ANALYSIS OF STUDENTS' NUMERICAL LITERACY BASED ON MATHEMATICAL ANXIETY IN SOLVING TWO-VARIABLE LINEAR EQUATION SYSTEM AT JUNIOR HIGH SCHOOL

Desi Putri Andini*[1], Ibnu Hadjar[2], Sukayasa[3], Bakri Mallo[4]
[1,2,3,4] Tadulako University, Indonesia

Article Info	ABSTRACT
	This study aims to obtain a description of students' numeracy literacy based on their mathematical anxiety in solving Two-Variable Linear Equation System problems. This study was conducted at Bala Keselamatan Palu Junior High School. The study employed a qualitative approach involving three eighth-grade students selected based on levels of mathematical anxiety (high, moderate, and low). The research subjects were selected based on the results of a mathematical anxiety questionnaire, taking into account the recommendations of the mathematics teacher. Data were collected through written Two-Variable Linear Equation System problem-solving tests and semi-structured interviews and analyzed using Miles and Huberman's qualitative data analysis model. The results indicate that students with low and moderate mathematical anxiety were able to meet all numeracy literacy indicators, although procedural weaknesses were observed in students with moderate anxiety. In contrast, students with high mathematical anxiety were only able to meet one numeracy literacy indicator.

Corresponding Author:

Desi Putri Andini,
Departement of Mathematics Education,
Universitas Tadulako Palu Sulawesi Tengah, Indonesia
Email: desiptrlambogo29@gmail.com

1. INTRODUCTION

21st century skills require students to master critical thinking, creativity, collaboration, and communication skills. The World Economic Forum (WEF) in 2015 stated that there are six fundamental literacy skills, one of which is numeracy literacy. Numeracy literacy is one of the most important literacy skills because it is closely

related to critical thinking skills in problem solving. Furthermore, numeracy literacy is not only about learning mathematics at school, but also includes the application of mathematical concepts to solve problems outside the classroom that require understanding and critical thinking in everyday life (Fajriyah, 2022). Therefore, this ability is an essential aspect of basic literacy skills for secondary school students when learning mathematics (Samad & Nur, 2024). Numeracy literacy can be found in mathematics learning, one of which is in the material on Two Variable Linear Equation Systems (TVLES), which discusses story problems related to numbers associated with everyday life, thus requiring numeracy literacy skills to make the right decisions (Permatasari & Hakim, 2024). Therefore, numeracy literacy plays an important role in daily life, as this skill involves understanding, analysing, and using information to make decisions.

However, this is not in line with the reality on the ground. Based on the results of PISA (Programme for International Student Assessment) which is part of the OECD (Organisation for Economic Co-operation and Development), it shows that in 2022, literacy and numeracy levels in Indonesia are still relatively low because they have not been able to achieve maximum results. As explained in the PISA results, Indonesia ranks 69th out of 81 countries, with a score of 359 in reading, 366 in mathematics, and 383 in science (OECD, 2023). This is in line with research conducted by Fauzi et al., (2021) which found that students' numeracy literacy is still low because they have difficulty understanding long story problems and determining strategies for solving them.

One of the factors that can be considered an obstacle to achieving numeracy literacy is mathematical anxiety (Istihapsari, dkk., 2022). Anxiety is a subjective experience of mental tension that causes distress as a general reaction and an inability to deal with problems or a sense of insecurity. These unpleasant feelings typically trigger physiological symptoms (such as trembling, sweating, increased heart rate, and others) as well as psychological symptoms (such as panic, tension, confusion, inability to concentrate, and so on) (Diana, dkk., 2020). Such anxiety becomes an impediment to students' numeracy literacy abilities when solving mathematical problems. In the field of mathematics, the anxiety experienced by students during mathematics learning is known as mathematical anxiety or math anxiety (Tasya, dkk., 2023). Each student exhibits different symptoms and levels of anxiety, which can affect their concentration, motivation, and performance in solving mathematical problems. The causes of mathematical anxiety include personality factors such as low self-esteem, an inability to cope with frustration, as well as feelings of embarrassment and intimidation (Syahbana, dkk., 2024).

