



Mathematic Literacy Ability of Choleric and Singuins Personality of High School Students

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Abstract

Mathematic literacy ability is the required performance by every student as a guide in the 21st century live. The teacher has an important role in knowing their students' character in developing mathematical literacy ability. This research supposes to analyse the character of students' mathematic literacy ability of choleric and singuine character type. The research method is a case study with a chosen example using purposive sampling. The result of the research shows that students' mathematic literacy ability of choleric is having the big curiosity of personality and demand on themselves on solving every problem but quickly and carefully in answering problems so that students of choleric could reach mathematic literacy ability on forth level. Mathematic literacy ability of singuine students is having high personality curiosity but they face difficulty in solving a problem and they do not care about solving every problem. So singuine students reach mathematic literacy ability on forth level.

Keywords: *Ability; Mathematics Literacy; Personality; Choleric; Singuins*

Introduction

Mathematic literacy ability that has been announced by Indonesian' study was apprehensive (Rosita, Wardono & Kartono, 2018; Mufidah & Karso, 2020). In two decades, Mathematic literacy ability of Indonesia was on the second place from the bottom (Sutisna, Setyo & Noornia, 2018; Puspita, Cahyani & Rahman, 2020). Education system ignores literacy ability that make students lose mathematic literacy ability (Gravemeijer et al., 2017; Magen-Nagar, 2016). Losing mathematic literacy ability creates bad effect on the study and student' ability in the 21st century live (Spaull & Kotze, 2015; Istikomah, Kristiawan & wardiah, 2020). Direct bad effect for student is unconfident and being afraid to face mathematic literacy ability in the international level and face difficulties in organizing the life in the 21st century (Hosokawa, 2018). But there were many researchers who do not understand yet and not be able to present the cause of the less mathematic literacy ability in 21st century live comprehensively.

The Indonesian government encourage the use of literacy study system at school (Wandasari, Kristiawan & Arafat, 2019). There are some results stated in recent several years. First, most of the students forget the mathematic material they have learned (Rosita, Wardono & Kartono, 2018). Second,

most of the students consider that mathematic do not have a relationship with real-life out of school (Wandasari, Kristiawan & Arafat, 2019; Carr et al., 2019). Third, there is fewer teachers' ability in using mathematic literacy study (Letwinsky, 2017; Amuko, Miheso & Ndeuthi, 2015). Fourth, the teacher has less knowledge about every student's character in learning mathematic (Buchori & Setyawati, 2015; Stocker, Rupnow, & Pthe ascoe, 2017). Based on the evaluation, students have lower quality and teachers have less knowledge to study students' character. Based on the important problem above, it is necessary to study students' character intensively for developing students' mathematic literacy ability.

Teachers have an important role in developing students' mathematic literacy ability (Lin & Tai, 2015; Colwell & Enderson, 2016). There are several problems related to the case; the expected ability as a guide to face their real-life out of school is low (Scott, 2015; Moschkovich, 2015); the students have different characteristic and difficulty level (Collins & Laski, 2019). Regarding the explanation, developing mathematic literacy ability requires knowledge about the dominant character or student's personality. The researchers is interested to know students' character in developing mathematic ability in the high school as a basic guide to enhance students' mathematics literacy ability. This research aims at finding out students' character with choleric and singuins personality in mathematic literacy ability.

Methodology

This research is carried out at SMA N 1 Karangdowo Klaten, Central Java Province. The research subjects are students with choleric and singuins personality. The selection of subjects is based on the results of a student personality test using questionnaires. The subject selection uses a purposive sampling technique by considering the objective of the research (Sugiyono, 2013; Prastowo, 2014). The subject in this study is one of the seven choleric students and one of the eight singuins students.

This research employs a descriptive method with a qualitative approach. There are two data collected by the researchers, namely the results of a written test of literacy ability and the results of the interview then the data are analyzed using the triangulation method (Moleong, 2013). The instruments are in the form of personality test instruments, mathematical literacy test instruments, and interview guidelines. The instrument of mathematic literacy ability is adjusted to the indicator of mathematical literacy ability, this is presented in Table 1.

