



Development Of Argumentation-Based 3D Audio Visual Media Exploding Box To Improve Students' Critical Thinking In Elementary Schools

Fajar Agus Agus Hari Firmansyah

Universitas Negeri Surabaya

Email: fajar.21001@mhs.unesa.ac.id

Waspodo Tjipto Subroto

Universitas Negeri Surabaya

Email: waspodosubroto@unesa.ac.id

Hendratno Hendratno

Universitas Negeri Surabaya

Email: hendratno@unesa.ac.id

Korespondensi penulis: fajar.21001@mhs.unesa.ac.id

Abstract. Abstract consist of the background of the problem, The results of the interviews also explained that teachers had difficulty making teaching aids or learning media so that they experienced obstacles in providing material to students. Based on the background of the problem and needs analysis, the formulation of the problem is the validity of Exploding Box 3D Audio Visual media, practicality of Exploding Box 3D Audio Visual media, Effectiveness of Exploding Box 3D Audio Visual media. Based on data analysis and discussion of research results, then associated with the formulation of the problem and research objectives, it was concluded that the validation of the media developed by the researchers received an assessment of 94%, meaning that the reliability of the media obtained results worthy of slight revisions. Validation of the material developed by researchers received an assessment reaches 89%, meaning that the reliability of the material in the media gets decent results with a little revision, the practicality validation of the media developed by researchers gets an assessment from the teacher validator reaches 95%, it means that the practicality reliability of the media gets decent results with a little revision, the practical validation of the media developed by researchers gets an assessment From the responses of the students, it was obtained that the percentage mode was $\geq 80\%$ with the category suitable for use. Validation of the effectiveness of the media developed by researchers. From the 10 questionnaire statements, the mode percentage was obtained $\geq 90\%$ with the category suitable for use, and the results of critical thinking test questions from the pretest value of 54% with the value of the increase in the posttest from the value of 95%. Therefore it can be concluded that the pretest data for students' critical thinking skills is very good because they have reached the specified KKM

Keywords: Exploding Box 3D Audio Visual, Critical Thinking

Abstract. Hasil wawancara juga menjelaskan guru kesulitan membuat perlengkapan peraga ataupun media pembelajaran sehingga mengalami hambatan dalam memberikan materi kepada peserta didik. Berdasarkan latar belakang masalah dan analisis kebutuhan maka rumusan masalah validitas media *Exploding Box 3D Audio Visual*, kepraktisan media *Exploding Box 3D Audio Visual*, Keefektifan media *Exploding Box 3D Audio Visual*. Berdasarkan analisis data dan pembahasan hasil penelitian, kemudian dikaitkan dengan dengan rumusan masalah dan tujuan penelitian, diperoleh simpulan yakni Validasi media yang dikembangkan oleh peneliti mendapat penilaian mencapai 94% artinya reliabilitas media mendapatkan hasil layak dengan sedikit revisi, Validasi materi yang dikembangkan oleh peneliti mendapat penilaian mencapai 89% artinya reliabilitas materi pada media mendapatkan hasil layak dengan sedikit revisi, Validasi kepraktisan media yang dikembangkan oleh peneliti mendapat penilaian dari validator guru mencapai 95% artinya reliabilitas kepraktisan media mendapatkan hasil layak dengan sedikit revisi, Validasi kepraktisan media yang dikembangkan oleh peneliti mendapat penilaian dari respon peserta didik diperoleh modus presentase $\geq 80\%$ dengan kategori layak digunakan, Validasi keefektifan media yang dikembangkan oleh peneliti Dari 10 pernyataan angket, diperoleh modus presentase $\geq 90\%$ dengan kategori layak digunakan, dan hasil soal tes berpikir kritis dari nilai pretest 54% dengan nilai peningkatan pada posttest dari nilai 95%. Oleh karena itu dapat disimpulkan bahwa data pretest keterampilan berpikir kritis pada peserta didik sangat baik karena sudah mencapai KKM yang ditentukan

