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INDONESIAN STUDENTS' MATHEMATICAL LITERACY BASED ON SELF-EFFICACY: SYSTEMATIC LITERATURE REVIEW

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ABSTRACT
The main purpose of this study is to describe the results of students' mathematical literacy based on self-efficacy. The method used in this study was Systematic Literature Review (SLR). The total sample was 17 articles of students' mathematical literacy based on self-efficacy. The samples were articles indexed in SINTA, published in 2018 until September 2022 and located in Indonesia. The description in this study will be reviewed based on the journal indexes, year of publication, methods used, study level, sample size, research locations Through the SLR, it was obtained that in the past five years, most of the articles were published in SINTA 4, the most publications of students' mathematical literacy based on self-efficacy happened in 2022, mix method became the most method used in this study, students' in junior high school was dominantly used as the sample of this research, many researchers used more than or equal to 30 samples, and its research was widely conducted in Java.

Keyword : Mathematical Literacy, Self-Efficacy, SLR

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INTRODUCTION

In order to learn mathematics, students need to develop their mathematical literacy. Mathematical literacy is an individual's capacity to formulate, employ and interpret mathematics in a variety of contexts including reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomenon (OECD, 2019). In addition, mathematical literacy is an ability that focuses on the use of mathematics in life day-to-day activities that are not limited to mathematical operations (Utomo et al., 2020). Hence, mathematical literacy will be useful for understanding the problem and using the mathematics knowledge to solve varied contexts of problem.

Even tough mathematical literacy is important to be mastered by learners, many students in Indonesia still have a lower mathematical literacy skill. This is evidenced by the results of research on mathematical literacy skills which state that many students in Indonesia are in the category of low mathematical literacy (Rifai & Wutsqa, 2017; Sari & Wijaya, 2017; Simarmata et al., 2020; Widianti et al., 2021; Wijaya, 2016; Yuniati et al., 2020). Around 28% of students in Indonesia achieve Level 2 or higher in mathematics and about 1% of students reach Level 5 or higher in mathematics (OECD, 2019). At level 1, students experience errors in constructing mathematical model that results in errors in the process final calculation. This condition occurs because students are less careful (Prabawati et al., 2021). At levels 2 and 3 students are still not able to interpret and use representation

based on different sources of information and students are not yet able communicating interpretation results and reasons (Widianti et al., 2021). Those datas proof that most of the learners in Indonesia achieve the low level of mathematical literacy.

The low achievement of mathematical literacy is because they are not accustomed to investigate situational problems, as a result they will be considered as a person who solves the narrow mathematical problem (Putri & Zulkardi, 2018). Most of the students are only able to solve the problem until at the stage of making the model, applying the design model and still difficulty in finding the right solution and interpreting it into real world context (Selan et al., 2020). Based on the research, it was attained that students made errors in misunderstanding (69%), transformation error (35%), error process skills (20%), and writing errors (15%) which indicated that most of the students have not been able to understand the questions correctly (Mahmudah, 2018).

Students' mathematical literacy can be affected by some factors such as self-efficacy. Self-efficacy expresses an individual's judgment about his or her ability to behave in ways that will lead to a desired outcome (Shonfeld et al., 2022). A person is more likely to put in extra effort to go through a challenge if they believe they can achieve it (Spisak, 2022). According to Masjaya et al. (2022) self-efficacy has a positive influence on students' mathematical literacy skills. This is in line with students' mathematical literacy can be determined based on their self-efficacy (Martalyna et al., 2018) and self-efficacy affects students' mathematical literacy skills (Ananda & Wandini, 2022a; Faozi et al., 2020). Students with different levels of self-efficacy have different mathematical literacy abilities (Annisa et al., 2022; Pertiwi et al., 2022). Based on Setiani et al. (2018) it was found that students with high self-efficacy are very good at identifying mathematical components in given problems. In addition, self-efficacy in the high and medium categories affects more mathematical literacy skills than the self-efficacy of students in the low category (Istiqomah et al., 2021). Therefore, self-efficacy took a necessary part in students' mathematical literacy as it influences them to be confident in solving mathematical literacy problem and have the belief that they are compatible to solve the problem.

