Ramos, 2011). Using wordless picture books has the same positive effect on narrative comprehension and vocabulary skills (Grolig et al., 2019). Moreover, it can also help students to gain general knowledge, train cognitive thinking, and learn about the rhythms and conventions of written language (Natalie A, 2013). Likewise, according to Lysaker and Alicea, the use of wordless picture books can create relationships between characters to build meaning, in which students are involved in strategies, processes, and thought activities that characterize reading abilities (Lysaker & Alicea, 2016).

Previously there was the research that developed teaching materials in the form of wordless picture books in social studies learning so that fourth-grade students could get a concrete picture of an event or occurrence. This wordless picture book allows students to

explore critical social studies topics through wordless picture books, and social studies subject matter is still rare to research (Wooten et al., 2019). Furthermore, the research explores the relationship of 11-year-olds with wordless picture books to foster reading diversity in older students and allow them to read and discuss picture books without words. Wordless picture book teaching materials are found in various classes and lesson content but not in social studies learning. Also, more research still needs to be done on using wordless picture books in learning involving high types (Lordanaki, 2021). Moreover, the results of the wordless picture book research help develop the application of critical literacy and as a stepping stone for students to apply critical skills in everyday life (Birner & Bromley, 2015). The novelty of this research is to develop a wordless picture book teaching material that can help students interpret and analyze the causes of animals becoming endangered through illustration.

Rare Animals are expected to create a new atmosphere in the learning process so that students are more actively involved and motivate students to develop critical and creative ways of thinking in understanding the material. From some previous research and development related to the wordless picture book, it can be seen that the wordless picture book teaching materials are very suitable to be used as a support for the learning process, so researchers are interested in developing teaching materials with illustrations in them, namely the wordless picture book teaching materials for social studies learning in elementary schools, especially in preserving material. Based on this background, the formulation of the problem can be stated as follows: (1) What is the process of developing wordless picture book teaching materials? (2) How is the level of validity of the wordless picture book teaching materials in the lesson content of preserving endangered animals? (3) How is the level of practicality of wordless picture book teaching materials in the lesson content of preserving endangered animals? (4) How is the effectiveness of wordless picture book teaching materials on the critical thinking skills of fourth-grade elementary school students on preserving endangered animals.

METHOD

The method used in the research method is Education and development or also known as Research and Development (R&D), with the ADDIE Branch theory research model through five stages, namely (a) analysis; (b) design; (c) development; (d) implementation; (e) evaluation. There are two stages at the analysis stage: problem identification and needs analysis. Furthermore, the design stage involves compiling materials and narrative stories, making storyboards, and preparing feasibility test instruments. At the development stage, the

concept on the storyboard is developed and assessed by experts before being tested. Furthermore, the implementation stage is given to the fourth-grade teacher to be evaluated, and after no revision is tested on students, the pre-test and post-test are given to 20 students. In the end, students are given an instrument to assess the product. The last stage of evaluation is analyzing the results of data from the field to determine the feasibility and effectiveness of teaching materials.

The research was conducted at the place where the researcher conducted PKM, namely SDN Kramat Pela 07, with the research subject using 20 fourth-grade students. Data collection techniques were carried out through observation, interviews with teachers and fourth-grade students, questionnaires for feasibility tests, and essay questions for effectiveness tests. To test the effectiveness of teaching materials, researchers used the "experiment before and after" design (Sugiyono, 2013) as follows:
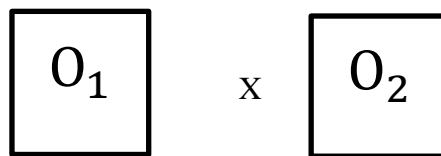
$$O_1 \quad X \quad O_2$$

Figure 1. Desain Eksperimen (Before-After)

The data analysis technique used is descriptive quantitative; the method is obtained through a questionnaire processed to get results in numbers. The results of students who do pre-test and post-test will be analyzed using a gain score test to determine whether or not there is a change in students' critical thinking skills and a t-test to determine whether or not there is an influence of teaching materials on students during the study.