Keywords: Exploding Box 3D Audio Visual, Berpikir Kritis

A. INTRODUCTION

Background

According to Majid (2014: 85) learning is a facility for humans to increase their potential. In order to obtain optimal skill development, the application of learning must be carried out as well as possible so as to produce reliable, qualified personnel who are sensitive to the surrounding environment, able to think logically, logically and systematically. Learning plays a significant role for the progress of a nation. The progress or decline of a nation's civilization is determined by the success of its development in the field of learning. One of the official learning institutions is a school, where the school is a place where there are teaching and learning activities. Salah satu tugas pendidik ataupun guru merupakan menghasilkan atmosfer pendidikan serta bisa memotivasi peserta didik buat tetap belajar dengan baik serta antusias. Atmosfer pendidikan yang demikian dapat menyebabkan dampak positif dalam pencapaian prestasi belajar yang maksimal peserta didik. Oleh sebab itu, guru sebaiknya memilah tata cara serta media pendidikan yang efektif. Ketidaktepatan dalam menggunakan tata cara serta media memunculkan

kejenuhan untuk peserta didik dalam menerima modul yang di sampaikan sehingga modul kurang bisa di pahami yang menyebabkan peserta didik jadi apatis(Sudjana 2009).

The phenomenon in Gresik has also become the center of attention in the problem of interaction with nature, especially in Cerme which is a regular flood every year. . The Head of the Regional Disaster Management Agency (BPBD) said that the floods in the Cerme District were due to high rainfall so that the rivers around the Cerme area such as the Lamong River were unable to accommodate rainwater. Even though the Gresik Regency Government has widened the rivers sector and the path from Kali Lamong, flooding is still a problem for Cerme residents because until now there has been no safe solution for flooding there. (East Java, 2023)

Most of Gresik has also experienced changes from the climate sector, namely that before Gresik could still be said to be an agrarian city but now it has undergone significant changes, namely it is famous for being an industrial city, it is common for the ears of the people of East Java that Gresik is ranked 2nd in the highest minimum wage in East Java. Industry in Gresik, according to researchers, has many positive and negative factors due to the construction of factories which can be said to be very fast. (Central Bureau of Statistics for Gresik Regency, 2022) Looking at the employment and economic sectors, it has helped Gresik residents to see that the economic growth of Gresik Regency in 2022 will reach 7.38 percent. The economic structure of Gresik Regency is dominated by the Processing Industry business field by 49.44 percent, because the many factories also increase employment in Gresik even though this applies to residents outside Gresik, not only that the negative factor is also very worrying, namely in the environmental sector, how is it possible to build a factory? also how much land was used up even at the establishment of JIPE who doesn't know about this industry that how many hectares of mangrove forest have been used up for the establishment and expansion of this factory. This is the researcher hopes that with the existing problems in Gresik with Exploding Box 3D Audio Visual media, students will understand that we as social beings who are entrusted with protecting the earth must be aware of climate change in Gresik. Media Exploding Box 3D Audio Visual also provides an understanding of the environment, that our attitude towards the environment will also have an impact on humans. Therefore Exploding Box 3D Audio Visual media is very suitable for social studies subjects which provide an understanding of the basic concepts of the environment.

In addition to Exploding Box 3D Audio Visual media, researchers also use argumentation-based education as a support for this media in an effort to increase students' critical thinking. The educational media that researchers use is Exploding Box 3D Audio Visual. This media is media that has been renewed so that it is 3D in which there is audio-visual output of sound from the media so that it has certain advantages, namely being able to stimulate creativity and increase critical thinking in students.

Based on the background above, it is necessary to conduct research on the Development of 3D Audio Visual Exploding Box Media with the title "Development of 3D Audio Visual Exploding Box Media Based on Argumentation to Improve Students' Critical Thinking in Elementary Schools". Using this media is expected to support teachers in overcoming teaching difficulties and support students in understanding the subject matter.

B. Problem Formulation

Based on the background of the problem and needs analysis, the formulation of the problem is as follows:

1. What is the validity of the Exploding Box 3D Audio Visual media in learning Theme 6 Heat and Its Movement, Sub-theme 1, Learning 4?
2. What is the practicality of Exploding Box 3D Audio Visual media in learning Theme 6 Heat and its Movement, Sub-theme 1, Learning 4?
3. What is the effectiveness of Exploding Box 3D Audio Visual media to improve students' critical thinking?

