The Preface of the Second Ahmad Dahlan International Conference on Mathematics and Mathematics Education (ADINTERCOMME) 2019

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The Preface of the Second Ahmad Dahlan International Conference on Mathematics and Mathematics Education (ADINTERCOMME) 2019

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Preface

The Ahmad Dahlan International Conference on Mathematics and Mathematics Education, abbreviated as AD INTERCOMME, is a biennial international conference hosted in a cooperation by the Mathematics Department - Faculty of Science and Applied Technology - and the Mathematics Education Department - Faculty of Teacher Training and Education - of Universitas Ahmad Dahlan, Yogyakarta, Indonesia. It aims to provide a great forum for worldwide mathematicians, professors, teachers, and researchers to share their ideas about the trends and the emerging issues both in mathematics and mathematics education. In 2019, the AD INTERCOMME would be implemented for its second edition. We invite researchers and practitioners to come and to contribute in this conference. We would be very happy to welcome you in Yogyakarta.

The keynote presentations are provided especially to show the contribution of Mathematician and Mathematics Educators in the world of mathematics and mathematics education towards research and knowledge sharing where our conference theme for this year is the contribution of Mathematics and Mathematics Education in Industrial Revolution Era 4.0. The main event is the talk of three keynote speakers. The first keynote speaker is Associate Professor Dr. Mazlini Adnan form Universiti Pendidikan Sultan Idris, Malaysia. The second keynote speaker is Associate Professor Martianus Frederick Ezerman, Ph.D from Nanyang Technological University, Singapore. The third keynote speaker is Associate Professor Dr. Sitti Maesuri Patahuddin from University of Canbera, Australia.

We also have speakers in workshop session coming from Universitas Ahmad Dahlan, Dr. Rully Charitas Indra Prahmana, S.Si., M.Pd who deliver the talk on the Publishing Manuscripts in a Scopus-indexed

Journal and M. Rizky Alif Yuza who deliver the talk on the Workshop Big Data: "Sentiment Analysis Using Pyhton, Elastic Search and Kibana. ADINTERCOMME 2019 was an overwhelming success, attracting the delegates, speakers and sponsors from many countries and provided great intellectual and social interaction for the participants. Without their support, the conference would not have been successfully organized. We trust that all the participants found their involvement in the Conference both valuable and rewarding. Our wish is that all participants would enjoy this conference, contribute effectively toward it and take back with you knowledge, experiences, contacts and happy memories of this conference and especially with this beautiful kingdom of Yogyakarta.

Dr. Puguh Wahyu Prasetyo, S.Si., M.Sc
Editor in Chief

Peer review declaration

Peer review declaration

All papers published in this volume of **(Choose One)** Journal of Physics: Conference Series/IOP Conference Series: Materials Science and Engineering/IOP Conference Series: Earth and Environmental Science have been peer reviewed through processes administered by the Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

- **Type of peer review: Single-blind / Double-blind / Triple-blind / Open / Other (please describe)**
  All articles are double-blind reviewed by using the open conference system provided by Universitas Ahmad Dahlan. Both author and reviewer worked anonymously.

- **Conference submission management system:**
  The authors submitted their articles to the open conference system at http://seminar.uad.ac.id/index.php/adintercomme. The papers were distributed to the reviewers with double-blind review process. One paper was reviewed by two reviewers. The review results were also announced by the editor by using the open conference system. Furthermore, all accepted papers were revised by the authors and after this process, all articles were edited by the layout team to make the papers meet with the JPCS layout style.

- **Number of submissions received:**
  The number of all submitted papers is 137 which consist of 130 papers distributed to the reviewers and 7 papers were directly rejected because they did not meet with the requirements determined by the committee.

Number of submissions sent for review: The number of papers sent for review is 130.

Number of submissions accepted: The number of accepted papers is 83.

Acceptance Rate (Number of Submissions Accepted / Number of Submissions Received X 100): Acceptance Rate = $\frac{83}{137} \times 100\% = 60{,}5\%$

Average number of reviews per paper: The average number of reviews per paper is 2.