Table 1. Indicators of Mathematical Literacy Ability

Level	Indicators of Mathematical Literacy	Literacy Ability	Indicators of Literacy Ability
1	Identifying information and complete routine procedures according to direct instruction in explicit situations.	Communication	Identifying information in explicit situations.
		Mathematical	Looking for the relationship between language and symbols.
		Representation	Doing actions easily with mathematical symbols.
		Reasoning	Analyzing mathematical situations that have a general context.
2	Applying basic algorithms, formulating, using, and implementing the procedures or basic determinates.	Communication	Sorting and using relevant information from a single source.
		Mathematical	Revealing a description in your language clearly
		Representation	Applying algorithms in implementing basic provisions.
		Reasoning	Analyzing mathematical situations to make

Level	Indicators of Mathematical Literacy	Literacy Ability	Indicators of Literacy Ability
3	Interpreting and representing the different resources information and state the reasons directly from obtained material.	Communication	conclusions about mathematical equations.
		Mathematical Representation	Understanding a mathematical representation and interpreting the situation into mathematics Doing procedures in sequence properly.
		Reasoning	Selecting and applying simple problem-solving strategy representations. Developing simple reasoning through results and mathematical interpretation in giving reasons directly.
4	Combining the different representations and develop skills with the real situations that are flexible according to context.	Communication	Communicating explanations based on interpretations of results.
		Mathematical Representation	Doing effectively with mathematical models implied in complex situations. Combining representations and symbolizing into real situations.
		Reasoning	Developing reasoning skills in presenting flexible reasons in context.
5	Evaluating problem-solving strategies using wide logical thinking and combining knowledge and skills of mathematic with real situations.	Communication	Reflecting on the previous employer and communicating it into the context in which it is facing.
		Mathematical Representation	Doing with thinking and reasoning in connecting mathematical knowledge and skills. Developing representations and work in complex situations
		Reasoning	Evaluating problem-solving strategies with complicated situations
6	Doing the conceptual, generalization, and using information base on investigation and modelling on the complex problem situations.	Communication	Communicating and reflecting on actions by considering the findings in real situations
		Mathematical Representation	Applying his understanding in depth accompanied by technical mastery of mathematical operations
		Reasoning	Applying and developing strategies for new approaches to dealing with new situations. Developing conceptualization and generalization of information based on investigation and modelling in complex situations.
		Reasoning	Developing conceptualization and generalization of information based on investigation and modelling in complex situations.

Based on Table 1, each indicator of literacy ability includes communication skills, mathematical abilities, representational abilities, and reasoning abilities. Each abilities of mathematics literacy have six levels. Based on Table 1, communication skills, mathematical abilities, representation abilities, and reasoning abilities in mathematical literacy ability have six levels. The higher the level, the better the communication skills are. The results reveal that there are differences of mathematics literacy ability between the choleric and singuins personality.

Discussion and Analysis

This research shows that each personality has different achievements in each ability of mathematic literacy. This is shown in Table 2 and Table 3.

Table 2. Mathematical Literacy Ability Results of Choleric Personality

Mathematical Literacy Level	Mathematical Literacy Ability	Ability Level					
		1	2	3	4	5	6
4	Communication	√	√	√	√	√	√
	Mathematical	√	√	√	√	√	-
	Representation	√	√	√	√	-	-
	Reasoning	√	√	√	√	-	-

Based on Table 2, the student who has a choleric personality on mathematics literacy ability is on the fourth level. It means he can combine different representations and develop ability with real situations. The ability achieved in mathematical literacy ability by choleric students in communication ability is on the sixth level, mathematical ability is on the fifth level, representation ability is on the fourth level, and reasoning ability is on the fourth level. Meanwhile, the results of the students with singuins personality can be shown in table 3.