Based on observations in the field during the implementation of the teaching assistance programme, during mathematics lessons at Bala Keselamatan Palu Junior High School, several students showed fear, especially when they were called upon to answer questions written on the blackboard. As a result, they felt anxious, restless, worried, cold sweats, confused, and even avoided the teacher when asked to complete tasks related to mathematics. This happened because some students considered mathematics to be a scary subject. This caused them to feel anxious and afraid to try to learn mathematics. This was an obstacle to students' numeracy skills, especially in solving mathematical problems. This is consistent with the findings of Harefa, dkk. (2023), which indicate that some students exhibit certain behaviors during mathematics learning, such as being afraid to answer questions posed by the teacher and tending to avoid tasks related to mathematics. To address these issues, an in-depth

analysis of students' numeracy literacy based on categories of mathematical anxiety is needed. However, studies that specifically analyze students' numeracy literacy based on levels of mathematical anxiety in solving two-variable linear equation system (TVLES) problems at the junior high school level are still limited. Therefore, this study focuses on examining numeracy literacy according to levels of mathematical anxiety in solving two-variable linear equation system problems among junior high school students. Thus, the purpose of this study is to obtain a description of students' numeracy literacy viewed from their mathematical anxiety when solving problems, particularly those related to two-variable linear equation system.

2. METHOD

This study employed a descriptive qualitative approach aimed at analysing students' numeracy literacy based on levels of mathematical anxiety in solving two-variable linear equation system problems. This research was conducted at Bala Keselamatan Palu Junior High School, Central Sulawesi. The research subjects were three eighth-grade students at Bala Keselamatan Palu Junior High School. The subjects were selected using a mathematical anxiety questionnaire and recommendations from the mathematics teacher at Bala Keselamatan Palu Junior High School.

The instruments used in this study were a Likert scale questionnaire to measure the level of mathematical anxiety, a written test containing one problem-solving question on two-variable linear equation system material designed to reveal students' numeracy literacy skills, and semi-structured interview guidelines used to explore the subjects' thought processes when solving two-variable linear equation system questions in order to explore numeracy literacy indicators and confirm test answers.

The questionnaire used in this study was developed by Nurkarim, et al., (2024) consisted of 29 statements, comprising 13 positive statements and 16 negative statements. The statements in this questionnaire covered three aspects described by Cavanagh & Sparrow, (2010) namely: attitude, cognitive, and somatic. These indicators are given for high, medium, and low levels of mathematical anxiety. The questionnaire is scored using a Likert scale with a score of 1-5 for each student response, which is divided into two categories: positive statements and negative statements. The guidelines for scoring the mathematical anxiety questionnaire are presented in Table 1.

The numeracy literacy test given to the subjects consisted of an open-ended TVLES problem developed based on the numeracy literacy indicators outlined by Han et al., (2017) in the National Literacy Movement (GLN). The numeracy literacy test design used in this study is presented in Table 2.

Table 1. Mathematics Anxiety Questionnaire Scoring Guidelines

Alternative answers	score	
	Positive Statement	Negative Statements
Strongly Agree (SA)	1	5
Agree (A)	2	4
Undecided (UD)	3	3
Disagree (D)	4	2
Strongly Disagree (SD)	5	1

Table 2. Numeracy Literacy Indicators

Numeracy Literacy Indicators	Description
Using various numbers and symbols related to mathematics to solve practical problems in various contexts in everyday life.	Students are able to use various mathematical numbers and symbols completely and accurately.
Analysing information presented in various forms (graphs, tables, charts, etc.)	Students can write down the data or information known from the questions presented completely and accurately.
Using the interpretation of the analysis results to predict and make decisions.	Students can interpret the results of the analysis correctly so that they can make decisions to solve problems using the appropriate procedures and draw correct and accurate conclusions.

