



Development of Textbook Based on Character Using Multimedia to Improve Critical Thinking Skills for Elementary School Students

*Hendratno¹, F N Yasin², N Istiq'faroh¹, Suprayitno²

¹Elementary Education, Universitas Negeri Surabaya, Indonesia

²Primary School Teacher Education, Universitas Nahdlatul Ulama Sidoarjo, Indonesia

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ABSTRACT

This research and development aim to produce character-based text books using multimedia that are of good quality in terms of validity, practicality, and effectiveness that can improve students' critical thinking skills. The research adopted the 4D model, which consists of four stages: define, design, develop, and disseminate. Data were collected through expert validation questionnaires, observation sheets of teacher and student activities, student response questionnaires and critical thinking tests (pretest and posttest). The results of the study indicated that: (1) the character-based textbooks were highly appropriate, (2) the textbooks were found to be highly practical based on observations of teacher and student activities, and received very positive feedback from students, (3) the textbooks were effective in improving critical thinking skills, as demonstrated by the medium category of n-gain on the critical thinking test and the posttest average score being higher than the pretest average score. This character-based textbook can assist teachers in instilling character and improving critical thinking skills in fourth grade elementary school students.

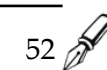


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INTRODUCTION

Elementary school level education in accordance with Government Regulation Number 19 of 2005 article 26 paragraph 1 aims to lay the foundation of intelligence, personality, knowledge, noble character, independent life, and follow further education (Pidarta, 2013; Horoz et al., 2022). The elementary school level plays a very important role in building one's knowledge, skills and attitudes in everyday life through various subjects presented in elementary schools which are expected to shape students' personalities for the better (Arteaga et al., 2022). Indonesia is a developing country that has dreams of turning into a developed country. To realize its dream, Indonesia needs to change its mindset. This mindset is related to human resources, especially productive human resources. In order to accelerate the country's development, these human resources should be managed properly. This is where education plays a major role in preparing quality Indonesian human resources. In other words, education has a major role in the success of the country's development (den Boer et al., 2021). Education is the best place to prepare generations of changes in the nation that bring prosperity to the nation and state. Currently, educational institutions are expected to no longer be a place for knowledge transfer, but rather as a forum for the formation of attitudes, behavior and national character. Thus, educational institutions are tasked with reflecting some of the basic values and characteristics of the Indonesian nation and cultivating them for all generations of the nation in the form of building national character through education.

As previously mentioned, education is the best medium to become a great nation in all fields. Therefore, the government is trying to open access to education for all Indonesian citizens, starting from children's education up to the tertiary level. The government must also guarantee education for the community, both facilities and infrastructure related to education (Xia et al., 2023). In line with



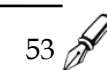
improving the quality of education, according to (Kementerian Pendidikan dan Kebudayaan, 2018) states that Strengthening Character Education is carried out through the application of Pancasila values in character education. The main character consists of religious values, honesty, tolerance, discipline, hard work, creative, independent, democratic, curiosity, patriotism, love for the motherland, appreciate achievement, communicative, love peace, like to read, care for the environment, care for others, and be responsible. The government hopes that by implementing all these character elements in the world of education, Indonesia's dream of becoming a developed country will come true.

The application of character education in schools is an important school task to improve student behavior. Everyone in the school environment must be involved in the process of cultivating character education. Especially those who play an important role in character education are teachers. Palunga & Marzuki (2017) assume that teacher quality has a major effect on student character education at school. Why does character education regard teachers as role models? In research of Sanderse (2013) said that in order to contribute to student character education, teachers are expected to be able to explain why the traits that are exemplified are morally significant and how students can acquire these qualities for themselves, especially students in elementary schools. In achieving the goals of character education.

Elementary school students are children aged 7-11 years. According to Piaget's cognitive development theory, students aged 7-11 years enter the concrete operational stage (Hanfstingl et al., 2019). Elementary school students, especially grade five, have the characteristics of being happy to play and happy to work in groups. From their association with peer groups, students will learn important aspects of socialization, such as; learn to comply with group rules, learn to be responsible, learn to compete in a healthy manner. This characteristic allows a teacher to design a learning model that allows children to play and learn in groups. Each student has unique characteristics, they have various learning styles. Teachers should be able to present subject matter by paying attention to each student's characteristics. According to Porter & Hernacki (2015) learning styles have three characteristics, namely: visual (learning by seeing), auditory (learning by listening), and kinesthetic (learning by moving, working, and touching).

