The analysis of implementation of multy source based learning media to improve the elementary students’ critical thinking skills in solving addition and subtraction problems

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Abstract. This study aims to investigate the analysis of implementation of multy source based learning media to improve the elementary students’ critical thinking skills in solving addition and subtraction problems. This is caused by the lesson plans cannot motivate students to improve critical thinking skills. The method used in this study is a mixed method which is a combination of quantitative and qualitative methods. The research subjects were the sixth grade students of elementary school consisting of 32 students of experimental class and 32 students of the control class. The instruments of this research are an interview, a questionnaire, observation, and documentation. Quantitative method is applied to analyze the difference of student achievement result among two classes, while the qualitative method is applied to analyze the students' higher order thinking skills. The results show that there are significant differences between the two classes that applied multi source based learning media and conventional learning. The statistical result indicates that the (2-tailed) significance of the independent sample t-test in the pre-test was 0.000 or α ≤ 0.05. It implies that the implementation of multy source based learning media affects the students' critical thinking skills in solving addition and subtraction problems.

1. Introduction
Mathematics is a science that relates to the study of the forms of structures and the relationship between them. Addition and reduction operations of positive or negative integers are not easy to be mastered by students, as negative numbers are abstract concepts [1]. Critical thinking is one of higher order thinking skills (HOTS) that are known to play a crucial role in moral, social, mental, cognitive, and science development [4]. This study analyzed students’ critical thinking skills. Defines critical thinking ability as a reflective thinking process that focuses on deciding what is believed to be done [6]. King (1993) also argues that critical thinking is included in higher order thinking [15]
Researcher found the references of multi-source learning media Mathematics. The medias used are 5 learning medias to solve addition and subtraction problems. They are 1) BILBUL puppet, 2) count, 3) electric charge props, 4) Puzzle Milus (minus and Plus), 5) Media GABIDROID (number line based on Android). However, this color card media is being less efficient and not durable. It also leads to misconceptualized students. Researchers are interested in developing a semi-circular-shaped Bilbul (integer chip) props to assist students in completing the summation material and the reduction of integers. An indicator of people who have the ability to think critically is he/she can evaluate the accuracy of various arguments. In the same way, Cottrell also conveys that evaluation is an essential part of critical thinking, involving a series of cognitive processes aimed identifying a problem, choosing a solution plan, and evaluating. Assuming this, people who have the ability to think critically can use appropriate criteria to evaluate an argument [3].

Critical thinking is part of cognitive skills which include interpretation, analysis, evaluation, inference, explanation, and self-regulation. Interpretation is the ability of a person to understand and express the meaning or purpose of various experiences in situations, data, events, decisions, conventions, and trustworthiness of rules, procedures or criteria. Analysis of the ability to identify true intentions and conclusions between statements, questions, concepts, descriptions based on beliefs, decisions, experiences, reasons, information or opinions. Evaluation is the ability to assess the credibility of statements or other presentations by assessing or describing a person's perceptions, experiences, situations, beliefs, decisions and using the logical power of expected inferential relationships or actual inferential relationships between statements, questions, descriptions and other forms of representation. Inference is the ability of students to identify and choose the elements needed to form reasonable conclusions or to form reasonable conclusions or to form hypotheses by paying attention to relevant information and reducing the consequences arising from data, statements, principles, evidence, judgments, opinions, description, statement, belief, and other forms of representation [14].

The conclusion of critical thinking is an important skill because it can prevent people from making wrong decisions and solve the problems encountered. Not everyone has a critical thinking skills, because to implement critical thinking requires or demands time and discipline. This means that at times of thought, developing ideas, and expressing opinions, it is important to actively respond to critical and planned questions and thoughts and apply them in real life or daily life. Research discussion the process of preparing the test is done by paying attention to each indicator of the achievement of learning outcomes. The preparation of the test includes the design of the test grain grid, test grain, and scoring guidelines. The class VI students whose studies were facilitated with multi-source learning media significantly display the skills of critical thinking better than those facilitated by expository strategies. It can happen because the implementation of learning using multi-source learning media can train critical thinking components. [10] The ability to think critically is important to understand and process information also develop ideas more deeply [7]. So, a student is said to be able to solve problems if he can apply the knowledge he had previously obtained to a new situation that is not yet known. This ability is known as high-level thinking skills [16].

