

Navigating Uncertainty: Exploring Elementary School Teachers' Perspectives on Metacognitive Development in the VUCA Era

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Abstract

Metacognition is the ability that learners have to evaluate their thinking processes to solve problems through understanding the problem, solving the problem, and evaluating metacognition knowledge. The novelty of this research is the findings obtained from the teacher's perspective on the importance of metacognition in elementary school students. Thus, the purpose of this study is to analyze elementary school teachers' understanding, the types, and the aspects of metacognition knowledge. The research method used in this research is a qualitative research method with a descriptive approach. The data collection methods used are observation, interviews, and documentation. After data is collected from various sources, data analysis is carried out with the stages of data collection, data reduction, data presentation, and verification of existing data. Primary data sources were from primary school teachers in West Java, Indonesia, and secondary data from relevant literature. The results showed that teachers' perceptions of metacognition consider it important, especially students' metacognition in learning, and the metacognitive abilities of students are also quite good. This is evidenced that with metacognition ability students can learn effectively and always think critically in learning. Therefore, the teacher's ability to understand student metacognition is the most important thing in learning. The theoretical implication of the results of this study is that this research strengthens the opinion about the importance of teachers' perceptions of students' metacognition abilities.

Keywords: metacognition ability, metacognitive development, metacognitive knowledge, metacognition skills, VUCA

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1. Introduction

In the learning process to explore their knowledge, learners are expected to actively process information, using prior knowledge, skills, and strategies (Martín-Blas & Serrano-Fernández, 2009; Zimmerman, Barry J; Schunk, 2018; Cahyono et al., 2017). De Corter explains that learning is the process of knowledge building and meaning construction is constructive, cumulative, self-organizing, goal-oriented, and collaborative (De Corte, 2000; Redvall,

2009). Therefore, educators no longer only focus on the transfer of knowledge knowledge, but also on metacognitive knowledge (Guillory et al., 2006; Sugrah, 2020). From this information, to find out metacognition knowledge, it is necessary to describe various theories about metacognition skills and what important functions metacognition skills have for students.

Metacognition is an awareness of how students learn, observe their level of

understanding, assess the difficulty of a problem, make the information they have to achieve their goals and assess their learning abilities (Krathwohl & Anderson, 2009; Bloom, n.d.; Wang, 2009). In other words, the metacognitive ability is the ability that individuals have to control their learning stages starting from the planning phase, choosing appropriate strategies when solving problems, monitoring learning progress and correcting if there are errors when understanding concepts, and being able to analyze the effectiveness of the strategies they choose (Azizah, 2021; Abdelrahman, 2020; Agustin et al., 2022). So metacognition knowledge is the process of thinking about one's cognition, self-regulation, and learning strategies to analyze, draw conclusions, and practice what has been learned. Metacognitive knowledge refers to learners' knowledge about their cognition, cognitive functions, and possibly others (De Jager, Bernadet et al., 2007; Zohar, 1999; Rahman, 2012). According to De Jager, metacognitive knowledge is expanded through reflection on learning experiences and can be used in planning subsequent learning tasks. As metacognition does not develop automatically in all learners, teachers play an important role in its development (Cera et al., 2014; Khairuddin et al., 2022; Herman & Fatimah, 2023).

Good metacognition skills will make the learning process of students more meaningful through the selection of strategies for improving future cognitive abilities (Ardianingsih & Salim, 2019). Simultaneously, metacognition ability can be seen in how learners analyze their learning process and solve a problem. Metacognition can lead learners to recognize their way of thinking so that they not only memorize concepts and principles in learning but can

also understand them correctly (Çer & Şahin, 2016; Herman & Naldi, 2007).

Learners are directed to be able to observe what they know and do, and to reflect on what they observe. Eggen and Kauchak explained that metacognitive knowledge helps learners understand and regulate their learning process so that they become self-regulated learners (Cera et al., 2014). Good metacognition will encourage learners to become independent learners (Çer & Şahin, 2016; W. N Jannah, 2014).

The importance of metacognitive skills stated by Sari (2020) is that through good metacognitive knowledge, students can carry out many of their learning tasks more effectively. Metacognitive skills play an important role in students' learning activities, especially in problem-solving, so they need to be applied by being taught and assessed by teachers in the classroom (Pintrich, 2010; Pukdeewut et al., 2013; Agustin et al., 2022).

The demand for organizations to always be responsive increases when conditions are unstable, uncertain, and complicated. Namely an era called Volatility, Uncertainty, Complexity, and Ambiguity (VUCA). Volatility can be interpreted as the emergence of changes that are very fast and occur continuously. Uncertainty means the inability to predict the possibility of unexpected events (Utama, 2023; Atrup & Putra, 2018). Complexity refers to the presence of many factors but they are all related without a clear cause-and-effect pattern. Ambiguity is defined as difficulty when interpreting current circumstances and reality.

In the past, starting in 1990, VUCA was an acronym used by American military forces to describe extreme conditions in Afghanistan and Iraq which were considered volatile, uncertain, complex, and ambiguous. Subsequently, this term developed to be used

in the business world as a description of fluctuating business situations. This changing condition is influenced by many factors, for example political, social, technological, cultural, and environmental. Plus, digitalization in various sectors (Rachmawati, 2017).

VUCA is an era where change occurs continuously, so there are opportunities for innovation in it. In the VUCA era, there is also a secret strategy that can inspire someone to manage the four VUCA components (Johansen 2012; Sholahuddin & Prasajo, 2022). In the VUCA era, the world is hit by uncertainty affecting the political, economic, technological, and other sectors. It is important for organizational leaders to always be able to face the VUCA era in their environment (Mishra 2020; Hadar et al., 2020).