The higher the student's self-efficacy, the better literacy skills of one person (Ananda & Wandini, 2022b; Lestari et al., 2022; Sulistiya & Dewi, 2021). People with high self-efficacy should, on average, allocate more resources to the focal task, and use those resources more effectively, than people with low self-efficacy (Yeo & Neal, 2013). In contrast, students with poor self-efficacy have a propensity to give up readily when faced a challenging problem (Martalyna et al., 2018). Unfortunately, these results do not imply students with high self-efficacy will always has the better mathematical ability. This is proven by the contradictions found Pradinar et al. (2021) that students with high self-efficacy cannot guarantee that their mathematical literacy skills are also high.

Even though numerous studies of students' mathematical literacy based on self-efficacy had been carried, there were some results which showed the differenced. The discrepancy of the study findings indicated that the results were heterogeneous, and it's probable that some of them may be biased. To get the comprehension results, the research was carried out in the form of a systematic literature review of the students' mathematical literacy based on self-efficacy.

The main purpose of this study is to describe the results of students' mathematical literacy based on self-efficacy which is reviewed based on the journal indexes, year of publication, methods used, study level, sample size, research locations. Through the research data retrieved, the researcher asks some relevant questions as follows:

1. How is the description of the students' mathematical literacy based on self-efficacy in the term of journal indexes?

2. How is the description of the students' mathematical literacy based on self-efficacy in the term of study levels?
3. How is the description of the students' mathematical literacy based on self-efficacy in the term of method used in the research?
4. How is the description of the students' mathematical literacy based on self-efficacy in the term of study levels?
5. How is the description of the students' mathematical literacy based on self-efficacy in the term of sample size?
6. How is the description of the students' mathematical literacy based on self-efficacy in the term of research location?
7. How is the description of the students' mathematical literacy based on self-efficacy in the term of self-efficacy categories?

METHOD

The method used in this study is Systematic Literature Review (SLR) using quantitative descriptive approach. SLR is a way of synthesising scientific evidence to answer a particular research question in a way that is transparent and reproducible, while seeking to include all published evidence on the topic and appraising the quality of this evidence (Lame, 2019).

The research stages are namely data collection, data analysis, and conclusions. The data collection utilized in this study involved gathering articles about students' mathematical literacy ability based on self-efficacy. The data are primary studies that have been published as publications in national journals, data are collected from electronic databases that are registered and indexed by Google Scholar, Garuda Portal, ERIC, and direct url of national journals. Furthermore, the extraction of all articles found was carried out. The analysis stage only contains articles that are pertinent and satisfy the inclusion criteria.

The population in this study are all researches on the students' mathematical literacy based on self-efficacy that having been issued in numerous publishers. The sample was obtained using the inclusion criteria. The inclusion criteria for this research are:

1. Articles published in 2018 until September 2022.
2. Articles indexed in SINTA.
3. Articles with the research location in Indonesia.
4. Research that includes students' mathematical literacy ability based on self-efficacy

Based on the inclusion criteria, it was obtained that the total sample was 17 articles of students' mathematical literacy based on self-efficacy

RESULTS AND DISCUSSION

Study by Number of Articles Indexed in SINTA

There are several journals to be a place for all researcher sharing their findings. The journal can be indexed by some portals such as Garuda, Google scholar, Eric, SINTA, and others. The number of publications about students' mathematical literacy based on self-efficacy published in SINTA during these past five years can be seen in Figure 1 below.

