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# Student's Numeracy on Solving Data and Uncertainty Problems In Term of Self-Efficacy

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**Abstract:** Numeracy is the ability to analyze, interpret information, and find a solution by involving one's mathematical knowledge. Numeracy is known to be influenced by self-efficacy. This study aims to describe students' numeracy in solving data and uncertainty problems in terms of high and low self-efficacy. This study is descriptive research with a qualitative approach was carried out by collecting data from research subjects purposively consisting of three students with high self-efficacy and three students with low self-efficacy. The instruments used included a self-efficacy questionnaire, three data and uncertainty questions, and an interview guide. The data is analyzed using the numeracy's sub-indicators. The results showed students with high self-efficacy have a tendency to do the process of identifying all the information presented in the problem, modeling important information, making strategy designs and process it using data processing concepts in mathematics, then interpret the results. And students with low self-efficacy only have a tendency for identifying all the information presented in the problem. Based on these result, it's recommended for teachers to create a learning climate that support student self-efficacy and numeracy, for future researchers should conduct interviews on all of the student's numeracy in order to obtain more complete research data.

## INTRODUCTION

Numeracy leads students to recognize the role of mathematics in life and make good judgments and decision-making (Meeks et al., 2014). This is in line with the definition of numeracy which is an ability that includes knowledge and skills with details: using various kinds of numbers and symbols related to basic mathematics to solve practical problems in various contexts of everyday life, analyzing information presented in various forms (graphs, tables, charts, and so on), using these interpretations to predict and make decisions (Dantes & Handayani, 2021). Meanwhile Ekowati et al. (2019)) stated that numeracy is a person's ability to formulate, apply, and interpret mathematics in various contexts, including the ability to reason mathematically, using concepts, procedures and facts to describe, explain or predict phenomena/events. When students can master numeracy well, they will have sensitivity to numeracy itself.

Numeracy is currently of concern to the world of education in Indonesia because of the 2018 PISA survey which placed Indonesia's math ability at number 73 out of 80 countries. (OECD, 2019). The mathematical abilities of Indonesian students from the 2018 PISA results did not differ significantly from the PISA results in previous years, namely below the international average score. The average mathematical literacy score of the PISA participating countries is 489 while Indonesia's mathematical literacy score is in the range of

375. In 2015 it scored 397 and in 2018 it scored 371 which is the lowest achievement for Indonesian students' mathematical literacy scores (Enggar, 2019). In addition to the results of the PISA study, other research shows that the numeracy of the majority of students is still relatively low, where only 34.04% and 14.89% of students are classified as having high and medium numeracy, and 51.06% of students are still classified as having low numeracy (Yunita et al., 2020). In addition, in research conducted by Lestari & Ratnaningsih (2022) it was also shown that students completing assessments with questions equivalent to AKM numeracy only achieved a score of 18.45 (classified in the low category because they are under a score of 40). This happens because students still have difficulty understanding the questions given. With the evidence showing the weaknesses of Indonesian students' numeracy above, numeracy needs special attention and detailed study. Because the role of numeracy is related to skills in applying mathematical concepts and rules in everyday situations when unstructured problems arise, there are many ways, and there may not be a complete solution (Han et al., 2017). For this reason, the Indonesian government includes numeracy in the Minimum Competency Assessment (AKM) contained in the National Assessment (AN) as a substitute for the National Examination (UN) adapted from the mathematical literacy framework in the Program for International Student Assessment (PISA) (Kemendikbud Pusmenjar, 2020).

To study in depth the numeracy needs of the AKM, many researchers have conducted studies related to the numeracy AKM. Several researchers have conducted detailed studies on several content components of the numerical AKM. Among them, Pambudi (2022) and Wulandari (2022) conducted a study on the content of numbers on the topic of developing the assessment and tests of the results of AKM numeracy. Hairunnisa & Izzati (2022; Pertiwi & Ekawati (2022) and Rezky et al. (2022) conducted a study on student numeracy and the development of AKM numeracy questions in geometric content with a sociocultural context. Arofa & Ismail (2022); Dina & Ekawati (2022); Sari et al. (2021) and Wida Utari et al. (2021) conducted a study of students' numeracy in completing algebraic content. Julie et al. (2017) examined students' mathematical literacy skills for uncertainty problems adapted from PISA questions. And an assessment of case studies of elementary students' mathematical literacy on the content Quantity, Uncertainty and Data, Space and Shape by Ekawati et al. (2020). However, from the studies that have been carried out, it is necessary to carry out specific studies regarding solving data and uncertainties problems with the translation of student numeracy. This is because several previous studies have not found research that specifically examines these problems and aspects.

