AN ANALYSIS OF THE CRITICAL THINKING SKILL ON ELEMENTARY SCHOOL STUDENTS

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Abstract
The aim of this research is to analyze the level of the mathematics critical thinking skill of elementary school students in grade IV on Mathematics subject. This research was conducted in one of public elementary school in Bandung year 2016/2017 academic year involving 28 students. The instrument of this research included a written test developed according to 4 critical thinking indicators i.e., know the problems, collect and set the information needed, find the way to solve the problem, and make the conclusion. We used descriptive statistics to analyze the data. The results showed that; (1) there are 25%, students in very low mathematics critical thinking skill category; (2) there are 10.71%, students in low mathematics critical thinking skill category; (3) there are 42.86%, students in average mathematics critical thinking skill category; (4) there are 17.86%, students in high mathematics critical thinking skill category; and (5) there are 3.57%, students in very high mathematics critical thinking skill category.

Keywords: Critical Thinking, Elementary School, Mathematics.

INTRODUCTION
Mathematics is very needed in daily and also in science development. However, Abdurrahman (2003) stated that from the various fields of study which taught in school, mathematics is a field of study which is considered the most difficult for the students, not only for the students who do not have learning difficulties but also for the students with learning difficulties.

In 2013 mathematics curriculum, the priority learning is started from the problem to find the properties or the formula of the material. So the learning implementation is emphasized in scientific approach. Problem solving learning makes the students more critical and analytical to the problem they face, whether in mathematical problem solving or in daily life. So, the learning process this day is expected be able to develope cognitive abilities and students psychologically optimally.

Ability means an individu capacities to do various tasks of his/her job. Overall, it is classified into two groups: (1) Intellectual ability, that is the ability needed to do the mental activities such as thinking, reasoning, and solving problems; (2) Physical ability, that is the ability to do physical tasks requiring the stamina, skill, strength, and such kind of characteristics (Robin and Judge, 2009).

There are several definitions of thinking defined by the experts. Purwanto (2000) defines thinking in a broad meaning, that is to get along with abstractions; specifically, it is to put or to find relationships between the abstractions. Riyantono (2010)suggests thinking as a condition in which the relationship is between the knowledge (including concepts, ideas, and meanings belong to human) inside an individu controlled by the sense. Sense is the strength controlling the mind. According to Santrock (2009), thinking activity involves manipulating activity and transforming information inside memory. The purpose of thinking is to form the concepts, to reason, to think critically, to make decisions, to think creatively, and to solve problems. Furthermore, Arends (2008) states that thinking is the process involving mental
operations such induction, deduction, classification, and reasoning. Thinking is the ability to analyze, criticize, and achieve the conclusion based on good inferences or judgements.

Therefore, from several definitions defined by the experts above, it is safe to conclude that thinking is psychological activity towards a thing or a problem, in the effort of solving it by relating problems into the simpler one so that it is solved. Thinking activities is started from a problem faced by an individu. Thinking process done by each person is improvized to the problems he/she is facing.

Critical thinking is a part of practical skills which can help an individu to solve a problem. Therefore, this ability has particular characteristics which have to be comprehend and done by each individu. Seifert and Hoffnung in Desmita (2010) describe several components of critical thinking:

1. Basic operations of reasoning. To think critically, a person has to have the ability to describe, generalize, conclude deductive conclusion, and formulate others logical steps mentally.
2. Domain-specific knowledge. In facing a problem, a person has to know the topic or content. To solve a personal conflict, he/she has to have knowledge about the person and other related individu related to the conflict.
3. Metacognitive knowledge. An effective critical thinking requires someone to monitor when he/she is trying to comprehend an idea, realizing when he/she needs new information, and plan to collect and study the information.
4. Values, beliefs, and dispositions. Critically thinking means fairly and objectively judging. It means that there is a self-confidence that he/she can find the solution. It also means there is a kind of persistently and reflectively disposition thinking.

According to Fisher (2009) critical thinking is thinking that demands interpretation and evaluation to observe, communicate, and other information sources, it is demanding skills, thinking about the assumptions, asking questions which are relevant, drawn implications, to think and debate the issues continuously.

Krutetski (1977), one of the determinants factor in mathematical talent at the 20th century was the presence of mathematics critical thinking as the skill to discharge from the sequence of wrong thoughts and to associate mathematics critical thinking with the problem solving which has more than one solution as the indicators of the flexible thinking.

According to Dewey (Baker Matt & Rick Rudd,2001;pp176) critical thinking is an active consideration, persistence (continuously), and accuration in a belief or a form of knowledge that is taken for granted by viewing from the supporting reasons and the advanced conclusions which have its tendency.