Total number of reviewers involved: Total number of reviewers involved is 37.

Any additional info on review process: The reviewers were assigned based on their expertise and research interest.

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Enhancing students' self-efficacy through metacognitive strategies in learning mathematics

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Enhancing students' self-efficacy through metacognitive strategies in learning mathematics

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Abstract. Student activities in the learning process in the classroom have not yet determined the effectiveness in thinking and learning. Students and teachers must learn in the right collaboration, one of which applies a learning strategy. Metacognitive strategies are learning strategies that support students in improving their cognitive abilities. The cognitive development of students is very important because it is often used with children's intelligence and children's intelligence is always directly proportional to self-efficacy. In addition to cognitive, affective domains are also important to stimulate students' minds to improve their academic abilities. The question is that students' self-efficacy, self-efficacy depends on the individual's confidence in his ability to complete the task. In this paper, the authors argue that metacognitive strategies can be applied in mathematics learning to improve students' self-efficacy in two ways. First, the orientation of the two variables are similar, although not completely as metacognitive activities are able to train students' thinking processes and their relevance with self-efficacy ie students who have a high sense of self-efficacy will affect their cognitive processes, for example students who are taught using metacognitive strategies will have a positive impact on metacognition and self-efficacy abilities . Second, learning with metacognitive strategies based on strengthening self-efficacy students will obtain high academic achievements in several cognitive aspects, such as reasoning and communication skills, problem solving skill.

1. Introduction

Metacognitive activity is thinking about what is in the mind. Flavell [1] explains that metacognitive includes a person's knowledge about cognitive processes or things related to it. The term metacognitive has been widely applied in learning in schools, such as mathematics [2-4], science [5-7], nursing [8] and English [9-12] as part of the development of students' cognitive domains, but not much research has been done yet. focus on using metacognitive strategies.

According to Kwang [5] that learning using metacognitive strategies has been emphasized in the curriculum in Singapore since 1992. Since then, guidelines in applying metacognitive strategies to teach mathematics have never been made explicit for teachers, but the resulting impact is that not many students have been able to develop and control his *metachogical* abilities and teacher's role provide only a few pointers in the problem solving process. Unlike education in Indonesia, the term metacognitive recently began to be widely known by people who are oriented in the world of education. Even though metacognitive is one of the supporting factors in developing students' cognitive abilities [13] .

Cognitive development is considered important because it is often associated with children's intelligence, even though the child's cognitive development is valid from the beginning of birth. Normal

cognitive development indicates the development of children's intelligence. Children's intelligence is always directly proportional to the child's self-efficacy . According to Bandura [7] that self-efficacy is a belief in the ability of himself to solve certain problems. Children who have high self-efficacy will affect their cognitive abilities [15,16] . In line with the opinion of Bong & Skaalvik [16] that having high self-efficacy can improve certain self abilities. The ability in question is not only in the cognitive aspect but also in other skills, such as the courage to express opinions and not be afraid of being wrong.

By using metacognitive strategies, teachers are expected to be able to condition and involve all aspects of students in mathematics learning, especially in the cognitive and self-efficacy domains . Therefore, this paper tries to review and explore the research literature systematically about whether students' self-efficacy can be improved through metacognitive strategies in mathematics learning.

2. Method

This article uses the literature review method regarding knowledge, ideas, or findings contained in the literature. So as to provide theoretical and scientific information that students' self-efficacy can be improved through metacognitive strategies. Data is collected and analyzed in the form of student self-efficacy literature and metacognitive strategies. In this article, the author will cite some facts that occur in the field based on the findings of previous research on students 'self-efficacy with metacognitive strategies so that metacognitive strategies can improve students' self-efficacy. Data obtained from scientific journals and some author's experience. The data analysis technique was carried out in several steps. The first step is to collect literature on self-efficacy and metacognitive strategies. The second step, the authors identify the use of metacognitive strategies in increasing students' self-efficacy. After believing that metacognitive strategies can improve students' self-efficays. Finally, the final step is the authors conclude that metacognitive strategies can improve students' self-efficays.

