



Analysis Of Mathematical Literacy Of Fifth-Grade Elementary Students Based on Their Mathematical Creative Self-Efficacy Level at SD Tumbuh 1 Yogyakarta

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Analisis Literasi Matematis Siswa Kelas V SD Berdasarkan Tingkat Efikasi Diri Kreatif Matematis di SD Tumbuh 1 Yogyakarta

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ABSTRACT

Abstract: This paper describes the analysis of Mathematical literacy of fifth-grade elementary students based on their level of Mathematical creative self-efficacy at SD Tumbuh 1 Yogyakarta. Mathematical literacy is the skill to use Mathematics to solve various problems in real life. The research is a qualitative approach. The research method used was the descriptive qualitative method. The subjects involved 6 fifth-grade students of SD Tumbuh 1 Yogyakarta. The technique analysis used the Miles and Huberman model. Data validity checks used triangulation of observation, interviews, and documentation. The research results indicate that Mathematical creative self-efficacy influences students' mathematical literacy skills. The higher the students' MCSE level was, the better their mathematical literacy skill was. The learning methods selected by teachers in implementing Mathematics learning were small and large group discussion methods, hands-on methods with games, and giving rewards or scores. The use of this learning method was adjusted to the material to be learned as well as the needs and skills of each student.

Keywords: teaching and learning methods, mathematical creative self-efficacy, mathematical literacy, elementary students

Abstrak: Tulisan ini mendeskripsikan analisis literasi matematika siswa kelas V SD berdasarkan tingkat efikasi diri kreatif matematika di SD Tumbuh 1 Yogyakarta. Literasi matematika adalah keterampilan menggunakan matematika untuk menyelesaikan berbagai permasalahan dalam kehidupan nyata. Penelitian ini menggunakan pendekatan kualitatif. Metode penelitian yang digunakan adalah metode deskriptif kualitatif. Subyek penelitian ini adalah 6 siswa kelas V SD Tumbuh 1 Yogyakarta. Teknik analisisnya menggunakan model Miles dan Huberman. Pemeriksaan keabsahan data menggunakan triangulasi observasi, wawancara, dan dokumentasi. Hasil penelitian menunjukkan bahwa Efikasi diri kreatif matematis berpengaruh terhadap kemampuan literasi matematis siswa. Semakin tinggi tingkat MCSE siswa maka kemampuan literasi matematikanya semakin baik. Metode pembelajaran yang dipilih guru dalam melaksanakan pembelajaran Matematika adalah metode diskusi kelompok kecil dan besar, metode praktik langsung dengan permainan, dan pemberian reward atau skor. Penggunaan metode pembelajaran ini disesuaikan dengan materi yang akan dipelajari serta kebutuhan dan keterampilan masing-masing siswa.

Kata Kunci: metode belajar mengajar, efikasi diri kreatif matematis, literasi matematika, siswa SD

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INTRODUCTION

21st century skills are something that is often studied these days. Life in the 21st century requires individuals to master various abilities to turn into effective individuals throughout daily life (Zubaidah, 2016: 1). In line with that, the world has now entered the period of society 5.0, which is an idea first coined by the Japanese government to characterize a human-focused society. All human activities in this period depend on innovation and modernization in various fields (Marliani, Siagian, 2017). Modernization in various daily issues has made information and data important, which affects people who have completely changed (Rahmanto et al., 2021). Network are expected to have the option to access and handle data quickly and precisely. The era of society 5.0 is very difficult for the world of education to work on the subtle abilities of students so that they can be internationally ruthless. Students are expected to be able to think fundamentally, think at a more significant level, think computationally and have options to handle problems appropriately (Agustina and Wibawa, 2019).

Facing the era of society 5.0, the world of education must not remain silent. Education is a protection that is a high priority for individuals in facing the difficulties of society 5.0. the progress of the enhanced period must undeniably be balanced with development in the field of training (Nugraha and Aminur Rahman, 2021). People must be better prepared for this period on the grounds that the difficulties they face are more extreme than previous times. People who are not ready to face this era will be displaced or crushed considering that this era is a continuation of the modern upheaval 4.0 (Hendrasyah, 2019). Furthermore, students must be truly prepared to face this era of society 5.0.