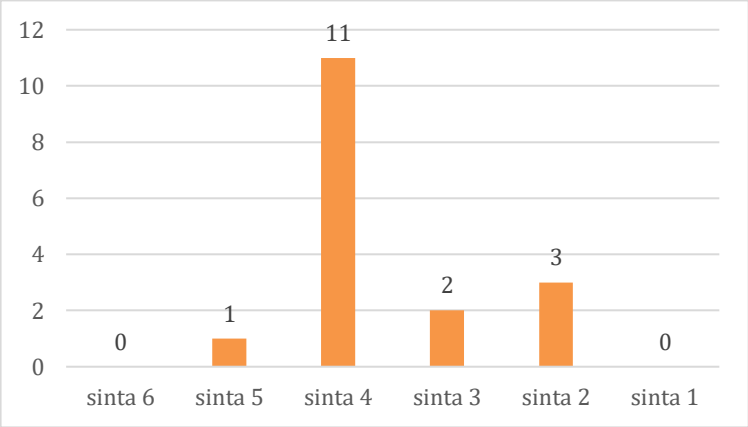

Figure 1. Study by Number of Articles Indexed in SINTA

From the Figure 1 above, it can be seen that the publications in SINTA 4 is the highest compared to the other SINTA, followed by the publication in SINTA 2, SINTA 3 and SINTA 5. In contrast, there is no publication in SINTA 6 and SINTA 1. It becomes a gap to be filled by the researchers to publish their article in SINTA 6, or even better in SINTA 1. The reason why there cannot be found any publications about it in SINTA 1 is due to the large number of models or variables to be utilized in analysing students' mathematical literacy ability which is in line with mathematical literacy may be largely studied using the application of other methods (Juandi, 2021). Hence, it can be a chance for researcher to publish their paper in SINTA 1.

Study by Year of Publication

Students' mathematical literacy becomes an issue even before the existence of PISA. Every research regarding students' mathematical literacy had been conducted each year using different samples, locations, using different learning models, and analyzing based on different aspect such as cognitive style, learning style, EQ, AQ, or self-efficacy. Research results as regards students' mathematical literacy based on self-efficacy is shown in the Figure 2 as follow.

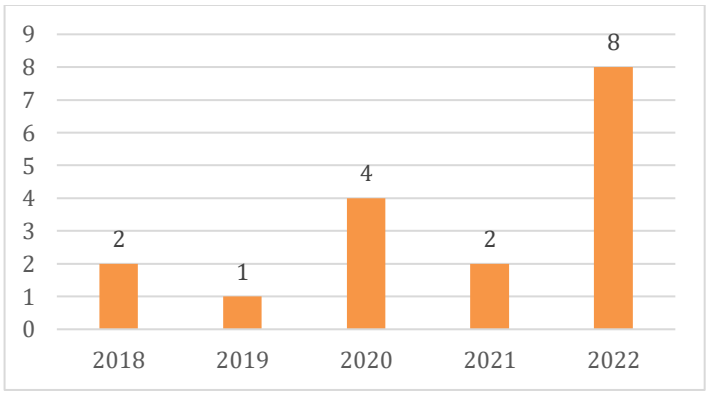

Figure 2. Study by Year of Publication

Based on Figure 2, it can be seen that the number of publications from 2018 until 2022 for each year faces the increase and the decrease. Based on the Figure 2 it is undeniable that the highest number of publications was in 2022. This information shows that the issue of students' mathematical literacy based on self-efficacy still reaches the attention as it is important to indicate students' belief towards their comprehension in using their mathematical knowledges and formulating them to solve the problem. This is in accordance with the analyzes of students' mathematical literacy is starting to be enthusiastically carried out these days (Aisyah & Juandi, 2022). Even though study of students' mathematical

literacy already gained big attention, this study still needs to be researched in the near future in order to get the most up to date data and obtain the other findings of it.

Study by Research Methods Using in The Research

The methods used in research can be different depending on the matter wanted to be studied by researcher. The method can be picked based on what kind of problem the researcher found during the observation. Several research methods used in the research about students' mathematical literacy can be seen in Figure 3 below.