Data and uncertainty problems are one of the most widely used domains of numeric content in everyday life (Pusmenjar, 2020). However, several previous studies have shown that students still experience difficulties in solving questions related to data problems and uncertainty. One of them is shown by the research results of Saidah & Mardiani, (2021) stating that students experience difficulties in understanding and interpreting mathematical ideas, have difficulty performing calculations, and have difficulty arranging words to explain statements again. In addition, research conducted by Monica et al. (2020) also stated

that they experienced difficulty in solving questions related to data and uncertainty problems in skills (procedures) with a percentage of 19% in working on questions and giving correct answers. Therefore, students must know, understand and master facts and procedures in solving problems. From these facts, it can be concluded that student's ability to solve questions related to data and uncertainties problems which are part of the AKM numeracy content still needs to be given more attention.

The low numeracy of students in Indonesia is not only due to the cognitive side but there are affective factors that also have an influence. Hadi & Novaliyosi (2019) revealed that one of the factors causing low numeracy is the learning climate in schools which is not optimal in providing habituation to students in solving problems that require higher-order thinking. This then makes students feel less confident or have a low level of self-confidence (self-efficacy). Self-efficacy is defined as a person's belief in his ability to act according to needs in order to be able to achieve an expected achievement Bandura (1993). This will also apply when students face problems that can be presented mathematically. According to Bandura (1997) dimensions of self-efficacy, including the level of difficulty (magnitude), generality, strength. The dimension of the level of difficulty (magnitude) relates to the level of difficulty of the task where a person feels able or unable to deal with problems, then the dimension of generality relates to one's belief in one's ability to take action in various fields, while the dimension of strength relates with the level of strength of one's beliefs regarding the abilities one has when facing the difficulties experienced (Revita, 2019). Based on self-efficacy indicators from Nursilawati (2010) and Özgen & Bindak (2008) with changes to several terms related to numeracy topics which include the numeracy process: understanding, applying, and reasoning as well as questions equivalent to AKM numeracy. The following are self-efficacy indicators for numeracy,

**Table 1**. Self Efficacy Indicators for Numeracy

| Dimension | Indicators |
|---|---|
| Magnitude | Do math problems related to events in everyday life from easy to difficult. |
| | Able to solve math problems related to events in everyday life even though the content used has not been taught or has not been understood. |
| Strength | Endure and be tenacious while doing mathematics related to events in everyday life. |
| | Persistent in dealing with math problems related to events in everyday life. |
| | Don't give up easily even though you've had personal experiences that don't support you |
| Generality | Consistent in activities and tasks |
| | Ready to use various numbers and symbols related to basic mathematics; analyzing information; and interpret the results of the analysis to find a solution to a problem in all situations. |
| | Have a positive attitude towards math problems related to events in the given daily life. |

In study by Nurtiana & Adirakasiwi (2022) regarding numeracy in terms of self-efficacy, self-efficacy is divided into three categories, namely high, medium and low. The results of this study indicate that there is a similarity in the results between students with high self-efficacy and moderate self-efficacy, while students with low self-efficacy show significantly different results. Different categorization was carried out in research by Rahmati (2015), where self-efficacy was divided into two categories, namely high self-efficacy and low self-efficacy. It aims to fulfill the hypothesis that shows a significant difference from the two

categories that have been determined. Some of these studies show that the categorization of self-efficacy into high self-efficacy and low self-efficacy has a greater possibility of showing significant differences in the subject's response to the treatment given. This is because a sense of interest in completing assignments appears in students with high self-efficacy, but students with low self-efficacy will avoid assignments, especially if the task is considered difficult to complete (Fitriani, 2019). Likewise, tests related to mathematical content will be completed well by students with high self-efficacy, but students with low self-efficacy will be the opposite (Liu & Koirala, 2009). The existence of a relationship between student's numeracy and self-efficacy levels was proven by Hiller et al. (2022) and Kurniawati & Mahmudi (2019). In this study it was stated that the numeracy of junior high school students is influenced by the student's self-efficacy. From the description of the relationship between self-efficacy and numeracy, it can be concluded that self-efficacy can influence student numeracy.

From the description above, it is found that there is a need for an assessment of the relationship between self-efficacy and student numeracy in solving data problems and uncertainties. This is deemed necessary, to find out how students' numeracy is in solving problems in terms of the low self-efficacy category and the high self-efficacy category. In addition, no research has been found specifically regarding the elaboration of numeric content in data and uncertainty, even though these domains are often related to everyday problems faced by students (Pusmenjar, 2020). So the researcher feels the need to describe students' numeracy in solving data and uncertainty problems in terms of high and low self-efficacy.