Based on the results of observations and discussions held at elementary school of Balas Klumprik (i.e. Balas Klumprik Elementary School) Surabaya, especially grade four students, several facts were found that (1) learning using published textbooks was not in accordance with the student learning environment, (2) the material was still short and incomplete resulting in less able students doing exercises, (3) delivery of material orally and not accompanied by visual aids or media, (4) assignments given are adopted directly from textbooks without any attempt to relate them to the characteristics of the learning environment, goals and competencies that students must achieve. In addition, students feel bored because the material is abstract so that students' understanding of the material is still low (Hsu et al., 2022). This causes students not to really understand and easily forget the material being studied. This habit shows symptoms of decreased critical thinking skills because students are reluctant to use their logical thinking. So, the teacher needs to examine whether students have used logical thinking or not in accordance with the learning objectives (Zuniari et al., 2022).

Critical thinking is an important goal in this research. The integration of critical thinking skills with character is very important to be studied. The fact shows that currently elementary school students are experiencing a character crisis (Abdurrahmansyah et al., 2022). Several previous studies have discussed the use of multimedia to improve critical thinking skills in students, but there are some differences with the research that has been conducted. For example, Illahi (2018) conducted a study on critical thinking skills through interactive multimedia materials on types of work for fourth-grade students in elementary schools. Furthermore, the study by Pramuji et al. (2020) examined multimedia-based STEM learning to improve students' thinking skills. Similarly, Muttaqin et al. (2020) study focused on the development of lectora to improve students' critical thinking skills. Some previous studies have focused more on the development of multimedia in the cognitive aspect. In contrast, this study focuses more on the development of character-based multimedia to improve students' critical thinking skills.



In creating a meaningful learning process, the teacher must provide a concrete picture of the material presented without ignoring the learning media. Learning media make a positive contribution in a teaching and learning process. Learning by using the right media provides optimal results for students' understanding. One of the keys to successful learning is a change in the cognitive, affective, and psychomotor aspects (Suryani et al., 2018). Learning media can make learning more interesting, so that it can foster motivation and improve student learning outcomes. Learning media contains information and knowledge that is used to make the learning process more effective and efficient.

Implementation of learning in the classroom, teachers can use various learning media that can help smooth the learning process so that learning objectives can be achieved properly. To create effective learning teachers need to create good communication with students (Cash & Pianta, 2023; Woenardi & Supratno, 2022). Communication is a very important factor in providing various understandings related to learning topics. This factor can be achieved if using the right strategy, one of which is by using the media. The use of learning media that is in accordance with learning objectives will create a conducive learning atmosphere and encourage the success of the learning process (Astutik et al., 2021).

The use of media in teaching and learning activities students will be more motivated to learn. This is in accordance with what was stated by Nugraha et al. (2016), motivated individuals are individuals who have a focus on the importance of effort and persistence in learning. The availability of media will also enable students to participate actively in learning activities. Learning media can be packaged in the form of textbooks equipped with pictures and assignments of high-level thinking questions according to the level of student development. Textbooks have a very important function in the field of education because it will facilitate the teaching and learning process for teachers and students (Intan et al., 2021). In addition to facilitating the learning process, textbooks can also be used as a medium to hone critical thinking skills. Critical thinking skills or level thinking height is relational reasoning where many representations are connected together, through inference, comparison, abstraction, and hierarchy (Frausel et al., 2021; Fita et al., 2021).

Character-based textbooks developed according to the guidelines on national education standards. Sensoy & Diangelo (2017) stated that textbooks are a component most influential on what actually happens in the learning process. Therefore, an in-depth study of textbooks is needed used in learning. In addition to containing material and critical thinking questions, this textbook also contains a character-building stimulus for students. Character education is carried out by integrating values with learning materials written in curriculum documents, syllabus, lesson plans, textbooks and learning processes Asymanidar et al. (2013). Teaching material is a book whose goal is for students to learn independently or without the help of a teacher. Strengthening Character Education must be practiced in accordance with the applicable curriculum because if it is only with theory then character education cannot be realized. According to Hariyanto (2016) character education is education that develops the values of the nation's character in students so that they have values and character as self-characteristics that distinguish them from others, apply this life in their own lives, as members of society, and citizens who are religious, nationalist, productive and creative.