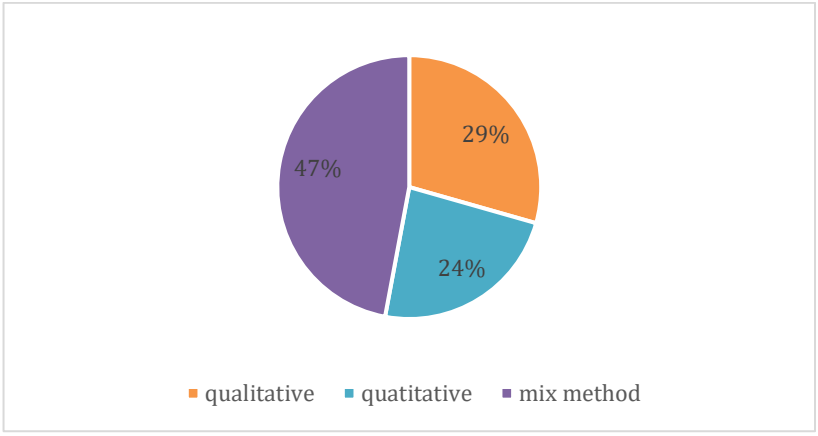

Figure 3. Study by Research Method Using in The Research

Based on the Figure 3, it can be known that the mix method was largely used in the research of students' mathematical literacy based on self-efficacy, followed by qualitative method and quantitative method, respectively. The possible reason why many researchers using mix method is due to their objectives in doing research to find confirmatory and exploratory questions. This is in line with mix method design incorporates techniques from qualitative and quantitative method which enable researchers to answer confirmatory and exploratory questions at the same time, and as a result the researcher is able to construct and confirm theory in the study (Byrne & Humble, 2007).

Study by Education Level

Mathematical literacy is essential for all students regardless of which level students are in. To be able solve mathematical problem, student should use their existing knowledges, formulate the models, connect one information to another information for the exchange of creating strategies and executing the plan. The study of students' mathematical literacy based on self-efficacy had been conducted in several level of education. The number of publications about students' mathematical literacy can be seen in Figure 4 below.

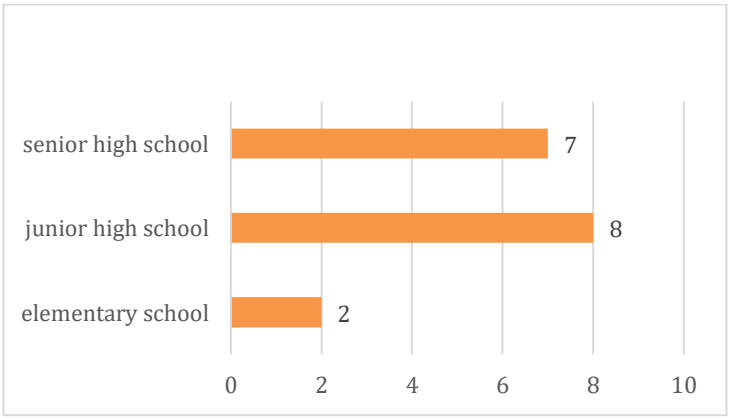

Figure 4. Study by Education Level

From Figure 4 it is obviously guaranteed that the study of students' mathematical literacy based on self-efficacy is dominantly conducted in junior high school (SMP) with the percentage reaching 47,1%. The research of students' mathematical literacy conducted in senior high school (SMA) is placed second with 7 researches and the its research in elementary school is placed third with only 2 researches.

The most plausible reason why this research largely conducted in junior high school is in accordance with the purpose of PISA itself which PISA's subject knowledge for evaluating mathematical literacy is relevant to a 15-year-old student assessment (OECD, 2017). Even though PISA was supposedly made for a 15-year-old student, it did not imply mathematical literacy is not important for students in other grades. Further research about students' mathematical literacy based on self-efficacy should be conducted as self-efficacy was a mediator variable between mathematics attitude and mathematics achievement (Liu et al., 2009). Besides, there are a lot of senior high school students' who had a low mathematical literacy ability (Mahdiansyah & Rahmawati, 2014). In addition, sometimes students are still having difficulties especially in the application of formulas that they already know (Masfufah & Afriansyah, 2021). That is becoming the reason why mathematical literacy is considered to be crucial to be developed since the young age (Juandi, 2021). Thus, it is important to dig more information and findings towards this matter.