To ensure data validity, a credibility test was conducted. Data credibility was ensured through member checking. Member checking was used to cross-check the research subjects' answers with their interview results (whether what they said during the interview matched the answers on the numeracy literacy test sheet). The data analysis technique used refers to the model analysis by Miles, et al. (2014), which consists of three stages, namely: (1) data condensation, carried out by selecting and categorizing relevant data based on three indicators of numeracy literacy (2) data presentation, presented in the form of descriptive narratives that describe how students' numeracy literacy is based on mathematical anxiety (3) drawing conclusions or verification, carried out by interpreting the data and verifying it to ensure its alignment with the research objectives. The written test used in this study consisted of two-variable linear equation system questions, as shown in Figure 1.

After school, Yumna and Zilla went to Harmony to purchase school supplies, including pens and notebooks. Details of the prices and quantities purchased by Yumna and Zilla can be seen in the following table:

School Supplies Purchase Table

No.	Name	Notebooks	Pen	Price
1.	Yumna	3 dozen	$1\frac{1}{2}$ dozen	Rp. 270.000,00
2.	Zilla	$1\frac{1}{2}$ dozen	$1\frac{1}{4}$ dozen	Rp. 153.000,00

If Anya wanted to purchase the same items at the store the next day, what would be the total price for 4 notebooks and 6 pens?

Figure 1. Written Test of Numeracy Literacy Two-Variable Linear Equation System Material

3.   RESULTS AND DISCUSSION
3.1 Results

The results of the mathematical anxiety questionnaire were categorized into three levels: low mathematical anxiety, moderate mathematical anxiety, and high mathematical anxiety. The frequency distribution of the mathematical anxiety categories is presented in Table 3.

Table 3. Frequency Distribution of Mathematics Anxiety Categories

Score Interval	Frequency	category
$29 \leq x < 62{,}0$	4	Low Mathematical Anxiety
$62{,}0 \leq x < 96{,}5$	18	Moderate Math Anxiety
$96{,}5 \leq x \leq 145$	4	High Math Anxiety

Based on Table 3, it is known that there were 26 students who participated in the mathematical anxiety questionnaire. The results showed that there were 18 students with moderate mathematical anxiety, 4 students with low anxiety, and 4 students with high mathematical anxiety.

The research subjects consisted of 3 students selected from 26 eighth A-grade students of SMP Bala Keselamatan Palu, based on their mathematical anxiety categories: 1 student with high mathematical anxiety, 1 student with moderate mathematical anxiety, and 1 student with low mathematical anxiety. The subjects were selected based on the results of the mathematical anxiety questionnaire, taking into consideration recommendations from the mathematics teacher. The selected subjects are presented in Table 4.

Tabel 4. Research Subjects Based on Mathematical Anxiety Questionnaire Results

| Anxiety Category	Score
Low Mathematical Anxiety	41
Moderate Mathematical Anxiety	63
High Mathematical Anxiety	99

The selected subjects were then used as the focus of the study to describe numeracy literacy analysis in solving two-variable linear equation system problems. The initials used for the subjects in this study were KR for students with low mathematical anxiety, KS for students with moderate mathematical anxiety, and KT for students with high mathematical anxiety.

The results obtained in this study are an analysis of students' numeracy literacy in solving two-variable linear equation system problems based on categories of mathematical anxiety. Numeracy literacy analysis was conducted to describe the abilities of subjects KR, KS, and KT in solving two-variable linear equation system problems based on numeracy literacy indicators.

Subjects with Low Mathematical Anxiety (KR)
Indicator 1: Using Various Numbers and Symbols Related to Mathematics to Solve Practical Problems Related to Various Contexts in Everyday Life.

