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STUDENTS' PROPORTIONAL REASONING IN SOLVING PISA PROBLEMS ON QUANTITY CONTENT: AN ANALYSIS FROM THE PERSPECTIVE OF MATHEMATICAL SELF-EFFICACY

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ABSTRACT

One of the abilities that students need to develop is proportional thinking. Mathematical problems and real-world situations involving the connection between numbers and comparisons need students to use their reasoning skills to reach conclusions. The purpose of this study is to characterize, in terms of self-efficacy, students' proportional reasoning skills when addressing quantity content PISA questions. The self-efficacy questionnaire, PISA questions on quantitative content, interview instructions, and documentation are among the instruments used in this descriptive qualitative study. The study's findings demonstrate that students with low self-efficacy struggle to meet proportional reasoning requirements, contemplate difficulties, and give up quickly out of fear of failing, Pupils rely on guesswork to solve issues instead than attempting to come up with novel solutions. Students with moderate self-efficacy can identify proportional quantities in problems and understand them, but they are not yet able to convert quantities into other forms. They can also use the appropriate strategy but are still hesitant and make mistakes when calculating. Students with moderate self-efficacy are eager to work on problems, but they give up easily when faced with challenging ones. However, despite their continued self-doubt, students continue to look for answers. Despite their restricted talents, students who possess strong self-efficacy are able to meet proportional reasoning markers. Students who have high self efficacy tend to have motivation, high enthusiasm and have confidence in their abilities, students will try to find new ideas to solve problems.
Keywords: Proportional Reasoning, PISA Problem, Quantity, Self-Efficacy

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PRELIMINARY

All educational levels teach mathematics, one of the foundational topics that is abstract and full of formulae and notions. Even though math is seen as being tough by students, it actually plays a vital part in life and involves a variety of issues. As stated (Setyaningsih et al., 2019), students need math skills, both in academic contexts and in real life. For this reason, the skills of thinking objectively, creatively, logically and organized are very important. This skill enables people to gather, organize, and use information to

address issues in their daily lives as well as while seeking answers to various issues. Therefore, reasoning is the key to solving various mathematical problems effectively.

The second objective of learning mathematics, as emphasized by (Depdiknas, 2006) is "Using mathematical operations to make generalizations, assembling data, or elucidating mathematical concepts and assertions are examples of applying reasoning to patterns and properties". This shows that reasoning is essential in learning mathematics. Research by Sukirwan et al. (2018) and Cabero-Fayos et al. (2020) indicates that one of the most crucial mathematical skills in education is reasoning. particularly proportional thinking, which is a cornerstone of mathematical education. (Cabero-Fayos et al., 2020). In addition, described in Depdiknas (2006), states that mathematics and reasoning are two things that cannot be separated, because solving math problems requires reasoning and reasoning is built in mathematics learning. One of the reasoning skills that students must have is proportional reasoning. In the context of mathematics learning, proportional reasoning is one of the main skills that students must master to understand and solve both mathematical problems and real-life problems involving number and comparison relationships in which solving them requires students' reasoning ability to formulate conclusions. In line with the findings (Sari & Mampouw, 2019) that proportional reasoning is often required for various problems in real life. However, research conducted by (Vebrian et al., 2021) shows that students' reasoning skills are still relatively low in solving mathematical contextual problems. Lack of understanding of the problem is the cause of students in finding answers (Muhalimah et al., 2023).

An initiative run by the Organization for Economic Cooperation and Development (OECD) every three years is called PISA (Programme for International Student Assessment) on 15-year-old students to assess the extent to which they acquire knowledge and skills at the international level that are of key importance in modern society. The assessment focuses on the subjects of reading, math and science (Ward, 2018). According to (OECD, 2019a), PISA questions cover three dimensions: content, context and process. Indonesia has participated in the PISA test since it was first held in 2000. 2018 was the 7th test that Indonesia participated in (OECD, 2019b). PISA 2018 was the most recent round, with 79 countries participating. Indonesian students performed 73rd out of 500 international students in the mathematics domain, with an average score of 379 in Indonesia (Hewi & Shaleh, 2020). These findings indicate that Indonesian students' proficiency in answering PISA questions is still on the low side. Students' poor proportional reasoning skills are one of the elements behind this poor outcome.

