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MATHEMATICS LEARNING WITH METACOGNITIVE INSTRUCTIONS IN MALAY CULTURE

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Abstract

The Purpose of conducting this research is to find out the relationship between mathematics learning and metacognition instruction based on Malay culture. In this study, using a descriptive research strategy, namely describing and explaining field variables based on existing literature (literature review). The results and discussion are that learning mathematics accompanied by metacognition instructions in Malay culture can be associated with reciprocating rhymes in Malay culture. This link is based on metacognition itself guiding in the right direction by asking questions that can lead, explore, and generalize. While reciprocating rhymes that provide a goal as a role model. Based on metacognition that guides in directing questions from leading, exploring and generalizing combined with rhymes in order to get the desired learning objectives.So that learning mathematics accompanied by metacognition instructions can be associated with reciprocating rhymes in Malay culture.

Keywords: Mathematics Learning, Metacognition Instruction, Malay Culture

INTRODUCTION

Mathematics is one of the most useful disciplines in everyday life, because mathematics is an abstraction from the real world and therefore needs to be understood. The era of globalization in the 21st century which exhibits features such as (1) rapid changes in the way people live their lives and (2) rapid advances in technology that change people's habits and practices (Surya, 2015). Many fields, including education, benefit from this, as it drives progress. The learning system has also undergone a paradigm shift, namely a learning-centered paradigm that is oriented toward achieving goals to prepare students to learn independently.

The change in the paradigm of learning mathematics includes the teacher's task not just conveying facts and figures to them (knowledge transfer), but actively encouraging them to learn (learning stimulation) so that they can build their own knowledge through participation in class exercises (Umar, 2012). Therefore, educators must be able to convey teaching that encourages students to play an active role in constructing their own knowledge.

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Therefore, it is important for students to be self-motivated in pursuing mathematical knowledge. As a result, there will be fruitful communication between educators and their students. Mathematics is often viewed as difficult and unpleasant, which can contribute to a number of problems for students (Chrissanti & Widjajanti, 2015).

Learning mathematics which focuses a lot on mathematical concepts without its application in everyday life is one of the causes of the difficulty of mathematics by students. In turn, this caused mathematics to be seen as impractical and theoretical. Low awareness of students in abstract mathematical concepts (Purnomo, 2016) where students tend to be passive in learning (Partini & Bachri, 2017) so waiting for instructions given by the teacher which results in reduced mathematical ability and student interest in learning, especially learning mathematics.

Improving the quality of education is one way to overcome these problems. Developing mathematical abilities cannot be done using conventional learning because it tends to be less varied and has less potential in developing students' mathematical abilities and interest in learning mathematics. Learning that can develop students' mathematical abilities can be through based on metacognition instruction. The ability to reflect on one's own cognitive processes is known as "metacognition." The ability to use one's own knowledge to guide and enhance one's own learning and thinking is another aspect of metacognition.

More specifically, Schoenfeld (Bahri & Idris, 2017) proposes that students can engage in metacognitive behavior in mathematics in three different but interrelated ways: (a) belief and intuition; (b) knowledge about thinking processes; and (c) self-awareness (regulation). Beliefs and gut feelings about which mathematical ideas are ready to solve problems and how these ideas guide one's approach to problems. When it comes to a person's level of understanding of thought processes, we are interested in how well they can articulate their ideas. Mathematical problem solving requires a high level of self-awareness and self-regulation, which refers to how well an individual tracks and organizes what he has to do, and how well he uses information obtained from his observations to guide solving problems.

The term metacognition (metacognition) comes from a combination of two words: meta and cognition (cognition). Meta comes from the Greek word for after, beyond, or above. Cognition is defined as what a person knows and can think about. An adverb of metacognition would be "metacognitive." Flavell coined the term "metacognition" in 1976. Metacognition, as defined by Flavell

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(Rahmania, 2019), is the ability to contemplate and take charge of one's thinking to achieve one's goals. Biryukov (Misu, 2017) explained that the term "metacognition" refers to "individual thinking about his mind", which includes "metacognitive knowledge" (individual awareness of what he knows), "metacognitive skills" (individual awareness about something), and "metacognitive experience" (individual awareness about what he does).