Study by Number of Samples

The sample used in variety of research is different. In this study, the number of samples used in the research is categorized into two parts namely <30 (less than 30) sample and >= 30 (more than or equals to 30) sample. For number of samples used in the research of students' mathematical literacy based on self-efficacy can be seen in the Figure 5 as follows.

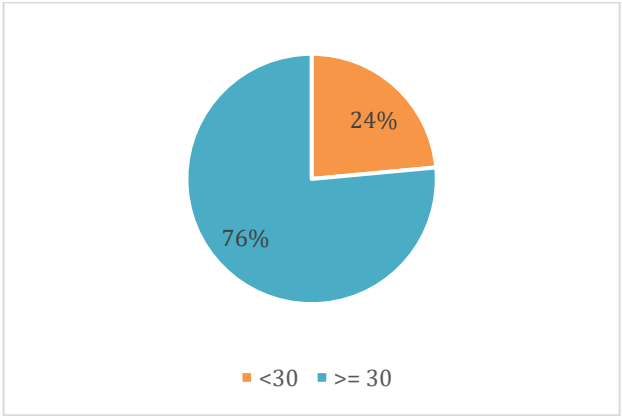

Figure 5. Study by Number of Samples

From the Figure 5 it was clearly true that more than a half or the research of students' mathematical literacy based on self-efficacy was used >= 30 samples, reaching 76% from the total or 13 out of 17 articles. Naiman, Resenfeld, dan Zirkel stated that the use of a sample size of >30 will statistically yields a mean distribution close enough to the normal distribution, so the calculation based on the normal curve makes sense (Rijanto, 2012). Thus, it was a good choice to use the sample more than or equals 30 as 47% of the sample in this study used mix method which require both quantitative and qualitative stages.

Study by Research Location

Various researches of students' mathematical literacy based on self-efficacy were conducted in different locations in Indonesia. The number of publications of students' mathematical literacy spread in 5 biggest islands in Indonesia is shown in Figure 6 as follow.