Subsequently, this term developed widely and became a topic of discussion in other sciences, not only in the field of leadership. VUCA is intended as an embodiment of a world that continues to develop, change, and never stagnate. The rate of change that is currently occurring is at an unpredictable pace, and the complexity, ambiguity, and uncertainty of whatever direction this change will lead to is unpredictable. In this study, we will examine how to face the transition to the VUCA era if it is linked to nationalism, with all the new challenges that have the potential to be faced in the future (Soraya et al., 2022; Mukhlisah, 2021; Stewart et al., 2016).

Likewise, challenges in the world of education are now increasingly complex and rapidly developing, including universities in Indonesia. Universities are now required to be able to train their students to be able to handle complex problems and systems both in scientific environments and the world of work (Delaney, Pattinson, Mc Carthy, &

Beecham, 2017; Longmore, Grant, & Golnaraghi, 2018; Mishra & Mehta, 2017). Higher education institutions in Indonesia must be able to produce graduates who are versatile and able to adapt to what is currently called the VUCA Era which has the characteristics of "volatile, uncertain, complex, and ambiguous" (Davie, 2013; Arvanto et al., 2023).

Based on the results of research conducted by Putri (2021), it is proven that students who have good metacognition skills tend to be able to compile complete lesson plans by directing their awareness and organizing their thoughts. As for the research conducted by William Merriman and John Marazita on the importance of word awareness and the meaning of lexical ignorance. According to his research children need to monitor their knowledge of the meaning of words children need to be able to realize that there are gaps in their lexis. In other words, understanding metacognition about oneself and others is very important in language learning, where children not only need to understand the referent of a word but also monitor their knowledge about words and the world in general (Riyadi et al., 2015). Learners' metacognition skills have a relationship with their achievement learning (Maesyaroh et al., 2020). In addition, there are several prerequisites for improving metacognition skills, including a curriculum that interests learners, integration of assessment, consistent practice, explicitly stated learning strategies, and verbalization (Ellis et al., 2014; Agustin, Inten, et al., 2021; Martín-Blas & Serrano-Fernández, 2009). Some of these studies show the importance of metacognition for learners, but research on teacher perceptions of the importance of student metacognition has not been done much.

Understanding metacognition in the world of education in the VUCA era has been in the spotlight of teachers and educational figures who consider that in the VUCA era teachers' understanding of student metacognition must be improved. This is done to measure and understand the skills that students have in absorbing science and technology that is developing today. Teachers' perceptions of students' metacognition development need to be studied more deeply so that teachers' understanding of students' metacognition becomes a benchmark in the development of students' skills (Abdelrahman, 2020; Jannah, 2014; Zohar, 1999).

For this reason, it is the role of the teacher who supports the development of metacognition skills. Before teachers develop metacognition skills in their cognitive activities, teachers must first understand the ability of metacognition and how important metacognition skills can improve the learning outcomes of their students. Teachers should also understand suitable models to develop learners' metacognition, measurement of metacognition (skills and knowledge), and students' intelligence. If teachers do not understand the importance of learners' metacognition skills and do not understand how to prescribe metacognition strategies, learning achievement will be less than optimal. Teachers apply the right model with the delivery of material and a learning environment that is suitable for the students' support and impact on improving students' metacognition skills (Ardianingsih & Salim, 2019; Agustin et al., 2018; Zimmerman, Barry J; Schunk, 2018).

Based on the results of observations and exposure to previous research on metacognition competence, shows that students must be equipped with

metacognition skills in learning so that these students can understand how to learn independently effectively, be able to think critically, and be able to solve problems according to their conditions, and abilities. This can be realized if the teacher can master and perceive students' ability to understand metacognition for learning, but this still needs to be studied and conducted in-depth research related to teacher perceptions in understanding student metacognition in learning.

From the above problems, the researcher formulated several problems in the form of questions as follows: How do teachers perceive the importance of elementary school students' metacognition skills in learning? The question is expected to reveal the object of research in the form of teachers' understanding of the definition, types of knowledge, and aspects of student metacognition, as well as students' metacognitive abilities themselves.

2. Method

The objects of this study are 1) teachers' understanding of the meaning of metacognition skills, 2) metacognition skills for elementary school students, 3) understanding of the types of metacognition knowledge, and 4) understanding of metacognition aspects, namely cognition knowledge and cognition regulation, where these objects are obtained through analysis of elementary school teachers' perceptions of the importance of metacognition skills in the context of VUCA era. The research was conducted in January 2023 by distributing observation sheets to teachers across West Java and Makassar.

To achieve these objectives, this research uses a qualitative approach with descriptive methods. Qualitative research is a process of understanding human or social phenomena by creating a comprehensive and

complex picture that can be presented in words, reporting detailed views obtained from informant sources, and conducted in a natural setting (Walidin, Saifullah & Tabrani, 2015: 77; Nassaji, 2015). Meanwhile, descriptive qualitative is a method that explains facts by scientific situations that are arranged systematically through words or descriptive harmonized or adjusted research results that have been obtained (Anggito & Setiawan, 2018; Agustin & Nurihsan, 2011; Milles & Huberman, 1984). This qualitative method with a descriptive approach is used in this study to find out and analyze the results of the study from the description of the results of field research on the importance of metacognition for students.