Table 3. Mathematical Literacy Ability Results of Singuins Personality

Mathematical Literacy Level	Mathematical Literacy Ability	Ability Level					
		1	2	3	4	5	6
4	Communication	√	√	√	√	-	-
	Mathematical	√	√	√	-	-	-
	Representation	√	√	√	-	-	-
	Reasoning	√	√	√	√	-	-

Based on Table 3, the student with singuins personality on mathematical literacy ability reaches fourth level. It means he has the ability to combine different representations and develop ability with real situations according to context. The ability level are; communication ability is in the fourth level, mathematical ability is in the third level, representation ability is in the third level, and reasoning ability is in the fourth level.

Mathematic Literacy Ability of Choleric Student

Based on Table 2, the mathematic literacy ability of choleric students is on the fourth level. It is highly reflected in its characteristics where the communication ability is in the sixth level. It means he can reflect the action by considering innovation in the real situations. The mathematical ability is in the fifth level. He has an ability to think widely in connecting knowledge and real-life situation. The represented ability is in the fourth level 4. It is the ability to combine different representations in symbolizing them and connecting them into real situations. The reasoning and argument ability is in the fourth level. It is the ability to develop reasoning skills and express flexible reasons according to the context.

Mathematic literacy ability of students with choleric personality is they who have strong-willed characteristics and rely on themselves in solving each problem but they are nimble and thorough enough in answering problems so that choleric students achieve mathematical literacy ability on the fourth level. It is conformable with Purniance's research, he stated that students with a choleric personality are very strong in solving mathematical problems by using their way of identifying problems than doing reasoning and doing practical problem solving (Purniance & Kamid, 2018). It is supported by another research which explains that choleric students are very ambitious and dominantly using their ways in mathematical literacy problem-solving.

Mathematic Literacy Ability of Singuins Student

Based on Table 3, the mathematic literacy ability of singuins student is in the fourth level. It is reflected in its characteristics where the ability to communicate is in the fourth level 4. He has the ability to communicate an explanation based on the interpretation results. The mathematical ability is in the third level 3. It means, He carries on the procedures sequentially using their language. Representation ability is in the third level. It is the ability to choose and apply the simple representations of problem-solving strategy. Reasoning and argument ability is in the fourth level. It is the ability to develop reasoning ability and express flexible reasons according to the context.

Mathematic literacy ability of students with singuins personality types are students who have high curiosity characteristics but are a bit forgetful in solving problems so students are not thorough and less careful in solving each problem but singuins students achieve mathematical literacy ability is in the fourth level 4. It is conformable with Nur Hamidah's research which stated that singuins students tend to finish the question less than the specified time but they are not thorough and check the answers repeatedly only on difficult questions (Hamidah, Susanto & Yudianto, E. 2018). The visual-spatial intelligence of Sangunis students for the characteristics of imagination is in the first level 1, the characteristics of the construct are classified in the fourth level, the characteristics of problem-solving are classified in the fifth level, and the characteristics of pattern innovation are classified in the fourth level 4. It is conformable with this research that singuins student has excellent ability in the mathematic ability, representations and reasoning in problem-solving, but they are less thorough to write and analyze problem-solving.

Conclusion

Based on the research, it can be concluded that the mathematic literacy ability of the choleric student is having strong-willed characteristics and relied on themselves in solving each problem but he is nimble and thorough enough in answering problems so that choleric students is in the fourth level. The mathematic literacy ability achieved by singuins students is having a high curiosity but a little forgetful in solving problems so that he is less thorough and less careful in solving each problem. So, the singuins student achieves mathematical literacy ability at fourth level.

Based on the research innovation, the characteristics found on the choleric student are communication ability in the sixth level, mathematical ability in the fifth level, representation ability in the fourth level, reasoning and argument ability in the fourth level. Meanwhile, the characteristics of the singuins students are the mathematics literacy communication ability in the fourth level, mathematical ability in the third level, representation ability in the third level, reasoning and argument ability in the fourth level.

Based on the results of mathematic literacy ability, mathematics teachers should understand the characteristics of each student comprehensively to find out the obstacles or problems faced by students in solving problems related to students' mathematics literacy. Besides, teachers also pay attention to the delivery of linear program material, not only to the routine completion according to the procedure but also to a solution that can enhance the level of students' literacy abilities in solving mathematics problems.

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