Table 1. The Indicators and Sub indicators on critical thinking skills

| Indicators           | Sub Indicators                                                                 |
|----------------------|-------------------------------------------------------------------------------|
| Focusing questions   | F1: Identifying or formulating questions                                       |
|                      | F2: Identify or formulate criteria to consider possible answers                |
|                      | F3: Maintain a thinking condition                                              |
| Analyzing arguments  | A1: Identifying conclusions                                                    |
|                      | A2: View the structure of an argument                                          |
|                      | A3: Create a summary                                                          |
In fact, there are many teachers using "ready to use" learning media that are less encouraging students in building their mathematical communication skills. Therefore, it needs to be compiled and developed the quality learning media according to certain criteria. Teachers need to changes the habit by creating a real life lesson plan as a starting point of learning in order to provide more motivation to students to learn maths. A learning media that makes students understand is by implementing innovative learning approaches so that students can solve mathematical problems easier to memories. The medias in this research are lesson plan based Curriculum 2013 revision 2019 based Strengthening Character Education.

The success of the learning process is influenced by the learning implementation plan (lesson plan). Teachers must arrange learning medias before teaching learning is conducted to get the expected goals. However, teachers rarely make such learning medias. Based on the above problems, researchers are interested to develop the mathematics trainer with the title "The analysis of implementation of multy source based learning media to improve the elementary students’ critical thinking skills in solving addition and subtraction problems”.

The purposes of this study are : 1) To find out that the process of multy source based learning media to improve the elementary students’ critical thinking skills in solving addition and subtraction problems. 2) To find out that the results of the development of Mathematics learning media can improve students’ critical thinking skills in solving addition and subtraction problems. 3) To find out the effectiveness of the implementation of multy source based learning media which can improve the elementary students’ critical thinking skills in solving addition and subtraction problems. 4) To analyze students’ activities when multy source based learning media are applied and 5) To analyze phase portraits of critical thinking skills students in solving addition and subtraction problems through the implementation of multy source based learning media.
The analysis of implementation of multi-source based learning media to improve the elementary students' critical thinking skills in solving addition and subtraction problems.
2. Method
To analyze the implementation of multi techniques based learning Mathematics media in improving the elementary school students’ higher order thinking skill in solving exponential problem, the researcher used a mixed method. A mixed method is the research method that is combining qualitative and quantitative methods [5]. In brief, we can depict the triangulation model in Figure 1. It can be seen from the figure; we started the research by determining the two classes of the 5th grade students of elementary school as an experimental class and a control class. Those consisted of 25 students of the experimental class and 24 students of the control class. Further, we developed a pre-test and we gave to both two classes and analyzed the result for the next steps. We did a sequential mixed method, starting from qualitative, quantitative and ended by qualitative. Since the qualitative results gave the result analysis narratively, we convince the result by statistical inferential and then we ended with doing an in-depth interview to some respondents to capture their portrait phase of their higher order thinking skills as well as to know the level of students’ higher order thinking skills and to convince the improvement of students’ higher order thinking skill. The combination of the two methods also aims to resolve the weaknesses of each method. The statement based on the reasoning process where its truth is not yet certain. Quantitative research was experimental research model by using pre-test and post-test [17]. The following table describes the research design.

The research used research and Development (R&D) design. Research and development (R&D) is a method of research used to develop or validate products used in education and learning. This research includes the operation research that refers to the ongoing activities, namely that the research is not creating new ones, but sticking to an ongoing activity. The following table explains the research design. [11]

| Group                  | Pre-Test | Treatment | Post-test |
|------------------------|----------|-----------|-----------|
| A (experimental class) | O₁       | X         | O₂        |
| B (control class)      | O₃       |           | O₄        |

This type of research and Development used in this study uses 4-D models [13]. This 4-D Model has four stages: definition (define), design, development and dissemination (disseminate).
2.1 Population and Sample
The research subjects were the sixth grade students of elementary school at SDN 3 PATOKAN Situbondo of academic year 2019/2020 consisting of 32 students of the experimental class and 32 students of the control class. The sampling technique used was cluster random sampling that was done by randomly choosing two classes, the first class was the experimental class with the implementation of mutly source based learning media, and the second class was control class with the implementation of a conventional learning.

![The Learning tool Development flow chart](image-url)
2.2 Instrument
The instruments used in this study were a test, an observation, an interview and documentation. The test instrument is a pre-test and post-test of essay type. The observation instrument used a Linkert scale encompassing into four categories, namely very good (score 4), good (score 3), quite good (score 2), poor (score 1), and the last is an interview completed with an open questionnaire to the students’ worksheet.