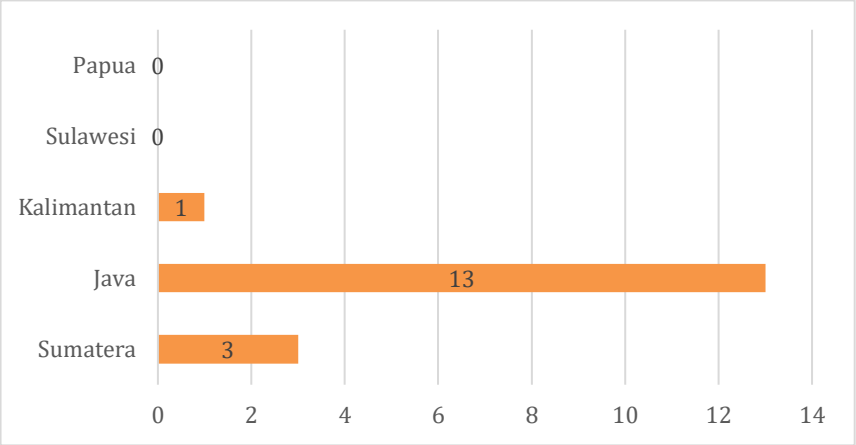

Figure 6. Study by Research Location

Based on Figure 6, it is assured that the highest number of publications by the research location about students' mathematical literacy based on self-efficacy was largely conducted in Java reaching 76% from all the samples in this study, followed by the research conducted in Sumatera and Kalimantan, respectively. On the other hand, there cannot be found any publication about students' mathematical literacy conducted in Papuan and Sulawesi. One of the possible reasons why the most researches were conducted in Java is because Java is island with the most densely population in Indonesia (Widiastuti et al., 2021). This matter also happens to another research about students' mathematics ability which was mostly conducted in Java while its research in Papua is still quite scarce (Ariati & Juandi, 2022; Khairunnisa et al., 2022; Taofik & Juandi, 2022). This situation made other student and teacher from another island outside Java do not have bigger chance to find unrevealed reason behind their students' mathematical literacy ability based on self-efficacy. It then makes teachers and students cannot predict the means to fix the problem in developing students' mathematical literacy as different location may give different findings that are beneficial as a tool for both teacher and student to elevate mathematical literacy. In addition, knowing students' self-efficacy can help teachers to support students in maintaining and developing their self-efficacy in solving mathematical problem so that students' performance towards mathematical literacy will be better. Thus, the study of this matter should be conducted evenly in the other islands in Indonesia.

Students' Mathematical Literacy in The Term of Self-Efficacy Categories

Various researches have been conducted utilizing several subject and being analyzed based on students' self-efficacy. From the prior research, it was known that students' mathematical literacy influenced by different categories of self-efficacy. Pratiwi et al. (2022) stated that student with a high level of self-efficacy can meet three indicators of mathematical literacy ability and use the knowledge gained from their experience in solving problems, student with a moderate level of self-efficacy only meet two indicators of mathematical literacy ability and tend to try to solve the problems given, besides that, student with a low level of self-efficacy only meet one indicator of mathematical literacy ability and are less aware of the role of mathematics in everyday life. This statement is supported by another findings which stated that students whose self-efficacy was low were less well able to communicate with what was known, and was not able to change the problems of the real world into the form of mathematical or otherwise, students whose self-efficacy was medium and high categories were able to communicate properly what was known and was able to change the problems of the real world into the form of mathematical to represent a problem. In addition, students with medium self-efficacy still made mistakes in using the formula so that the results were unclear and difficult to understand meanwhile students who had high

self-efficacy were able to identify problems and formulate mathematical situations well (Nugroho et al., 2020).

The reason behind the results above is explained by the other findings that described students' self-efficacy influences the results of students' mathematical literacy skills independently, high and medium self-efficacy categories influence mathematical literacy skills more than the self-efficacy in a low category (Istiqomah et al., 2021). By this statement, it can be said that students with high and medium self-efficacy can use their mathematical literacy better than students with low self-efficacy. Another research also shared similar findings which stated self-efficacy is very influential on students' mathematical literacy skills in which the higher the self-efficacy of students the better their mathematical literacy skills will be. In addition, improving mathematical literacy skills can affect students' positive thinking, students with high self-efficacy and positive perceptions of themselves will be able to improve their ability to solve math problems, students who show the ability to solve math questions are greatly helped by these positive thinking skills (Ananda & Wandini, 2022).

Thus, students with high self-efficacy have a better mathematical literacy than those who are in medium or low self-efficacy category. It becomes a need for students to have a high self-efficacy so that it can influence their mathematical literacy well. It also becomes a concern for a teacher to create a better learning strategy to help student in elevating their students' self-efficacy and developing their students' mathematical literacy.

CONCLUSION

From year to year, the study on students' mathematical literacy is gaining its attention since there are various factors affecting its development. One of the factors that affects students' mathematical ability is self-efficacy. Many researches of students' mathematical literacy based on self-efficacy had been conducted and it was provided many information needed. In the past five years, the most publications of students' mathematical literacy based on self-efficacy happened in 2022, mix method became the most method used in this study, students' in junior high school was dominantly used as the sample of this research, many researchers used more than or equal to 30 samples, and its research was widely conducted in Java. In addition, it can be concluded that students with high self-efficacy has a better mathematical literacy than students who have medium or low self-efficacy.

RECOMMENDATION

The research on students' mathematical literacy should be conducted more in elementary school and senior high school. Furthermore, its study in the other island instead of Java should be developed more as it is important to know the factor that affects students' mathematical literacy and the difference location may produce difference results.

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