C. THEORETICAL STUDIES

There has been no research looking at the development of exploding box learning media, according to various research studies. Nonetheless, a number of previous scientific studies related to our research, including:

1. Research conducted by Artapranata et al., (2014) in the PGSD UPG Pulpit Journal. Vol 2.No. 1. Regarding the Think Pair Share (TPS) learning model assisted by audio-visual media, it has an effect on social studies learning outcomes for fifth grade elementary school students. This research concluded that there was a significant difference in the learning outcomes of fifth grade students between groups of students who participated in audio-visual media-assisted learning and

- groups of students who attended conventional learning. Thus, audio-visual media-assisted learning has an influence on social studies learning outcomes for fifth grade elementary school students.
2. Research conducted by Zahro (2016) entitled: "Development of Pop Up Multimedia-Based Textbooks in Class II Mi Al-Azhaar Bandung". This research is development research. The results of this research are developing Multimedia Pop Up-Based Textbooks in class II MI Al-Azhaar Bandung Tulungagung which includes teaching materials, learning support videos, puzzle games and quizzes for student training with small group trial results of 93%, and for student results field trials reached 95%. The similarities and differences from the research conducted by Lutfiatuz Zahro, namely the similarities are that they are both development research using the Pop Up technique and using the ADDIE model research type. The instruments used to collect data were interview guides, observation guides and questionnaires. The difference is in the media packaging, where previous research was book-based and in data collection techniques researchers did not use quantitative research which referred to the T-test formula and used SPSS computer calculations.
 3. Sari's research (2014), regarding the Development of problem-based Audio Visual Media in increasing learning motivation and critical thinking skills in students on redox material shows that problem-based audio-visual media is effective in increasing learning motivation and students' critical thinking skills.
 4. Research conducted by Pramesti (2015) entitled: "Development of Event Theme Pop-Up Book Media for Grade III SD Negeri Pakem 1". This research is development research. The results of this research are the development of pop-up book media and knowing the validity level of the pop-up book media developed. The similarities and differences from the research conducted by Jatu Pramesti, namely the similarity is that both development research uses the Pop Up technique while the difference is that if the previous researcher used the Borg and Gall research model and developed Pop Up Book media, the researcher used Exploding Box Pop Up 3D .
 5. Suriawati's research (2014) on the Development of Audio Visual Media with the SETS Approach to Increase Learning Motivation and Critical Thinking Skills of

- Students shows that there are differences in the results of critical thinking skills between the experimental class and the control class, and the achievement of increasing students' critical thinking skills after using audio-visual media with the SETS approach reaches 0.25 which is included in the low category.
6. Something for Everyone? An Evaluation of the Use of Audio – visual Resources in Geographical Learning in the UK by John H. McKendrick and Annabel Bowden (1999) in the international Journal of Geography in Higher Education. Vol 23 Pp 9-19 (McKendrick & Bowden, 1999). The research stated that based on a survey of students majoring in geography in the UK, their experience of using audio-visual media was examined very well to support teaching and learning.
 7. Research by Sarwinda (2014), regarding the development of Audio Visual Learning Media with CTL Income Material Ksp to Increase Learning Motivation and Critical Thinking Ability of Students shows that audio visual learning media is able to improve students' critical thinking skills with completeness of critical thinking results in the experimental class as much as 80% while the control class is only 62.5%.
 8. Research by Yew Leong & Tan (2008), International Journal of Pedagogies and Learning Vol 5 Pp 36-47 namely the use of audio-visual media in the teaching of philosophy in secondary schools. This study investigates how audio-visual media, especially films, can be used in teaching and learning activities in philosophy lessons in secondary education.
 9. Kusni et al's (2021) research on the Development of Local Wisdom-Based Batik Tanjung Bumi Ebook Media to Improve Student Character shows that audio-visual media is able to develop students' critical thinking skills in learning history.
 10. Wahyunita & Subroto (2021) The Effectiveness of the Blended Learning Learning Model with the STEM Approach in Efforts to Improve Students' Critical Thinking Ability. This model enables students to be more massive and effective in improving critical thinking.

D. RESEARCH METHODS

The development research model for theory is used as a research framework and the development of this research is the ADDIE theory (analyze, design, development, implementation, evaluation). This study aims to identify the existence of validity,

practicality, and effectiveness of efforts to improve critical thinking skills in social studies subjects. So that this research is categorized in development research.

In this study, the implementation of data collection techniques played a role in collecting objective data. This research uses data collection techniques as follows:

a. Interview.