The type of data used is qualitative data. Data sources in this study were obtained from primary and secondary data. Primary data sources are data from informants and elementary school teachers. Primary sources are often referred to as research subjects, as the main informants, and even autori-active in providing information relevant to what

researchers need (Karim, Agus, et al., 2023). Meanwhile, secondary data is in the form of data obtained during the literature study, in the form of literature and written data relating to the research to be studied. The sampling technique used in the study (Cahyono et al., 2017; Guillory et al., 2006; Sugrah, 2020).

This is probability sampling with the type of sampling being random cluster or area (Cluster/random sampling). Probability sampling is a sampling technique that provides equal opportunities for each element or member of the population to be selected as a sample (Sugiono, 2014; Bloom, n.d.; Krathwohl & Anderson, 2009).

The data collection techniques used were observation and document study. The instruments used were observation sheets and documentation checklists (Karim et al., 2022; Wang, 2009; (Widia Nur Jannah et al., 2022). The components of the observation sheet for elementary school teachers' perceptions of the importance of cognition skills are as follows:

Table 1. Components of Elementary Teachers' Perception of the Importance of Metacognition Skills

Aspects	Indicators
Definition of Metacognition Skills	Metacognitive knowledge refers to what students understand and believe about a particular subject matter.
Metacognitive Knowledge	a. Procedural Knowledge 1) Students know the strategies and steps to be used in solving a problem. 2) Students know how to apply effective strategies to be successful in solving the problem. b. Procedural Knowledge 1) Students know the strategies and steps to be used in solving a problem. 2) Students know how to apply effective strategies to be successful in solving the problem. c. Conditional Knowledge 1) Students know when the concepts and strategies are used in solving problems. 2) Students know why these concepts and strategies are used in solving problems.
Regulation of Cognition	Regulation of cognition refers to actions that can assist students in organizing or controlling their cognitive activity.
Knowledge Cognition	Knowledge of cognition refers to activities that involve conscious reflection on cognitive abilities and activities

(Brown, 1987; Flavell dan Brown, Tolga, 2010; Tolga, 2010)

For the information collected in the form of teacher perceptions through observation sheets, researchers conducted qualitative data analysis with the stages of reduction, display, and interpretation (Karim, Fathurrohman, et al., 2023), the reduction was carried out to filter information from teachers who did not, the display was carried out to filter information from teachers who did not pattern the filtered information, and interpretation to interpret the information. Then the final information from the in-Forman is validated by triangulation techniques, at least confirming the data source from observation with documentation (Karim, Purnomo, et al., 2020; Nurkholis et al., 2021), so that the problem formulation can be answered.

3. Result and Discussion

a. The Importance of Metacognition Skills for Students in VUCA era

Based on the results of research conducted in elementary schools in West Java and Makasar Indonesia, metacognitive skills have a very important value for students at all levels of education, including elementary school in the VUCA era. Developing metacognition skills from an early age can provide important benefits for student's academic and personal development.

The development of students' metacognition is needed in learning at the basic education level to provide students with skills in learning independently, solving problems, self-management, and thinking critically about problems that occur to students. This is consistent with that of Abdelrahman, R. M. (2020), Jannah, W. N. (2014), and Zohar, A. (1999) which state that metacognition can help students learn independently, think critically, and can solve problems in every learning they face

(Abdelrahman, 2020; Jannah, 2014; Zohar, 1999).

Metacognition is a person's knowledge about their thinking process and everything related to the thinking process during thinking activities that are controlled by themselves. (Faizati, A. 2020). Metacognition is knowledge about one's thinking about one's thinking which includes metacognitive knowledge (one's awareness of what one knows), metacognitive skills (one's awareness of what one does), and metacognitive experience (one's awareness of one's cognitive abilities) (Ahmad, 2018; W. N Jannah, 2014; Nirmala et al., 2018).

Metacognition is second-order cognition which means thinking about thinking. Thinking about knowledge or reflecting on actions taken (Weinert, 1987; Agustin, Nurdiansyah, et al., 2021; Agustin et al., 2022). Christoph (2006: 16) explains this principle of self-regulation requires a structured learning environment to organize learning. Learners can actively monitor and control their learning behavior. The use of metacognitive skills is directly related to knowledge transfer. Metacognition makes it possible to monitor one's learning progress while solving a particular problem in a particular learning environment, e.g. In certain learning, there is a type of learning regulation that is highly recommended. Students can plan, direct, and evaluate their cognitive activities jointly (Abdelrahman, 2020; Abdulrazzaq, 2022; Agustin, 2013).

Based on the theories of metacognition above, show that metacognition skills for elementary school students are very important to apply so that students can have skills in learning independently, solving problems, self-management, and thinking critically about problems that occur. Therefore, teachers as mentors of students in learn-

ing should understand the competence of students' metacognition in learning.