RESULTS AND DISCUSSION

Results

1. Process Results Development

The development of wordless picture books as teaching materials through the stages of analysis, design, development, implementation, and evaluation.
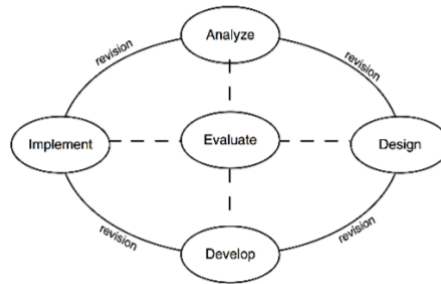
Figure 2. ADDIE Model

In the analysis stage, there are two stages. The first stage is the analysis stage. Problem identification in the form of observations during PKM and needs analysis through interviews with teachers and fourth-grade students. The results of problem identification and needs analysis then selected one material that became the target developer. The subject matter is about preserving rare animals. The second stage of design is the stage of designing wordless picture book teaching materials, including preparation of feasibility test instruments, preparation of materials, preparation of tools and materials to create concepts, then compiling story narratives and making storyboards. The third stage is development. At this stage, the storyboard idea is developed through the services of an illustrator entitled rare animals. The following is the cover of the product produced.

Figure 3. Front and Back Cover

Moreover, after completion, the researcher gave products and assessment instruments to material experts, linguists, and media experts. This is done so that teaching materials are assessed and given input before being tested in the field. Here are the results of the assessment from the experts:

Table 1. Recapitulation of Expert Review

Validator	Percentage (%)

Material expert	92,5%
Language expert	92,5%
Media expert	92,5%
Average	92,5%

Table 1 shows that the results of the assessment of wordless picture book teaching materials by experts are 92.5% from media experts, 92.5% from material experts, and 92.5% from linguists. If on the overall average, it gets 92.5% in the excellent category and can be tested on students.

2. The Practicality of Teaching Materials Wordless Picture Book

Before the teaching materials were tested on students, the researchers conducted practical validation by the fourth-grade teacher to determine whether the product was valid or not to be used as teaching materials, getting a percentage of 91.6% with an efficient category.

Table 2. Practical Validation by The Fourth-grade Teacher

Questions	S	N	P (%)	Category
The attractiveness of the product cover.	4	4	100	Very Good
Match between illustration and material.	3	4	75	Good
Appropriateness of the sequence of materials with illustrations.	4	4	100	Very Good
The number of pages is entirely appropriate.	3	4	75	Good
Conformity of teaching materials with KI and KD.	4	4	100	Very Good
Conformity of teaching materials with learning objectives.	4	4	100	Very Good
Conformity of teaching materials with the material discussed.	4	4	100	Very Good
The application of teaching materials requires supporting facilities.	4	4	100	Very Good

Presentation of teaching materials following the available time allocation and can be carried out at home.	3	4	75	Good
The content and presentation of teaching materials can attract students' interest in understanding the material.	3	4	75	Good
The form of illustration presentation can help students improve their critical thinking skills.	4	4	100	Very Good
Story illustrations can help students find concepts independently or in groups.	4	4	100	Very Good
Illustrations help the interaction of teachers and students through discussion.	3	4	75	Good
Illustrations in the story have a relationship with the natural world situations of students,	4	4	100	Very Good
Illustrations in stories can help teachers interact with students through discussion.	4	4	100	Very Good
Total	55	60	91,6%	Very Good

After that, the product was assessed by class students. IV and get a percentage of 88.6% with a convenient category. The result data shows that the wordless picture book teaching materials are efficient for learning.

Table 3. Practical by The Fourth-grade Students

Name of Students	Item Number										Score
	1	2	3	4	5	6	7	8	9	10	
AAJ	4	4	3	3	4	4	4	4	3	4	37
AGA	4	3	4	4	3	4	4	4	4	4	38
AN	4	3	3	3	3	3	4	4	3	3	33
ANA	4	4	4	4	4	4	4	4	4	4	40
ABK	3	4	4	3	3	4	3	3	4	3	34

AM	4	4	4	4	4	4	4	4	4	4	40
AAK	3	4	4	3	3	2	4	3	3	4	33
CWJ	3	4	3	4	3	3	3	4	4	3	34
DDA	4	4	3	3	4	3	4	4	3	3	35
DAPK	4	3	4	3	4	4	3	4	4	4	37
F	4	3	4	3	4	4	3	4	4	4	37
HCS	4	3	4	4	3	4	4	4	4	3	37
KMS	4	3	4	3	4	4	3	4	4	4	37
KDM	3	3	3	3	3	3	4	3	3	3	31
MES	3	3	4	2	1	4	1	3	3	4	28
MRAF	4	2	3	3	3	4	3	4	4	4	34
RMIR	3	3	3	3	3	3	2	2	3	3	28
RA	4	4	4	4	4	1	4	4	4	4	37
RPD	4	4	4	4	4	4	4	4	4	4	40
SRK	4	4	4	4	4	3	4	4	4	4	39
Total											709
Percentage (%)											88,6

3. The Effectiveness of Wordless Picture Book Teaching Materials

In this fourth stage, researchers will see the effectiveness of the wordless picture book teaching materials in the lesson content of preserving endangered animals in grade IV SD which was developed through two stages, namely the pre-test and post-test stages with one-to-one and small groups. The following are the results of the pre-test and post-test.