To produce examples that must be examined, information is collected using an interview approach. The interview, which was conducted on February 2, 2023, with the fifth grade teacher at SD Al-Islam Gresik aims to uncover certain issues that require in-depth responses from respondents.

b. Questionnaire.

Questionnaires are used to evaluate the reliability and usability of the innovated media. Validation questionnaires and questionnaires to measure student reactions were used in this study. The validation questionnaire is used to assess the reliability of the media produced. This questionnaire has standards aligned with the needs of researchers, which are as follows:

Table of Aspects of Validator Criteria

Validator	Kriteria
Media Validity	1. Media Expert
	2. Material Expert
Media Practicality	1. Class V teacher
	2. Students
Media Effectiveness	1. Students

a. Test

The test is carried out at this stage, namely a test of students' critical thinking skills. Critical thinking tests in the media are usually called learning test questions with the completion of the Exploding Box 3D Audio Visual media implementation. Through evaluation questions, test questions by students over a certain period of time are measured before implementation (pretest) and after implementation (posttest). In this study a test was used to assess students' critical thinking in understanding the concept of learning through the Exploding Box 3D Audio Visual learning media produced in addition to measuring the usefulness of the media. The effectiveness of a strategy is

measured by how well the achievement of the KKM that has been set is 75 in line with the national KKM standards.

b. Studi Dokumentasi

This accumulated information is used to fulfill information on the results of media realization, images relating to the application of the realization of the developed learning media.

The purpose of using data collection instruments include:

- c. Feasibility instrument for Exploding Box 3D Audio Visual media on Theme 6 Learning 1. Experts consisting of learning media experts who need to validate learning media that have been made by researchers in collaboration with programmers. So that learning media is getting ready and feasible to be applied to elementary school children.
- d. The practical instrument for Exploding Box 3D Audio Visual media uses a questionnaire to find out the response to the implementation of audio-visual and observation sheets to observe student activities and student behavior during learning activities using audio-visual.
- e. The instrument for the effectiveness of Exploding Box 3D Audio Visual to improve critical thinking in learning uses pretest and post-test learning instruments.

This study uses several instruments that are used to collect valid data. The research instruments that can be used are aligned with the aspects being assessed, the instruments, the observed data, and the respondents, namely as follows:

Table of assessed aspects, Instruments, observed data, and Respondents

Rated aspect	instrument	Observed data	Respondents
Media Validity	Validation Questionnaire	Media Validity	Media expert & Material Expert
Media Practicality	Research Sheet	Implementation of Learning	Class V Teachers & Students
Media Effectiveness	Questionnaire	Student Response	Learners

E. DATA ANALYSIS RESULTS

After conducting trial I the researcher obtained findings which included media and material validity, practicality and effectiveness of Exploding Box 3D Audio Visual media to improve critical thinking skills.

1. The validity of the 3D Audio Visual Exploding Box media meets the criteria for use with minor revisions which include:
 - a. Media validation developed by researchers received an assessment from the validator with a tendency of media validity, namely very good. The validator gave an assessment of 14 aspects of media validity by reaching 94%, meaning that media reliability got decent results with a little revision so that this media can be implemented and can be accounted for scientifically. .
 - b. The validation of the material developed by the researcher received an assessment from the validator with a tendency for the validity of the material to be very good. The validator gives an assessment of 7 aspects of material validity reaching 89%, meaning that the reliability of the material in the media gets decent results with a little revision so that the material in this media can be implemented and scientifically justified.

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2. The validity of the 3D Audio Visual Exploding Box media meets the criteria for use with minor revisions which include:
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 - b. The validation of the material developed by the researcher received an assessment from the validator with a tendency for the validity of the material to be very good. The validator gives an assessment of 7 aspects of material validity reaching 89%, meaning that the reliability of the material in the media gets decent results with a

little revision so that the material in this media can be implemented and scientifically justified.

3. The effectiveness of Exploding Box 3D Audio Visual media is developed which meets the effectiveness criteria which include:

- a. The students' responses were obtained from filling out the questionnaire given after the learning process. This questionnaire sheet was filled out by 10 students in class V, the results of student responses were obtained from the number of students who answered "YES" to each statement in the questionnaire sheet. The results of the percentage aspects of evaluating the effectiveness of the media obtained include; This device is easy to use and operate 100%, There are clear instructions for using the material 100%, Users are happy with the media 90%, Media users are not bored with it 90%, After using this media, users feel excited and encouraged to learn 90%, Users understand and understand clearly how the media presents information 80%, Users are enthusiastic about using this media for learning both at home and at school. 90%, Users want to have this media 100%, Interested in viewing the material 100%, Facilities to understand the material being taught more 70%.