Based on the results of the questionnaire distributed to elementary school teachers regarding the importance of understanding metacognitive competence for students, it was found that teachers' perceptions that metacognitive abilities in learning can help teachers guide students to increase achievement and independence in solving problems and encourage students to think critically in learning. This understanding of metacognition can be illustrated as follows:

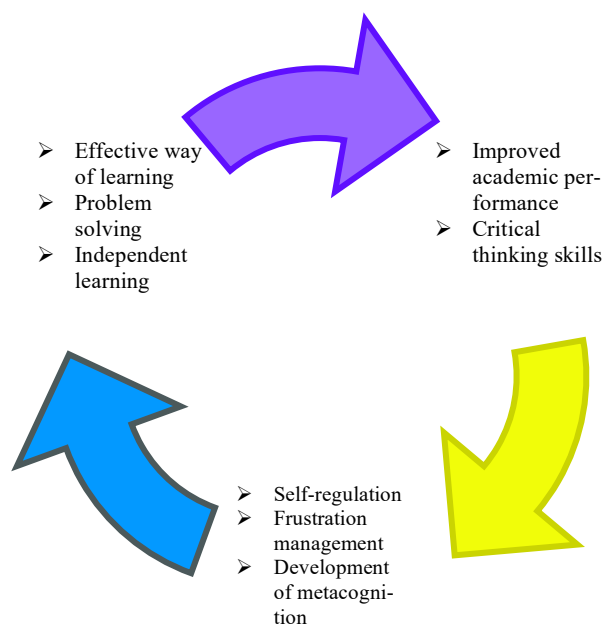


Figure 1. Illustration of important metacognition

The illustration above shows that the importance of metacognition in learning is characterized by the nature that students have in learning, and solving problems in learning. After this trait is fulfilled, students will begin to understand how to learn by thinking critically and improve their achievements, then by themselves with the ability of metacognition, students can manage their time, themselves, and their frustration so that it has an impact on the personality of students who become more mature and wise in learning

problems. Metacognitive abilities are the ability to understand, control, and regulate one's thought processes. This ability allows a person to be more effective in processing information, solving problems, and making decisions. So this metacognitive ability has a good impact on students' intellectual and academic development. Based on the illustration above, understanding metacognition will help students solve problems in the learning process they face, for example, students have difficulty understanding learning material in mathematics. If students are equipped with metacognitive competencies, they will try to resolve difficulties in understanding lessons either by studying with friends who understand, or discussing with their private teacher, and solving other problems that support learning completion.

Based on the existing chart, the flow in understanding student metacognition can begin with an effective way of learning, where students are invited to learn to understand problems and think critically in understanding the lessons delivered by the teacher, making it easier for students to learn and receive lessons from the teacher. Then students are also given examples of lesson questions that can train students to solve problems well and can be solved independently without involving teachers or parents as their mentors.

The example above shows that metacognition from the perspective of student experience is very supportive of students' ability to think critically, solve problems, and learn independently with various challenges encountered in learning.

Students' metacognition skills need to be trained and improved with the help of guidance from their teachers. Therefore, to improve students' metacognitive abilities, teachers' perceptions and understanding of students' metacognition must also be im-

proved by attending training, seminars, and teacher competencies in understanding metacognition.

Teachers always improve academic performance to train students' pedagogical competence in understanding lessons to make students skilled in all competencies and have critical thinking skills in learning and receiving lessons from teachers.

In understanding metacognition, students are also trained to be able to control themselves from the various learning problems they face to reduce the learning frustration experienced by students. This of course requires cooperation between teachers and students in carrying out the teaching and learning process in the classroom, especially since these students are still in the basic education age category.

Analysis of the results of the questionnaire distributed to elementary school teachers regarding the importance of understanding metacognitive competence for students also found several teacher perceptions regarding metacognitive abilities for students which are explained as follows:

Question 1: Is it important for every elementary school student to have metacognitive abilities?

Teacher 1: Important, because metacognition controls the six levels of cognitive aspects defined by Benjamin Bloom in Bloom's taxonomy which consist of memory, understanding, applied, analysis, and synthetic and evaluation stages.

Teacher 2: Important, because basically when students can monitor their learning process consciously then they will be more confident and able to be independent in learning.

Teacher 3: Important, because by mastering metacognitive skills, elementary school students will be better able to manage themselves in the learning process, more

motivated to learn, better able to control emotions, and able to solve problems.

Teacher 4: Metacognitive abilities are very important for elementary school students because students can be more able to manage themselves in the learning process, more capable and more motivated to learn, and more likely to be able to regulate their emotions (even in difficult situations) more able to handle complexity and understand - solve problems in learning.

Metacognitive ability is the ability to understand, control, and regulate one's thought process. It enables one to be more effective in processing information, solving problems, and making decisions. The importance of metacognitive skills in primary school students cannot be ignored as it has a significant impact on their intellectual and academic development (Agustin, & Nurihsan, 2011; Agustin, Inten, Permatasari, & Mulyani, 2021).

Here are some reasons why metacognitive skills are important for elementary school students in West Java & Makasar in the VUCA era:

- 1) By developing metacognition skills, students can learn to recognize the most effective ways of learning for themselves. They can become aware of successful learning strategies, such as reading with understanding or remembering information well, and use them consistently.
- 2) Problem solving, cognition helps students deal with challenges and problems in a more structured way. They can learn to identify barriers to understanding or problem-solving and take concrete steps to overcome these problems.
- 3) Learning independence, metacognition helps students develop independence in learning. By understanding how they

process information and learn, students can plan their ways to understand new material, overcome difficulties, and seek help when needed.

- 4) Improved academic performance, Students who have good metacognition skills tend to have better academic performance. They can be more effective in understanding, remembering, and applying the information learned.
- 5) Improved critical thinking skills, Metacognition involves reflection and evaluation of one's thought processes. It promotes the development of critical thinking skills, where students learn to ask questions, analyze information, and make decisions based on deep thinking.
- 6) Improved self-regulation, students who have an understanding of metacognition can better organize their time and effort. They can plan tasks, set priorities, and evaluate the extent to which learning goals are achieved.
- 7) Dealing with frustration, students who have good metacognition are more likely to deal with frustration or confusion in learning more positively. They know how to respond to not understanding by finding ways to understand the material better.
- 8) Further development of metacognition skills, teaching students about metacognition at the elementary school level helps them to understand the material better to develop more complex metacognition skills at higher levels of education.