One of the important factors in solving PISA tests with reasoning is the level of ability related to attitudes and values in the form of belief / self efficacy that the conclusion / answer chosen is the right answer. According to (Fadhila & Kurniasari, 2023), self efficacy can affect students in solving math problems. In line with the opinion (Hadiat & Karyati, 2019), the level of belief plays an important role in the success of learning mathematics because it has an influence on mathematical reasoning ability. Self-efficacy is closely related to the belief in their abilities and has a positive influence on proportional reasoning. pupils with high self-efficacy outperform those with low self-efficacy because they have more self-belief in their talents, which can boost motivation. Self-efficacy has an impact on how well pupils learn so that they are not easily discouraged (Indirwan et al., 2021). The capacity to solve mathematical problems increases with self-efficacy. On the other hand, a student's aptitude for mathematics decreases with decreasing levels of self-efficacy. So that self efficacy has a relationship with math learning ability (Muhtadi et al., 2022). Self-efficacy has a key role in using reasoning to answer PISA assessments. Students who have high confidence are more able to solve math problems and reach the right conclusions because self efficacy increases students' motivation, perseverance, and enthusiasm when facing challenging math problems.

In a study conducted by khusnul (2000), it was mentioned that reasoning and self-efficacy have a significant influence on student learning outcomes. therefore, this study focuses on students' self-efficacy and their ability to use proportional reasoning when answering PISA questions on quantity content. thus, the purpose of this study is to provide an overview of how participants' level of self-efficacy can affect their capacity to face various challenges in the real world.

METHODS

This research uses a descriptive method with a qualitative approach to describe students' proportional reasoning ability in working on PISA questions on quantity content in terms of self efficacy. Qualitative descriptive research presents the data as it is which aims to provide a complete picture of an event by describing several variables related to the problem under study (Rusandi & Rusli, 2021). A well-defined procedure is the first step in descriptive research using a qualitative method so that inferences may be made from the event (Yuliani, 2018). At SMP Muhammadiyah 5 Surakarta, 23 students of grade VIII were used as the subjects of this study. Self-efficacy survey, PISA questions on quantity content, semi-structured interviews, and documentation were used in the data

collection methods of this study. The interactive model data analysis methods included data reduction, data presentation, and conclusion drawing.

The self-efficacy questionnaire consists of 30 questions divided into 19 positive questions and 11 negative questions with the indicators used are level, strength, and generality to measure students' subjective self-efficacy perceptions, so it does not require validation and is used to divide low, medium, and high self-efficacy categories. PISA written test questions on quantity content were taken from the 2012 PISA questions so no prior validation was required. The test questions to measure students' proportional reasoning consisted of 2 questions as follows.

1. *Usually, a pair of penguins produces two eggs each year. The only egg to survive is the largest of the two. The first egg of a rockhopper penguin weighs roughly 78g, while the second egg weighs 110g. What proportion of the time does the second egg usually weigh more than the first?*
2. *One of the advantages of The benefit of employing a kite sail is that it may soar up to 150 meters. The wind speed is about 25% higher there than it is below deck. At what approximate speed is the wind blowing into the kite sail when a wind speed of 24 km/h is measured on the deck of the ship?*

The self-efficacy questionnaire results are analyzed in this study to determine which students fall into the low, medium and high self-efficacy groups. Additionally, the results of the written PISA test on student quantity content are analyzed. The Researchers divided the self-efficacy categories using a Likert scale where each question had a minimum score of 1 and a maximum score of 5. So that students could get the lowest score of 30 and the maximum score of 150. Then, using a hypothetical score, the students' self-efficacy is categorized. The results of student categories based on self efficacy obtained grouping guidelines according to table 1.

Table 1. Self-efficacy categories

Interval Value	Category
$x < 70$	Low
$70 \leq x < 110$	Medium
$x \geq 110$	High

RESULT AND DISCUSSION

This research was conducted on students of class VIII-D at SMP Muhammadiyah 5 Surakarta by giving questionnaires and PISA test questions on quantity content. Based on

the results of distributing the self efficacy questionnaire, the level of self efficacy of students in class VIII-D was obtained as follows.