The results of the KR written test for this indicator are presented in Figure 2.
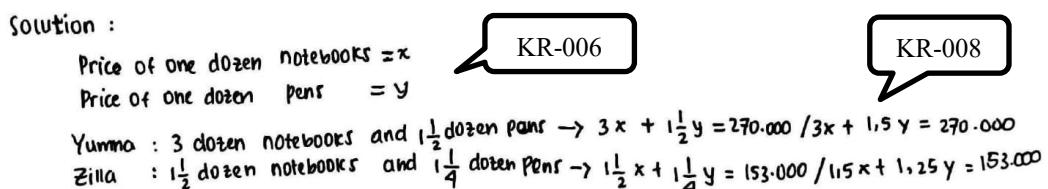
Figure 2. KR's Answer in Using Mathematical Symbols

At the interview stage, KR presented responses related to the indicator of using various numbers and mathematical symbols in solving practical problems. The interview excerpts are presented below:

PN-005 : What kind of analogy did you make? Can you explain it?
KR-006 : So I assumed the price of a dozen notebooks to be x and the price of a dozen pens to be y. After I did the assumptions, I made a mathematical model, sis.
PN-007 : What is the mathematical model of these questions?
KR-008 : So for Yumna, 3 dozen notebooks and $1\frac{1}{2}$ dozen pens cost 270.000, itu jadi $3x + 1\frac{1}{2}$ y = 270.000. For Zilla, $1\frac{1}{2}$ dozen notebooks and$1\frac{1}{4}$ dozen pens cost 153.000, so $1\frac{1}{2}x + 1\frac{1}{4}y = 153.000$

Indicator 2: Analysing Information Presented in Various Forms (Graphs, Tables, Charts, etc.)

The results of the written test for this indicator are presented in Figure 3.

Figure 3. KR's response in analysing information

At the interview stage, KR presented responses related to the indicator of analyzing information presented in tabular form. The interview excerpts are presented below.

PN-003 : What did you do to solve the problem?
KR-004 : Previously, I wrote down what was known and asked in the question, such as Yumna buying 3 dozen notebooks and $1\frac{1}{2}$ dozen pens for a total price of 270.000, then Zilla buying $1\frac{1}{2}$ dozen notebooks and $1\frac{1}{4}$ dozen pens for 153.000. Then the question was how much Anya would have to pay in total if she bought 4 notebooks and 6 pens. after that I assume the variables.

Based on the written test and interview results, it appears that KR wrote down what he knew and what was asked in the question (KR-004).

Indicator 3: Using Interpretation of Analysis Results to Predict and Make Decisions.
The results of the KR written test for this indicator are presented in Figure 4.

Figure 4. KR's Response in Interpreting Analysis Results to Make Decisions

At the interview stage, KR presented responses related to the indicator of using the interpretation of analysis results to make decisions in solving problems. The interview excerpts are presented below.

PN-009 : After that, how did you solve the problem?
KR-010 : I decided on the method I would use to solve this problem. The method I used was the same as the one I used in the previous problem, namely the combined method. Then I worked on it.
PN-011 : So, can you draw a conclusion from the answers you worked on?
KR-012 : Sure. So, the total price that Anya has to pay if she buys 4 notebooks and 6 pens is 42.000.

KR determined the method to be used to solve the problem, as seen in the interview excerpt (KR-010). KR also correctly solved the problem using the specified method, allowing for accurate conclusions to be drawn, as seen in the interview excerpt (KR-028).

Subjects with Moderate Math Anxiety (KS)
Indicator 1: Using Various Numbers and Symbols Related to Mathematics to Solve Practical Problems Related to Various Contexts in Everyday Life.

The results of the KS written test for this indicator are presented in Figure 5.

Figure 5. KS Answers in Using Mathematical Symbols

At the interview stage, KS presented responses related to the indicator of using various numbers and mathematical symbols in solving practical problems. The interview excerpts are presented below:

PN-005 : After that, what did you do?
KS-006 : I wrote the equation, sis
PN-007 : What is the mathematical equation or model for this problem?

KS-008 : So there are two equations that I wrote, the first equation is $3x + 1\frac{1}{2}y = 270.000$ and the second equation is $1\frac{1}{2}x + 1\frac{1}{4}y = 153.000$

PN-009 : In the equation you mentioned earlier, what did you represent by x and y?

KS-010 : x is the price of a notebook, y is the price of a pen, sis

PN-011 : Why don't you write down the example you mentioned earlier?