In the conclusion of Ardianingsih, & Salim, (2019); Baddeley, (2012); Bahri, (2015) that by introducing the concept of metacognition early on, schools can help students build a strong foundation to become effective, adaptive, and independent learners

in their educational journey in the context of VUCA era.

b. Types of Metacognition

Metacognitive ability has a relationship with knowledge. In the world of education in the VUCA era, to improve metacognitive abilities, students need to have, realize, and understand three types of content knowledge. The three types of knowledge are declarative knowledge, procedural knowledge, and conditional knowledge.

Declarative knowledge is factual information known by a person. This knowledge can be expressed either orally or in writing. An example of this knowledge is students knowing the concepts that will be used in solving a problem (Anderson & Krathwohl, 2001; Cahyono, Sutarto, & Mahardika, 2017; Çer, & Şahin, 2016).

Procedural knowledge is knowledge of how someone does something, knowledge of how someone performs in carrying out the steps in a process. An example of this knowledge is a student knowing why concepts and strategies need to be used in solving a problem (Cera, Mancini, & Antonietti, 2014; Guillory, Everson, & Ivester, 2006; Gumartifa, Syahri, Siroj, Nurrahmi, & Yusof, 2023).

Conditional knowledge is knowledge related to when a procedure, skill, or strategy is used when it is not used, under what conditions a procedure can be used, and why one procedure is better than another. Examples of this knowledge include students knowing how to apply effective strategies to be successful in solving problems (Herman, & Fatimah, 2023; Herman, & Naldi, 2007; Hermita, Putra, Alim, Wijaya, Anggoto, & Diniya, 2022).

Based on the results of a questionnaire distributed to elementary school teachers regarding the types of metacognitive

knowledge for students, it was found that metacognitive knowledge is divided into three, namely declarative knowledge, procedural knowledge and conditional knowledge. as explained above. These three types of metacognition are an inseparable part in understanding the importance of metacognitive abilities for students. Based on the questionnaire distributed, this type of cognitive knowledge provides a formulation which concludes that students know the concepts that will be used in solving a problem, students also know how to apply effective strategies to be successful in solving the problem. , and students know why these concepts and strategies are used in solving problems. This explanation of the answer is the basis that declarative, conditional and procedural knowledge is part of students' metacognitive abilities.

This description is depicted in the following table:

Table 2. Metacognitive Knowledge

Metacognitive Types	West Java Teachers	Makassar Teachers
Declarative	80% understand	75% understand
Conditional	70% understand	80% understand
Prosedural	90% understand	70% understand

Based on the classification of teachers' perceptions about metacognitive knowledge in elementary school students which is divided into three categories, namely declarative, conditional and procedural which we distributed through a questionnaire, it was concluded that teachers in West Java better understand the importance of metacognition for students in the knowledge aspect better than teachers. -teacher in Makassar. This happens because teachers in West Java accept developments in information, science

and technology more quickly compared to teachers in Makassar. Referring to the table above, if illustrated in a graph it is depicted as follows:

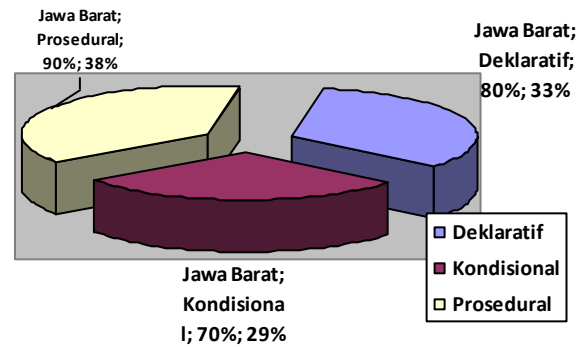


Figure 2. Metacognitive Knowledge

The figure 2 illustrates that the level of teacher understanding of metacognition in the declarative aspect is 80%, meaning that teachers understand the importance of factual information in metacognition that students need to provide, the conditional aspect has a value of 70% which shows that teachers understand when learning procedures are applied to students and why the procedures it must be implemented. Meanwhile, in the procedural aspect, teachers in West Java understand 90% of the level of metacognitive knowledge, which shows that teachers understand the procedural steps that must be carried out in the learning stages for students.

c. Aspects of Metacognition

Based on observation and interview to teachers and students in West Java and Makassar show that metacognition consists of two main aspects, namely knowledge and regulation. The following is a brief explanation of these two aspects in the context of VUCA era: Knowledge, which includes declarative knowledge, procedural knowledge, and conditional knowledge.

Declarative knowledge is knowledge about facts or information that a person has, while procedural knowledge is knowledge about how to carry out an action or process. Conditional knowledge is knowledge about when and how a piece of knowledge or strategy should be used. For example, students are aware of their cognition where students know and even realize what they have to do, how, when, and why students do it. The regulation includes self-awareness, planning, monitoring, and evaluation. Self-awareness is the ability to understand oneself and understand the tasks that must be done. Planning is the ability to plan strategies and manage time. Monitoring is the ability to monitor progress and correct errors. Evaluation is the ability to evaluate results and improve strategies if necessary (Jannah, 2014; Karim, Agus, Nurnilasari, Widiatari, Fikriyah, Rosadah, Syarifudin, Triono, Lesmi, & Nurkholis, 2023; Kashefi, Ismail, & Yusof, 2010).