2.3 Tasks
In this study students in the control class and the experimental class were given assignments in the form of essay about the exponential problem. Inferential statistics use the independent sample t-test to test the difference between the experimental class and the control class by comparing the mean values of the two groups with a significance level of 0.05. To measure the level of higher order thinking skills used essay tests. The teacher gave an explanation of some techniques. Students answered the questions related to the material using the easiest multi source based learning media.

The best multi source based learning media used in this study are as follows:

a. Mistar Count
   1) Zero will be in the middle. All negative numbers will be on the left zero and all positive numbers will be at the right zero.
   2) Slide your finger to the right, to the delimiter mark and the next number. Reducing negative numbers is almost the same as summation with regular numbers. If you start from -8, you should now be at-7. You’ve moved one step.
   3) Slide fingers a few steps, as many as the second number in your question, then stop. This will ensure that you stop at the answer to your question.
   4) Look at the location finger in your number line. That number is the answer to your reduction. For example, in the matter \((-8)\)\((-3)\), you’ll start your finger from -8 and it will move 3 steps to the right, ending at -5. \((-8)\)\((-3)\) = -5.

b. Electric Charge Viewer Media
The meaning of "electric charge viewer" is the creation of Rohayati [2], which is a card made of cardboard or paper marked as positive or negative; Or a bottle cap painted in two different colors, each representing a positive or negative number. This viewer was developed to help students understand the basic operation of the summation, subtraction, multiplication and division of integers.

3. Result and discussion
3.1 Result
We gave pre-test and post-test to both experimental and control class. We also apply observation, interview and documentations with the subject research. The quantitative analysis was applied by using a t-test on the pre-test and post-test results. The qualitative analysis was carried out by using interview and observation instruments. The inferential and descriptive statistics were applied to analyze respectively quantitative and qualitative data. The derived data from the research result were a frequency, mean, and a standard deviation. Moreover, the inferential statistic used independent sample t-test to test the difference between the experimental class and the control class. The independent samples t-test were used to compare the mean score of the two groups with a significance level of 0.05.

3.1.1 The results of the validity and reliability test
Before showing the results, we need to test the reliability and validity of our post-test instrument. The reliability and validity of the post-test results can be seen in the following table:
Based on Table 3, it can be seen that the value \( r_{\text{count}} \) of problem 1 is 1.000, problem 2 is 0.378, problem 3 is 0.462, problem 4 is 0.360, and problem 5 is 0.604. All of the items give the value of \( r_{\text{count}} > r_{\text{table}} \) with \( N = 32 \), thus all items are valid.

### Table 4. The Test Result of the Reliability Question: Reliability Statistics

| Cronbach’s Alpha | N of Items |
|------------------|------------|
| .680             | 5          |

3.1.2 The distribution of students’ higher order thinking skills based on Pretest

Furthermore, we will show the distribution of students’ higher order thinking skills of both control and experimental classes based on their pre-test result as follow:

#### Critical thinking skills of the control class

![Critical thinking skills of the control class](image1)

**Figure 3** The distribution of student’s critical thinking skills of the control class based on pre-test score.
Figure 4 The distribution of student’s critical thinking skills of the experimental class based on pre-test score.

Based on Figure 2 and Figure 3, the analysis of the pre-test results between the two classes can be seen that both classes have the same variant. The result of the pre-test of critical thinking skills in control and experimental class has several differences. In the control class, critical students are 4% lower than the experimental class that has 28%. The fair students are 41% in the control class greater than the experimental class i.e 32%. The poor level is 47% in the control class and 38% in the experimental class. But there are no students at the very critical level in both classes. The comparison of pre-test of the critical thinking skills of control and experimental class is shown in the table and bar diagram below.

Furthermore, pretest results were analyzed based on the level of students' higher order thinking skills in solving powers and numbers problems between the control class and the experimental class as in the figure 5 and table 5 below:

Table 5 The comparison of pret-test higher order thinking skill between control and experimental class

| No | Level     | Control Class | Experimental Class |
|----|-----------|---------------|--------------------|
|    | Sum      | Percentage    | Sum               | Percentage    |
| 1  | Very critical | 0  | 0% | 0  | 0% |
| 2  | Critical  | 4  | 13%| 9  | 28%|
| 3  | Fair     | 13 | 41%| 11 | 34%|
| 4  | Poor     | 15 | 47%| 12 | 38%|
|    | Total    | 32 | 100%| 32 | 100%|
Figure 5 The comparison of pre-test higher order thinking skill between control and experimental class

Based on table 5 and figure 5 show that the result of the pre-test of critical thinking skills in control and experimental class is not different significantly. In the control class, students with very critical level are 0% same as experimental class. The critical level's students are 13% in the control class. It is almost as large as in the experimental class i.e 28%. The fair level is 41% in the control class and 34% in the experimental class. The poor level is 47% in the control class and 38% in the experimental class.