Based on the results obtained the percentage of each statement. Of the 10 questionnaire statements, the percentage mode $\geq 90\%$ was obtained with the appropriate category to use. Therefore, from the data above, it can be concluded that students are enthusiastic and happy with the media developed by researchers.

- b. As for the results of the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were 2 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest was 54%. Therefore it can be concluded that the pretest data of students' critical thinking skills is still low because they have not reached the specified KKM.

Meanwhile, from the results of the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were

10 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest was 95%. Therefore it can be concluded that the pretest data for students' critical thinking skills is very good because they have reached the specified KKM.

F. **DISCUSSION**

A. **Media and Material Validation Results**

a. **Media Validation**

The validation of Exploding Box 3D Audio Visual learning media is validated by media experts who are experts in their fields. The results of media validation by the validator can be used with a little revision.

Tabel 4.1
Media Validation Results

VALIDATION SHEET
The Validity of 3D Audio Visual Exploding Box Media to Improve Critical Thinking in Students

Instruction :

1. Give an assessment by ticking (√) in the assessment score column while at the same time giving a value according to the weight provided.
2. If the validator deems it necessary to revise, we ask you to write in the suggestions section or write directly in the validated text.
3. Description:
1 = not good
2 = not good
3 = pretty good
4 = good

No	Rated aspect	Validator Assessment			
		1	2	3	4
A	Pewarnaan(Colour)				
	1. Interesting mix of media colors				√
	2. Color does not affect the material			√	
B	Material on Media				
	3. The media is made according to the media material.				√
	4. The information presented in the media is understandable and clear.				√
C	Use of words or language (Text Layout) Graphics (Graphics)				
	5. It's easy to monitor the sound being used.				√
	6. The language is easy to understand.				√
	7. Media text size viewable.				√
	8. Media materials are presented in a clear and easy to understand manner.				√
D	Design (Interfaces)				
	9. Innovative appearance and design				√
	10. Visual media				√
	11. Other learning materials can be applied with media				√
	12. Using simple and safe media (Potable)			√	
	13. The medium is cheap and easy to reach			√	
	14. Media is flexible (light and does not take up much space.				√
Total Score		53			

Comments and suggestions:

1. The use of language can be mixed with the typical language from Gresik or the local area to make it easier to understand the learning material.
2. The sound of the media used can use the sound of learning in general.

By paying attention to the score on each aspect of the assessment on the validation sheet, here is a checklist (√) which indicates that this Exploding 3D Audio Visual media:

- () is suitable for use without revision
- (√) suitable for use with minor revisions
- () is worth using with multiple revisions
- () is not feasible and must be replaced

Based on table 4.1, the validation of the media developed by the researcher received an assessment from the validator with a tendency for media validity, which was very good. The validator gave an assessment of 14 aspects of media validity by reaching 94%, meaning that media reliability got decent results with a little revision so that this media can be implemented and can be accounted for. answer scientifically.

a. Material Validation

In validating the material on the Exploding Box 3D Audio Visual learning media it is validated by media experts who are experts in their fields. The results of media validation by the validator can be used with a little revision. The validation results can be presented in table 4.2

Tabel 4.2
Material Validation Results

VALIDATION SHEET

**The Validity of 3D Audio Visual Exploding Box Material to Improve
Critical Thinking in Students**

Instruction :

1. Give an assessment by ticking (√) in the assessment score column while at the same time giving a value according to the weight provided.
2. If the validator deems it necessary to revise, we ask you to write in the suggestions section or write directly in the validated text.
3. Description:
1 = not good
2 = not good
3 = pretty good
4 = good

No	Rated aspect	Validator Assessment			
		1	2	3	4
A	Learning				
	1. Media is used for small and large group learning				√
	2. he use of interesting titles			√	
	3. Media is relevant to the material that students must learn.			√	
B	Curriculum				
	4. KD in social studies subjects according to the theme of objects and their movements.				√
	5. IPS subject indicators are in accordance with KD IPS subjects			√	
	6. Social studies subject learning objectives are in accordance with social studies subject indicators				√
C	Content of Matter				
	7. Social studies subject matter is in accordance with social studies learning objectives				√
	Skor Total	25			