Several studies related to the use of textbooks to improve critical thinking skills, namely research conducted by Saputro et al. (2021) with textbooks with a high older thinking skills perspective, there was an increase in critical thinking activities in learning. In addition, research conducted by Haryanti & Hasan (2019) states that the learning process is still teacher-centered with a below average student learning success rate. One of the efforts in character building is that a teacher must be able to design the learning process in class because the main activity in formal education is organizing the learning process (Suri & Chandra., 2021; Suwija et al., 2022). With text books based on strengthening character education, it makes it easier for teachers to train critical thinking skills and build student character. This study aims to produce character-

based textbooks for elementary school students that are of good quality in terms of validity, practicality, and effectiveness of a product.

The purpose of this research is to develop and measure the effectiveness of a character-based textbook using multimedia to improve critical thinking skills of elementary school students. Specifically, the research aims to create a multimedia-integrated learning product that emphasizes character values and critical thinking skills, as well as evaluate the effectiveness of the developed textbook in improving students' critical thinking abilities. The research also aims to identify the extent of the impact of multimedia-based learning on the character building of elementary school students.

RESEARCH METHOD

This research is a type of research and development or Research and Development (R&D). Ramot & Bialik (2022) and Sukmadinata (2013) states that development research is a process used to develop and perfect a product that can be accounted for after validation tests and effectiveness tests have been carried out. This research produced a development product in the form of a character-based text book on human interaction with the environment at the high grade level, especially for fourth grade elementary school students. The development procedure in this study uses the 4-D development model (Four-D Model). This model is used to develop learning tools developed by Thiagarajan et al. (1974). The research and development model of the 4-D model consists of 4 stages, namely; define, design, develop, and disseminate. The 4-D model can then be adapted into the 4Ps namely: defining, designing, developing, and deploying (Maleki et al., 2022).

The subjects in this study were fourth grade students at Elementary School of Balas Klumprik, Surabaya City totaling 34 students with details of 19 female students and 15 male students. The time for carrying out research and development activities is carried out in the even semester of the 2021-2022 academic year. The theme developed is theme 3, sub-theme 1, learning 3, material about human interaction with the environment.

Data was collected using observation data collection techniques, questionnaires and tests. Observation is used to observe teacher and student activities during the learning process using character-based textbooks. Questionnaires are used to see the results of validation by experts in their fields and the results of student responses. The tests in this study consisted of a pre-test and a post-test to measure students' critical thinking skills. The five aspects used in the assessment of critical thinking skills are the skills of analyzing, synthesizing, recognizing and solving problems, concluding, and evaluating or assessing.

The validation analysis developed can be obtained from the value of the validation instrument sheet which is validated by the material expert validator and media expert. Character-based text book validation consists of material feasibility validation, language validation, and graphic validation.

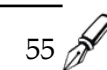
$$\text{Percentage} = \frac{\text{total score of the validation results}}{\text{highest total score}} \times 100\%$$

(Riduwan, 2013)

The score used in scoring the validation sheet is a Likert scale with answer levels ranging from positive to negative (Mawardi, 2019). A list of Likert scales and their scores can be seen in Table 1.

Table 1. Likert scale

Score	Information
1	Not good
2	Not good
3	Pretty good
4	Well
5	Very good



The data generated from the validation process is in the form of a score which is then calculated using the following formula:

$$p\% = \frac{\text{total score of data collection results}}{\text{max score}} \times 100\%$$

(Riduwan, 2013)

Character-based textbooks are called feasible if the average of media and material validation gets $\geq 61\%$ of the eligibility percentage criteria table. The Table 2 is the percentage eligibility criteria.