Table 2. Results of the distribution of self efficacy questionnaire

***Self Efficacy* Level**	**Number of Student**
Low	5
Medium	12
High	6
Total	23

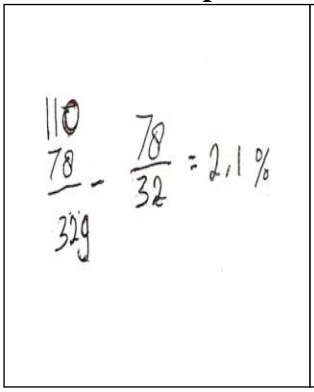
Based on the results of distributing self efficacy questionnaires, there are 5 students who have low self efficacy, 12 students have medium self efficacy and 6 students who have high self efficacy. Three students were selected as research subjects with one student representing the low, medium, and high self-efficacy categories. The selection of subjects was based on the highest score in each category obtained from the results of distributing the self-efficacy questionnaire. The selected research subjects are presented in table 3.

Table 3. Selected Research Subjects

Subject	***Self Efficacy* Level**	**Subject Code**
J	Low	S1
KLD	Medium	S2
OPN	High	S3

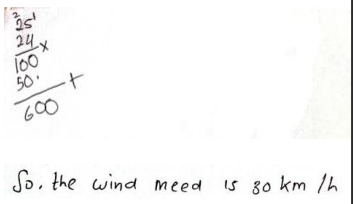
After being given a self efficacy questionnaire, students were then given PISA questions on quantity content to measure proportional reasoning ability. Then the subjects were interviewed one by one to get more and clearer data. In this study, we analyzed students' proportional reasoning ability in working on quantity content PISA problems by considering students' self efficacy. The following are the results of the analysis of student tests and interviews to measure students' reasoning skills in working on PISA quantity content questions in terms of self efficacy.

Results of Proportional Reasoning Analysis of Low Self Efficacy Students



P : "Do you understand the problem?"
S1 : "I don't know."
P : "What information do you get from the problem?"
S1 : "The weight of the egg"
P : "Then how do you solve the problem?"
S1 : "I put everything known in the problem, but I'm confused about how to calculate it."
P : "Okay, can you explain the answer you wrote?"
S1 : "....."
P : "Then how did you get this answer?"
S1 : "Just guess, because I'm confused"
P : "Are you sure about your answer?"
S1 : "No, I'm confused"

Figure 1. Answer and Interview Result Number 1 Subject S1



P	: "Do you understand the problem?"
S1	: "No idea sis"
P	: "What information did you get from the problem?"
S1	: "....."
P	: "Okay, then how do you solve the problem?"
S1	: "Multiplied"
P	: "Can you explain the answer you wrote?"
S1	: "...."
P	: Okay, then how did you get this answer?"
S1	: "Just guessing, I don't know"
P	: Okay, are you sure about your answer?"
S1	: "No, I don't know how"

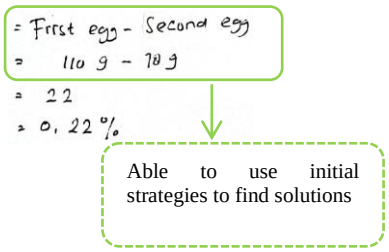
Figure 2. Answer and Interview Result Number 2 Subject S1

In the indicator of identifying proportional quantities based on Figure 1 and Figure 2 S1 cannot identify the proportional quantities used to find solutions because S1 does not understand the problem in the problem even though S1 is able to find important information in the problem. In the indicator of converting proportions into different forms S1 also cannot do it, based on Figure 1 S1 directly answers in percentage form without knowing the results of division and how to convert to percentage form, while based on Figure 2 S1 cannot convert percentages into numbers because S1 multiplies wind speed in percentage form without being converted into a number with wind speed with units of meters. In the indicator of choosing and using the right strategy to solve the problem, S1 cannot choose and use the right strategy to solve the problem, in Figure 1 S1 only subtracts and divides the data in no structured order, so S1 cannot find the correct solution and only guesses directly in percentage form. While from Figure 2 S1 only multiplies the percentage of wind speed by wind speed with units of kilometers, but does not change the percentage so it is difficult to find the right solution. In the indicator of checking the solution, S1 also did not double-check the solution and the results of his calculations because S1 did not understand the problem so S1 could not use the right operation and had difficulty when calculating. In the indicator of explaining the solution, based on the interview results from Figure 1 and Figure 2, S1 could not explain where to get the way to solve the problem because S1 wrote and obtained the final result by guessing so that S1 could not fulfill the indicator of providing evidence to support the solution.