In the aspect of regulation, metacognition requires the awareness that students have to act and do what is in the school rules as an example of actions that can help students in regulating or controlling their cognitive activities so that it can be done to support student learning in the VUCA era (Martín-Blas, & Serrano-Fernández, 2009; Milles, & Huberman, 1984; Nassaji, 2015).

Knowledge of cognition can refer to activities that involve conscious reflection on students' cognitive abilities and activities. This happens because knowledge of cognition refers to the process of observing and controlling cognitive activities that take place in our heads. In other words, thinking about thinking (Kay, 2018; Khairuddin, Darussamin, & Fauzi, 2022; Krathwohl, & Anderson, 2009).

4. Conclusion

Based on the results of research conducted in elementary schools on the importance of metacognition for students in the VUCA era, it can be concluded that metacognition ability in students is one of the important indicators in learning because with metacognition ability students can learn effectively, independently, be able to solve learning problems and always think critically in learning. Therefore, the teacher's ability to understand student metacognition is the most important thing in learning so that the teacher can measure the level of student understanding in absorbing learning. This shows that elementary school teachers must understand how important metacognitive abilities are because metacognitive abilities are the ability to understand, control, and regulate one's thinking process. This ability allows a person to be more effective in processing information, solving problems, and making decisions. The importance of metacognitive skills in elementary school students cannot be ignored as it has a significant impact on their intellectual and academic development.

This metacognitive ability has several types of knowledge, namely knowledge of the world, knowledge of the world, and knowledge of the world (conditional knowledge). In addition, metacognition in the VUCA era also has the main aspects that must be understood, namely knowledge and regulation.

5. References

- Abdelrahman, R. M. (2020). Metacognitive awareness and academic motivation and their impact on academic achievement of Ajman University students. *Heliyon*, 6(9), e04192. <https://doi.org/10.1016/j.heliyon.2020.e04192>
- Abdulrazzaq, A. (2022). Teacher Appraisers' Perceptions of Teacher Appraisal.

- Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 4(3), 233-245.
doi:<https://doi.org/10.23917/ijolae.v4i3.18779>
- Agustin, M. (2013). Mengenal Dan Mengembangkan Potensi Kecerdasan Jamak Anak Sejak Dini Sebagai Tonggak Awal Melahirkan Generasi Emas. *Cakrawala Dini: Jurnal Pendidikan Anak Usia Dini*, 4(2).
- Agustin, M., & Nurihsan, A. J. (2011). Dinamika Perkembangan Anak Dan Remaja: Tinjauan Psikologi, Pendidikan, dan Bimbingan. Bandung: PT Refika Aditama.
- Agustin, M., Inten, D. N., Permatasari, A. N., & Mulyani, D. (2021). Strategi Guru PAUD dalam Mengembangkan Kecerdasan Interpersonal Anak Usia Dini di Saat Belajar dari Rumah. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 5(2), 1997-2007.
- Agustin, M., Inten, D., Permatasari, A., & Mulyani, D. (2021). Strategi Guru PAUD dalam Mengembangkan Kecerdasan Interpersonal Anak Usia Dini di Saat Belajar dari Rumah. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 5(2), 1997-2007. doi:<https://doi.org/10.31004/obsesi.v5i2.1055>
- Agustin, M., Inten, D., Permatasari, A., & Mulyani, D. (2021). Strategi Guru PAUD dalam Mengembangkan Kecerdasan Interpersonal Anak Usia Dini di Saat Belajar dari Rumah. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 5(2), 1997-2007. doi:<https://doi.org/10.31004/obsesi.v5i2.1055>
- Agustin, M., Nurdiansyah, D., Suryana, S. I., & Sobari, T. (2021). Teacher's strategy in developing environmental care through simple science experiment towards elementary students. *PrimaryEdu: Journal of Primary Education*, 5(2), 145-145.
- Agustin, M., Saripah, I., & Gustiana, A. D. (2018). Analisis tipikal kekerasan pada anak dan faktor yang melatarbelakanginya. *JIV-Jurnal Ilmiah Visi*, 13(1), 1-10.
- Agustin, M., Suryana, S. I., & Pratama, Y. A. (2022). Penguatan pembelajaran sains di PAUD saat dan pasca belajar dari rumah (BDR). *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 6(6), 7264-7272.
<https://doi.org/10.31004/obsesi.v6i6.3734>
- Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives: complete edition*. Addison Wesley Longman, Inc..
- Ardianingsih, W., & Salim, R. M. A. (2019). Perbedaan Gender pada Kesadaran Metakognitif dalam Strategi Membaca Bacaan Akademik. *Jurnal Psikologi Teori Dan Terapan*, 10(1), 74-84. <https://doi.org/10.26740/jptt.v10n1.p74-84>
- Baddeley, A. (2012). Working memory: Theories, models, and controversies. *Annual review of psychology*, 63, 1-29. doi:<http://doi.org/10.1146/annurev-psych-120710-100422>
- Bahri, A. (2015). Pemberdayaan Keterampilan Metakognitif Dan Pengembangan Karakter Mahasiswa Melalui Strategi Pembelajaran Problem Based Learning (Pbl) Dipadu Reading, Questioning, And Answering (Rqa) Pada Perkuliahan Biologi Dasar.
- Cahyono, B. A. D., Sutarto, S., & Mahardika, I. K. (2017). Model pembelajaran REACT (relating, experiencing, applying, cooperating, transferring) disertai media video kejadian fisika terhadap keterampilan proses sains dan hasil belajar siswa dalam pembelajaran fisika di SMA. *Jurnal Edukasi*, 4(3), 20-24.
- Çer, E., & Sahin, E. (2016). Improving Reading Comprehension Skills with Children's Books through Metacognitive Strategy: The Turkish Context. *Journal of Education and Training Studies*, 4(9), 109-119.