## METHOD

This research is a descriptive study with a qualitative approach emphasizing the description of facts through a series of observations from the point of view of the subjects studied. The qualitative descriptive research approach aims to describe the data obtained in more detail and detail (Cohen et al., 2007). The source of the data in this study was class VIII junior high school students. In this study, one class will be taken to work on a self-efficacy questionnaire with same-sex controls. From the results of the questionnaire, students will be classified into categories of high self-efficacy levels and low self-efficacy levels. From the results of this categorization, three students with a high level of self-efficacy and three students with a low level of self-efficacy will be taken for data presentation problems. Taking this subject aims to determine the ability of students to work on questions related to data and uncertainty problems on the basis of a review at the level of self-efficacy. To get more in-depth results about student numeracy in solving data and uncertainty problems, after solving the problems given, the subject will be interviewed personally. The benchmark in determining the number of subjects is not on representation, but on the depth of information that can be obtained from the selected subjects (Heryana & Unggul, 2018).

18 children from class VIII at a public junior high school in Trenggalek for the 2022/2023 academic year were given a self-efficacy questionnaire. The following is a chart of taking subjects in this study,

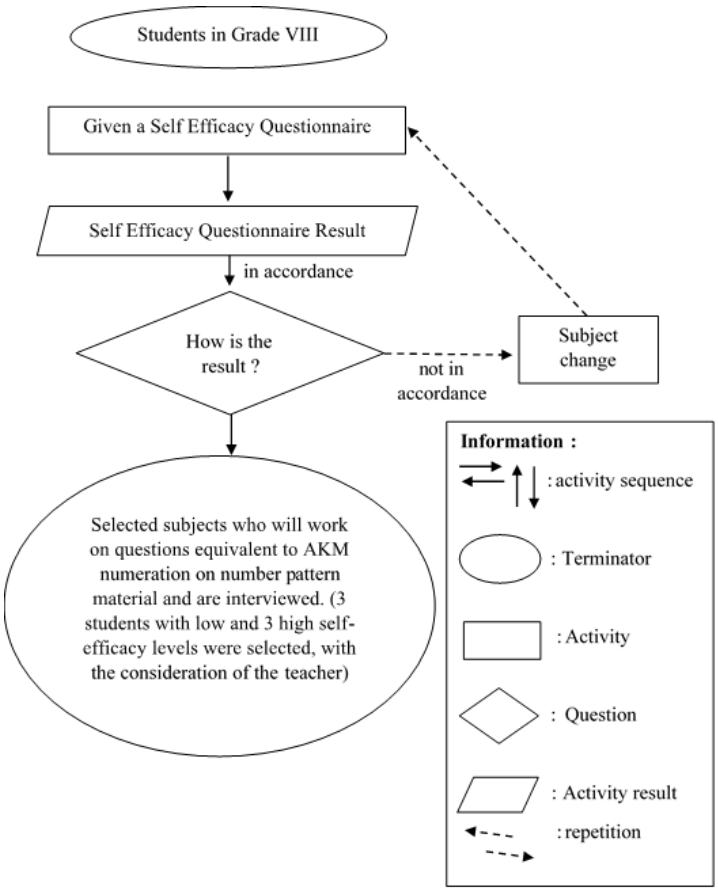



**Figure 1**. Subjects Selection

Then three students with a high level of self-efficacy and three students with a low level of self-efficacy is taken for getting three questions with data and uncertainty problems adapted from PISA and an interview guide. The self-efficacy questionnaire in this study was adapted from Nursilawati (2010) and Özgen & Bindak (2008) with several changes in the choice of words and phrases including the words Pythagoras, geometry, circles, and geometric shapes which were changed to data and uncertainties problems as well as mathematical problem phrases and mathematical tasks. become mathematical problems related to everyday life (directed at the type of numeracy problems) and replace words to make them more familiar to students including words making mathematical relationships to understanding problems, modeling problems, analyzing problems. Consists of 24 item statements. After obtaining data in the form of student self-efficacy questionnaire scores, then the data is analyzed based on the score range which refers to calculations from (Sutanto, 2016). The reason for adapting the instrument from Nursilawati (2010) and Özgen & Bindak (2008) is because some of the statement items in the self-efficacy questionnaire are relevant to the process of solving numeracy problems.

The form of the scale used in this study is the Likert model scale, with four alternative answer choices consisting of favorable and unfavorable item groups consisting of SS

(strongly agree), S (agree), TS (disagree), STS (strongly disagree). The favorable statement group consists of positive statements, while the unfavorable item group consists of negative statements. The explanation regarding the scoring for the self-efficacy scale is as follows:

**Table 2**. Self Efficacy Scale

| Answer Choices | Favorable | Unfavorable |
|---|---|---|
| SS | 3 | 0 |
| S | 2 | 1 |
| TS | 1 | 2 |
| STS | 0 | 3 |