By paying attention to the score on each aspect of the assessment on the validation sheet, here is a checklist (√) which indicates that this Exploding 3D Audio Visual media:

- () is suitable for use without revision
- (√) suitable for use with minor revisions
- () is worth using with multiple revisions
- () is not feasible and must be replaced

Based on table 4.2, the validation of the material developed by the researcher received an assessment from the validator with a tendency for the validity of the material to be very good. The validator gives an assessment of 7 aspects of material validity reaching 89%, meaning that the reliability of the material in the media gets decent results with a little revision so that the material in this media can be implemented and scientifically justified.

B. Media Practicality Validation Results

The practical validation of the Exploding Box 3D Audio Visual learning media was validated by the teacher and fifth grade students to see how the media was

implemented. The results of media validation by the validator can be used with a little revision. The validation results can be presented in tables 4.3 and 4.4

Tabel 4.3
Media Practicality Validation results

RESEARCH SHEET

**The Practicality of 3D Audio Visual Exploding Box Media to Improve
Critical Thinking in Students**

Instruction :

1. Give an assessment by ticking (√) in the assessment score column while at the same time giving a value according to the weight provided.
2. If the validator deems it necessary to revise, we ask you to write in the suggestions section or write directly in the validated text.
3. Description:
1 = not good
2 = not good
3 = pretty good
4 = good

No	Rated aspect	Validator Assessment			
		1	2	3	4
A	Learning				
	1. Classes and small groups make use of media for learning.				√
	2. Utilize motivating titles so that students are interested				√
	3. Media relates to what students need to learn.				√
B	Curriculum				
	4. The media follows the relevant curriculum			√	
	5. Benefits and objectives are clearly stated			√	
C	Content of Matter				
	6. The contents of the material contain a clear and precise understanding.				√
	7. The substance of the information is in accordance with the core competencies (IC)				√
	8. The contents of the material follow Basic Competency (KD)				√
D	Interactional				
	9. The media is easy to use and operate.				√
E	Feedback				
	10 The use of media does not make users bored				√
F	Error Handling (Treatment of Errors)				
	11. content contains examples of questions and pictures				√
	12. The media encourages children to try to answer practice questions correctly.				√
Skor Total		42			

Comments and suggestions:

1. Media is very interesting to use in learning
2. This media is very unique because no one has used audio-visual media yet.
3. Media can be further developed with other materials and researchers can teach teachers how to make these media

By paying attention to the score on each aspect of the assessment on the validation sheet, here is a checklist (√) which indicates that this Exploding 3D Audio Visual media:
 () is suitable for use without revision
 (√) suitable for use with minor revisions

() is worth using with multiple revisions

() is not feasible and must be replaced

Based on table 4.3 the practicality validation of the media developed by the researcher received an assessment from the teacher validator with a tendency for media practicality validity, namely very good. can be implemented and can be justified scientifically.

Tabel 4.4
Media Practicality Validation Results (n = 10 students)

RESEARCH SHEET
The Practicality of 3D Audio Visual Exploding Box Media to
Improve Critical Thinking in Students

No	Aspects assessed	Percentage of students who answered	
		Yes	No
A	Learning		
	1. Classes and small groups make use of media for learning.	70%	30%
	2. Utilize motivating titles so that students are interested	90%	10%
	3. Media relates to what students need to learn.	90%	10%
B	Curriculum		
	4. The media follows the relevant curriculum	80%	20%
	5. Benefits and objectives are clearly stated	80%	20%
C	Content of Matter		
	6. The contents of the material contain a clear and precise understanding.	90%	10%
	7. The substance of the information is in accordance with the core competencies (IC)	80%	20%
	8. The contents of the material follow Basic Competency (KD)	80%	20%
D	Interactional		
	9. The media is easy to use and operate.	100%	0%
E	Feedback		
	10. The use of media does not make users bored	100%	0%
F	Error Handling (Treatment of Errors)		
	11. Content contains examples of questions and pictures	100%	0%
	12. The media encourages children to try to answer practice questions correctly.	80	20%

Based on the table above, the percentage of each statement is obtained. Of the 11 questionnaire statements, the percentage mode $\geq 80\%$ was obtained with the appropriate category to use. Therefore, from the data above, it can be concluded that students are enthusiastic and happy with the media developed by researchers.