The next step, we will analyze the homogeneity test and normality test, and finally, we will analyze the mean difference by using the independent sample t-test.

Table 6 Homogeneity Pre-test

| Levene Statistic | df1 | df2 | Sig. |
|------------------|-----|-----|------|
| 1,107            | 1   | 62  | .297 |

Table 6 shows test results of pre-test homogeneity. The significance value (Sig.) is 0.297. It can be concluded that the assumption of variant homogeneity fulfilled. The resulting significance value is greater than 0.05 which indicates that the data is homogeneous.

Table 7. The result of mean scores pre-test between control and experimental classes

| Group Statistics | class         | N  | Mean       | Std. Deviation | Std. Error Mean |
|------------------|---------------|----|------------|----------------|-----------------|
| data_pretest     | control class | 32 | 65,468     | 7.76254        | 1.37224         |
|                  | experimental class | 32 | 62,500     | 9.15811        | 1.61894         |

Based on table 7, it can be seen that the mean pre-test value of the control class was 65,468 (SD = 7,76254) while the average pre-test value of the experimental class was 62,500 (SD = 9,15811).

3.1.3 The distribution of students’ critical thinking skills based on Posttest

Students' critical thinking skills are measured based on the results of the posttest, that is the answer to the essay question. Students' answers were analyzed on a Likert scale with a range of 1 to 4 according to aspects and indicators of higher order thinking skills in solving exponential problems. The results of
the analysis are calculated on the percentage of each assessment indicator to determine the distribution of students' critical thinking skills.

Figure 6. The distribution of student’s critical thinking skills of the control class based on post-test result.

Figure 7. The distribution of student’s critical thinking skills of the experimental class based on post-test result.

Based on Figure 6 and 7, The result of the post-test of critical thinking skills of control and experimental class is different significantly in several levels. In the control class, very critical students are 44% that lower than the experimental class at 59%. The fair students are 16% in the control class that greater than the experimental class at 3%. The poor level is 3% in the control class, but there are no students at that level in the experimental class. While critical students in the control class are the same as in experimental class, i.e 38%. The comparison of the post-test of critical thinking skills of the control class and the experimental class students is shown in the table and bar diagram below.
Furthermore, postest results were analyzed based on the level of students' higher order thinking skills in solving powers and numbers problems between the control class and the experimental class as in the figure 8 and table 8 bellow:

**Table 8. The comparison of post-test of critical thinking skills**

| No | Level     | Sum | Control Class | Experimental Class |
|----|-----------|-----|---------------|--------------------|
|    |           |     | Percentage    | Percentage         |
| 1  | Very critical | 14  | 44%           | 19                 | 59%                |
| 2  | Critical   | 12  | 38%           | 12                 | 38%                |
| 3  | Fair       | 5   | 16%           | 1                  | 3%                 |
| 4  | Poor       | 1   | 3%            | 0                  | 0%                 |
|    | Total      | 32  | 100%          | 32                 | 100%               |

![The Comparison of Critical Thinking Skills Post-test between Control and Experimental Class](image)

**Figure 8. The comparison of post-test of critical thinking skills**

Based on table 8 and figure 8 show that the post-test of higher-order thinking skills result of control and experimental class is different significantly. In the control class, students with very critical level are 44% that less than the experimental class at 59%. The critical level students are same 38% experimental The fair level is 16% in the control class. It is greater than the experimental class that has 3% for the fair level. The poor level is 3% in the control class. It is greater than the experimental class that has 0% for the fair level.