Thus, it can be concluded that in general, the proportional reasoning of students with low self efficacy in solving PISA questions on quantity content is as follows: ability to understand proportional relationships with indicators of identifying proportional quantities, students can find the information listed in the problem but cannot identify proportional quantities, in converting proportional quantities into different forms, students

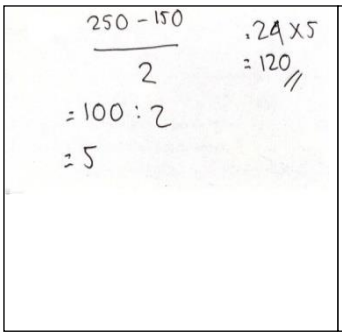
have not been able to convert numbers into different forms because they do not understand the concept. The ability to use the right strategy, students cannot fulfill the indicators of choosing and using strategies because students do not understand the problem in the problem, on the indicator of re-examining the solution, students cannot do it because students only guess the answer. In the ability to explain the solution, students are unable to explain the steps used to find the final answer, besides that students get the final answer by guessing so that students cannot fulfill the indicators of explaining the steps of completion and providing evidence that supports the solution.

Results of Proportional Reasoning Analysis of Medium Self-Efficacy Students



P : "Do you understand the problem?"
S2 : "Understand, looking for the percentage of eggs"
P : "What information do you get from the problem?"
S2 : "Weight of the egg"
P : "How did you solve the problem?"
S2 : "First, find the difference between the two eggs, then convert the result into a percentage"
P : "Are you sure about your answer?"
S2 : "(pauses to look at her work) No, because there was a calculation error and I forgot how to convert it into percentage form, then if I'm not mistaken this (the difference result) is divided by the weight of the first egg. But I wasn't sure about that method, so I worked on it until I found the difference and then I converted it into percentage form."

Figure 3. Answer and Interview Result Number 1 Subject S2



P : "Do you understand the problem?"
S2 : "I understand, finding the wind speed"
P : "What information do you get from the problem?"
S2 : "Wind speed and altitude"
P : "Then how do you solve the problem?"
S2 : "I don't know, I'm confused"
P : "Are you sure about your work?"
S2 : "No, sir"
P : "Why aren't you sure?"
S2 : "Because I don't know how to do it, and then there are calculation errors too"

Figure 4. Answer and Interview Result Number 2 Subject S2

On the indicator of identifying proportional quantities, based on Figure 3 and Figure 4 S2 can understand and find important information in the problem and can identify proportional quantities. However, based on Figure 4 S2 does not understand the relationship between the percentage and the meter unit because S2 converts the percentage into an integer and subtracts it from the height with the meter unit. In the indicator of converting proportions to different forms, S2 has not been able to convert a number into a percentage form, and vice versa S2 has also not been able to convert a percentage number into a number. In the indicator of choosing and using strategies based on Figure 3 S2 can choose the initial strategy but has not been able to use the right strategy to find a solution to the problem because there are errors in calculating and cannot solve correctly. While

Figure 4 S2 has not been able to choose and use the right strategy to find a solution. On the indicator of re-examining the solution, S2 did not re-examine the results of his answers can be seen based on Figure 3 and Figure 4 there are some mistakes in calculating because S2 is not careful. On the indicator of explaining the solution based on the interview results in Figure 3 S2 was able to explain the sequence of solutions in detail accompanied by giving the reasons even though it was not correct when working because of doubt. Meanwhile, based on the interview results in Figure 4 S2 has not been able to explain the steps of solving the problem because S2 does not know the right way to solve the problem. In the indicator of providing evidence that supports the solution, based on Figure 3 and Figure 4 students have not been able to solve the problem because students cannot provide supporting evidence.