C. Media Effectiveness Validation Results

In the validation of the effectiveness of the Exploding Box 3D Audio Visual learning media it was validated by fifth grade students to see the effectiveness of the media. The results of the effectiveness validation by the validator can be used with a little revision. The validation results can be presented in table 4.5

Tabel 4.5
Media Effectiveness Validation Results (n = 10 Siswa)

STUDENT RESPONSE SHEET

The Effectiveness of 3D Audio Visual Exploding Box Media to Improve Critical Thinking in Students

No	Aspects assessed	Percentage of students who answered	
		Yes	No
A	Media Operation/Implementation		
	1. This device is easy to use and operate	100%	0%
	2. There are clear instructions for using materials	100%	0%
B	Usage Reaction (User Reaction)		
	3. Users are happy with the media	90%	10%
	4. Media users are not bored with it	90%	10%
	5. After using this media, users feel excited and motivated to learn.	90%	10%
	6. Users clearly understand and understand how the media presents information.	80%	20%
	7. Users are enthusiastic about using this media to study both at home and at school.	90%	10%
	8. The user wants to own this media.	100%	0%
	9. People are attracted by the look of the material.	100%	0%
C	Supporting/Additional Facilities		
	10. Facilities to understand the material being taught more.	70%	30%

Based on the table above, the percentage of each statement is obtained. Of the 10 questionnaire statements, the percentage mode $\geq 90\%$ was obtained with the appropriate category to use. Therefore, from the data above, it can be concluded that students are enthusiastic and happy with the media developed by researchers.

D. Critical Thinking Skills Test Results.

To find out critical thinking skills in students by giving 10 critical thinking skills test questions to students before learning (pretest) and after learning (posttest) using Exploding Box 3D Audio Visual media. The pretest and posttest results of students' critical thinking skills are in table 4.6 and table 4.7

Tabel 4.6
Pretest data of students' critical thinking skills

Name of Student	Number of Questions										Correct Answers	Percentage
	1	2	3	4	5	6	7	8	9	10		
A	x	√	√	x	x	√	√	x	√	√	6	60%
B	√	√	√	x	√	√	√	x	√	√	8	80%
C	x	√	x	√	x	x	√	√	√	√	6	60%
D	√	√	√	x	x	√	x	x	√	√	6	60%
E	x	√	√	x	x	x	x	x	√	√	4	40%
F	√	√	√	x	x	x	x	x	√	√	5	50%
G	√	√	x	x	x	x	x	x	√	√	4	40%
H	√	√	x	x	x	x	x	x	√	√	4	40%
I	√	√	√	√	x	√	√	x	√	√	8	80%
J	x	x	x	√	√	x	x	x	√	√	4	40%
Total											54	54%

From the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were 2 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest was 54%. Therefore it can be concluded that the pretest data of students' critical thinking skills is still low because they have not reached the specified KKM.

Tabel 4.7
Posttest data of students' critical thinking skills

Name of Student	Number of Questions										Correct Answers	Percentage
	1	2	3	4	5	6	7	8	9	10		
A	√	√	√	√	x	√	√	√	√	√	9	90%
B	√	√	√	√	√	√	√	√	√	√	10	100%
C	√	√	√	√	√	√	√	√	√	√	10	100%
D	√	√	√	√	√	√	√	√	√	√	10	100%
E	x	√	√	√	√	√	√	√	√	√	9	90%
F	√	√	√	√	√	√	√	x	√	√	9	90%
G	√	√	√	√	√	√	x	x	√	√	8	80%
H	√	√	√	√	√	√	√	√	√	√	10	100%
I	√	√	√	√	√	√	√	√	√	√	10	100%
J	√	√	√	√	√	√	√	√	√	√	10	100%
Total											95	95%

From the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were 10 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest was 95%. Therefore it can be concluded that the pretest data for students' critical thinking skills is very good because they have reached the specified KKM.

