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Mathematical Literacy Reviewed from Self Regulated Learning on Collaborrative Problem Solving Assisted By Qr Code

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Abstract

The purpose of this study is to describe students' literacy skills in terms of Self Regulated Learning in the Collaborative Problem-Solving model assisted by QR Code. This type of research is descriptive research with a qualitative approach. The research subjects for class XI MIPA 2 SMA Bustanul Ulum NU Bumiayu for the 2021/2022 academic year were 36 people. Data was collected by the method of tests, questionnaires, observation, documentation, and interviews. The results of research on students' TLM achievement in terms of Self Regulated Learning on Collaborative Problem Solving with the help of QR Code are very varied. Mathematical literacy in terms of Self Regulated Learning shows that students with high category TLM and high and medium Self Regulated Learning categories can understand and master the seven basic stages of mathematical literacy, but stage 1 can be completed with additional time. Students with medium category TLM and high and medium categories of Self Regulated Learning can understand and master the three basic stages of mathematical literacy, and students with low category TLM and high and medium categories of Self Regulated Learning can understand and master one stage of basic mathematical literacy.

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INTRODUCTION

Mathematical literacy ability is only one of the abilities possessed by students from a cognitive perspective. In the current education system, achievement in the cognitive and affective domains is an important goal of mathematics education (Cheung, Mak & Sit, 2018). The psychological concept explains that the affective aspect also makes a major contribution to improving students' cognitive abilities. One of the affective aspects that is expected to play a role in students' cognitive development is Self Regulated Learning. Self Regulated Learning or better known as independent learning is a process of careful planning and self-monitoring of cognitive and affective processes in completing academic assignments (Hargis in Hendriana, et.al, 2018).

A teacher must have innovation in learning that varies such as strategies, models, and media that are applied in learning. Things like this are appropriate to use to improve the quality of learning in the classroom so that learning can achieve the expected goals. Efforts to find the right learning model must be done so that learning objectives can be further enhanced. Dillenbourg (1999: 7) Collaborative Problem Solving is a collaboration carried out by two or more people who have the same goal, namely to solve a particular problem.

Collaborative Problem Solving according to Nelson (1999: 245) is a combination of two learning approaches, namely collaborative learning and problem-based learning.

Based on the description of the background above, it encourages researchers to describe mathematical literacy in terms of Self-Regulated Learning in Collaborative Problem Solving assisted by QR Code.

METHOD

This research was conducted at SMA Bustanul Ulum NU Bumiayu. This type of research is descriptive research with a qualitative approach. The research subjects were students of class XI MIPA 2 SMA Bustanul Ulum NU Bumiayu for the 2021/2022 academic year. Intake of research subjects in this study was determined by cluster random sampling. Research data were collected by tests, questionnaires, interviews, observation and documentation. Determination of research subjects is based on the results of tests of mathematical literacy skills and assessments from the Self Regulated Learning questionnaire.

Mathematical literacy data was obtained from the results of the mathematical literacy test, while data on Self Regulated Learning characters were obtained from the results of the Self Regulated Learning questionnaire. Data analysis was carried out by data reduction, data presentation, and data conclusion.

RESULTS AND DISCUSSIONS

To obtain a description of students' mathematical literacy in terms of Self Regulated Learning. Researchers used 3 instruments consisting of tests of mathematical literacy abilities, Self Regulated Learning questionnaires, and interviews.

Mathematical literacy test, conducted in limited face-to-face compliance with health protocols. With test questions that have been validated by an expert validator with the results of the validation being in the category of good criteria and can be used for tests. The mathematical literacy test is in the form of a written essay test with the aim of identifying the results of students' mathematical literacy. The categories for grouping students' mathematical literacy tests are presented in table 1 below (Pujiastuti, 2014).

Table 1 Categories of Students' Mathematical Literacy Grouping

Score	Category
$x \geq 70\%$	High
$60\% \leq x < 70\%$	Average
$x < 60\%$	Low

Self Regulated Learning questionnaires are distributed and filled in directly by students on the questionnaire sheet given at the beginning of learning, the aim is to identify the Self Regulated Learning characteristics possessed by students. The broad intervals covering each category are determined as follows:

Table 2 Ideal Categorization of Students' Mathematical Literacy Data Scores

Interval Area	Note
$(\mu + 1{,}0\ \sigma) \leq x$	High
$(\mu - 1{,}0\ \sigma) \leq x < (\mu + 1{,}0\ \sigma)$	Average
$x < (\mu - 1{,}0\ \sigma)$	Low

In case:

μ : mean

σ : standard deviation

The last instrument is the interview. The interviews were conducted privately between the researchers and the research subjects based on the interview guidelines that had been prepared by the researchers.