Table 2. Validation percentage criteria

No.	Average score	Category
1.	0% - 20%	Very less
2.	21% - 40%	Not enough
3.	41% - 70%	Enough
4.	71% - 80%	Decent
5.	81% - 100%	Very Decent

The procedure for analyzing data for the quality of character-based textbooks includes observing the learning activities carried out by teachers and students. Besides that analysis of the results of teacher and student responses using observation sheets or questionnaires in the form of a google form. Teacher and student activities can be identified by observing activities during learning. The observation results are in the form of a score using a Likert scale.

$$P(\%) = \frac{\sum K}{\sum N}$$

Information:

P = Percentage of learning implementation

$\sum K$ = Frequency of aspects performed

$\sum N$ = Frequency of all observed components

The results of teacher and student observation activities are then transformed into guidelines for observing learning activities in Table 3.

Table 3. Guidelines for observing learning activity criteria

No.	Average score	Category
1.	0% - 20%	Very inactive
2.	21% - 40%	Not active
3.	41% - 70%	Less active
4.	71% - 80%	Active
5.	81% - 100%	Very active

Character-based textbooks are declared practical if the average results from observations of learning implementation get $\geq 66\%$ of the observation percentage criteria table. While the analysis of student responses to the use of character-based textbooks uses the Guttman scale. The results of the questionnaire were obtained through a questionnaire on student responses to comic media. The measurement scale uses the Guttman scale reference in Table 4.

Table 4. Student questionnaire assessment scale

Answer	Score
Yes	1
Not	0

(Riduwan, 2013)

After giving the questionnaire to students, the score obtained from the questionnaire is then processed using the formula below.



$$p\% = \frac{\text{total score of data collection results}}{\text{max score}} \times 100\%$$

(Riduwan, 2013)

The percentage of student questionnaires was used to determine student and teacher responses to the use of character-based textbooks. After the percentage results are obtained, interpretation is carried out according to the following Table 5.

Table 5. Student questionnaire percentage criteria

No.	Average score	Category
1.	0% - 20%	Very less
2.	21% - 40%	Not enough
3.	41% - 70%	Enough
4.	71% - 80%	Good
5.	81% - 100%	Very Good

Character-based textbooks are declared effective if the average of the results of the questionnaire or questionnaire responses to media use gets ≥ 61 from the table of teacher and student response criteria.

Analysis of the effectiveness aspect of character-based textbooks is determined based on the results of students' critical thinking skills test. The calculation technique uses quantitative descriptive, namely by measuring the completeness of the individual student skills test results with a minimum completeness criteria value of 75 then classical completeness. The formula used to calculate student scores is as follows:

$$\text{Final Value} = \frac{\text{scores obtained by students}}{\text{mas score}} \times 100$$

Next, calculate the completeness of the classical critical thinking skills test where students are declared complete if the acquisition score is $> 80\%$ and is analyzed using the formula:

$$\text{Classical completeness} = \frac{\text{number of students who completed}}{\text{total number of students}} \times 100\%$$

Table 6. Category of completeness of critical thinking skills results

Percentage	Criteria
$>75\%$	Very high
70%-75%	Tall
55%-69%	Currently
20%-55%	Low
$<20\%$	Very low

(Aqib & Chotibuddin, 2018)

Data analysis on the effectiveness of using character-based textbook products in the form of quantitative data with a one group pretest - posttest design. This design is depicted with the following pattern.

O1 X O2

Information:

O1 = pretest value

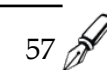
X = treatment

O2 = posttest value

(Sugiyono, 2019)

Before the treatment is given pretest so that the results are known to be more accurate and to be able to compare conditions before being given treatment (but not the control class). Score pretest is the result of the fourth-grade students' critical thinking skills at SDN Balas Klumprik Surabaya City before using character-based textbooks. While value posttest is the result of students' critical thinking skills after using character-based textbooks.

Differences before and after using character-based textbooks can be identified by processing the data using the mean and t-test (Zakariah & Afriani, 2021). If the results of the



comparison of t-count and t-theoretical state that $t\text{-count} \geq t\text{-table}$, then the use of character-based textbooks after learning has increased compared to before using the textbook based character.

RESULTS AND DISCUSSION

Research and Development Results

Prior to being used for research, the developed character-based textbooks along with learning tools are validated first. The components of learning tools that are tested are validated first, such as learning implementation plans (i.e. RPP), student activity sheets, critical thinking ability validation sheets and character-based textbooks. Following are the validation results assessed by experts in their fields in Table 7 as follows.