3. Result and Discussion

3.1 Self efficacy

According to Bandura [10], there are two factors that influence whether a person engages in certain behaviors: outcome expectations and self-efficacy . In other words, our ability to achieve goals or complete tasks depends on whether we are able to build self-efficacy in the minds of our minds, and whether we think the results obtained are good (expected results). Bandura defines self-efficacy is the belief of an individual with the ability and skills he has today to do things in a variety of conditions. Meanwhile, Baron and Byrne [18] revealed that self-efficacy is an activity to evaluate someone about their abilities or competencies in achieving goals, doing a task, and overcoming obstacles. Furthermore Bandura also revealed, Self-efficacy has an important influence on the amount of individual effort applied to the task given. Someone with a high level of self-efficacy is able to complete the task given in a tough and persistent manner, while someone with a low level of self-efficacy with the same task can get away or avoid problems. For example, a student who is not very talented in a particular subject but believes in his own ability to learn it well . Based on the description above, self-efficacy refers to the individual's belief in his ability to complete tasks, assign tasks and do something that depends on the interaction between behavior, personal factors to achieve the desired results.

Bandura [10] explains that the source that is very influential in self-efficacy is the performance accomplishment/experience of success, because the experience of success will strengthen / increase the confidence they have, for example someone who has achieved achievements in the past, which will be very influential on the person's self-efficacy if later found the same case . On the other hand , vicarius experience can increase effectiveness, depending on the number and quality of learning experiences that can be observed and imitated by the individual , ie observing others (based on the experience of the person being observed) and when the person is successful, then the individual's self-efficacy can increases, but if the individual's self-efficacy fails it can decrease. Then, social persuasion that convinces someone about their ability to get things done will have a positive effect on self-efficacy. This happens

if someone believes in the person who gives the persuasion, and vice versa, namely a bad emotional state can also reduce self-efficacy.

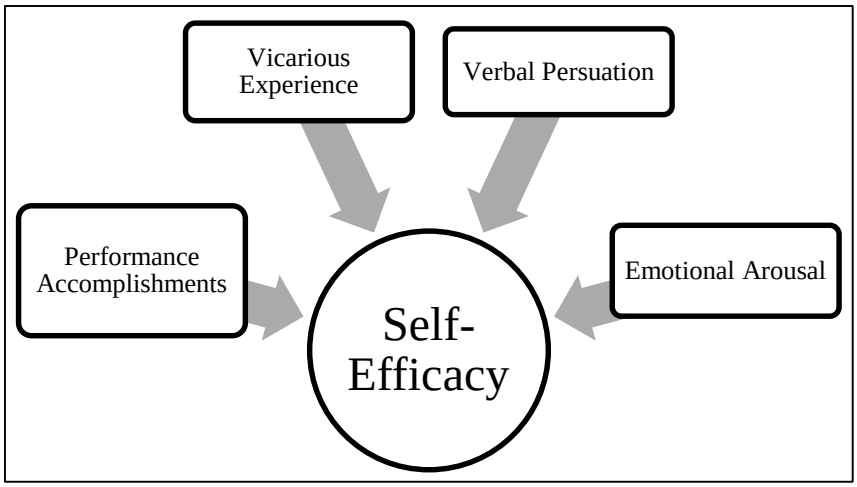

Figure 1. Sources of self-efficacy

Beliefs in one's abilities vary depending on each dimension. According to Bandura [10], self-efficacy beliefs can be divided into three dimensions, namely: the dimension of magnitude, is the level of confidence in the ability of individuals to determine the level of difficulty of the problems / problems faced; dimension of strength, is the level of individual confidence in the ability to overcome problems or difficulties arising from problems / problems; and the dimension of generality, is a belief in the ability of individuals in various activities / generalizing tasks and previous experiences.

