# The Role of the Dynamics of Critical Thinking and Metacognitive Ability in the Successful Learning of Indonesian High School Students

Dyah Werdiningsih [1]; Alfan Zuhairi[1]; Moh Badrih[1]; Zulkifli Osman[2]

[1] Faculty of Teaching and Education, University Islamic of Malang Indonesia, Indonesia

[2] Faculty of Language and Communication, Sultan Idris Education University Malaysia, Indonesia

### Abstract

The purpose of this study is to examine the dynamics of students' critical and metacognitive ability skills, and their contribution to achieving the success of high school students' Indonesian learning. This study uses a quantitative approach with a correlational design. The population of this study were students of class X SMA Negeri in East Java, with cluster random sampling technique. Data were collected through questionnaire filling techniques and summative score scores, namely the results of students' final semester exams. The data were analyzed using bivariate analysis and multivariate correlation techniques, which were used to determine the close relationship between the three variables and to determine the direction of the relationship. The results of this study found that there was a dynamic of students' critical thinking and metacognitive abilities ranging from the lowest score of 65 to the highest score of 92 for critical thinking ability, and the lowest score of 60 to the highest score of 93. The results of the analysis showed that the significance value of 2- tailed critical thinking and metacognitive abilities, critical thinking and metacognitive skills, critical thinking skills and learning outcomes critical thinking skills and learning outcomes, metacognitive abilities and learning outcomes $0.000 < 0.05$, and 2-tailed significance value critical thinking skills, metacognitive and outcomes learning is $0.000 < 0.05$, so there is a correlation between critical thinking skills, metacognitive and learning outcomes.

**Keywords:** *Dynamics; Critical Thinking; Metacognitive; Learning Outcomes*

### Introduction

Critical thinking skills are active, continuous, and thorough consideration of a knowledge obtained by providing supporting reasons and rational conclusions (John Dewey in Kasdin, 2012). Critical thinking according to Ennis in Fisher (2008:4) is critical thinking is thinking that makes sense and focused reflection to decide what should be believed or done. Metacognitive skills are knowledge about how students learn, how students assess learning methods and the learning progress they have made. Students' critical thinking ability is one of the implementations of metacognition skills, namely the process of knowing and monitoring students' own thinking processes or cognitive processes. Metacognition is awareness of what is known and what is not known by the learner. Metacognitive strategies refer to ways that are carried out to increase awareness of the prevailing thinking and learning

processes. If this awareness is realized, students can control their thoughts by designing, monitoring, and assessing what they are learning.

In the students' thinking process, critical and metacognitive ability skills become an inseparable unit. Therefore, with the development of critical and metacognitive ability skills, the level of student creativity and student motivation will increase. This will also make students able to learn something independently widely. Furthermore, students will be able to understand their learning goals, understand what must be done to achieve these goals, plan their learning, access their learning progress independently, and evaluate their learning outcomes. This will ultimately be able to support the achievement of student learning outcomes. Thus, the critical and metacognitive ability skills applied by students are able to have an impact on learning outcomes. The activity of monitoring and evaluating one's thought processes is part of metacognition (Biryukov, 2015).

Industry 4.0 education emphasizes that learning is the development of potential and character building in students. These efforts can be developed through students' thinking skills, especially critical thinking in the learning process. This is reinforced by the opinion of William (2010: 5) that the relevance of critical thinking in the learning process is to have an impact on students in solving problems, determining decisions, and motivating students in learning. Critical thinking skills can be developed through learning in schools, including through learning Indonesian. The importance of developing thinking skills in students to support the quality of learning. Maulana (2008:39) suggests that students' critical thinking skills play an active and effective role in building their own knowledge and cognitive structures that focus on systems, structures, concepts, principles, and the tight link between one element and another.

Critical thinking ability has a relationship with metacognitive skills. This is related to students' critical thinking skills, they will be able to organize and control their own learning activities. Self-control activities can bring up a question that must be answered by students themselves and the evaluation of students themselves is a representation of metacognitive abilities. The process of finding answers to questions that arise and self-evaluation will improve critical thinking skills, which in turn will affect student learning outcomes.

This can be interpreted that students with high metacognitive abilities show high critical thinking skills as well. This idea is reinforced by the opinion of Magno (2010:137) that metacognitive skills are related to students' ability to plan, monitor and evaluate their learning process, including the selection of appropriate control strategies. Metacognitive skills help students to be able to manage their learning process independently and be able to think critically so that they can make the right decisions in overcoming the problems they face. In this situation, students can develop their thinking skills.