Table 7. Results of Research Instrument Validation by Experts

No.	Validated instrument	Average Percentage (%)	Category
1.	Material component character-based textbook	83%	decent
2.	Language component character-based text book	93%	very decent
3	Character component-based textbook of graphics	89%	very decent
4.	Lesson plan	87%	very decent
5.	Teacher observation sheet	91%	very decent
6.	Student observation sheet	94%	very decent
7.	Student response questionnaire sheet	90%	very decent
8.	Critical Thinking Test	86%	very decent

Based on the table, it can be seen that all aspects validated by the validator get a very decent average percentage score. Thus, the developed character-based textbooks along with learning tools have met the eligibility criteria and can be used to conduct research. Validity of feasibility character based textbook developed is carried out to determine the feasibility level of character based textbook. The quality of this aspect of the textbook was validated by several experts, namely material experts validated the material and media experts validated the quality of the media. Based on the results of the validity of draft I, there are several scores on the validity instrument that must be corrected according to validator/expert suggestions. Then, based on the suggestions from the validator, there are also several aspects of the instrument that are being improved. The results of the revision resulted in draft II and all validators stated character based textbook worth using. Validation character based textbook done first to material experts and then media experts. Assessing the eligibility of textbooks in terms of material is carried out through a validation process by material experts. While the feasibility assessment character based textbook from the aspect of content and purpose, language, graphics and presentation through a validation process by media experts.

Validation results character based textbook by the material component expert validator obtained a score of 33.2 out of a maximum score of 40, so that it is equivalent to 83% in the very feasible criteria. The language component obtained a score of 29.7 out of a maximum score of 32, so that it is equivalent to 93% in the very feasible criteria. Meanwhile, the graphical component obtained a score of 35.6 out of a maximum score of 40, so that it is comparable to 89% in the very feasible criteria.

The size of a product can be said to be of quality if it fulfills several aspects of product quality. The product developed in this development research based on the results of the expert validation test has shown that all aspects tested have a product validity score with very decent criteria. This statement is in accordance with the opinion put forward by Nieveen (1999) that a product can be said to be of high quality if it meets the aspects of product quality, including (1) validity; (2) practicality; (3) effectiveness.

Assessment of observations of teacher activity using a Likert scale based on observation sheets of teacher activity observed by two observers. The following shows the results of the average observation of teacher activity presented in the Table 8.

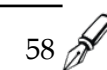


Table 8. Recapitulation of Teacher Activity Observation Results

Aspects of Teacher Activities	O1	O2	Percentage	Information
Meeting I	3,19	3,13	79%	active
Meeting II	3.71	3.74	93%	very active

Description: O1 = Observer 1; O2 = Observer 2

Furthermore, the assessment of student activity observations used a Likert scale based on the student activity observation sheets observed by two observers. The following shows the average results of observing student activity in the Table 9.

Table 9. Recapitulation of observations of student activities

Aspects of Student Activities	O1	O2	Percentage	Information
Meeting I	3,18	3,22	80%	active
Meeting II	3.81	3.75	94%	very active

Description: O1 = Observer 1; O2 = Observer 2

Obtained data results from student response questionnaires given according to students carrying out learning activities in trials on 34 students. The results of student responses to character-based textbooks on human interaction with their environment to improve critical thinking skills of fourth grade elementary school students are presented in the Table 10.

Table 10. Results of Student Responses to Character-Based Textbooks

No	Question	Student Response		Percentage	
		Yes	Not	Yes	Not
1	Is the look of this character-based textbook appealing?	34	0	100%	0%
2	Does this character-based textbook make learning more enthusiastic in class?	33	1	97%	3%
3	Can using this character-based textbook make learning material about human interaction with the environment fun?	34	0	100%	0%
4	Will this character-based text book support me in mastering human interaction with the environment?	30	4	88%	12%
5	Does the character-based textbook contain interesting descriptions, pictures, audio, video and animation?	33	1	97%	3%
6	Do the picture features in this character-based textbook affect the understanding of the lessons given by the teacher?	32	2	94%	6%
7	Are character-based textbooks easy to use?	33	1	97%	3%
8	Is the material presented in this character-based textbook easy to understand?	34	0	100%	0%
9	Does the character-based textbook encourage me to practice critical thinking?	31	3	91%	9%
10	Does using character-based textbooks get new experiences?	31	3	91%	9%
Average Percentage				95%	5%

Based on table 10, it explains that student responses to the developed character-based textbooks obtained data with detailed percentages answering "yes" between 85% - 100% and answering "no" between 0% - 15%. A product can be said to be practical if it makes it easy for the

user to use or use the product. The products produced in this development research were tested to determine the level of practicality of a product. The results of the trial can be known from the results of the observations of 2 observers and questionnaires.