3.2 Metacognitive Strategies

Flavel was the first to introduce the term metacognitive in 1976. Although various concepts of the term "metacognitive" have been used in the literature on cognitive development, this concept is usually broadly defined as cognitive knowledge or activity that takes as its object, or regulation of every aspect of every effort cognitive [19]. Cognitive is a term used by psychologists to describe all mental activities related to thoughts, perceptions, memories, and information processing that enables a person to solve problems, gain knowledge, and plan for the future, or all psychological activities related to how an individual observes , pay attention, study, imagine, estimate, assess and think about the environment.

According to Flavell [1] metacognitive refers to a person's knowledge or awareness about the thought process and self control during thinking. Furthermore, metacognitive is formed from one's knowledge of cognitive processes and their own products. Metacognitive leads to a high level of ability that involves active control during the cognitive process in learning. [20] suggested that metacognitive as " thinking about thinking" which means thinking about what is being thought. Metacognitive knowledge of strategies includes how to do things and use strategies, or solve a problem.

Tavakoli & Koosha [14] states that metacognitive processes are expressed through metacognitive strategies that are directed, procedural, intentional, full of effort, essential and facilitative. Meanwhile the opinion by Sun [15] that metacognitive strategies are based on metacognition, further explained that metacognitive strategies are successive processes to regulate or measure cognitive activity, thereby ensuring that cognitive goals will be obtained. This process contributes to the regulation and management of learning, including planning and assisting cognitive activities and evaluating the results of these activities. Hartman [16] mentions that there are four things students do in metacognitive strategies, namely 1) identifying the assignment; 2) determine the initial approach to the task; 3) selecting available information using information management skills and understanding techniques; and 4) evaluating the work, efficiency, and effectiveness of the methods used to complete the task.

Woolfolk [17] states that there are three important types of skills that make it possible to do metacognitive, namely a) Planning, these skills involve decisions about how much time is used for a problem / task, which strategies to use, how to start, what resources will be used, what order will be followed, what will be given more attention and so on; b) Monitoring, this skill is a full awareness of how someone works; and c) Evaluating, this skill involves an assessment of the process and results of thinking.

Metacognitive strategies are used to monitor the process of one's cognitive activity. Where someone can find out whether the activities carried out in accordance with the expected goals or not. Therefore, an outline of metacognitive strategy includes three phases that include planning (planning), monitor the process of its solution (monitoring), and evaluate the results (evaluating).

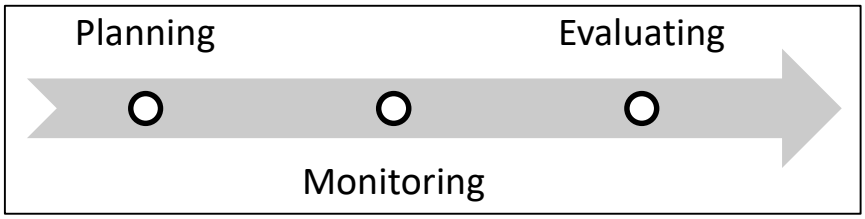

Figure 2. Stages of metacognitive strategy

3.3 The relationship between self-efficacy and metacognitive strategies

In the literature, there are a number of research results linking self-efficacy and metacognitive strategies [25-31] . In general, it can be understood that these two variables are not independent of one another would but can not be separated from each other. Because the application of metacognitive strategies in learning often results in conditions where when investigated students with high metacognition abilities , the level of student self-efficacy is also found to be high. Likewise, when students with high levels of self - efficacy , it is likely that students have higher metacognition abilities.

When looking at studies conducted in some literature, it appears that most researchers using the subject of their research are children, in line with some studies in Indonesia that make students as subjects or respondents of research conducted [9], [13], [32], [33]. This indicates that the importance of confidence in self-efficacy in students to be improved since the beginning of school, because it will affect the child's performance in thinking and learning.

According to the theoretical review above, this paper argues that there are at least two things why metacognitive strategies can improve student self-efficacy . First, the orientation of the two variables are similar, although not completely as metacognitive activities are able to train students' thinking processes and their relevance with self-efficacy ie students who have a high sense of self-efficacy will affect their cognitive processes [34,35], for example students who are taught using metacognitive strategies will have a positive impact on metacognition and self-efficacy abilities . Second, learning with metacognitive strategies based on strengthening self-efficacy students will obtain high academic achievements in several cognitive aspects, such as reasoning and communication skills [32], [36]; problem solving skill [37,38]. This relationship is shown in Figure 3.