Thinking and metacognitive abilities in students can determine learning outcomes. Suranto & Seftiana (2017: 181) argue that learning outcomes are student achievements obtained based on assessments that include changes in aspects of attitudes, knowledge, and skills. Critical thinking and metacognitive abilities in students will make students able to be motivated in improving their learning outcomes. There are several factors that influence student learning outcomes, one of which is the initial ability of students. According to Johnson and Lawson (1998) early abilities in students also play an important role in understanding new concepts.

The initial ability of students is an ability that is mastered by students during the learning process. In addition to the initial ability of students which is an internal factor, learning motivation is one of the external factors that affect student learning outcomes. According to Sardiman (1990:75) learning motivation plays an important role in learning activities. Learning motivation as a driving force contained in students who provide learning direction so that learning objectives can be achieved. To stimulate

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students' enthusiasm for learning, supporting factors can be through teachers or classmates. The more active students in participating in learning will motivate other students to be active in learning activities.

The purpose of this study was to examine the level of students' critical thinking and metacognitive abilities, as well as their contribution to the success of high school students' Indonesian learning, which was represented in (1) the correlation between students' critical thinking and metacognitive abilities, (2) the correlation of critical thinking skills with student learning outcomes, (3) the correlation between metacognitive abilities and student learning outcomes, and (4) the correlation between critical and metacognitive ability skills and Indonesian language learning outcomes for students of class X SMA in East Java.

## *Method*

In this study, a quantitative approach was used, with a correlational design. The data of this research are in the form of numbers, namely the scores of the students' critical thinking and metacognitive abilities, and the scores of students' learning outcomes. The population of this research is all students of High School in East Java. Considering the size of the population, to make this study more manageable, the researchers conducted sampling by applying the cluster random sampling technique. Of the nine high schools, consisting of five science classes and four social studies classes, two clusters (two classes) were selected, namely class X MIPA 4 and X MIPA 5.

The instrument of this research is a questionnaire. There are 2 types of questionnaires used to measure critical and metacognitive ability skills. Both questionnaires were prepared using a Likert scale form. This questionnaire contains statements about the items of critical thinking and metacognitive abilities. In this study, respondents were asked to do a self-assessment about the level of critical thinking and metacognitive skills in learning Indonesian. Respondents choose one of several alternative answers provided, namely never, rarely, sometimes, often, and always. Learning outcomes data is the student's final semester test scores obtained from the teacher's documentation.

Data analysis was carried out using correlational statistical analysis procedures, namely bivariate and multivariate correlational through SPSS.20. The analytical technique was used to examine the inter-correlation of the use of critical and metacognitive ability skills with Indonesian high school students' learning outcomes. The correlational mulvariate analysis was used to achieve the objectives relating to the relationship between critical and metacognitive ability skills and Indonesian high school students' learning outcomes.

## *Result and Discussion*

### Dynamics of Critical Thinking, Metacognitive, and Student Learning Outcomes

Critical thinking skills were obtained from questionnaires distributed to students via Google form and then analyzed using descriptive SPSS.20, the results are as follows.

Table 1. Data on Students' Critical Thinking Ability

| N | Valid | 51 |
|---|---|---|
|  | Missing | 0 |
| Mean | | 79.50 |
| Std. Error of Mean | | .905 |
| Median | | 79.50 |
| Mode | | 74 |
| Std. Deviation | | 6.462 |
| Variance | | 41.757 |
| Range | | 27 |
| Minimum | | 65 |
| Maximum | | 92 |
| Sum | | 4054 |

From table (1) above, it is explained that the Critical Thinking Ability of grade X students of SMAN 2 Trenggalek gets a total (∑score = 4054). With the average value obtained is 79 (rounded up), while the lowest value is 65 and the highest value is 92.

The use of metacognitive abilities was obtained from a questionnaire distributed to students via google form and then analyzed using descriptive SPSS.20 which results were as follows:

Table 2 Ability Usage

| N | Valid | 51 |
|---|---|---|
|  | Missing | 0 |
| Mean | | 77.75 |
| Std. Error of Mean | | 1.128 |
| Median | | 80.00 |
| Mode | | 86 |
| Std. Deviation | | 8.054 |
| Variance | | 64.874 |
| Range | | 33 |
| Minimum | | 60 |
| Maximum | | 93 |
| Sum | | 3965 |

**Student Metacognitive**

From table (2), it is known that the metacognitive ability of class X students of SMAN 2 Trenggalek gets a total (∑score = 3965). With the average value obtained is 80 (rounded up), while the lowest value is 60 and the highest value is 93.