The results of observations of teacher activity at the first meeting obtained a percentage of 79% with active criteria and at the second meeting obtained a percentage of 93% with very active criteria. While the results of observations of student activity at meeting I obtained a percentage of 80% with active criteria and meeting II obtained a percentage of 94% with very active criteria. The results of the recapitulation of students' questionnaire responses in the field trial of 34 students towards the use of character-based text books on human interaction with their environment obtained a percentage of 95% of students who answered "yes". The percentage results of 95% can be categorized as very good qualifications based on the Guttman scale reference in determining the criteria for this research (Antipkina & Ludlow, 2020; Leonid & Kanonire, 2022).

Effectiveness of character-based textbooks developed by researchers can be seen from the results of critical thinking skills tests after participating in learning with the treatment given by the teacher in the form of character-based textbooks. To find out the results of increasing students' critical thinking, before being given treatment students were given pretest questions first and after being given behavior students were given posttest questions. The pretest is given at the beginning to find out the students' initial abilities while to find out the increase in critical thinking skills a posttest is given after carrying out learning using comic media material for human interaction with the environment. The results of the pretest and posttest of students' critical thinking skills in the trials are presented in the Table 11.

Table 11. Recapitulation of critical thinking skills results

Data	Average	Completeness	Percentage	N-Gain	Information
Pretest	65	11	32%	0.59	currently
Posttest	82.7	28	82%		

Data analysis in this study used the t-test with the paired t-test formula to determine the effectiveness of the character-based textbooks on human-environment interaction material that was developed. Statistical analysis including parametric statistical tests must meet the prerequisite test, namely the normality test. The error rate (significance level) used in this study is 0.05. The prerequisite analysis test aims to determine whether there are deviations or not from the existing variables. The results of the pre-requisite test carried out are as follows.

The normality test in this study used the Shapiro-Wilk. To find out whether the distribution of data is normal or not, it can be seen from the magnitude of the Shapiro-Wilk value for each variable studied. Test criteria if the p value ≥ 0.05 then the data is normally distributed. Conversely, if the p value ≤ 0.05 , the data is not normally distributed. The normality test results of several variables in this study can be seen from the following table.

Table 12. Normality Test Results

Test	Significance (p)	Level (5%)	Information
<i>Pretest</i>	0.073	0.05	Normal
<i>Posttest</i>	0.092	0.05	Normal

Based on the Table 12, the results of the normality test can be seen that the significance value for all data on each variable in the study obtained a value greater than 0.05, then all data is stated to be normally distributed.

After the analysis prerequisite test is carried out, namely the normality test, the next step is to carry out data analysis. The data analysis technique used in this study was the paired t-test. Because the pretest and posttest tests fulfill the assumptions of normality and homogeneity, a paired t-test formula t-test is used to determine the significance of the product that has been developed. The calculation results are as follows.

Table 13. Paired T-Test Test Results

t count	Sig. (p)	Information
19,811	0.017	There is a difference before using character-based textbooks (pretest) and after using character-based textbooks (posttest).

Based on the Table 13, the calculation using a significance test for the value of students' critical thinking skills in this study obtained a tcount of 19.811 with a significance of 0.017. So, it can be concluded that the significance value ($0.017 < 0.05$). Thus, it can be stated that there is a significant difference in the critical thinking skills of fourth grade elementary school students after using character-based textbooks on human interaction with the environment. Product effectiveness can be seen from the results of the tests given to students, so learning outcomes are very important for measuring learning effectiveness. This indicates that a person's learning success can be measured by how far they are able to understand and absorb the material or content that has been provided (Münchow et al., 2023). In this research and development the effectiveness is seen from the results of giving students' critical thinking skills tests which are given to students through pretest (before treatment) and posttest (after treatment) using character based textbook.