Tabel 4.8
Data Value of students' critical thinking skills

No	Nama Siswa	KKM	Hasil		Ketuntasan	N-Gain	Kategori
			Pretest	Posttest			
1.	A	75	60	90	T	0.75	Tall
2.	B	75	80	100	T	1.00	Tall
3.	C	75	60	100	T	1.00	Tall
4.	D	75	60	100	T	1.00	Tall
5.	E	75	40	90	T	0.83	Tall
6.	F	75	50	90	T	0.80	Tall
7.	G	75	40	80	T	0.66	Currently
8.	H	75	40	100	T	1.00	Tall
9.	I	75	80	100	T	1.00	Tall
10.	J	75	40	100	T	1.00	Tall

Information :

T = Complete

TT = Incomplete

Giving pretest and posttest which was tested on 10 students of SD Al-Islam Gresik. In giving the pretest, the results obtained from 10 students were only 2 students who were able to reach the KKM, namely 75 with the complete category. After being given treatment and given a posttest, all students completed the learning process and achieved the specified KKM, which was $\geq 75\%$. As many as 9 out of 10 students get the high category and as many as 1 out of 10 students get the medium category. From this discussion, it can be concluded that students' critical thinking skills increased.

G. CONCLUSIONS and ADVICE

Based on data analysis and discussion of research results, then associated with the formulation of the problem and research objectives, the following conclusions are obtained.

1. The validity of the 3D Audio Visual Exploding Box media meets the criteria for use with minor revisions which include:
 - a. Media validation developed by researchers received an assessment from the validator with a tendency of media validity, namely very good. The validator gave an assessment of 14 aspects of media validity by reaching 94%, meaning that media reliability got decent results with a little revision so that this media can be implemented and can be accounted for scientifically. .
 - b. The validation of the material developed by the researcher received an assessment from the validator with a tendency for the validity of the material to be very good. The validator gives an assessment of 7 aspects of material validity reaching 89%, meaning that the reliability of the material in the media gets decent results with a little revision so that the material in this media can be implemented and scientifically justified
2. The practicality of Exploding Box 3D Audio Visual media is developed which meets the practical criteria which include:
 - a. The practicality validation of the media developed by the researcher received an assessment from the teacher validator with a tendency for media practicality validity, namely very good. The validator gave an assessment of 11 aspects of media practicality validity by reaching 95%, meaning that media practicality reliability got decent results with a little revision so that the practicality of this media can be implemented and scientifically justifiable.

- b. The practicality validation of the media developed by the researcher received an assessment from the responses of students with a tendency towards media practicality validity, namely very good validators gave an assessment of 11 aspects of media practicality validity by achieving a percentage of each statement. Of the 11 questionnaire statements, the percentage mode $\geq 80\%$ was obtained with the appropriate category to use. Therefore, from the data above, it can be concluded that students are enthusiastic and happy with the media developed by researchers.
3. The effectiveness of Exploding Box 3D Audio Visual media is developed which meets the effectiveness criteria which include:
 - a. The students' responses were obtained from filling out the questionnaire given after the learning process. This questionnaire sheet was filled out by 10 students in class V, the results of student responses were obtained from the number of students who answered "YES" to each statement in the questionnaire sheet. The results of the percentage aspects of evaluating the effectiveness of the media obtained include; This device is 100% easy to use and operate, There are clear instructions for using the material 100%, Users are happy with the media 90%, Media users are not bored with it 90%, After using this media, users feel excited and encouraged to learn 90%, Users understand and understand clearly how the media presents information 80%, Users are enthusiastic about using this media for learning both at home and at school. 90%, Users want to have this media 100%, Interested in viewing the material 100%, Facilities to understand the material being taught more 70%.

Based on the results obtained the percentage of each statement. Of the 10 questionnaire statements, the percentage mode $\geq 90\%$ was obtained with the appropriate category to use. Therefore, from the data above, it can be concluded that students are enthusiastic and happy with the media developed by researchers.

- b. As for the results of the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were 2 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest

was 54%. Therefore it can be concluded that the pretest data of students' critical thinking skills is still low because they have not reached the specified KKM.

Meanwhile, from the results of the students' pretest data, the results of the test questions were obtained from the 10 questions given in looking at critical thinking skills. Researchers set the minimum completeness criteria (KKM), namely $\geq 75\%$. There were 10 students who were able to achieve KKM with a percentage of 80%. Meanwhile, the average score of students who were able to answer the pretest was 95%. Therefore it can be concluded that the pretest data for students' critical thinking skills is very good because they have reached the specified KKM.

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