**Student's Indonesian Learning Outcomes**

Student learning outcomes are obtained from the teacher's document in the form of report cards and then analyzed using descriptive SPSS.20 which results are as follows.

Table 3 Student Learning Outcomes

| N | Valid | 51 |
|---|---|---|
| | Missing | 0 |
| Mean | | 78.80 |
| Std. Error of Mean | | 1.065 |
| Median | | 79.00 |
| Mode | | 81 |
| Std. Deviation | | 7.603 |
| Variance | | 57.801 |
| Range | | 37 |
| Minimum | | 52 |
| Maximum | | 89 |
| Sum | | 4019 |

From table (3) it is known that the results of learning Indonesian for class X students of SMAN 2 Trenggalek get a total ($\sum$score = 4019). With the average value obtained is 79 (rounded up), while the lowest value is 52 and the highest value is 89.

**Correlation between Students' Critical Thinking and Metacognitive Ability**

To answer the problem formulation in this study, an analysis of (1) the correlation between critical thinking and metacognitive abilities was carried out, (2) the relationship between critical thinking skills and learning outcomes, (3) the correlation between metacognitive abilities and learning outcomes, (4) the correlation of thinking abilities. Critical and metacognitive with learning outcomes. The results of the analysis of the four relationships are presented in Tables 4 to d. 7.

Based on the significance value (2-tailed) there is a correlation between the variables that are connected if the sig. (2-tailed) < 0.05. On the other hand, if the value of sig. (2-tailed) > 0.05 then there is no correlation. The results of the analysis to answer the formulation of the first problem, namely the relationship between critical and metacognitive ability skills are shown in the data exposure in table 4 as follows.

Table 4. Relationship between Critical Thinking and Metacognitive Ability

| | | Berpikir Kritis | Metakognitif |
|---|---|---|---|
| Berpikir Kritis | Pearson Correlation | 1 | .768** |
| | Sig. (2-tailed) | | .000 |
| | N | 51 | 51 |
| Metakognitif | Pearson Correlation | .768** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 51 | 51 |

The data in table 4 shows the relationship between critical and metacognitive ability skills where the 2-tailed significance value of the two variables is 0.000 <0.05. So it can be said that there is a correlation between critical and metacognitive ability skills.

Based on the results of calculating the correlation with standard analytical techniques with simple correlation (Bivariate Correlation) through SPSS.20, students' critical thinking skills and metacognition in students correlated with a 2-tailed significance value of both < 0.05, i.e. 0.000. These results show that critical thinking and metacognitive abilities are interrelated in the learning process of students. That in students' metacognitive abilities there is a critical thinking process. Related to this, Livingston (1997) states that learning how to learn metacognitive skills is simply defined as learning how to learn and thinking about thinking is defined as thinking about thinking. In line with the opinion of Sugiarto and Sophianingtyas (2013:21) metacognition plays an important role in regulating and controlling students' cognitive processes in learning and thinking more effectively and efficiently.

Good use of students' metacognitive abilities, able to analyze their own thinking. So that by developing students' metacognitive, students directly also have their understanding in the critical thinking process. This is reinforced by the opinion of Livingston (1997) which states that a person's ability to use his cognitive abilities to plan the steps used in solving problems in learning. Planning the steps in learning is part of metacognition skills while problem solving is part of critical thinking skills.

**Correlation between Critical Thinking Ability and Student Learning Outcomes**

The results of the analysis to answer the second problem formulation, namely the relationship between critical thinking skills and Indonesian class X learning outcomes are shown in the data exposure in table 5 as follows.

Table 5. Relationship between Critical Thinking Ability and Student Learning Outcomes

|  |  | Berpikir Kritis | Hasil Belajar |
|---|---|---|---|
| Berpikir Kritis | Pearson Correlation | 1 | .834** |
|  | Sig. (2-tailed) |  | .000 |
|  | N | 51 | 51 |
| Hasil Belajar | Pearson Correlation | .834** | 1 |
|  | Sig. (2-tailed) | .000 |  |
|  | N | 51 | 51 |

The data in table 5 shows the relationship between critical thinking skills and learning outcomes where the 2-tailed significance value of the two variables is 0.000 <0.05. So it can be said that there is a correlation between critical and metacognitive ability skills.