Ennis (2011) stated that the critical thinkers ideally have 12 critical thinking skills which are grouped into 5 critical thinking aspects i.e; 1) Basic clarification (focusing on questions, analyzing the opinions, clarifying an explanation through the question and answer); 2) The basis for the decision (considering whether the source is reliable or not, observing and considering an observation result report); 3) Inference (deducting and considering the results of the deduction, inducting and considering the results of the induction, create and specify scores judgment); 4) Advanced clarification (defining the term and considering the definition, identifying the assumptions); 5) Supposition and integration (considering the reasons or assumptions which are doubtful but without taking it in our thinking assumptions, combining the ability and another character in deciding.

Students need mathematics critical thinking skill in solving the problem in their daily life. This is in accordance to Gracia and Pintrich (Sayeed & Rousta, 2013) “Critical thinking has an important for the transfer of knowledge and application of problem solving skills to
novel situations”. In critical thinking students are required to use the right particular cognitive strategies to test the reliability of the problem solving idea and resolve any errors or lack. So, by practicing critical thinking skill, it is expected students able to decide the right steps in solving their problems.

The indicators which are used to measure mathematics critical thinking skills in this research is refer to the indicators that stated by Glazer (1941) i.e. 1) know the problems; 2) collect and arrange the information needed; 3) find the way to solve the problems; 4) students can make a conclusion.

The step to decide the appropriate learning which is suitable for the students to develop their mathematics critical thinking skill, so it needs preliminary research, especially for elementary students in grade IV, so that the relevant parties (teacher, educators and school staffs) can decide related decission to choose appropriate method, strategy, or learning model.

RESEARCH OBJECTIVES
This research is generally aims to analyze the mathematics critical thinking skill. The findings of this research are expected to be useful as a reference for the teachers and the school to choose and make the learning planning which able to increase mathematics critical thinking skill of elementary school students.

POPULATION AND SAMPLE
Subjects in this preliminary study are the fourth graders in one of the students elementary schools in Bandung City, which amounted to 28 students.

INSTRUMENTS
This research uses the instrument test consists of 10 written test which contains the indicators to measure the mathematics critical thinking skills i.e., 1) the student can decide the right operation to solve the questions; 2) students can explain the reasons of their answer; 3) the students can decide the way in solving the problem based on the information which collected and; 4) the students can make the conclusions from the counting result (strategy) which done accurately.

METHODODOLOGY
This research is a preliminary study taking these steps:
- Develop problems based on the indicators of mathematically critical thinking ability.
- Before the critical thinking ability test is given, the logic validity is conducted by asking suggestions from two experts.
- Test of critical thinking ability mathematically is given to fourth graders in one of students elementary school in Bandung with the number of students 28 students.
- Each of the students’ answer is analyzed and scored based on the indicators listed.

DISCUSSION
The analysis skill base data scores of mathematics critical thinking skill can be viewed in the table below:

<table>
<thead>
<tr>
<th>Table.1 Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score Test Skill Thinking</td>
</tr>
<tr>
<td>Critical Mathematics</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>28</td>
</tr>
</tbody>
</table>

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Based on the initial ability data of students’ mathematics critical thinking skill, then the data analysis was held by descriptive category technique and percentage that shows in Table below.

**Table.2** Analysis Skill Base Data of Students’ Mathematics Critical Thinking

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Category</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 &lt; K &lt; 2</td>
<td>Very Low</td>
<td>7</td>
<td>25%</td>
</tr>
<tr>
<td>2 &lt; K ≤ 4</td>
<td>Low</td>
<td>3</td>
<td>10.71%</td>
</tr>
<tr>
<td>4 &lt; K ≤ 6</td>
<td>Average</td>
<td>12</td>
<td>42.86%</td>
</tr>
<tr>
<td>6 &lt; K ≤ 8</td>
<td>High</td>
<td>5</td>
<td>17.86%</td>
</tr>
<tr>
<td>8 &lt; K ≤ 10</td>
<td>Very High</td>
<td>1</td>
<td>3.57%</td>
</tr>
</tbody>
</table>

Students’ critical thinking skill base data scores show that 25% students in very low category; 10.71% students in low category; and 42.86% students in average category; 17.86% students in high category; and 3.57% students in very high category. Therefore, it can be concluded that students’ mathematics critical thinking skill are in very low, low and average category. So that it needs strategy as an effort to increase students’ mathematics critical thinking skill.

**SUGGESTION**

Based on the result analysis above, we can conclude that:
One of the lack factor of students’ mathematics critical thinking skill is in the learning process that still teacher centered. Mathematics learning should involve the students actively in order to use their critical thinking skill. As stated by Johnson (2010), if the students are given chance to train their thinking skill, so it will be building the habit to differ between right and wrong, assumption and fact, fact and opinion, and also knowledge and believe. In order, it will build the argument which based on logically proof and reliable, and students will always think creatively. That will shown by the habit to make different things be related, to view unexpected possibility, and to think in a new way on the problems that usually faced. The process of learning mathematics class should be able to motivate students to think critically mathematically by providing non-routine problem-solving problems that are not too easy and not too difficult for students, but can challenge students' interest to solve the problem.

**BIBLIOGRAPHY**