KS-012 : I'm not used to it, sis, because usually I just make the equation, sis.

KS immediately wrote down equations or mathematical models without first explaining what was being assumed. KS explained that he was not used to writing explanations of the symbols he would use, as seen in the interview excerpt (KS-012).

Indicator 2: Analysing Information Presented in Various Forms (Graphs, Tables, Charts, etc.)

The results of the written test for this indicator are presented in Figure 3.

Figure 6. KS Answers in Using Mathematical Symbols

At the interview stage, KS presented responses related to the indicator of analysing information presented in tabular form. The interview excerpts are presented below:

PN-003 : What did you do to solve the problem?

KS-004 : Previously, I wrote what was known, namely Yumna bought 3 dozen notebooks and $1\frac{1}{2}$ dozen for 270.000 and Zilla bought $1\frac{1}{2}$ dozen notebooks and $1\frac{1}{4}$ dozen pens for 153.000, then wrote the question, namely how much did Anya have to pay in total.

Indicator 3: Using Interpretation of Analysis Results to Predict and Make Decisions.

The results of the KS written test for this indicator are presented in Figure 7.

Figure 7. KS Answers in Interpreting Analysis Results for Decision Making

At the interview stage, KS presented responses related to the indicator of analysing information presented in tabular form. The interview excerpts are presented below:

PN-013   :   After that, how do you solve the problem?
KS-014   :   Determining the method I used to solve this problem. Here, I used the same combined method as in the previous problem.
PN-029   :   So, can you draw a conclusion from the answers you worked on?
KS-030   :   Yes, I can. So the total amount that Anya has to pay is 42.000

Subjects with High Math Anxiety (KT)
Indicator 1: Using Various Numbers and Symbols Related to Mathematics to Solve Practical Problems Related to Various Contexts in Everyday Life.

The results of the KT written test for this indicator are presented in Figure 5.

Figure 8. KT Answers in Using Mathematical Symbols

At the interview stage, KT presented responses related to the indicator of using various numbers and mathematical symbols in solving practical problems. The interview excerpts are presented below:

PN-005:   What did you do to solve the problem?
KT-006:   First, I made an example so 1 dozen notebooks = B and 1 dozen pens = P.

KT assigned *P* to represent the price of one dozen notebooks and *B* to represent the price of one dozen pens (Interview excerpt KT-006).

Indicator 2: Analysing Information Presented in Various Forms (Graphs, Tables, Charts, etc.)

The results of the KT written test for this indicator are presented in Figure 9.

Figure 9. KT's Response in Analyzing Information

At the interview stage, KT presented responses related to the indicator of analysing information presented in tabular form. The interview excerpts are presented below:

PN-007　：　After that, what did you do?

KT-008　：　Write down what you know, which is: Yumna = $3B + 1\frac{1}{2}P$ = 270.000 and Zilla = $1\frac{1}{2}B + 1\frac{1}{4}P$ = 153.000 hen the question is Anya = 4B + 6P =?

PN-009　：　Why don't you explain it first before writing the mathematical model?

KT-010　：　Because I'm not used to it, sis, so I just wrote it like this, sis.

KT immediately wrote down what was known and asked using mathematical symbols without first explaining in detail what was known and asked in the question. KT also explained that they were not used to writing down what was known and asked in detail, as seen in the interview excerpt (KT-010).

Indicator 3: Using Interpretation of Analysis Results to Predict and Make Decisions.

The results of the KT written test for this indicator are presented in Figure 10.

Figure 10. KT's Response in Interpreting Analysis Results to Make Decisions

At the interview stage, KT presented responses related to the indicator of using the interpretation of analysis results to make decisions in solving problems. The interview excerpts are presented below:

PN-011　：　After that, what did you do to solve this problem?

KT-012　：　I used the method that was taught before, but I forgot the name of the method.

PN-013　：　Can you explain how?

KT-014　：　First, I did it like number 1, so I multiplied equation 1 by 1 and equation 2 by 2. So 36 B + 18 P = 270.000, and 36 B + 30 P = 306.000 Then I subtracted them to get P = 36.000

PN-015　：　After that, what did you do?