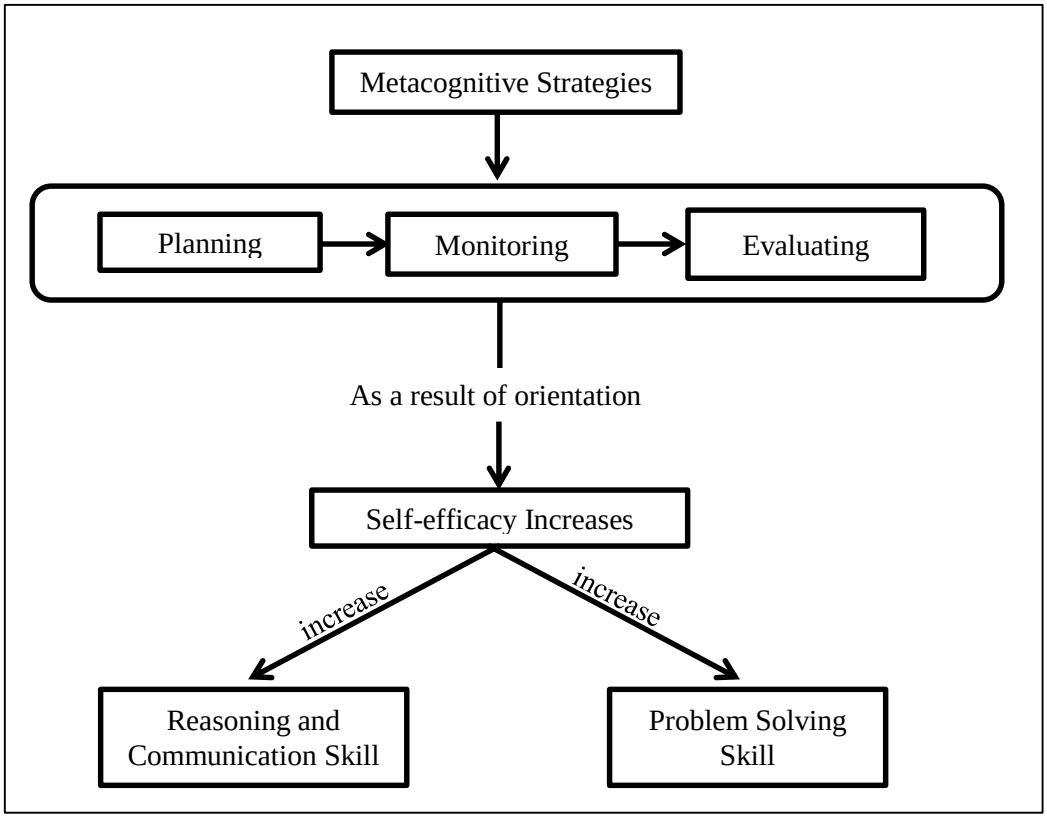

Figure 3. Relationship between self-efficacy and metacognitive strategy

4. Conclusion

Metacognitive strategies are the knowledge that everyone has about how their cognitive processes work. Metacognitive strategies are used to monitor the process of one's cognitive activity. Meanwhile, self-efficacy refers to an individual's belief in his ability to complete a task. Seeing the relationship between two variables is that they do not depend on one another to be but it can't be separated. It can be said, learning mathematics with metacognitive strategies can improve students' self-efficacy. The first reason, the orientation of the two variables have in common although not completely like metacognitive activities able to train students' thought processes and their relevance with self-efficacy is students who have a high sense of self-efficacy will affect their cognitive processes, for example students who are taught using metacognitive strategies will have a positive impact on metacognition and self-efficacy abilities. Second, learning with metacognitive strategies based on strengthening self-efficacy students will obtain high academic achievements in several cognitive aspects, such as reasoning and communication skills.

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