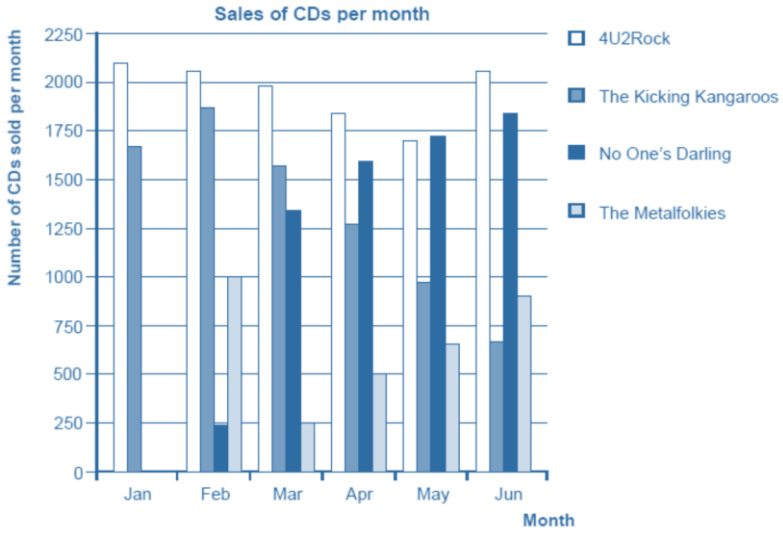
After obtaining data in the form of student self-efficacy questionnaire scores, the data was then analyzed based on the score range which refers to calculations from Sutanto (2016). Thus, the categories of student self-efficacy can be seen in the following table,

**Table 3.** Category of Self Efficacy

| Interval Score | Self Efficacy |
|---|---|
| $0 \leq x \leq 36$ | Low |
| $37 \leq x \leq 72$ | High |

From the results of categorizing students' self-efficacy levels, three students were taken with the lowest total self-efficacy questionnaire scores and three students with the highest total self-efficacy scores. If it is found that students with scores that meet the category exceed the needs, then the homeroom teacher's consideration will be asked regarding the selection of students by considering the students' self-efficacy during the learning process in class.

As for the test of data and uncertainty problems given to six students who have been selected. Here is an example along with alternative solutions,




**Problems**
How many CDs have the band The Metalfolkies sold in April?
A. 250
B. 500
C. 1000
D. 1270
Answer: B. 500

**Figure 2**. Chart of CD's Sales (Source: Delima et al, 2022)

When one of the alternative solutions to the problem described above is explained as follows: Known: The diagram above is a diagram showing the number of sales of CDs from 4 music groups namely 4U2Rock which is represented in white, The Kicking Kangaroon is represented in light blue, No One's Darling is represented in blue old, and The Metalfolkies are represented in a faint blue from January to June. (Identifying Information). Wanted: How many CDs of the band The Metalfolkies have been sold in April? Answered: Defines

a chart on the colors that represent the band The Metalfolkies in April. It is found that the diagram has a height that is parallel to the number 500 on the side which represents the sale of CDs (Designing Strategies). So the answer is B, which is 500 CDs sold (Interpreting and Making a Decision)

Furthermore, the results of student work are analyzed with numeracy indicators that have been translated into several sub-indicators. The following is the coding of each sub-indicator,

**Table 4.** Numeracy's Sub-Indicator Coding

| Numeracy | Numeracy's Sub-Indicator | Sub-Indicator Coding |
|---|---|---|
| Formulate | Modeling the information obtained from the problem into a mathematical form (with numbers and mathematical symbols or other forms of modeling) | FP1 |
| | Design a strategy to solve the problem | FP2 |
| Employ/Apply | Using the concept of data processing in mathematics. | EP1 |
| | Interpret the results in the context of the problem. | EP2 |
| Interpret | Identify the overall information presented. | IP1 |

Interviews are used to find out more specifically about the results of student work, the level of student confidence and the reasons students choose or not choose a step. This interview was also used to find more in-depth information about the numeracy abilities of students who have different levels of self-efficacy. The interviews were conducted in a semi-structured manner using interview guidelines which could be improvised according to the conditions during which the interview took place. Interviews were also recorded using an audio recorder to make it easier to analyze the results of the interviews and no information was missed. Analysis of the interview data (in the form of recordings from an audio recorder) was carried out using the analysis technique of (Miles & Huberman, 1992)) consisting of data reduction, data presentation, and drawing conclusions. In this study using triangulation of data sources. Triangulation of data sources is a technique as an effort to prove the data obtained using a variety of relevant data sources. The first data source is the result of student work on the given numeracy questions and the second data source is interviews with students with the aim of validating and deepening the information presented on the answer sheet for the numeracy questions.