KT-016   :   So I multiply it by this (equation 1). So 36 B + 18 (36.000) = 270.000 then 18×36000 is 548.000. Then, I subtract 270.000 from 548.000, which equals 224.000.
PN-017   :   After that, what result did you get?
KT-018   :   It's not finished yet. I can't get the answer.
PN-019   :   Why don't you finish it?
KT-020   :   Because I've gone blank and don't know anymore. I'm also dizzy looking at all these numbers.
PN-021   :   Okay, so you think number 2 is difficult?
KT-022   :   It's difficult, more difficult than the first one, especially since it uses fractions.

3.2 Discussion

Based on the explanation of the research findings, it was discovered that the subject with low mathematical anxiety (KR) was able to meet all three indicators of numerical literacy in solving two-variable linear equation system problems. The subject was able to apply various numbers and symbols as part of the steps to solve the problem, which was clearly demonstrated through the explicit use of variable definitions and the construction of mathematical models using those symbols. The subject also showed strong analytical skills by writing down the known and unknown information from the problem in detail, and during the interview, the subject was able to express this information clearly. This aligns with the study conducted by Himawan & Sulaiman, (2021) which states that students with low mathematical anxiety are able to understand and explain the information given and asked in a problem. In addition, the subject with low mathematical anxiety was also able to describe the method used to obtain the correct answer and draw accurate conclusions from the results obtained.

The description above shows that subjects with low mathematical anxiety can meet all of the numeracy literacy indicators. This is in line with research conducted by Lusiana, dkk., (2025), which found that students with low mathematical anxiety have high literacy skills because they are able to meet all numeracy literacy indicators.

Subjects with moderate mathematical anxiety (KS) in solving two-variable linear equation system problems were able to correctly fulfill all three numeracy literacy indicators. Subjects are able to apply various numbers and symbols as one of the steps to solve problems. In addition, subjects also demonstrate good analytical skills by writing down the information known and asked in the question in detail. Furthermore, subjects are also able to describe the methods used in solving problems so that they obtain the correct answers and can draw the right conclusions from the results obtained.

Based on the explanation above, it can be seen that the subject with moderate mathematical anxiety was able to meet all of the numerical literacy indicators. However, an interesting finding emerged in the subject's problem-solving process. The subject with moderate mathematical anxiety did not write variable representations or explain the symbols used in solving the problem. Instead, the subject directly wrote the mathematical model of the problem without first clarifying the meaning of the symbols being used. The interview results revealed that the subject was not accustomed to writing variable representations to explain the symbols used; therefore, the subject only wrote the mathematical model. This indicates a procedural incompleteness that has become a habitual pattern for the subject when solving problems, particularly in

word problems. Nevertheless, the subject was still able to solve the problem correctly and accurately. This finding aligns with the study conducted by Fadila, et al. (2024) which states that students with moderate mathematical anxiety are able to understand the problem but often display inaccuracies in symbolic representation and in constructing mathematical models.

The subject with high mathematical anxiety (KT) was only able to fulfill one numerical literacy indicator when solving two-variable linear equation system problems. The subject successfully met the first indicator of numerical literacy, namely the ability to use various numbers and mathematical symbols to solve problems. This is evident from the fact that the subject was able to write variable representations from the problem before proceeding with the solution and was also able to formulate equations or mathematical models based on the test problem. The interview results further revealed that the subject could explain the symbols used in solving the problem. However, with regard to the second indicator, the subject showed limited ability to analyze information from the given problem. As a result, the subject could not clearly explain the details of what was known and what was being asked in the problem; instead, the subject directly wrote the mathematical model or equation. The interview results also indicated that the subject was not accustomed to this process, leading them to immediately express the known and unknown information using mathematical symbols without first providing a detailed verbal explanation. This finding is consistent with the study conducted by Mulyani, dkk., (2025) which states that students with high mathematical anxiety may understand the general intent of a problem but tend to experience difficulties in analyzing and working through it, resulting in an inability to solve the problem correctly.