The *Program for International Student Assessment* (PISA) is one of the projects started by the *Organisation for Economic Cooperation and Development* (OECD) which is one of the main assessments on a world scale that surveys the numerical capacity of learners and provides data to public authorities and various meetings on the level of appropriateness of the framework of training specifically in preparing future students (Kaye and Rose, 2015). The PISA study has been conducted many times, especially in 2000, 2003, 2006, 2009, 2012, 2015 and 2018 which were participated by several countries, both OECD and non-OECD countries including Indonesia. Indonesia's support in PISA focuses on the hope to determine the ability to achieve Indonesian children at the level of ability levels set universally by developed countries in three literacies namely reading literacy, scientific literacy, and mathematics literacy. In 2012, Indonesia ranked 64th out of 65 countries with a reading score of 396, math score of 375, and science score of 382 with a world average score of 494. In 2015, Indonesia ranked 69th out of 76 participating countries with a reading score of 372, math score of 386, and science score of 382 with an international average score of 403. The latest PISA achievement results, specifically in 2018, Indonesia ranked 73rd out of 78 participating countries with a reading score of 371, math score of 379, and a science score of 396 with normal OECD averages for each perspective of 487, 489, and 483.

Looking at the consequences of the PISA concentration above, it is very clear that the mathematical literacy skills of Indonesian students are still low. This also shows that Indonesian students' thinking and mathematical literacy skills in facing international examinations are still low or not good enough. The low mathematical literacy skills of students in Indonesia are also listed in research by (Muzaki and Masjudin, 2019). This should be seen in students ability to solve problems that are still familiar with procedural and substantial answers. Students are also unfamiliar with problems that require intelligents, fundamental, innovative reasoning and organization of material with courage (Muzaki and Masjudin, 2019). In the on going thousand-year period, students are expected to have high mathematical literacy skills to be able to compete with other world countries.

One of the efforts that can be made to overcome the problem of low mathematical literacy is that students need to develop their *Mathematical Creative Self-Efficacy* (MCSE) on the ability to reason and verify mathematical thinking. *Mathematical Creative Self Efficacy* can be developed through *Computational Thinking* (CT) based learning. Computational thinking is an innovative thinking ability in identifying life phenomena in order to provide various practical solutions to the problems studied (Fajri Yuniwati, & Utomo, 2019). In an effort to develop CT, humans are required to formulate problems and then organize better computational solutions in the form of algorithms (Malik, Prabawa, & Rusnayanti, 2019).

Creative thinking is a learning process that requires teachers to be able to motivate and bring out student creativity during learning, using several varied methods and strategies (Huda, 2011). In learning mathematics, students should understand the relationship between mathematical ideas and other fields of study (Afriansyah, 2015). When students have been able to creativity some mathematical ideas, then students will get better and lasting mathematical reasoning. Students who have high mathematical creative self efficacy will believe they can effectively deal with mathematical problems in certain situations. This means that students with high mathematical creative self efficacy will have very good confidence in their mathematical thinking abilities.

SD Tumbuh 1 Yogyakarta has made several efforts to improve students mathematical literacy skills, especially by implementing *Computational Thinking* (CT) based learning and including students in the *Bebras Indonesian Computational Thinking* (ICT). Basically, an educational organization must have a dream as a guide to achieve normal educational goals, as well as SD Tumbuh 1 Yogyakarta. The school's vision is for children to develop and create as students with character, respect for diversity, love for the country and the environment, and show concern for world citizenship. In an effort to understand the schools's vision, SD Tumbuh 1 Yogyakarta applies demand learning to address the child's drive to effectively discover and think experimentally in concentrating on things and a singular methodology is also taken to foster the uniqueness and abilities of each child.

The results of this study can show scientific evidence about the description of mathematical literacy analysis according to the level of mathematical creative self efficacy in high grade students in elementary schools. Furthermore, this research can be used as further research material to deepen and expand the knowledge, especially in the fields of student mathematical literacy.

The difference between this research and some previous training is in the research aspect, namely using the level of mathematical creative self efficacy ability. The focus of the problem to be studied in this study is how the level of mathematical literacy of elementary school students according to the level of mathematical creative self efficacy. Based on the previous discussion, the purpose of this study is to describe the analysis of mathematical literacy skills of elementary school students according to the level of mathematical creative self efficacy of fifth grade students of SD Tumbuh 1 Yogyakarta.