Furthermore, inferential statistical analysis is performed to determine the differences in the implementation of multi source techniques based learning media in improving the elementary school students’ higher critical thinking skill in solving exponential problem by independent sample t-test. Previously, the researchers conducted a prerequisite test, which is the normality test.
**Table 9** The analysis of the normality test of both class for the post-test

|                  | control_class | experimental_class |
|------------------|---------------|--------------------|
| N                | 32            | 32                 |
| Normal Parameters |               |                    |
| Mean             | 75,4688       | 82,9688            |
| Std. Deviation   | 9,78473       | 9,57646            |
| Most Extreme Differences |         |                    |
| Absolute         | 0.200         | 0.237              |
| Positive         | 0.144         | 0.141              |
| Negative         | -0.200        | -0.237             |
| Kolmogorov-Smirnov Z | 1.129        | 1.343              |
| Asymp. Sig. (2-tailed) | 0.156         | 0.054              |

a. Test distribution is Normal.

b. Calculated from data.

Based on Table 9, Normality test results show us the significance value of the control class is 0.156 and the significance value of the experimental class is 0.054. The significance value of the two classes is greater than 0.05 so it can be concluded that both of the study samples are normally distributed.

**Table 10.** The comparison of post-test scores of control and experimental class using independent sample t-test

|                  |                |                |                |                |
|------------------|----------------|----------------|----------------|----------------|
|                  | Levene's       | t-test for Equality of Means |                |                |
|                  | Test for       | Equality of    |                |                |
|                  | Variance       |                |                |                |
| F                | Si.            | t              | df             | Sig.           | Mean Diff. | Std. Error | Diff. | 95% Confidence | Lower | Upper |
|                  | g.             |                |                | (2-tailed)     | Diff.        |            | Diff. | Interval of the Difference |            |       |
| data_            | Equal          | .8             | .0             | -              | 62          | .003       | 2,42029 | -             | -     |       |
| post test        | variances      | Equal          | .8             | .0             | -              | 62          | .003       | 2,42029 | -             | -     |       |
|                  | assumed        | 23             | 38             | 3,09           | 7,500       | 12,3380    | 2,66191 |                |       |       |
|                  | Equal          | -              | 61,9           | .003           | -              | 2,42029 | -          | -             |       |       |
|                  | variances not  | 3,09           | 71             | 7,500          | 12,3381     | 2,66187   |            |                |       |       |
|                  | assumed        | 9              | 00             |                | 3             |            |            |                |       |       |

Table 10 shows a significant difference between the two classes obtained from the significance value
of 0.038 (p <0.05). While the significance value of the t-test sig. (2-tailed) of the independent sample t-test the post-test value was 0,000 (p <0.05). It shows that the implementation of multi techniques based mathematics learning media significantly influences students' higher order thinking skills in solving the exponential problem.

3.1.4 Students’ activity during the multi source implementation
To convince our result, we did an observation of all students activities in mathematics learning in solving addition and subtraction problems based on multi source media. The observation items were assessed by using a Likert scale encompassing very active (score 4), active (score 3), fair (score 2), and poor (score 1). The observation result can be shown in the following figure.

Figure 9. The distribution of the observation result on the students’ activities in mathematics learning based on multi technique

3.1.5 Students' Test Results
From the results of the posttest, 3 samples were taken representing critical thinking skills in the category of less critical, critical, and very critical student.

Based on the three samples of students’ post-test, it represented critical thinking skills in the category of less critical, critical, and very critical. Based on the sample worksheet above, the student who had excellent critical thinking skills could solve the problem of adding and subtracting integers. Students can use the easiest and most effective multi-techniques that was explained by the teacher. Students who had critical thinking skills can complete assignments faster than others.

3.1.5.1 Student test results with very critical categories

The student focused the question and could work on the problem by using the number lines and models without teacher’s assistance. The student analysised arguments and could work on the problem by using the number lines and models without teacher’s assistance.
3.1.5.2 Student test results with critical categories

![Figure 10 Posttest results of very critical categories](image)

- The student asked and answered questions and can work on the problem by using the number lines and models.
- The student could analyze arguments and could work on the problem by using the number lines and models beaded media.
- The student focused the question and could work on the problem by using the number lines.
- The student could not work on the problem by using the number lines and models.
- The student asked and answered questions and could work on the problem by using the number lines.
- The student analyzed arguments but could not work on the problem by using the number lines.
Based on the sample worksheet above, the student who had good critical thinking skills could solve the problem of adding and subtracting integers. But she made a little mistake in doing assignments. She could find the easiest way but he cannot complete the task faster than student who had excellent critical thinking skills.

3.1.5.3 Student test results with poor categories

The student asked and answered questions and could work on the problem by using electric charge viewer media.