- doi:<https://doi.org/10.11114/jets.v4i9.1566>
- Cera, R., Mancini, M., & Antonietti, A. (2013). Relationships between Metacognition, Self-efficacy and Self-regulation in Learning. *Journal of Educational, Cultural and Psychological Studies (ECPS Journal)*, 4(7), 115-141. doi:<https://doi.org/10.7358/ecps-2013-007-cera>
- Guillory, J. D., Everson, J. M., & Ivester, J. G. (2006). Community development: Lessons learned about coalition building and community connections for stakeholders with disabilities. *Community Development*, 37(3), 83–96. <https://doi.org/10.1080/15575330.2006.10383110>
- Gumartifa, A., Syahri, I., Siroj, R., Nurrahmi, M., & Yusof, N. (2023). Perception of Teachers Regarding Problem-Based Learning and Traditional Method in the Classroom Learning Innovation Process. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 5(2), 151-166. doi:<https://doi.org/10.23917/ijolae.v5i2.20714>
- Herman, T., & Fatimah, S. (2023). Considering the Mathematical Resilience in Analyzing Students' Problem-Solving Ability through Learning Model Experimentation. *International Journal of Instruction*, 16(1). doi:<https://doi.org/10.29333/iji.2023.16113a>
- Herman, T., & Naldi, W. (2023, June). The Effectiveness of 3D Visual Media Based on the Realistic Mathematics Education Approach in Mathematics Learning in Elementary Schools. In *International Conference on Elementary Education* (Vol. 5, No. 1, pp. 414-422).
- Hermita, N., Putra, Z., Alim, J., Wijaya, T., Anggoro, S., & Diniya, D. (2021). Elementary Teachers' Perceptions on Genially Learning Media Using Item Response Theory (IRT). *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 4(1), 1-20. doi:<https://doi.org/10.23917/ijolae.v4i1.14757>
- Jannah, W. N. (2014). Pembelajaran Kontekstual untuk Meningkatkan Kemampuan Pemecahan Masalah (Aspek Metakognitif) dan Kemampuan Komunikasi Matematik Siswa Sekolah Dasar. *Jurnal Penelitian Pendidikan*, 14(1). doi:<https://doi.org/10.17509/jpp.v14i1.3217>
- Jannah, Widia Nur, Faiz, A., & Pradina, Q. (2022). Membangun Karakter dan Budaya Literasi Dalam Pembelajaran Tatap Muka Terbatas di SD. *Conference of Elementary Studies Wajib*, 641–646.
- Karim, A., Agus, A., Nurnilasari, N., Widi-antari, D., Fikriyah, F., Rosadah, R. A., ... & Nurkholis, N. (2023). A study on managerial leadership in education: A systematic literature review. *Heliyon*. doi:<https://doi.org/10.1016/j.heliyon.2023.e16834>
- Karim, A., Bakhtiar, A., Sahrodi, J., & Chang, P. H. (2022). Spiritual leadership behaviors in religious workplace: the case of pesantren. *International Journal of Leadership in Education*, 1-29. doi:<https://doi.org/10.1080/13603124.2022.2076285>
- Karim, A., Fathurrohman, O., Muhammadun, Saripudin, W., Rahmat, D., & Mansir, F. (2023). Altruistic works, religion, and corruption: Kiai s' leadership to shape anti-corruption values in pesantren. *Cogent Social Sciences*, 9(1), 2238968. doi:<https://doi.org/10.1080/23311886.2023.2238968>
- Karim, A., Purnomo, H., Fikriyah, F., & Kardiyati, E. N. (2020). A charismatic relationship: how a Kyai's charismatic leadership and society's compliance are constructed?. *Journal Of Indonesian Economy & Business*, 35(2).doi:<https://doi.org/10.22146/ji eb.54705>
- Kashefi, H., Ismail, Z., & Yusof, Y. M. (2010). Obstacles in the learning of two-variable functions through mathematical