Based on the results of calculating the correlation between students' critical thinking skills and student learning outcomes, it is correlated with a 2-tailed significance value of both < 0.05, which is 0.000. Thus there is a relationship between critical thinking and learning outcomes. Critical thinking skills in students who are weak have an impact on unsatisfactory learning outcomes. In the process of solving problems in learning requires a critical thinking process by understanding the source of the problem. In using critical thinking skills, students make their own problem formulations in solving problems well. This will have a good impact on learning outcomes because students understand well and are critical in responding to questions or problems encountered in learning. Students' ability to think has an impact on understanding in learning and is required to solve problems or problems that are able to stimulate students to think. In accordance with the opinion of Monalisa (2007) which states that critical thinking skills can help a person to make the right decisions based on careful, systematic, logical efforts, and consider various points of view. Thus students obtain good learning outcomes.

Critical thinking skills in students are able to show the direction of thinking in determining the relationship that is related to one problem with another problem accurately. Thus, critical thinking skills are needed in finding solutions. This is reinforced by the opinion of Munfahroyin (2009) which states that critical thinking skills are a tool used in the process of mastering concepts in thinking because conceptual knowledge is the result of a constructive process. Student understanding is obtained by constructing the knowledge possessed by each individual student. Thus the ability to think critically has positive benefits in increasing understanding that affects student learning outcomes.

**The Relationship between Metacognitive Ability and Student Learning Outcomes**

The results of the analysis to answer the third problem formulation, namely the relationship between metacognitive ability and Indonesian class X learning outcomes are shown in the data exposure in table 6. as follows.

Table 6. Relationship between Metacognitive Ability and Learning Outcomes

|  |  | Metakognitif | Hasil Belajar |
|---|---|---|---|
| Metakognitif | Pearson Correlation | 1 | .834[**] |
|  | Sig. (2-tailed) |  | .000 |
|  | N | 51 | 51 |
| Hasil Belajar | Pearson Correlation | .834[**] | 1 |
|  | Sig. (2-tailed) | .000 |  |
|  | N | 51 | 51 |

The data in table 6 shows the relationship between metacognitive ability and learning outcomes where the 2-tailed significance value of the two variables is 0.000 <0.05. So it can be said that there is a correlation between critical and metacognitive ability skills.

Based on the results of calculating the correlation between students' metacognitive abilities and student learning outcomes, it is correlated with a 2-tailed significance value of both < 0.05, which is 0.000. Thus there is a relationship between students' metacognitive abilities and learning outcomes. Satisfactory student learning outcomes cannot be separated from the role of metacognitive abilities. Students with good metacognitive abilities tend to obtain satisfactory learning outcomes. This is similar to the opinion of Coutinho (2007:39) which states that there is a positive relationship between learning achievement and cognitive eyes. The achievement of learning outcomes is closely related to student independence in learning and student learning independence is related to students' metacognitive abilities. Related to this, Coutinho (2007:39) argues that students who have good metacognitive skills will also show good learning achievements compared to students who have low metacognitive abilities.

In the learning process, students who have high learning motivation cannot be separated from their metacognitive abilities. In controlling their own learning and being able to know the point of students' needs in learning, it raises the motivation for their curiosity. So that students will be encouraged to learn independently and in class. The same thing is explained by Pierce (2003) that metacognition affects students' learning motivation. The more often students are aware of their thinking processes while studying, the more they will be able to control their learning goals, personality and attention. This of course will have an impact on their learning motivation.

**Relationship between Critical Thinking and Metacognitive Ability with Student Learning Outcomes**

The results of the analysis to answer the fourth problem formulation, namely the relationship between critical and metacognitive ability skills with Indonesian language learning outcomes for class X are shown in the data exposure in table 7. as follows:

Table 7. Relationship between Critical Thinking and Metacognitive Ability with Learning Outcomes

|  |  | Metakognitif | Hasil Belajar | Berpikir Kritis |
|---|---|---|---|---|
| Metakognitif | Pearson Correlation | 1 | .834** | .768** |
|  | Sig. (2-tailed) |  | .000 | .000 |
|  | N | 51 | 51 | 51 |
| Hasil Belajar | Pearson Correlation | .834** | 1 | .834** |
|  | Sig. (2-tailed) | .000 |  | .000 |
|  | N | 51 | 51 | 51 |
| Berpikir Kritis | Pearson Correlation | .768** | .834** | 1 |
|  | Sig. (2-tailed) | .000 | .000 |  |
|  | N | 51 | 51 | 51 |

The data in table 7 shows the relationship between metacognitive ability and learning outcomes where the 2-tailed significance value of the three variables is $0.000 < 0.05$. So it can be said that there is a correlation between critical and metacognitive ability skills.