## RESULT AND DISCUSSION

On May 2, 2023, a self-efficacy questionnaire on numeracy was distributed again to 18 female students from class VIIIB for 20 minutes. Selection of students with female gender is used as a control variable. From self-efficacy questionnaire scores on student numeracy obtained, students are then categorized based on high or low self-efficacy. The results of the student self-efficacy questionnaire are presented in Table 5 below,

**Table 5**. Categorization of Student Self-Efficacy

| Score | Number of Students | Categories of Self-Efficacy Against Numeracy |
|---|---|---|
| 0 – 36 | 8 | Low |
| 37 – 72 | 10 | High |

Table 5 above shows that as many as 8 (44%) students fall into the category of low self-efficacy with the lowest score obtained by students is 20 and the highest score obtained by students is 34 and the average student score is 26. There are 10 (56) %) students are included in the high self-efficacy category with the lowest score obtained by students is 37 and the highest score obtained by students is 50 and the average student score is 42. Based on Table 5 and predetermined criteria, three students with self-efficacy for high numeracy and three students with low self-efficacy for numeracy. Three students in the high self-efficacy category had the highest scores and three students in the low self-efficacy category had the lowest scores, resulting in extreme differences between the two self-efficacy categories. The subject coding is presented in Table 6 below:

**Table 6**. Selected Subject Coding

| Subject Initials | Category of Self-Efficacy | Code | Obtaining Self-Efficacy Questionnaire Scores |
|---|---|---|---|
| NAW | High | SET1 | 57 |
| JDN | High | SET2 | 56 |
| AAI | High | SET3 | 54 |
| WCD | Low | SER1 | 24 |
| SNT | Low | SER2 | 22 |
| RAP | Low | SER3 | 20 |

On May 4, 2023, the six subjects took the 90-minute numeracy test, after which they continued with the next activity, namely interviews. The following is example of the numeracy tests and interviews results that have been coded for the numeracy sub-indicators carried out by students. And this is the example of student with high self-efficacy,

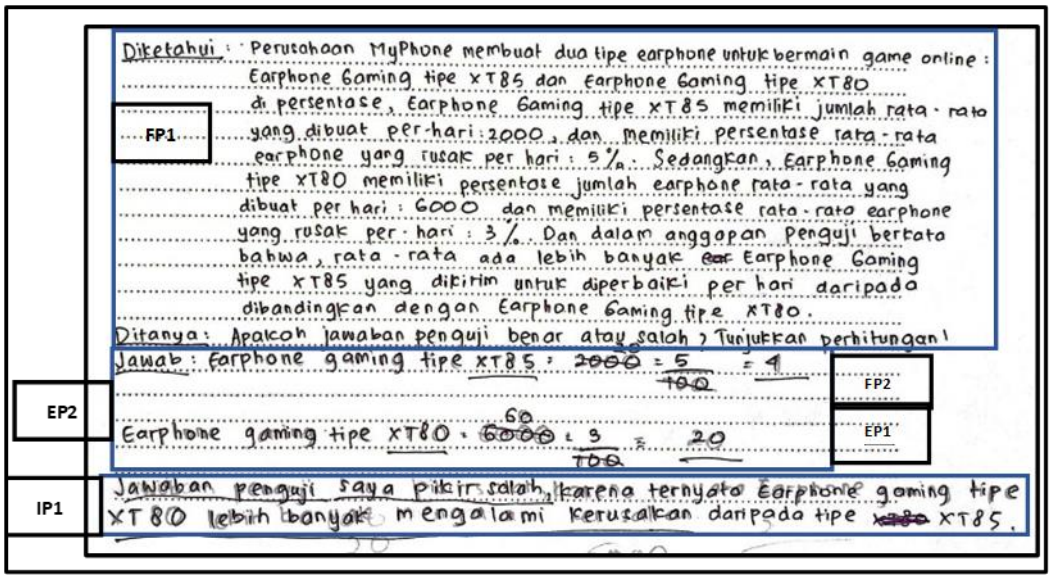



**Figure 2.** Test Answers from SET

Transcript from SET Interview:

*P : Pada soal pertama kamu diminta mencari apa?*
*SET2 : (Bepikir) Diminta memilih yang benar atau yang salahnya. (FP1)*
*P : Lalu kamu memilih yang mana?*
*SET2 : Salah.*
*P : Karena apa?*

*SET2 : Karena tidak sesuai dengan pernyataannya penguji dimana dari perhitungannya saya temukan lebih tinggi XT80. Jadi anggapan penguji tersebut salah. (IP1)*
*P : Kamu yakin?*
*SET2 : Yakin.*

From the results of the students' work above, on the numeracy indicator of understanding the problems presented in various forms it can be seen that based on Figure 2 SET is able to identify all the information presented (FP1) in the table which includes the number of earphones produced for each type and the percentage of damage from each type of earphones by describing the information in the form of paragraphs. In addition, SET is able to identify the main problems that must be solved in the problem correctly. From Figure 2 it is known that SET is able to model the information obtained from the problem into a mathematical form (FP2). SET makes a mathematical model of a given problem by writing numbers and symbols correctly and completely based on their understanding of the problem.