Thus it can be concluded that in general, the proportional reasoning of students with moderate self efficacy in solving PISA questions on quantity content is as follows: Students' ability to understand proportional relationships with indicators of identifying proportional quantities, students cannot identify proportional quantities even though they are able to find important information in the problem, on indicators of converting proportions into different forms students have not been able to convert proportional quantities to different forms due to lack of understanding of the concept. The ability to use the right strategy with indicators of choosing and using strategies, students can choose the right initial strategy but have not been able to use it because they are not sure, in the indicator of re-checking the solution students do not re-check their answers so they cannot solve the problem. The ability to explain the solution, students are able to explain the correct solution steps even though students do not use the method because they are not sure.

Results of Proportional Reasoning Analysis of High Self Efficacy Students

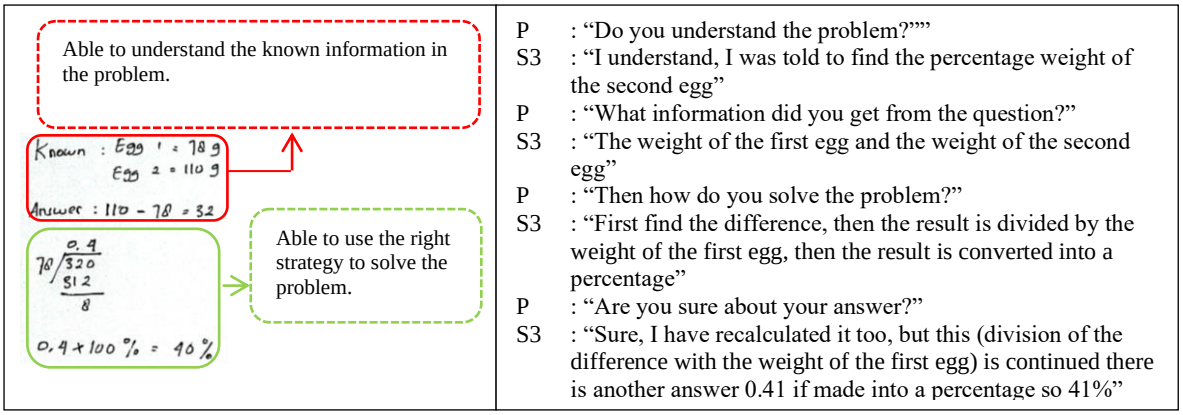
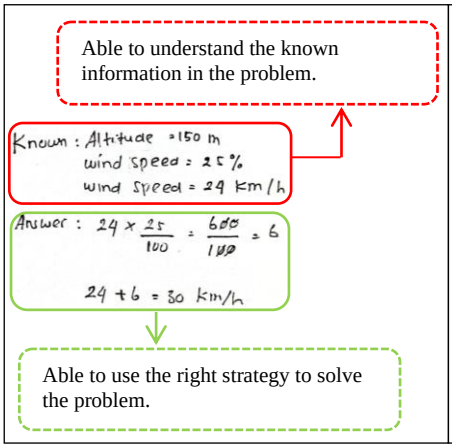


Figure 5. Answer and Interview Result Number 1 Subject S3



P : "Do you understand the problem?"
S3 : "Yes, sis"
P : "What information did you get from the question?"
S3 : "Altitude, percentage of wind speed and wind speed on the deck of the ship"
P : "Then how do you solve the problem?"
S3 : "To find the wind speed at a height of 150 m which is 25% faster than the wind speed on the deck of the ship so first find 25% of the wind speed on the deck of the ship then add it to the wind speed on the deck of the ship."
P : "Are you sure about your answer?"
S3 : "Sure sis,"
P : "How can you be sure of your answer?"
S3 : "Because I have looked for 25% of the speed on the deck of the ship and I have recalculated it"