Explanation of the description of students' mathematical literacy in terms of Self Regulated Learning students go through several stages.

Data reduction, in this stage the researchers carried out the following: (1) prepared learning tools in the form of syllabi, lesson plans, worksheets, self-regulated learning questionnaires, and math literacy test questions that had been validated by expert validators with results feasible to implement, (2) provide an assessment of the results of the Self Regulated Learning questionnaire and the results of the mathematical literacy test and (3) the researcher determines 12 children as research subjects, consisting of 2 students from each category.

Presenting the data, in this stage, two kinds of categories are obtained, namely (1) the mathematical literacy of students with Self Regulated Learning is in the high category, and (2) the mathematical literacy of students with Self Regulated Learning is in the medium category. The percentage of TLM results can be seen in table 3 below.

Table 3. Percentage of TLM Results

TKLM Category	Amount of Student	Percentage
High	13	36,11%
Average	15	41,67%
Low	8	22,22%
Total	36	100%

Table 3 shows that students who are included in the high category of TLM are only 36.11% or 13 out of 36 students. Students who are included in the average category of TLM are 41.67% or 15 of 36 students. Furthermore, students who are included in the low TLM category are 22.22% or 8 of 36 students.

While the percentage of the results of the Self Regulated Learning questionnaire can be seen in Table 4.

Table 4. Percentage of Self Regulated Learning Questionnaire Results

Self Regulated Learning Category	Amount of Student	Percentage
High	20	55,5%
Average	16	44,5%
Total	36	100%

Table 4. shows that students who are included in the high category of Self Regulated Learning are 55.5% or 20 out of 36 students. Students who are included in the average category of Self Regulated Learning are as much as 44.5% or 16 of 36 students.

Conclusion in this last stage, the following results are obtained: (1) students with high category TLM and high and medium categories of Self Regulated Learning can understand and master the seven stages of basic mathematical literacy skills, but stage 1 can be completed with additional time. (2) students with medium category TLM and high and average Self Regulated Learning categories can understand and master the three stages of basic mathematical literacy skills, and (3) students with low category TLM and high and average Self Regulated Learning categories can understand and master one stage of basic mathematical literacy skills.

The results of research on students' TLM achievement in terms of Self Regulated Learning on Collaborative Problem Solving with the help of QR Code are very varied. Mathematical literacy in terms of Self Regulated Learning shows that students with high category TLM and high and medium Self Regulated Learning categories can understand and master the seven stages of basic mathematical literacy skills, but stage 1 can be completed with additional time. Students with medium category TLM and high and medium categories of Self Regulated Learning can understand and master the three basic stages of mathematical literacy, and students with low category TLM and high and medium categories of Self Regulated Learning can understand and master one stage of basic mathematical literacy.

Table 5 Recapitulation of SRL Questionnaire Results and TLM Results

SRL	*TKLM*		
	High	Average	Low
High	8	7	5
Average	7	6	3

Based on Table 5, 2 students from each category were chosen as research subjects. The following will describe each category.

Description of Students' Mathematical Literacy with High Category Self Regulated Learning.

The achievement of subjects based on high-value TLM results with high Self Regulated Learning can understand and master the seven stages of basic mathematical literacy skills. When interviewed, the student was able to complete the seven stages. There were 8 students who were included in both high categories. Achievement of subjects with average TLM with high Self Regulated Learning can understand and master the three basic stages of mathematical literacy. There are 7 students based on average TLM results with high Self Regulated Learning. Achievement of subjects with low TLM with high Self Regulated Learning can understand and master one stage of basic mathematical literacy skills. There are 5 students based on low TLM results with high Self Regulated Learning.

Description of Students' Mathematical Literacy with Self Regulated Learning in Medium Category.

The achievement of the subject based on high-value TLM results with Medium Self Regulated Learning can understand and master the seven stages of basic mathematical literacy skills, but stage 1 can be completed with additional time. When interviewed, the student was able to complete the seven stages. There are 7 students who fall into this category. Achievement of subjects with average TLM with average Self Regulated Learning can understand and master the three stages of basic mathematical literacy skills. There are 6 students based on average TLM results with average Self Regulated Learning. Achievement of subjects with low TLM with average Self Regulated Learning can understand and master one stage of basic mathematical literacy skills. There are 3 students based on low TLM results with average Self Regulated Learning.

CONCLUSION

Based on the analysis and discussion, it was concluded that students with high category TLM and high and medium categories of Self Regulated Learning could understand and master the seven stages of basic mathematical literacy, but stage 1 could be completed with additional time. Students with medium category TLM and high and medium categories of Self Regulated Learning can understand and master the three basic stages of mathematical literacy, and students with low category TLM and high and medium categories of Self Regulated Learning can understand and master one stage of basic mathematical literacy.

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