The numeracy indicators use various mathematical concepts to solve problems, based on Figure 2, SET is able to design strategies to find solutions to given problems (EP1). SET determines the number of defective earphones of each type. Then, from the results obtained, the type with the most number of broken earphones was determined and the type with the less number of broken earphones. However, SET is not able to use the data processing concept (EP2) properly. SET erroneously found the number of defective earphones of each type of SET using the division operation. In addition, the determination of the number of damaged earphones of each type was divided by the percentage of damaged earphones of each type and the division operation was carried out inaccurately. Based on this it is known that SET is not able to use data processing concepts in mathematics (EP2).

In the indicators of interpreting the results and making decisions from the problems presented in Figure 2 it is shown that SET is able to interpret the results in the context of the problem (IP1). SET makes a connection from the final solution obtained with the initial context which is the main problem that must be solved in the problem correctly. And this is the example of student with low self-efficacy,

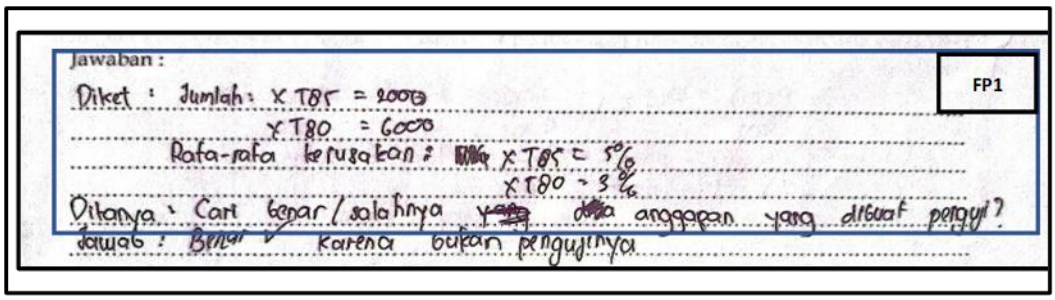



**Figure 1**. Test Answers from SER

Transcript from SET Interview:

*P : Inikan kamu menjawab benar. Kenapa menjawab benar?*
*SER3 : Karena saya tidak tau, saya bukan pengujinya.*
*P : Berarti ini ngasal?*
*SER3 : Iya*
*P : Apakah kamu yakin bahwa jawaban kamu ini benar?*

*SER3 : Mungkin.*

From the results of the students' work above, on the numeracy indicator of understanding the problems presented in various forms, it can be seen from Figure 3, that SER is able to identify all the information presented (FP1) in the table which includes the number of earphones produced for each type and the percentage of damage for each type of earphones. In addition, SER was able to identify the main problems that must be solved in the problem correctly. SER was unable to make a mathematical model of the given problem by writing numbers and symbols correctly and completely based on his understanding of the problem.

In the numeracy indicators using various mathematical concepts to solve problems, based on Figure 3 it is known that SER is not able to design strategies to find solutions to the problems given (EP1). In addition, SER is also unable to use the concept of data processing in mathematics (EP2) to determine the solution to a given problem. On picture

In the indicators interpreting the results and making decisions from the problems presented with the sub-indicators interpreting the results in the context of the problem (IP1), from Figure 3 it is shown that SER is not able to interpret the results in the context of the problem (IP1) in a given problem.

Student numeracy is related to self-efficacy. Students with high self-efficacy have good numeracy in solving a given problem. The student is able to fulfill all numeracy indicators. And conversely, students with low self-efficacy will tend to be less able to fulfill all of the numeracy indicators, even unable to fulfill them at all. Based on the research process that has been carried out, in general it shows that the numeracy of students with high self-efficacy in solving data problems and uncertainties, is detailed as follows,

**Table 7.** Data Summary of Students with High Self-Efficacy

| Subject's Coding | Question Number | Numeracy Sub-Indicator Code | | | | |
|---|---|---|---|---|---|---|
| | | FP1 | FP2 | EP1 | EP2 | IP1 |
| **SET1** | **1** | √ | √ | √ | √ | √ |
| | **2** | √ | √ | √ | √ | √ |
| | **3** | √ | **-** | √ | **-** | √ |
| **SET2** | **1** | √ | √ | √ | √ | √ |
| | **2** | √ | √ | √ | √ | √ |
| | **3** | √ | √ | √ | √ | √ |
| **SET3** | **1** | √ | √ | √ | √ | √ |
| | **2** | √ | √ | √ | √ | √ |
| | **3** | √ | √ | √ | √ | **-** |

From the Table 7, it is shown that in solving numeracy problems with data problems and uncertainties numbers 1, 2 and 3, both SET1, SET2 and SET3 are able to identify all statistical information presented in the problem (FP1) both in tables and in graphs/bar

charts and able to identify the main problems that must be solved in the problem correctly. SET1 and SET2 on the three questions given were able to model the information obtained from the problems into mathematical form (FP2) in most of the problems given involving numbers and symbols in mathematics. However, SET3 on number 3 is unable to model the information obtained from the problem into a mathematical form (FP2) involving numbers and symbols in mathematics. Problem 3 focuses on using a bar chart and estimating the number of albums sold in the future assuming that the linear trend continues. Because answers can be observed directly/made from assumptions and without calculations from a given chart, SET3 is able to find the final solution correctly even though it doesn't create a mathematical model.

