The Role of Metacognitive Skills in Developing the 21st Century Skills

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ABSTRACT

Metacognition is one of the dimensions of education that is very important in building students' knowledge, skills, and character. This metacognitive ability is indispensable in learning to develop the 21st century skills that must be mastered by students. This article review aims to determine the role of metacognition in learning to develop the 21st century skills. Some the 21st century skills that can be developed using this metacognition ability are problem solving skills, critical thinking skills, reflective thinking skills, and the ability to obtain information. Thus, it can be concluded that honing students' metacognitive skills can be one of the determinants of student success in mastering the 21st century skills.

Key words: metacognition ability, learning, 21st century skills

INTRODUCTION

The 21st century was marked by a rapid development in information technology and communication as well as automation. These developments have an impact on human life in the world, among them is improving the relationship of citizen in the world both directly and indirectly (the virtual world) and a lot of human work has been replaced by machine (Sukmana, 2018) . Hence, the 21st century has often been referred to as “the age of knowledge, the age of economic based, the age of information technology, globalization, the industrial revolution 4.0 and so forth” (Redhana, 2019) . This change in the 21st century presents a challenge in the educational world to prepare learners to be able to survive in this information age.

In order to prepare a new generation to meet the challenge of the 21st century, The Ministry of Education and Culture of The Republic of Indonesia developed a new curriculum of each level of education that adapts to a skill-oriented 4C: creativity, critical thinking, communication and collaboration (Bialik & Fadel, 2015) . Syahputra (2018) developed the 4C skills into 6 skills that student must have mastered in the 21st century, which are: (1) creativity and innovation, (2) communication and collaborative, (3) research and information flow, (4) critical thinking, problem solving and decision making, (5) digital citizenship and (6) technological and concept operations. In this regard, Redhana (2019) argues that the result of learning participants in the 21st century must be some learning and innovation skills focused on critical thinking, creativity and innovation, critical thinking and problem solving, communication and collaborative, information skills, media and technology acquisition,

information and communication, adaptive ability , initiative, leadership and responsibility. Thus, learners are asked to develop ideas with creative effort, to reason effectively, to use system thinking, to solve types of problems and to identify and ask question (Redhana, 2019).

The 21st century paradigm emphasizes on the student's ability to master those 21st century skills. Bialik & Fidel (2015) from The Center for Curriculum Redesign (CCR) offer a complete framework that covers four dimensions of education: knowledge, skill, character and metacognition. Among these four dimensions, the metacognition dimension is one of the most important dimensions to build the other three dimensions, that are knowledge, skill and character (Bialik & Fadel, 2015). Metacognitive ability will grow with age, but (Rukminingrum, Hanurawan, & Mudiono, 2017) stated that metacognitive ability can also be developed through learning processes by combining several appropriated strategies and approaches. This is similar to research which states that using learning methods can help in developing thought management with metacognitive ability (Panggayuh, 2017).

METHOD

The search focused on the literature on metacognition in learning published between January 2013 and December 2020. The process for selecting the literature included the current review started with a search in the databases Google Scholar. Publication whose title contained the term "metacognition" and which responded to the descriptors/topics "the 21st century skills or learning" were sought. A total of 17 papers are relevance to the topic (main focus on the role of metacognition in improving the 21st century skills).

RESULT AND DISCUSSION

Metacognition

The word of metacognition was released in 1976 by Flavell, a psychologist from the Standford University (Fitri HRP, Ardiana, & Pratiwi, 2018). Flavell (1976) and Livingston (1997) in Adhitama, Kusnadi dan Supriatno (2018) mentions that metacognition is thinking about thinking, that is, thinking about thought process itself or the ability to monitor and control its thinking. Metacognitive ability in general is a person's awareness of his knowledge of the process and thinking (cognition) and his ability to control and evaluate their own cognitive processes. Metacognitive abilities have an important role in learning (Livingston in Effendi, 2016). Thus, it can be concluded that metacognition is an ability to think logically in the process, control and evaluate the result of the thought process itself.