Based on the results of calculating the correlation of students' critical thinking and metacognitive abilities with student learning outcomes correlated with the 2-tailed significance value of the three $<0.05$, which is 0.000. Thus the two dependent variables, namely the ability to think critically and metacognitive are interconnected with the dependent variable, namely learning outcomes. This is deemed appropriate because in the second problem formulation, critical thinking ability is significantly correlated with student learning outcomes in class X and the third problem formulation metacognitive ability is also significantly correlated with student learning outcomes in class X.

The students' metacognitive ability is aimed at the problem solving process in learning while the critical thinking skills are shown in the cognitive development process in students by processing information and reasoning. Agree with Slavin (2008:253) that metacognitive skills are to emphasize students' self-understanding of the material that has been studied. Mastery of the material will be better if students are taught by asking themselves. Related to critical thinking skills according to Martinez (2006:696) which states that critical thinking skills as a self-evaluation tool that aims to assess the quality of ideas, especially to assess whether an idea makes sense or not, by asking yourself.

In students' metacognitive abilities, there are thinking activities that develop according to the capacity of students' abilities which become critical thinking abilities. This is reinforced by the opinion of Purwanto (2010) which states that high metacognitive skills indicate high critical thinking skills as well. It has something to do with students' metacognitive abilities; metacognitive skills can regulate and control their own learning activities. Self-control activities in learning can raise a question that has to do with the evaluation of their own learning. The emergence of questions and evaluation in learning is a critical thinking process that has an impact on students' knowledge and learning outcomes. With high critical thinking and metacognitive skills will have a positive impact on learning outcomes.

## *Conclusion and Recommendation*

**Conclusion**

Based on the results of data analysis and discussion, it can be concluded as follows. *First,* the role of critical and metacognitive ability skills is indicated by the relationship between the two variables. In other words, in the process of solving problems, high school students if they are able to use critical thinking skills well then they are also able to use metacognitive skills well, and vice versa. This can be seen in the score of the measurement results of students' critical thinking and metacognitive abilities and the results of data analysis with the significance value of the two variables being 0.000 <0.05 which means that there is a relationship in the use of critical and metacognitive ability skills in students.

*Second,* the role of critical thinking skills in student learning outcomes is shown by the mutual relationship between the two. In problem solving, if students tend to use critical thinking skills with high intensity, then the learning outcomes are high, and vice versa. This can be seen through the calculation of the correlation between critical thinking skills and interrelated learning outcomes, which is indicated by the significance value of the relationship between the two variables is 0.000 <0.05. This means that critical thinking skills and learning outcomes are significantly correlated.

*Third,* the role of metacognitive abilities in student learning outcomes shows that there is a mutual relationship between the two. In achieving learning objectives, if students empower metacognitive abilities with high intensity, then the learning outcomes are high, and vice versa. This can be seen through the calculation of the correlation between metacognitive abilities and learning outcomes that are interconnected, which is indicated by the significance value of the relationship between the two variables is 0.000 <0.05. This means that metacognitive ability and learning outcomes are significantly correlated.

*Fourth,* the role of critical and metacognitive ability skills in student learning outcomes shows that they are interconnected, meaning that if the critical and metacognitive ability skills of high school students are in the good category, then student learning outcomes are good. This can be seen in the calculation of the correlation between critical and metacognitive ability skills with student learning outcomes who obtained a significance value of 0.000 <0.05. This means that there is a significant relationship between critical and metacognitive ability skills and learning outcomes.

**Recommendation**

Based on the results of this study, it is hoped that it can help in efforts to improve the quality of Indonesian language learning using learning strategies to bring up critical and metacognitive ability skills in students. Therefore, the researcher gives the following suggestions, (1) teachers need to implement improving students' critical thinking and metacognitive skills to support the achievement of student learning outcomes, (2) the school is expected to be able to provide support by maximizing learning facilities that encourage teachers and students in order to optimally empower students' critical thinking and metacognitive abilities, and this research needs to be studied further by examining the level of influence of critical thinking and metacognitive abilities on student learning outcomes, developing learning models that integrate the development of students' critical and metacognitive ability skills, testing their feasibility and effectiveness, to obtain an effective learning model to support the development of students' critical and metacognitive ability skills.

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