In the numeracy indicator using various mathematical concepts to solve problems on the three questions given, both SET1, SET2 and SET3 are able to design strategies to find solutions to problems (EP1) and SET1 and SET2 are able to use data processing concepts in mathematics (EP2) correctly. All three of them use to create a strategy by utilizing statistical information obtained from the chart provided. Then SET2 and SET2 use the concept of operations on basic mathematics such as multiplication, addition and subtraction to get a value that becomes the solution to the given problem. However, SET3 in solving problem number 3 did not carry out the process of using the concept of operations on basic mathematics, but was able to find the final result correctly. In the indicator of interpreting the results and making decisions from all the questions given, both SET1, SET2 and SET3 are able to interpret the results in the context that is the problem (IP1) namely by making a connection from the final solution obtained with the initial context which is the main problem.

Students with high self-efficacy fulfill self-efficacy indicators on the numeracy specified from the dimensions of self-efficacy: level of difficulty (magnitude), generality (generality), strength (strength) from Bandura (1997). They want to work on numeracy questions from easy to difficult, persevere and be tenacious while working on it as shown by the maximum duration of work (90 minutes), consistency in the work process and the answers given are shown by the suitability of the answers written with the results of the interviews. They also have a positive attitude towards math problems related to events in daily life given, shown by going through each process carefully and making maximum efforts to solve each given problem. This is in accordance with the attitudes of students with high self-efficacy as conveyed in the research by Permana et al. (2017)Students with high self-efficacy tend to choose to be directly involved in doing a task; tend to do certain tasks, as well as tasks that are considered difficult; persistent in trying; believe in your own abilities.

In general, it shows that the numeracy of students with low self-efficacy in solving data problems and uncertainties, is detailed as follows,

**Table 8**. Data Summary of Students with Low Self-Efficacy

| Subject's Coding | Question Number | Numeracy Sub-Indicator Code | | | | |
|---|---|---|---|---|---|---|
| | | FP1 | FP2 | EP1 | EP2 | IP1 |
| SER1 | 1 | √ | - | - | - | - |
| | 2 | √ | - | √ | √ | √ |
| | 3 | √ | - | √ | - | - |
| SER2 | 1 | √ | - | - | - | - |
| | 2 | - | - | √ | - | - |
| | 3 | √ | - | - | - | - |
| SER3 | 1 | √ | - | - | - | - |
| | 2 | √ | √ | √ | √ | - |
| | 3 | √ | - | - | √ | - |

From the Table 8, it is shown that in solving numeracy problems with data problems and uncertainties numbers 1, 2 and 3, both SER1 and SER3 were able to identify almost all of the statistical information presented in the problem (FP1) both in tables and in graphs/bar charts and were able to identify the main problem that must be solved in the problem correctly. SER2 was only able to identify almost all of the statistical information presented in question (FP1) in question numbers 1 and 3 only. SER1 and SER2 on the three questions given did not model the information obtained from the problems into a mathematical form (FP2) involving numbers and symbols in mathematics. Only SER3 on number 2 does modeling of information obtained from problems into mathematical form (FP2) by involving numbers and symbols in mathematics. In questions number 1 and 3, SER3 did not model the information obtained from the problem into a mathematical form.

The numeracy indicators use various mathematical concepts to solve problems, both SER1, SER2 and SER3 do not design strategies to find solutions to problems (EP1) for all the questions given. Only SER1 in number 2 and 3 and SER2 and SER3 in number 2 designed a strategy to find a solution to the problem (EP1) in all the questions given. In the numeracy sub-indicator using the concept of data processing (EP2), SER1, SER2 and SER3 did not carry out the process of using the concept of operations on basic mathematics in all the questions given. Only SER1 in numbers 2 and 3 and SER3 in number 2 carried out the process of using the concept of operations in basic mathematics in all the questions given. All three of them use to create a strategy by utilizing statistical information obtained from the chart provided. Then use the concept of operations on basic mathematics such as addition and subtraction to get a value that becomes the solution to the given problem.

In the indicator of interpreting the results and making decisions from all the questions given, neither SER2 nor SER3 carried out the process of interpreting the results in the context of the problem (IP1). Only SER1 in question number 2 carried out the process of interpreting the results in the context that was the problem, namely by making a connection from the final solution obtained with the initial context which was the main problem. And in

questions number 1 and 3 SER1 did not carry out the process of interpreting the results in the context that is the problem.