- thinking approach. *Procedia-Social and Behavioral Sciences*, 8, 173-180. doi: <http://doi.org/10.1016/j.sbspro.2010.12.024>.
- Kay, C. L. (2018). *Meta-cognition and Psychopathology in Children and Adolescents*. The University of Manchester (United Kingdom).
- Krathwohl, D. R., & Anderson, L. W. (2009). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Longman.
- Listiana, L., Daesusi, R., & Soemantri, S. (2019, December). Peranan metakognitif dalam pembelajaran dan pengajaran biologi di kelas. In *Symposium on Biology Education (Symbion)* (Vol. 2).
- Maesyaroh, S., Jannah, W. N., & Karim, A. (2020, March). Penerapan Program Lisabil (Lihat Sampah Ambil) dalam Usaha Penguatan Karakter Siswa Sekolah Dasar di Lingkungan SDN 1 Kamarang. In *Seminar Nasional Pendidikan Dasar* (Vol. 2).
- Martín-Blas, T., & Serrano-Fernández, A. (2009). The role of new technologies in the learning process: Moodle as a teaching tool in Physics. *Computers & Education*, 52(1), 35-44.
- Maulani, S., Musthafa, B., Damaianti, V. S., Agustin, M., & Puspita, R. D. (2021). Applying social cognitive-based literacy learning model to improve students' reading and reasoning skills in Indonesian elementary school. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(9), 1205-1224.
- Milles, M., & Huberman, M.. (1984). *Qualitative Data Analysis*. Sage Publication.
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, 19(2), 129-132.
- Nurkholis, Jannah, W. N., Aji, T. S., & Anggita. (2021). Strategi guru dalam pembelajaran daring pada anak berkebutuhan khusus (ABK) (Studi kasus di SLB Negeri Pangeran Cakrabuana kecamatan Depok kabupaten Cirebon. *Jurnal Education and Development Institut Pendidikan Tapanuli Selatan*, 9(3), 364–368.
- Panjaitan, M. B. (2018). Improving students' metacognition and problem-solving skills in electricity and magnetism. *Journal of Suluh Pendidikan FKIP-UHN*, 6(2), 6-21.
- Prayitno, H., Kusmanto, H., Nasucha, Y., Rahmawati, L., Jamaluddin, N., Samsuddin, S., & Ilma, A. (2019). The Politeness Comments on The Indonesian President Jokowi Instagram Official Account Viewed From Politico Pragmatics and The Character Education Orientation in The Disruption Era. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 1(2), 52-71. doi:<https://doi.org/10.23917/ijolae.v1i2.8785>
- Pukdeewut, S., Chantarasombat, C., & Saptornwong, P. (2013). Creative thinking development program for learning activity management of secondary schoolteachers. *International Education Studies*, 6(12), 82. <https://doi.org/http://doi.org/10.5539/ies.v6n12p82>
- Putra, I. K. D. D. (2012). Improvement of a cognitive learning model tool with a problem-solving approach to improve activity and learning outcomes.
- Putri, Z., Sukarno, S., & Sukmawati, N. (2021). *Metakognisi Dan Self Efficacy Pengaruh Mahasiswa Terhadap Hasil Belajar pada Mata Kuliah Inovasi Pembelajaran Fisika* (Doctoral dissertation, UIN Sulthan Thaha Saifuddin Jambi).
- Rahman, A. (2012). Pendidikan agama Islam dan pendidikan Islam: Tinjauan epistemologi dan isi- materi. *Jurnal Eksis*, 8(2053–2059), 1.
- Rahman, R., Darussamin, Z., & Fauzi, A. (2023). Tolerance Towards Multiculturalism in the Diversity of Cultures and Traditions as a Form of Moderation in

- the Implementation of Muhammad's Prophetic Attitude. *International Journal of Cultural and Religious Studies*, 3(1), 01-12. doi: <https://doi.org/10.32996/ijcrs>
- Redvall, E. N. (2009). Scriptwriting as a creative, collaborative learning process of problem finding and problem solving. *MedieKultur: Journal of Media and Communication Research*, 25(46), 22 p. <https://doi.org/10.7146/mediekultur.v25i46.1342>
- Riyadi, I., & Nugrahaningsih, T. K. (2015). Model Pembelajaran Membaca Pemahaman Berbasis Strategi Belajar Metakognisi. In *Prosiding Seminar Nasional & Internasional*.
- Rizalia, S., & Syam, A. N. (2020). Penguasaan keterampilan metakognitif mahasiswa Tadris Biologi melalui tugas menulis jurnal belajar. *Al-TA'DIB: Jurnal Kajian Ilmu Kependidikan*, 13(1), 1-17.
- Sari, E. V., & Sumilah, S. (2021). Relationship of metacognitive awareness and self efficacy to mathematics learning outcomes. *Elementary School Teacher*, 3(2).
- Silwana, A., Subanji, S., Manyunu, M., & Rashahan, A. (2021). Students' Responses Leveling in Solving Mathematical Problem Based on SOLO Taxonomy Viewed from Multiple Intelligences. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 3(1), 1-16. doi: <https://doi.org/10.23917/ijolae.v3i1.10528>
- Sugrah, N. (2019). Implementasi teori belajar konstruktivisme dalam pembelajaran sains. *Humanika, Kajian Ilmiah Mata Kuliah Umum*, 19(2), 121-138. doi: <https://doi.org/10.21831/hum.v19i2.29274>
- Suzana, S., Karim, A., Amanah, A., & Munajim, A. (2021). Bermain Kognitif Matematika Anak Melalui Pemanfaatan Barang Bekas Pada Masa Pandemi Covid-19. *Jurnal Pendidikan Anak Usia Dini Undiksha*, 9(2), 158-166.
- Suzana, S., Munajim, A., Casta, C., Pratama, G., Sulaeman, E., Sukarnoto, T., ... & Karim, A. (2020). Gadget and the internet for early childhood distance learning. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 17(7), 8019-8028.
- Wang, V. X. (Ed.). (2010). *Assessing and evaluating adult learning in career and technical education*. IGI Global.
- Yusuf, H. (2022). Teachers Evaluation of Concurrent and Consecutive Teacher Education Models in South-west, Nigeria. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 4(2), 107-117. doi: <https://doi.org/10.23917/ijolae.v4i2.17599>
- Zimmerman, Barry J; Schunk, D. H. (2018). Motivation and self-Regulated Learning. *Journal of School Psychology*, 5.
- Zohar, A. (1999). Teachers' metacognitive knowledge and the instruction of higher order thinking. *Teaching and teacher Education*, 15(4), 413-429.