Table 4. Pre-test and Post-test Assessment Results

Name of Students	Score	
	Pre-Test (x)	Post-Test (y)
AAJ	10	60
AGA	20	70
AN	10	60
ANA	60	80
ABK	30	90
AM	20	60
AAK	20	90
CWJ	40	90
DDA	20	80
DAPK	10	80
F	20	80
HCS	20	90
KMS	40	90
KDM	50	70

MES	20	70
MRAF	30	70
RMIR	60	90
RA	50	100
RPD	70	100
SRK	10	70
Total	610	1590
Average	30,5	79,5

The next step is to determine whether there is a change in students' critical thinking skills before and after using wordless picture book teaching materials by doing the Gain Score test.

Table 5. A score of Pre-test and Post-test

Score	Total	Score Min	Score Max	Average
Pre-test	20	10	70	40
Post-test	20	60	100	80

Table 6. Critical Thinking Ability Data (*Gain Score*)

Jumlah Siswa	Nilai *Pre-test*	Nilai *Post-test*	*Gain score*
20	30,5	79,5	49

Based on the data above, the difference between the pre-test and post-test scores is 49. This indicates a significant effect on the use of wordless picture book teaching materials on preserving endangered animals that have been developed in the development of critical thinking skills of fourth-grade elementary school students. Kramat Pela 07.

The student score data was then analyzed using the t-test with a significant level of 0.05. This analytical technique determines whether or not a treatment affects students during research. The steps for the t-test are as follows:

a. Make Ho and Ha in sentence form

Ho = There needs to be more development in students' critical thinking skills before and after using wordless picture books as teaching materials in the lesson content of preserving endangered animals in grade IV SD.

Ha = There is a development in students' critical thinking skills before and after using wordless picture books as teaching materials in the lesson content of preserving endangered animals in grade IV SD.

b. Find t$_{count}$ with the formula

$$t = \frac{Md}{\sqrt{\frac{\Sigma_d{}^2 - \frac{(\Sigma_d)^2}{n}}{n(n-1)}}}$$

Description:

t   = t coefficient/t-test value

Md = mean the difference between post-test and pre-test

d   = score difference between the pro-test and pre-test of each subject

n   = number of subjects

c. Determine the t-test criteria

H$_0$ is accepted if $_{count}$ < t$_{table}$ means H$_o$ is accepted and H$_a$ is rejected.

H$_a$ is accepted if t$_{count}$ > t$_{table}$ means H$_o$ is rejected and H$_a$ is accepted.

d. Calculating the results of *pre-test* and *post-test*

Table 7. Pre-test and Post-test Results

No	Score		Gain	
Absent	*Pre-test* (x)	*Post-test* (y)	d (y-x)	d²
1.	10	60	50	2500
2.	20	70	50	2500
3.	10	60	50	2500
4.	60	80	20	400
5.	30	90	60	3600
6.	20	60	40	1600
7.	20	90	70	4900
8.	40	90	50	2500
9.	20	80	60	3600
10.	10	80	70	4900
11.	20	80	60	3600
12.	20	90	70	4900
13.	40	90	50	2500
14.	50	70	20	400
15.	20	70	50	2500
16.	30	70	40	1600
17.	60	90	30	900
18.	50	100	50	2500
19.	70	100	30	900

20.	10	70	60	3600
Total	610	1590	980	52.400

$$t = \frac{49}{3,40}$$

$$t = 14,41$$

So obtained $t_{count} = 14,41$

e. Compare to count and table

t_{table} = ta : db

db = n - 1

= 20 – 1

= 19

At the table = $t_{0,05}$: 19 = 2,09

Therefore $_{count}$ (14,41) > t_{table} (2,09)

f. Conclusion

The calculation results above show that count greater than ttable, then,

Ho = There is no development in students' critical thinking skills before and after using wordless picture book teaching materials in the lesson content of preserving endangered animals in grade IV SD. (REJECTED)

Ha = There is a development in students' critical thinking skills before and after using the wordless picture book teaching materials in the lesson content of preserving endangered animals in the fourth grade of elementary school. (ACCEPTED)

After that, it was known that there was a significant difference between before and after using the wordless picture book teaching materials in the lesson content of preserving endangered animals in the fourth grade of elementary school. The average post-test value exceeds the pre-test score (79.5 > 30.5). It shows that the wordless picture book teaching materials in the lesson content of preserving endangered animals in grade IV SD are effectively used and can develop students' critical thinking skills in learning.