The student asked and answered questions and could work on the problem by using the number lines.

The student was unable to work correctly on integer problems due to errors in the arrows so it did not use multi-source learning.

**Figure 11** Postest results good absorbent power student

**Figure 12** Results of the Postest Low-absorbent student
Based on the sample worksheet above, the student who had poor critical thinking skills could not solve the problem of adding and subtracting integers. She made a little mistake in her assignment. He could not find the easiest way and completed the task slower than the others.

The results of interviews with students on the following critical thinking abilities:

Teacher: "Did you ask some questions if you don’t understand?"
Student: "Yes, I did"
Teacher: "What is your friend's answer related to integers?"
Student: "They almost chose the techniques correctly"
Teacher: "Is the technique chosen able to solve integer problems?"
Student: "Yes, it's even easier, because I used the ruler count technique"
Teacher: "What is the conclusion of using the techniques used in solving integer problems?"
Student: "The conclusion is that the use of tectic learning media by using objects around can be replaced with buttons"
Teacher: "What is your opinion about the media using numbers and models?"
Student: "It's easy to make and use in solving the problems"
Teacher: "Did you explain the result before?"
Student: "Yes, I did"
Teacher: "Did your friends answer your questions directly?"
Student: "Yes, they did but my friends sometimes didn't understand what I meant"
Teacher: "Give me examples that are easy for you to do using the instructional media for number lines and the selected model?"
Student: "for example -3+ 9. The easy way is using a number line. Then draw a model at the end of each arrow. Sometimes friends have difficulty putting the direction of the arrow"
Teacher: "What is the way to use the instructional media for the teaching of selected electric charge props?"
Student: "operation + or add means to be given again or added, operation - or less means taken"

The portrait of this phase is based on the results of interviews with students can be seen through the phase portrait diagram as follows:

![Phase Portrait Diagram]

**Figure 13** Portrait phase

### 3.2 Discussion

The results showed the learning outcomes of critical thinking in the control class were very critical 0%, critical 13%, fair 41%, and poor 47% while in the experimental class the critical thinking ability of students was very critical 0%, critical 28%, fair 34%, and poor 38%. The results showed learning outcomes in the posttest critical thinking skill in the control class was very critical 44%, 38% critical, 16% fair, and poor 3% while in the experimental class the critical thinking ability of the students was
very critical 59%, critical 38%, fair 3%, and poor 0%. Through this distribution, it can be seen that the critical thinking ability of the experimental class students is better than the control class.

The multy source based learning media is intended to accustom students to think at a critical level so that with these habits students have good critical thinking skills. The results of the study showed that implementation of multy source based learning media to improve the elementary students’ critical thinking skills in solving addition and subtraction problems. The result is in line with Cottrell (2012) conveys that evaluation is an essential part of critical thinking, involving a series of cognitive processes aimed identifying a problem, choosing a solution plan, and evaluating. Assuming this, people who have the ability to think critically can use appropriate criteria to evaluate an argument. This opinion explains that critical thinking skill is able to improve several competencies, one of them is mathematical critical thinking skill[8].

The success of this research is supported by studies that have been carried out previously by SETIawan [12] with the results of the benefits or advantages of critical thinking skills that a student is said to be able to solve problems if he can apply the knowledge he had previously obtained to a new situation that is not yet known. Critical thinking is a part of higher order thinking skills [9]. This ability is known as high-level thinking skills. In addition, critical thinking skills can improve students’ learning outcomes because it can train students to think creatively and critically, namely the ability to think that is not merely to recall, restate, or refer without doing processing (recite), and critical thinking skill can improve the achievement of student learning outcomes so that students are able to compete nationally and internationally. From this opinion, it can be said that by designing multi sources based learning media make students who use these medias have critical thinking skills. During the course of the research, the use of multi source based learning media had a significant influence on students learning activities. So it can be concluded that multi source based learning media can improve students’ critical thinking skill.

4. Conclusion
The implementation of multy source based learning media can improve the elementary students’ critical thinking skills in solving addition and subtraction problems. This is evidenced by the results of the t-test which showed significant differences in the average posttest results between the control class and the experimental class. In addition, the implementation of multy source based learning media can improve students’ activity so that learning takes place more effectively.

Phase portraits of critical thinking skills students solve the problem of passing through the application of multi-techniques based Mathematics learning media shows that there are differences in the pattern of phase portraits. This is according to the ability of different students so that students' answers are varied.

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