Learning mathematics accompanied by metacognition instruction is expected to be able to improve students' abilities through better understanding and awareness of their own thinking processes. The teacher's role in instructing metacognition in learning mathematics is strategy, observation, and assessing student work (Dignath & Büttner, 2018). Teaching students what to do when they make a mistake is very important. In addition, by analyzing student work, educators can determine which methods are most successful and which are least successful (Rahmania, 2019). Thus students' mathematical abilities will be more developed. So that students are no longer seen as passive objects by the teacher. But actively control the process of thinking and learning. Mathematics is presented not as an inculcation of abstract concepts but as an activity of thinking and reasoning. One barrier to success in mathematics is a lack of student interest in the subject, but these more varied activities are thought to have the potential to overcome this problem. Mathematics learning with Metacognition instruction is very necessary because it can map the results of his thoughts.

Students will be more involved in mathematics if they have a feeling that what they are learning is relevant to their daily lives. Starting math lessons with a problem students can relate to or at least conceptualize is very important (Hemmi & Ryve, 2015). Cultural elements should be incorporated into lessons as much as possible. The students' main cultural reference point is their own local culture. Local culture-based education that is taught to students aims to make students always attached to real situations so as to create good character and a foundation for life, because it is used as a source of learning materials, so that it can bridge students to know and preserve local cultural values they have (Hutagaol et al., 2022).

Culture in Indonesia, especially North Sumatra, has many varieties, such as Karo Batak, Mandailing Batak, Toba Batak, Malay, and so on. However, in this case the researcher wants to take Malay culture. The richness of the repertoire of Malay culture has actually been studied a lot, especially in the aspects of completeness of traditional ceremonies, traditions, household items, decoration and shape of the

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house, traditional clothing, traditional expressions (poetry, seloka, gurindam, rhymes, parables, parables, thimbles, sayings petitih etc.), which are inherited from generation to generation. Cultivating a cultural context for learning mathematics is very important. As stated (Nurjehan, 2017) that the best results can be achieved through learning that utilizes local culture as a medium that facilitates learning.

Based on the wealth of existing Malay cultural treasures, the researcher wants to link mathematics learning with metacognition instruction. Therefore, the aim of conducting this research is to find out the link between mathematics learning and metacognition instruction based on Malay culture.

METHOD

Approach The method used here is descriptive, meaning that a literature review is used to describe or explain field variables (Zellatifanny & Mudjiyanto, 2018). Reading articles and books on the subject at hand is the main method of research. Books, scientific articles, research journals, research reports, seminar proceedings, and so on are examples of literature that can be used as a data source for a research. There are three stages in the implementation of this research method, namely the collection stage, the classification stage and the discussion stage.

RESULT AND DISCUSSION

The literature in this study used book literature and scientific articles in accordance with research subjects such as metacognition and Malay culture.

Mathematics Learning Accompanied by Metacognition Instruction

Mathematics is important and must be mastered by students in developing mathematical thinking and problem solving skills. Therefore, it is important for students to be involved in various problem solving, pattern recognition, making conjectures, examining, drawing conclusions, and communicating ideas. From this perspective, the mathematics education experience must be tailored to the needs and goals of each student.

In optimizing the existence of learning mathematics, students need to develop the habit of actively seeking new information for learning. Mathematical models are simplifications of word problems or other mathematical description problems, giving students practice using mathematics as a tool in understanding or conveying information, such as in the case of equations or tables (Winarso, 2014). According to Umbaryati (2016) The process of learning mathematics is an interaction between teachers and students that involves the

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development of thinking patterns and logical processing in a learning environment that is deliberately created by the teacher using various methods so that mathematics learning programs can grow and develop optimally and students can carry out learning activities effectively and efficiently . Meanwhile according to Priatna (2016) Learning mathematics is a process of giving students learning experiences through a series of planned activities to help them acquire knowledge and skills in subject matter.

Based on the above, learning mathematics is a process that involves not only receiving information from the teacher but also participating in various activities and actions if better learning outcomes are desired for students. So that it is more precise that good mathematics learning is used which illustrates that students have a bigger role in the process of knowledge construction so that it allows students to achieve results according to their goals (Amsari & Mudjiran, 2018).

Learning that can construct knowledge in accordance with the formation of students' mindsets so that solving problems can be accompanied by metacognition instructions. This is in accordance with several theories on metacognition, the first of which Piaget stated that knowledge is built in the child's mind. Second, Ausubel stated that meaningful learning produces retention that is more durable than memorization because students learn to associate each new concept with the underlying cognitive structure. (Ariyanto, 2012). Vygotsky's third focuses on the student's active participation rather than passive reception of information and on prior knowledge to help him shape his progress forecast. The fourth Bruner emphasizes obtaining new information, changing existing knowledge, and evaluating what has been learned are all cognitive processes involved in the learning process. According to O'Neil dan Brown (Rusliah, 2021) states metacognition is a process in which a person thinks about his own cognitive process to construct a solution to a problem.