The large number of unachieved numeracy sub-indicators is because students with low self-efficacy tend to only want to work on numeracy questions that they find easy, less persistent and less tenacious during work as indicated by the duration of the work which is not used optimally (30 minutes instead of 90 minutes. They also does not have a positive attitude towards the numeracy given, is shown to be reluctant to solve questions, gives answers by guessing (without going through the calculation process) This is in accordance with the attitude of students with low self-efficacy conveyed by Permana et al (2017).Students with low self-efficacy have the following characteristics tend to avoid assignments; doubt about their abilities; weak aspirations and commitment to tasks; don't think about how to deal with problems (Permana et al., 2017).

The results of this study are consistent with research conducted by Nurtiana & Adirakasiwi (2022) which shows that students with high self-efficacy in working on numeracy questions, go through the process of analyzing information and understanding the questions, modeling problems by writing numbers and symbols, using the right concepts. in solving problems, as well as doing calculations, writing and explaining the conclusions from the results obtained correctly and precisely. And for students with low self-efficacy in solving numeracy problems, students cannot analyze information, cannot model problems, cannot use concepts correctly in solving problems, and are unable to explain conclusions from the results. In addition, the results of this study are also in line with the research of Salsabilah & Kurniasih (2022) which shows that students with high self-efficacy in solving numeracy problems can go through the process of understanding problems, modeling problems, using concepts in solving problems, and interpreting them in the initial context of given problem. And for students with low self-efficacy in working on numeracy problems, they can understand the process of the problem, but are unable to make a mathematical model of the problem, are unable to use concepts in dealing with problems, and are unable to interpret the results in the initial context. Research from Geraldine & Wijayanti (2022) also shows results that are in accordance with the results of this study, namely students with high self-efficacy can collect important information in problems, can change problems into appropriate mathematical language, can design and use strategies to get solutions to problems by using the required mathematical concepts, applying the algorithm during the process of finding the right solution. And for that students with low self-efficacy in working on numeracy literacy questions can obtain useful information for finding complete solutions along with what is asked in the problem, unable to transform problems into appropriate mathematical forms, unable to design and use strategies to find solutions from problems using mathematical concepts, and not being able to apply facts, rules, during the process of finding the right solution.

## CONCLUSION AND SUGGESTIONS

Based on the results of the research and discussion that has been done, student numeracy in solving data problems and uncertainties in questions equivalent to AKM numeracy on the topic of percentages (comparisons) with the cognitive level of interpreting and formulating, and using shows that students with high self-efficacy have a greater tendency to do the process of identifying all the information presented in the problem by mentioning statistical information involving uncertainty on the displayed chart, modeling/formulating important information obtained by involving numbers and basic mathematical symbols, making strategy designs using statistical information related to comparisons and patterns of displayed numbers on the chart and process it using data processing concepts in mathematics such as multiplication, addition, subtraction and division operations. After getting the final score from the statistical information processing process carried out, students interpret the results in the initial context asked in the problem. However, in questions with a cognitive level using there is a slight tendency for students with high self-efficacy not to carry out the whole process of numeracy sub-indicators such as modeling/formulating important information obtained by involving basic mathematical numbers and symbols and using data processing concepts in mathematics such as multiplication operations, addition, subtraction and division, as well as interpreting the results in the initial context asked in the problem.

Numerical students with low self-efficacy in solving questions equivalent to AKM numeracy on data problems and uncertainty in socio-cultural contexts with cognitive levels interpreting, using and formulating tends to only carry out the process of identifying all the information presented in the problem by mentioning statistical information that involves uncertainty in the displayed chart. In the following numeracy sub-indicators, it tends not to do so. Among them are not designing strategies to find solutions to given data and uncertainty problems, not modeling information obtained from tables, graphs, and the results of estimated values on diagrams into mathematical form and not using data processing concepts in mathematics such as finding the original value. of a data presented in the form of a percentage. And even though they have obtained a solution to the problem, most students with low self-efficacy also tend to be unable to interpret the results in the context of the data problem and the uncertainty being asked. However, in questions with the cognitive level of formulating and using there is a slight tendency for students with low self-efficacy to design strategies using statistical information displayed on charts and process them using data processing concepts in mathematics such as multiplication, addition, subtraction and division operations.

Based on the results obtained in this study which showed a significant difference in the numeracy of students with high self-efficacy and the numeracy of students with low self-efficacy. Students with high self-efficacy can fulfill the five sub-indicators of the numeracy indicators used in this study, while students with low self-efficacy can only fulfill one sub-indicator of the numeracy indicators used. The teacher as a party directly related to students should create a learning climate that can support increased student self-efficacy in the hope

that it can also have a positive influence on student numeracy. Among them, namely by setting achievement targets that can be achieved by students, creating a pleasant learning atmosphere and providing motivation and support to students.

In addition, due to the limitations in this study, it is hoped that future researchers can use the results of this study as a reference for broader studies by linking self-efficacy and numeracy to other topics according to developments and needs in the world of education.

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