RESEARCH METHODS

This study aims to provide an analysis of mathematical self-efficacy among fifth grade students of SD Tumbuh 1 Yogyakarta in relation to their level of mathematical creativity. This study uses a qualitative research strategy by going through several stages. The research started with the collection of basic information which will be described in the next stage. Then, the researcher analysed the information found in the field using the 1992 Miles and Huberman model. The subjects in this study were 6 grade 5 students of SD Tumbuh 1 Yogyakarta in the 2022/2023 academic year. The information sorting methods used were (1) perception; (2) interview; then (3) documentation. The strategy of information triangulation is used to really see the validity of information through the exercise of correlating information or data in different ways. In this study, triangulation was carried out by triangulating techniques, namely observation, interviews. The researcher made observations

when mathematics learning took place in the classroom. Furthermore, researchers confirmed back through interviews and supporting documents, namely students' mathematics learning outcomes. Interviews were conducted with 2 students with high mathematical creative self-efficacy, 2 students with average mathematical creative self-efficacy, and 2 students with low mathematical creative self-efficacy. Researchers conducted in-depth interviews by asking questions to students, teachers, and principals to obtain information related to mathematics literacy skills, students' mathematical creative self efficacy, and learning methods used in mathematics learning.

RESULTS AND DISCUSSION

Mathematical creative self-efficacy is an ability that emphasises a person's beliefs about their mathematical ability to generate creative ideas in solving mathematical problems they encounter in the real world (Gao, 2020). According to Facione, creative thinking is one of thinking that mobilises new insights, new approaches, or new ways of understanding things (McGregor, 2007). SD Tumbuh 1 Yogyakarta has strived for students to think creatively by always giving challenging tasks. In accordance with interview data obtained from the Principal who said that students' mathematical creative thinking skills have always been and will continue to be pursued by the school by providing training on HOTS-based questions and including students in the Bebras Indonesia Computational Thinking (ICT) competition.

Reinforced by the results of interview data with mathematics subject teachers who said that one of the school's support in improving students' mathematical creative thinking skills is by including students in the Bebras ICT Competition, namely solving problems with logic, which is very helpful not only for training students but also for teachers to continue to improve the quality of learning in the classroom. So that exercises will be given with the problem solving method. With such problem solving, students' logic will be more honed and very useful in their mathematics.

Based on the results of the questionnaire, the ability of mathematical creative self-efficacy of class V students is very diverse. After being classified into 3 categories, namely high MCSE, equal MCSE and low MCSE. The results showed that there were 6 students with high MCSE, 6 students with moderate MCSE, and 5 students with low MCSE. Where the average score of mathematical creative self-efficacy ability of class V students is 50.35 and is included in the medium MCSE category. The grouping of mathematical literacy ability categories according to the level of mathematical creative self-efficacy (MCSE) can be seen from the following table.

Table 1. List of Research Subject Names

No.	Subjects Name Initials	MCSE Category	Initials
1.	VD	High	NS1
2.	JV	High	NS2
3.	B	Medium	NS3
4.	L	Medium	NS4
5.	FJ	Low	NS5
6.	SS	Low	NS6

Table 1 shows the list of names of research subjects and it can be seen that there are 6 research subjects who are divided into 3 ability categories, namely VD and SS as NS1 and NS2 belonging to high ability, B and L as NS3 and NS4 belonging to moderate ability, and FJ and JV as NS5 and NS6 belonging to low ability.

Mathematical literacy is the ability of individuals to understand and engage science in a variety of settings to solve problems, and to explain to others how to use mathematics (Yunus, 2017).

Expanding mathematical literacy is aimed at helping an individual deeply understand the power of mathematics in everyday life and engaging it to pursue ideal choices as an understanding, caring and thinking citizen. Mathematical literacy is the ability to understand numerical problems that can be applied in everyday life with numerical settings (Ginancar and Widayanti, 2019). Based on this definition, it can be concluded that students' mathematical literacy is the ability to understand the critical thinking of existing mathematics to be applied in everyday life.

Mathematical literacy consists of 4 stages, namely formulating, using, interpreting and assessing. (OECD, 2018). This depends on the extent of mathematical literacy skills possessed by individuals, to be more specific: a) Formulate real problems in dealing with mathematical problems; b) Engage mathematical ideas in solving mathematical problems; c) Interpret solutions in solving mathematical problems; d) Assess solutions in solving mathematical problems. Information and understanding of mathematical ideas are important, but more importantly, mathematical literacy skills need to be developed to solve mathematical problems experienced in everyday life.