Metacognition consists of two related sets of capabilities: (1) the understanding of abilities, strategies and resources needed in a task, and (2) the ability to know when and how to use a strategy and a skill that he has to ensure a task can be completed perfectly. According to

Baker & Brown in Shunk in Chrissanti & Widjajanti (2015), the first abilities include: (1) locating a principal idea, (2) training information, (3) shaping pictures, (4) using memory techniques, organizing, writing or underlining, and (5) using experimental techniques, whereas the second abilities include: (1) checking the level of understanding, (2) predicting results, (3) evaluating effectiveness, (4) planning activities, and (5) managing time. According to Gradler in Fitriah, Ardiana & Pratiwi (2018), there are three components in the metacognitive: planning, monitoring and evaluation. These means that metacognition relates to monitoring and mind control that has the ability to consciously plan, to monitor and evaluate his learning process. Therefore, through metacognition, a student is expected to be able to be self-reliant and learn what he has learned, what he is learning, and what he must learn (Adhitama, Kusnadi, & Supriatno, 2018; Fitri HRP, Ardiana, & Pratiwi, 2018).

The Role of Metacognitive in Developing Problem-solving Capabilities

Problem solving is a vital activity enhancing a student's ability to judge truth on a statement or issue and explain why (Chrissanti & Widjajanti, 2015) . The student's metacognitive capability has a link to the problem solving capability (Sophianingtyas & Sugiarto, 2013; Lukum, Laliyo, & Sukamto, 2015) . This is similar to Yoong's in Effendi (2016) which suggest that students who have low metacognitive abilities will end up failing, whereas those who have good metacognitive abilities will elevate their problem solving ability. Metacognitive skills relate to the student's thinking process in order to find an appropriate strategy for solving problems. The metacognitive ability can increase student's ability to analyze both a statement and a problem based on a relevant theory, fact or formula (Lukum, Laliyo, & Sukamto, 2015) . The student's ability to determine which concepts or formulas are relevant and properly used in resolving calculations suggested that the student has a good metacognitive ability (Sophianingtyas & Sugiarto, 2013; Lukum, Laliyo, & Sukamto, 2015) . Problem solving coupled with high math academic ability can help students to understand the problem, and to create and carry out problem solving and problem assessments very well (Fitri HRP, Ardiana, & Pratiwi, 2018).

The Role of Metacognitive in Developing Critical Thinking Ability

Metacognitive ability is also known to increase critical thinking ability (Kuhn in Chrissanti & Widjajanti, 2015; Ikhsan, Munzir, & Fitria, 2017). According to Chrissanti & Widjajanti (2015), metacognitive is able to enhance student to be more active in thinking, so the student can thinking systematically to identify strengths and weaknesses in studying. The implementation in metacognitive ability is able to encourage the student to filter information that has been given about create a plan to solve problem, to write step by step to solve problem and to re-evaluate the problem solving (Fasha, Johar, & Ikhsan, 2018). Thus, the critical thinking ability will encourage the student to actively thinking in result and finally able to trigger the

improvement of student critical thinking. Ikhsan, Munzir & Fitria (2017) also explained that student which has a good metacognitive ability capable to observe his own thought and research, so the student are capable to make right decision. Siregar (2019) also explain that critical thinking ability is awareness of metacognitive, because it able to enhance analytical ability improvement about lesson that has been learned.

The Role of Metacognitive in Developing Reflective Thinking Ability

Metacognitive ability also related to reflective thinking ability, that is critical thinking based on argument and focused on what to convince or done (Nindiasari, Kusumah, Sumarmo, & Sabandar, 2014). The reflective thinking ability require ability in thinking to reach knowledge that involve metacognitive activity which is planning, monitoring, ruling and evaluating to result of a cognitive analysis. Thus, this thinking ability will train people to find sources of information or experience that can related with daily problems, that will shape independent, critical, and honest individuals (Yasir, Ibrahim, & Widodo, 2015) . This is similar with Nindiasari, Kusuma, Sumarno & Sabandar (2014) reported that metacognitive approach can trigger student to think reflectively and critically due to student has been given opportunity to ask a question and to monitor also to rule their own thinking.

The Role of Metacognitive in Developing Information Ability

According to Aditama, Kusnadi & Supriatno (2018), metacognitive ability is also able to improve information ability included ability to arrange information and to process information efficiently. This ability also consists of organizing, analyzing, concluding, and focusing useable information. One of the metacognitive awareness is information ability that very needed in 21st century, which student being pushed to change information with their own words, make an example and link information that read by student with known information, or with facts or phenomenon that happened in their environment, so that this ability is so useful in their real life by relating with daily life (Adhitama, Kusnadi, & Supriatno, 2018).

CONCLUSION

Metacognitive ability is essential to developing a 21st century skill, including problem solving, critical thinking and accessing information. Mastery of these four skills of the 21st century was a determining factor in students' success into the future, thus sharpening students' metacognitive abilities became one of the important focus of school learning.

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