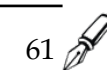
Discussion

Based on the validation results of research instruments on learning devices, it can be concluded that learning devices in the form of lesson plans, character-based textbooks and critical thinking skills questions have met the established eligibility criteria, namely learning devices are said to be valid if they have validity criteria > 70 (Akbar, 2013; Matosas-López & Cuevas-Molano, 2022). Textbooks are declared feasible if they fulfill most of the indicators in each aspect with certain validity criteria, so that it can be concluded that the learning tools developed in this study have fulfilled the validity aspect so that the devices are suitable for use in learning.

After assessing its feasibility by two validators, the next step is to test the practicality of character-based textbooks. To test the practicality of character-based textbooks, it can be seen through student responses, teacher questionnaires, observation sheets on the implementation of learning, and student activity observation sheets. The results of student responses in large group trials obtained an average score of 95% so that character-based textbooks on human interaction with the environment can be said to be very practical. Learning devices are said to be practical if they obtain a percentage of $> 70\%$. Apart from that, the same thing was stated by Suniasih (2019) that practicality of teaching materials can be seen from students' responses to textbooks. This practicality shows the ease of students in using textbooks that are developed in accordance with a predetermined time allocation, as well as the tools, materials, and media used in learning that are easily available and easy to use. Based on these results, it was stated that the learning tools developed in this study had fulfilled practical aspects so that the devices could be used in learning.

Based on the results of the students' critical thinking skills test during the pretest, they got an average score of 65 with details of 11 students who completed their studies, whereas after getting treatment in the form of a learning character-based textbook, they got an average score of 82.700 with details of 28 students who completed their studies. The average value of n-gain is 0.59 in the medium category (Sundayana, 2016). The results of the paired t-test obtained a tcount value of 19.811 with a significance of 0.017. So, it can be concluded that the significance value is ($0.017 < 0.05$), so it is stated that there is a significant difference in the critical thinking skills of fourth grade elementary school students.

Students need to be equipped with critical thinking skills so that students can survive in a competitive society. The ability to think critically is considered very much needed by individuals in their lives. So that teachers are required to be able to develop students' critical thinking skills. This is in line with the demands of 21st century learning. Wibowo et al. (2021) stated that one of the right places to train and improve the quality of someone's critical thinking is in education as a provision for students to prepare themselves to enter society. Therefore, the



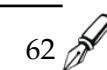
teacher as the spearhead in education is required to be able to know, explore, and develop students' critical thinking skills in the learning process. Developing critical thinking in education means that a teacher gives respect to students as a person (respect a person) where students are given equal opportunities to play an active role in learning (Song & Wang, 2022; Ramadani et al., 2021).

Alternative to overcome the weaknesses in improving critical thinking skills related to the learning process, a learning development is needed, one of the learning developments that can be done is to develop textbooks as a support in improving students' critical thinking skills. Interesting textbooks can encourage students to improve their critical thinking skills (Lee & Shin, 2023). Textbooks play an important role in learning. There are various forms of teaching materials, such as books, modules, media, worksheets and others. The development of an increasingly advanced era in various fields, especially the field of education requires educators to be able to make new innovations in the learning process so that the cognitive abilities and potential that exist in students can increase (Indariyani et al., 2019).

Ardan (2016) states that increasing local knowledge and good habits for students can be done through learning local cultural wisdom. Textbooks that present local wisdom in conveying learning material can make it easier for students to absorb the subject matter provided. This is because the closer the material presented is to the student learning environment, the easier it will be for students to understand problems and find solutions to solve these problems. This is supported by the statement of Mandalika et al. (2018) that the text size used is mostly the material must pay attention to environmental characteristics student. Teachers should be able to raise wisdom local in learning. So the learning process more lively, comfortable and fun. Students are able play an active role in preserving and maintaining wisdom local area. Planting character in students should done early. Active role between school and people parents to observe, supervise, and report character development of students is very necessary.