Students' mathematical literacy skills are improved by conducting training on HOTS questions. The teacher will stimulate students to write down important information in the question. At the stage of formulating real problems in problem solving, NS1 and NS2 with high MCSE ability are able to simplify mathematical problems by writing down important information in the question. NS3 and NS4 with equal MCSE simplify mathematical problems by making an arrangement of information or directly solving mathematical problems. Whereas NS5 and NS6 with low MCSE directly solved the mathematical problem without writing down the important information of the question.

In learning mathematics, teachers always provide understanding related to mathematical problem solving strategies and ask students to remember the formulas to be used. At the stage of using mathematical concepts in problem solving, NS1 and NS2 with high MCSE have understood and memorised mathematical formulas and have been able to use them well. NS3 and NS4 with one MCSE have understood but not memorised the formula and have been able to use it well. NS5 and NS6 with low MCSE have not really understood the formula but have memorised the formula and are able to use it well.

Mathematics learning in the classroom is often carried out with group discussions and class discussions. The teacher will encourage students to be able to explain the results of the solutions they get in solving mathematical problems. At the stage of interpreting solutions in solving mathematics problems, NS1 and NS2 with high MCSE were able to explain the strategies and solutions they obtained in solving mathematics problems very well. NS3 and NS4 with an average MCSE were able to explain the strategies and solutions they obtained in solving mathematical problems well despite having doubts. NS5 and NS6 with low MCSE did not feel confident in explaining the strategies and solutions they found in solving the mathematics problems.

The teacher will go around to check the results of the solutions used by students in solving mathematics problems. At the stage of evaluating solutions in solving mathematics problems, NS1 and NS2 with high MCSE evaluate by checking the results of the solutions they get independently. NS3 and NS4 with one MCSE evaluated by rechecking the results of the solutions they obtained by comparing the results of their friends' solutions. NS5 and NS6 with low MCSE recheck the solution results they obtained with the help of their teachers or friends.

This is in accordance with research conducted by (Pradinar et al., 2021) which states that individual mathematical literacy ability is more or less determined through self-efficacy. This is also in accordance with research conducted by (Abida and Setyaningsih, 2022) and (Ananda and Wandini, 2022) which states that students with high SE have a higher level of mathematical literacy ability than students with moderate SE. Students with moderate SE have a higher level of mathematical literacy than students with low SE. While students with low SE have a low level of mathematical literacy skills as well. It's just that the difference in this study is studied with Mathematical Creative Self- Efficacy.

Teachers have an important role in education. Teachers are examples for students so that the initial appearance is very influential in the learning process (Budiana, et al, 2022). Teachers must be active and able to place their position as professionals in accordance with the demands of a growing society (Hamid, 2017). The teacher's task is to select new information, tasks, or problems related to initial abilities (unbalanced conditions) then the teacher helps students so that through accommodation and association a new balance occurs. In this case, the teacher has full authority to choose learning strategies and the use of appropriate learning methods/steps to improve students' mathematics skills.

The learning methods chosen by the teacher in conducting mathematics learning are small and large group discussion methods, direct practice methods with games and giving prizes/rewards. According to the meeting information obtained from the mathematics teacher, Mrs Dhinta said that the use of learning methods is adjusted to the material to be learned as well as the needs and abilities of each student. This is in accordance with research conducted by (Rinaldi, 2016) which states that the inquiry learning model through discussion is very influential on mathematics learning outcomes. (Miasari, 2018) also revealed that the use of discussion methods in carrying out mathematics learning can improve students' mathematics learning outcomes. The discussion method can expand students' inspiration to learn mathematics, which in turn will be very influential in determining student learning outcomes, especially in learning mathematics.

CONCLUSIONS AND RECOMMENDATIONS

The conclusion in this study shows that mathematical creative self-efficacy affects students' mathematical literacy skills. The higher the students' MCSE level, the better their mathematical literacy skills. The learning methods chosen by teachers in implementing mathematics learning are small group and large group discussion methods, direct practice methods with games and giving rewards/points. The use of these learning methods is adjusted to the material to be learned as well as the needs and abilities of each student. However, the learning method that is generally implemented is the discussion method.

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