Figure 6. Answer and Interview Result Number 2 Subject S3

In the indicator of identifying proportional quantities, based on Figure 5 and Figure 6 S3 can write down important information in the problem and identify proportional quantities, in the indicator of changing proportions, based on Figure 5 and Figure 6 S3 is able to convert a number into a percentage, and vice versa S3 is able to convert a percentage number into a number. On the indicators of choosing and using strategies based on Figure 5 and Figure 6 S3 can choose and use the right strategy even though it directly writes what is known in the problem without writing the formula, besides that S3 is also able to use the right mathematical operations and write down the steps even though the way to answer is still not so perfect. In Figure 5 S3 looks for the difference whose results are divided by the weight of the first egg then used as a percentage. While in Figure 6, S3 changed the wind speed in percentage form into fractions and multiplied the wind speed by kilometers which the results were then added to the known wind speed. On the indicator of rechecking the solution, S3 is able to double-check his answer by recalculating and believing the truth. On the indicator of explaining the solution based on the interview results in Figure 5 and Figure 6 S3 is able to explain the problem solving steps to solve. On the indicator of providing supporting evidence, based on Figure 5 S3 shows that there are other alternatives if the calculation is continued to obtain results more than one number behind the comma and S3 is able to prove by calculating it.

Thus, it can be concluded that in general, the proportional reasoning of students with high self efficacy in solving PISA questions on quantity content is as follows: Students' ability to understand proportional relationships with indicators of identifying proportional quantities students can identify proportional quantities and write them down, on indicators of converting proportions into different forms students can convert

proportions to different forms and understand the concept. The ability to use the right strategy on the indicator of choosing and using strategies, students are able to use the right strategy even though they did not plan the strategy to solve the problem carefully beforehand, on the indicator of checking back, students check by recalculating the final answer obtained even though the way to answer is still simple. The ability to explain the solution in the indicator of explaining the steps of completion, students are able to explain the steps used with their limited abilities, in the indicator of providing evidence that supports the solution, students are able to provide evidence if there are other answers by calculating.

Based on the research and analysis conducted, the general results obtained are that, the proportional reasoning ability of students with low self efficacy in solving PISA questions on quantity content, students cannot solve the problem properly and correctly because students lack understanding of the problem at hand. So that they cannot identify proportional quantities and cannot convert proportions into different forms. This can be caused by students' lack of understanding of proportional concepts and mathematical concepts so that students are only able to mention the information in the problem. Students are also unable to use the right strategy to solve the problem because they feel confused when determining the strategy to use. Students also stick to one known strategy and hesitate to try new strategies to solve problems that have never been done. The existence of student constraints when calculating also causes students to be able to solve problems. These obstacles can occur because students lack practice working on math problems related to arithmetic operations. As a result, students can only answer by guessing the answer they think is correct and cannot get the results of their work. This finding is in line with other research conducted by (Fadhila & Kurniasari, 2023) that students with low self efficacy are only able to mention known information. Students with low self efficacy in working on PISA questions on the content of change and relationship are only able to identify the mathematical aspects of the problem (Geraldine & Wijayanti, 2022). According to (Rahmadhani & Mariani, 2021), students with low self efficacy have not been able to solve and choose strategies in solving problems. In line with research conducted (Imaroh et al., 2021), students with low self efficacy have not been able to understand the problem, determine the right formula and do not re-examine the answers obtained. In research conducted (Niswah & Agoestanto, 2021) shows that students with low self efficacy tend to be less able to work on problems correctly and coherently and are unable to explain problem solving.

Students with low self-efficacy feel that the problem given is an impossible obstacle to overcome. This causes them to give up more easily when solving problems for fear of failure. students' unfamiliarity when facing complicated problems or have never been taught also exacerbates the situation, triggers demotivation, and inhibits trying new ideas in finding solutions. Previous research supports these findings, (Nurani et al., 2021) revealed that students with low self-efficacy give up more easily and do not want to work when facing difficult math problems. (Nuraeni & Kusuma, 2022) added that students with low self efficacy always feel worried, not enthusiastic and lazy to look for new ideas to solve problems and do not dare to explain math problems. (Abida & Setyaningsih, 2022) also found that students with low self efficacy will distance themselves from difficult problems and give up easily when solving problems.