The subject was also unable to fulfill the third indicator of numerical literacy, namely using the interpretation of analytical results to make predictions and decisions. This was evident from the written test results, which showed that the subject could not correctly carry out the chosen solution method, resulting in an inability to make decisions or draw accurate and appropriate conclusions. This occurred because the subject was unable to obtain the final answer and also stated verbally that they felt overwhelmed when seeing many numbers. In addition, there were calculation errors during the problem-solving process, which further contributed to the subject's inability to make decisions and formulate conclusions. This finding aligns with the study conducted by Himawan & Sulaiman, (2021) which reported that students with high mathematical anxiety are often unable to carry out the plans they have constructed during problem-solving. Furthermore, when reviewing their answers to draw conclusions, such students tend to rush through the process.

4. CONCLUSION

Based on the results and discussion, this study concludes that students' numeracy literacy in solving two-variable linear equation system problems varies according to their levels of mathematical anxiety.

1. Students with low mathematical anxiety demonstrate strong numeracy literacy skills, as they are able to fulfill all numeracy literacy indicators, including the use of mathematical symbols, analysis of information, and interpretation of results to make accurate decisions.

2. Subjects with moderate mathematical anxiety were able to meet all numeracy literacy indicators, namely: (1) Using various numbers and symbols related to

mathematics to solve practical problems related to various contexts in everyday life, (2) Analyzing information presented in various forms (graphs, tables, charts, etc.), and (3) Using the interpretation of the analysis results to make predictions and decisions. However, there are weaknesses in the procedure; subjects tend to skip formal steps such as writing examples. Subjects are not accustomed to writing examples to explain the symbols used, so they immediately write mathematical models.

3.   Students with high mathematical anxiety are only able to meet one numeracy literacy indicator, namely the use of mathematical symbols. They experience difficulties in analyzing problem information and interpreting results, which prevents them from making accurate decisions and conclusions.

Based on the discussion and conclusions outlined in this study, several suggestions are proposed as follows:

1.   Mathematics teachers are encouraged to identify students' levels of mathematical anxiety early through observation or simple questionnaires. Teachers should also apply interactive and context-based learning approaches and emphasize correct procedural steps in solving word problems to help reduce students' mathematical anxiety.

2.   Future researchers are encouraged to conduct more in-depth analyses of numeracy literacy across various mathematical topics and to examine other factors influencing mathematical anxiety to enrich and strengthen future findings.

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REFERENCES

Cavanagh, R., & Sparrow, L. (2010). Measuring Mathematics Anxiety: Paper 2-Constructing and Validating the Measure. *Prosiding AARE Conference.* https://www.aare.edu.au/data/publications/2010/2063CavanaghSparrow.pdf

Diana, P., Marethi, I., & Pamungkas, A. S. (2020). Kemampuan Pemahaman Konsep Matematis Siswa: Ditinjau dari Kategori Kecemasan Matematik. *SJME (Supremum Journal of Mathematics Education)*, *4*(1), 24–32.

Fadila, L., Yulis Tyaningsih, R., & Kurniati, N. (2024). Analisis Kemampuan Pemecahan Masalah Matematika Ditinjau dari Kecemasan Matematis Siswa. *Journal of Classroom Action Research*, *6*(4). https://doi.org/10.29303/jcar.v6i4.9521

Fajriyah, E. (2022). Kemampuan Literasi Numerasi Siswa pada Pembelajaran Matematika di Abad 21. *Prosiding Seminar Nasional Pendidikan*, *4*, 403-409. https://prosiding.unma.ac.id/index.php/semnasfkip/article/view/824

Fauzi, F. G., Melyana, F., Rahmawati, D., Yasmin, S., & Nurrahmah, A. (2021). Analisis Literasi Numerasi Siswa Kelas VIII di SMP Petri Jaya Jakarta Timur pada Konten Aljabar. *Himpunan: Jurnal Ilmiah Mahasiswa Pendidikan Matematika*, *2*.