The development of this textbook can assist students in instilling noble values so that indirectly the character building of students is inherent in them. Almerico (2014) in his research explained the virtues of the development and implementation of character education applied to the curriculum at the elementary and high school levels by including content to make students more responsible, respectful, and contributing to social activities. The virtue of character education is to form good and responsible citizens (Smith, 2022). To realize character education, it is not enough just to teach students about what is right and what is wrong. A strong habit of character education is needed to help students understand what is right and wrong. Parents assume that the character education their children receive in the school environment is very good and the teacher has succeeded in instilling this character (Paul et al., 2022). In reality, character education will not work if there is no cooperation between schools, teachers and the community. This is in line with Dewantara et al. (2020) character education will run optimally if it gets support from family, school and community. Character assessment that includes parents as supervisors and assessors of children's character development. One type of character learning is through this textbook. The textbooks developed by the author are accompanied by invitational activities which students unknowingly are part of c multivating character values at the end of learning. This activity involves the active role of parents to monitor the development of children's character. Parents are tasked with reminding and giving awards in the form of checklist marks when the child has carried out these activities. Anggraini & Kusniarti (2016) states the need to make character assessment sheets so that parents know and participate in these assessments so that they participate in the success of school programs regarding character education.

The development of character-based textbooks received a positive response from teachers and students, this can be seen from the results of the interviews and responses that were conducted where the development of character-based textbooks much needed in supporting the learning process and improve students' critical thinking skills. Learning development by



developing character-based textbooks can also make it easier for teachers to convey material (Oonk et al., 2022). The positive response from teachers and students regarding the development of this textbook is also in line with previous research conducted by Mandalika et al. (2018) regarding the development of character-based textbooks as a support for the Teams Games Tournament model. The results of the study stated that through character habituation activities expected of students able to have a good personality. Teachers should pay attention to the characteristics of students to receive the material learning.

The findings from the study are in line with those conducted by Anjarsari et al. (2022) that modules that can improve critical thinking skills are those that are structured based on a contextual approach. In this case contextual-based teaching materials are effectively used in improving students' critical thinking skills. The same thing happened in Lestariningsih & Suardiman (2017) research on the development of integrative thematic teaching materials based on local wisdom to increase the character of caring and responsibility. The aims of this study were (1) to produce appropriate local wisdom-based thematic integrative teaching materials to enhance students' caring and responsible characters, and (2) to determine the effectiveness of local wisdom-based integrative thematic teaching materials to enhance students' caring and responsible characters.

CONCLUSION

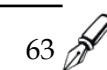
Based on the results of the analysis and the findings of the research results, it can be concluded that the character-based text books developed on human interaction with the environment are stated to be very valid, practical and effective for use in learning for fourth grade elementary school students. Planting character in students should be done early. An active role between schools and parents to observe, supervise, and report on the character development of students is very necessary. Through habituation and character development activities, students are expected to be able to have a good personality. In addition, aspects of the usefulness of teaching materials which can be used to do assignments and improve students' critical thinking skills.

The implication of this research is that multimedia-integrated learning with character-based approach can be an effective alternative to improve critical thinking skills of elementary school students. In developing character-based textbooks, this research can contribute to the development of more engaging learning materials that focus on character building of students.

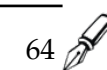
Furthermore, the hope for future research is to have more development of character-based textbooks that are integrated with multimedia, so that learning can be more effective and efficient in enhancing students' critical thinking skills. In addition, further research can be conducted to explore how character and multimedia-integrated learning can affect the character building of students, as well as to identify factors that influence the effectiveness of this learning approach.

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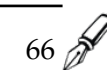


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Author (s):

* Hendratno (Corresponding Author)
Elementary School Teacher Education Study Program
Faculty of Education Science
Universitas Negeri Surabaya,
Jl. Lidah Wetan, Surabaya, 60213, Indonesia
Email: hendratno@unesa.ac.id

Fajar Nur Yasin
Elementary School Teacher Education Study Program
Faculty of Teacher Training and Education Science
Universitas Nahdlatul Ulama Sidoarjo,
Jl. Rangkah Kidul, Sidoarjo, 61234, Indonesia
Email: fajarnuryasin.pgds@unusida.ac.id

Nurul Istiq'faroh
Elementary School Teacher Education Study Program
Faculty of Education Science
Universitas Negeri Surabaya,
Jl. Lidah Wetan, Surabaya, 60213, Indonesia
Email: nurulistiqfaroh@unesa.ac.id

Suprayitno
Elementary School Teacher Education Study Program
Faculty of Education Science
Universitas Negeri Surabaya,
Jl. Lidah Wetan, Surabaya, 60213, Indonesia
Email: suprayitno@unesa.ac.id