Discussion

Stories in wordless picture books can be used as teaching material in the learning. because it has its characteristics, including being rich in pictures with full details so that readers

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read it more carefully and the wordless picture book genre is intended for pedagogy and is suitable for measuring children's competence in verbal expression (Ramos & Ramos, 2011). The use of wordless picture books has the same positive effect on narrative comprehension skills on vocabulary skills (Grolig et al., 2019).

Although most use of wordless picture books is used to help children develop vocabulary, understanding the storyline through text is not only an important function of children's books for young readers but, understanding the story or the meaning in it by examining and interpreting the illustrations visually is a function. additional picture books in cognitive development (Nicholas, 2007). So, the use of wordless picture books in assisting students in developing critical thinking skills. The wordless picture book was made according to learning indicators based on our concern as a society with fellow endangered animals. Apart from the narrative background, wordless picture books have a variety of themes that can be raised, one of which can contain the theme of special interactions between humans and their environment, and with the act of interpretation, the reader is regulated by a sequence of pictures so that the hypothesis can be confirmed validly (Karabulut, 2012; Ramos & Ramos, 2011). These steps can go into developing critical thinking skills. This study uses one of the indicators from facione, namely interpretation with the intention that students can write down what is being asked about the questions/questions clearly and precisely

The wordless picture book itself is usually used for low-class students but does not close the space for use by high-class students, because research on high-class students is still limited. By assuming that some of the illustrations are too simple to read, teachers or parents sharing books with children can risk limiting older children's reading experience and depriving them of stories that have the potential to evoke children's mindsets (Lordanaki, 2021). where picture books are not only useful for developing critical literacy skills but also as a stepping stone for students to apply these critical skills in everyday life (Birner & Bromley, 2015). Therefore the use of wordless picture books makes it possible to use them in high grades by paying attention to the aspects or contents of the story to be discussed.

The use of wordless picture books in social studies is still very small because Social Studies lessons start from grade IV. It can be used in Grades IV in social studies lessons and highlights projects with activities that reflect best teaching practices for social studies in primary education advocated within a C3 framework that focuses on the immorality of spending (Wooten et al., 2019). In the material that the researcher raised regarding the relationship of living things with their environment, the use of wordless picture books can

create relationships between characters to build meaning, in which case students are involved in strategies, processes, and mental activities that characterize cognitive abilities (Lysaker & Alicea, 2016). With the help of the wordless picture book as an illustration in the teaching materials that the teacher uses for dealing with endangered animals, students can make connections and make sense of pictures.

CONCLUSION

Based on the data from the research conducted, it can be concluded as follows:

1. Wordless picture book teaching materials to improve critical thinking skills in preserving endangered animals have been successfully developed as teaching materials for teachers to use for students in grade IV SDN Kramat Pela 07. Research and development of wordless picture book teaching materials to improve critical thinking skills in the lesson content of preserving endangered animals in grade IV SD are based on the R&D development method using the Branch theory ADDIE model. The stages in this development start from first analyzing problems and needs, determining product materials, designing texts and wordless picture book teaching materials, then product testing, revision, validation, implementation in the schools studied, and finally, evaluation of the data generated.

2. Wordless picture book teaching materials in preserving rare animals developed have been measured for their feasibility.

    a. Feasibility test by Material Expert, namely Prof. Dr. Arifin Maksum, M.Pd, wordless picture book teaching materials developed by researchers reached a percentage of 92.5% with a very decent category.

    b. Feasibility test by a linguist, namely Prof. Dr. Herlina, M.Pd, wordless picture book teaching materials developed by researchers reached 92.5% in the appropriate category.

    c. Feasibility test by Media Expert, namely Drs. Endang Wahyudiana, M.Pd, the wordless picture book teaching materials developed by the researchers reached 92.5% with a very decent category.

    Wordless picture book teaching materials received comments and suggestions from the validator. Therefore the researchers made revisions to the teaching materials developed following the validator's directions to improve the teaching materials. Meanwhile, based on the percentage of the fourth-grade teacher response instrument by Mr. Gazali was 91.6%, and the portion of the fourth-grade student response at SDN Kramat Pela 07 was 88.6%.

3. Wordless picture book teaching materials to improve students' critical thinking skills in the lesson content of preserving endangered animals in grade IV elementary school are proven to be significantly effective in developing students' critical thinking skills, which can be seen from the difference in pre-test scores and post-test scores. The data results show that the pre-test's average value is 30.5 and the post-tests is 79.5, which is then calculated using the t-test with the results of tcount 14.41 > ttable 2.09, which means it means HO is rejected and Ha is accepted.

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