Han, W., Susanto, D., Dewayani, S., Pandora, P., Hanifah, N., Miftahussururi, Nento, M. N., & Akbari, Q. S. (2017). *Materi Pendukung Literasi Numerasi*. Jakarta.

Harefa, A. D., Lase, S., & Zega, Y. (2023). Hubungan Kecemasan Matematika dan Kemampuan Literasi Matematika terhadap Hasil Belajar Peserta Didik. *Educativo: Jurnal Pendidikan*, *2*(1), 144–151. https://doi.org/10.56248/educativo.v2i1.96

Himawan, R. F., & Sulaiman, R. (2021). Analisis Kesalahan Siswa dalam Menyelesaikan Permasalahan Matematika Menurut Teori Polya Ditinjau Berdasarkan Kecemasan Matematika. *Jurnal Ilmiah Pendidikan Matematika*, *10*(1), 1-9. https://doi.org/https://doi.org/10.26740/mathedunesa.v10n1.p1-9

Istihapsari, V., Sukestiyarno, Y., Suyitno, H., & Rochmad, R. (2022). Kemampuan Literasi Matematika Peserta Didik SMP Berdasarkan Kecemasan Matematika. *Prosiding Seminar Nasional Pascasarjana*, *5*(1). http://pps.unnes.ac.id/prodi/prosiding-pascasarjana-unnes/

Lusiana, Sukayasa, Pathuddin, & Mubarik. (2025). Analisis Kemampuan Literasi Numerasi Siswa Ditinjau dari Kecemasan Matematika. *Jurnal Pendidikan Matematika: Judika Education*, *8*(1). https://doi.org/10.37150/jp.v8i2.3137

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis: A Mathods Sourcebook*. SAGE, London.

Mulyani, S., Nurcahyono, N. A., & Lukman, H. S. (2025). Analisis Kemampuan Literasi Numerasi Siswa SMP Ditinjau dari Kecemasan Matematika. *Jurnal PEKA (Pendidikan Matematika)*, *8*(2), 121–131. https://doi.org/10.37150/jp.v8i2.3137

Nurkarim, A. W., Qonita, W., & Isroil, A. (2024). Skala Kecemasan Matematika Siswa: Ukuran Gejala Fisiologis, Psikologis, Perilaku, dan Kognitif Matematika. *Sains Data Jurnal Studi Matematika dan Teknologi*, *1*(2), 60-68. https://doi.org/10.52620/sainsdata.v1i2.18

OECD. (2023). *PISA 2022 Results: The Stateof Learning and Equity in Education* (Vol. 1). Paris: OECD Publications. https://doi.org/10.1787/53f23881-en

Permatasari, P., & Hakim, D. L. (2024). Analisis Kemampuan Numerasi Siswa pada Materi SPLDV. *Seminar Nasional Matematika Dan Pendidikan Matematika (Sesiomadika)*, *5*(2), 271-283. https://doi.org/https://journal.unsika.ac.id/index.php/sesiomadika/article/view/10459

Samad, I., & Nur, M. A. (2024). Kemampuan Literasi Numerasi Matematika Melalui Penerapan Model Pembelajaran Problem Based Learning (PBL). *Proximal: Jurnal Penelitian Matematika dan Pendidikan   Matematika*, *7*(1), 100-107. https://doi.org/10.30605/proximal.v5i2.3159

Syahbana, A., Rizta, A., Suryati, S., & Kusumawati, I. N. (2024). Tingkat Kecemasan Matematika Siswa SMP pada Pembelajaran Materi Prisma. *Indiktika : Jurnal Inovasi Pendidikan Matematika*, *7*(1), 58–70. https://doi.org/10.31851/indiktika.v7i1.16908

Tasya, E. L., Hafiz, M., & Musyrifah, E. (2023). Kemampuan Berpikir Kritis Matematis Siswa dalam Menyelesaikan Masalah Trigonometri Ditinjau dari Kecemasan Matematisnya. *FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika*, *9*(2), 207–218. https://doi.org/10.24853/fbc.9.2.207-218