Efforts to encourage the emergence of students' metacognition after planning, implementing, monitoring, controlling and evaluating thoughts can be asked questions about what they have done. Students here can act as guides who help students develop their potential by asking questions that lead to new discoveries and broaden their perspectives and relate their knowledge to the knowledge they are learning. Based on this, learning mathematics accompanied by metacognition instructions is very important in developing cognitive abilities.

Malay Culture

There is cultural diversity in Indonesia, one of which is Malay culture. Malay culture has many

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characteristics, both physical and non-physical. Malay culture has physical characteristics in the form of dance, food, traditional houses, and so on. Meanwhile, non-physical characteristics such as classic Malay art works have existed for a long time. Such as poetry, rhymes, prose, poetry, and so forth.

Non-physical Malay culture is always used at weddings and other activities. According to Budiawan (2021) fussing, needles, proposing, delivering signs, receiving delivery, hanging, steaming (making tabak), stomping, tomatoes (khatam al qur'an), marriage contract/ijab, henna bits, henna, direct day/ wedding reception, eating nasi hadap are the various stages that make up the procession of a traditional Malay wedding ceremony. Among the processions of traditional Malay cultural wedding ceremonies, eating rice-face and reciprocating rhymes at wedding receptions that are often seen by Indonesian people.

When eating rice face to face, many foods come out with the characteristics of Malay culture, such as bando cakes, sweets and others. Meanwhile, reciprocating rhymes is passed from mouth to mouth with the intention of providing guidance, advice, examples, teachings, even satire to someone in an action related to him.

Zaidan et al (Maulina, 2012) describes pantun as an old form of poetry with four lines that rhyme a-b-a-b. Rows 1 and 2 are the cover, and lines 3 and 4 are the contents. It is possible to classify pantuns into two different categories—noble rhymes and non-noble rhymes—based on the inherent relationship between the sampiran and the content.

Noble rhymes occur when the sampiran in lines 1–2 function as phonetically prepared content and content cues. On the other hand, a non-noble rhyme is a rhyme whose sampiran (lines 1-2) only functions as a phonetic arrangement of its contents and has no semantic relationship with rhymes in arrays 3 and 4.

Mathematics learning is accompanied by metacognition instruction in Malay culture

Learning is a learning activity carried out in schools with the aim of achieving certain results. According to Nurjanah (2019), As cognitive scientists define it, learning occurs when "memory, cognition, and metacognition interact to influence understanding." The math class is, so to speak, an interactive environment in which students and instructors work together to build their students' memory, understanding, and self-awareness. Conclusion: The process of learning mathematics is a type of teacher-student interaction with the aim of developing students' memorization, understanding, and self-awareness.

Learning mathematics accompanied by metacognition instruction is a very important lesson to be carried out so that students can develop their cognitive abilities with thought processes.

According to research Tanti et al., (2018) Subjects at moderate

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cognitive level have metacognitive thinking in planning, monitoring but are not yet precise in evaluating their thinking processes in the process of mathematical communication.

The role of students in cultivating cognitive abilities in learning mathematics accompanied by metacognition instructions here can act as a person who acts as a facilitator and provides direction and guidance to students by directing questions, exploring questions, and generalizing questions so that students are aware of their cognitive abilities and relate their knowledge to existing knowledge. he is studying. So that students construct concepts-principles-rules into new knowledge.

In learning mathematics accompanied by metacognition instructions, it can be associated with Malay culture by reciprocating rhymes which are a hallmark of Malay. This link is based because metacognition itself provides direction and guidance through questions that can lead, explore, and generalize. Based on research results Rosady et al., (2018) Jambi culture-based geometry learning on congruence and congruence material can improve students' metacognition. Based on this, it can be associated with reciprocating rhymes that provide goals as role models. So that learning mathematics accompanied by metacognition instructions can be associated with reciprocating rhymes in Malay culture. However, researchers have limitations in this study due to the lack of mastery of researchers in Malay culture which only uses rhymes so that the obstacles in this study are not using other parts of Malay culture.

CONCLUSION

One of the distinctive features of Malay culture is reciprocity of rhymes, in mathematics learning it can be associated with metacognition instructions based on ways of thinking. Metacognition itself provides direction and guidance through questions that can accompany, explore, and generalize according to rhymes that use the ability to think through concepts first so as to provide goals as role models for wedding activities. So that learning mathematics accompanied by metacognition instructions can be associated with reciprocating rhymes in Malay culture.

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