The proportional reasoning ability of students with moderate self-efficacy in solving PISA questions on quantity content shows a good ability to understand the problem. Students are able to identify proportional quantities and important information in the problem. Students are also unable to convert proportional quantities to different forms due to lack of understanding of the concept of proportion. Students are able to use the right strategy to find solutions even though there are errors when calculating due to the lack of accuracy of students when solving problems. Students also do not re-examine the answers obtained when working so that students know where the wrong calculations are after they are collected. Even though they have not been able to get the right answer, students can explain the correct steps to find a solution which is the cause because students cannot interpret the results of the answers obtained so they are not sure of the method to be used. In accordance with research (Abida & Setyaningsih, 2022), students with moderate self efficacy do not write important information and what is asked in the problem. Research (Aziziyah et al., 2022), students with moderate self-confidence have difficulty solving problems and understanding the strategies used, so they find it difficult to work on problems.

Students with moderate self-efficacy can be seen to show enthusiasm that ebbs and flows in working on problems. The enthusiasm increases when faced with familiar problems, but tends to decrease when faced with unfamiliar problems and experiencing difficulties. Nevertheless, students still try to solve the problem at hand. Students have sufficient confidence in their abilities, but students sometimes still hesitate when faced with tasks. In line with the findings (‘Aini, 2020), students with moderate self efficacy do not give up easily when doing tasks, but if the task cannot be completed students will give

up. Students who have moderate self efficacy have doubts about their abilities so that they cannot solve the problems they are facing (Nurani et al., 2021). (Rahmadhani & Mariani, 2021) found that students with moderate self efficacy have confidence in completing various tasks, but if they are in an unusual situation students feel hesitant and lack confidence.

The ability of students with high self efficacy in solving PISA questions on quantity content is able to solve the problem well. Students are able to understand the problem at hand. Students are able to identify important information, understand the keywords in the problem and the proportional amount needed to find a solution. Students also have adaptive skills in converting information to different forms. Another advantage is that students are able to use and apply appropriate strategies and are able to use appropriate mathematical operations, but students have not been able to write the design of the solution steps coherently. Students double-check their answers by recalculating. Students are also able to explain and provide evidence for the answers obtained and are able to explain if there may be other answers besides those obtained. In accordance with research (Abida & Setyaningsih, 2022),that students with high self efficacy are able to communicate and collect important information, are able to convert information into mathematical language, plan strategies and can explain the completion steps coherently and are able to provide evidence and explain the conclusions obtained. This is also supported by research conducted by (Geraldine & Wijayanti, 2022), that students with high self efficacy in working on PISA questions on the content of change and relationship are able to collect important information, convert problems into appropriate mathematical language, design and use strategies, explain the results of the solution obtained and are able to re-correct and explain the answers obtained make sense. (Fadhila & Kurniasari, 2023) in their research students with high self efficacy are able to find information and what is asked, able to connect the problems at hand, able to carry out and re-examine the solutions obtained. In line with this research (Rahmadhani & Mariani, 2021) revealed that students with high self efficacy are able to complete tasks and are able to understand and choose strategies.

Students with high self-efficacy have motivation, enthusiasm in facing challenges and confidence in their abilities and are not afraid of failure. Curiosity and enthusiasm encourage them to practice and look for new ideas to find solutions to the problems at hand without sticking to one way when doing new work even though their abilities are still limited. As proven by (Nurani et al., 2021), students with high self-efficacy are able to solve problems because students do not give up easily and have confidence in their

abilities. Then (Rahmadhani & Mariani, 2021)revealed that students with high self efficacy are able to persist and believe when facing tasks and challenges and have the confidence to complete different tasks. students who have high self efficacy have high commitment, always try, do not give up easily, are optimistic, and dare to take risks (Indirwan et al., 2021).

The proportional reasoning ability of VIII grade students in working on PISA questions on quantity content is quite good. This is based on their ability to understand proportional problems, determine the right strategy, and implement the strategy well. However, there are still many students who have not been able to utilize their reasoning skills optimally. Therefore, it is necessary to improve the learning of proportional reasoning in schools. Proportional reasoning plays an important role in solving problems, so understanding the concept of proportion and students' reasoning ability are important indicators in working on PISA questions on quantity content. Students' lack of understanding of unfamiliar PISA questions is also one of the factors inhibiting their proportional reasoning skills. Appropriate learning strategies need to be implemented to help students improve their proportional reasoning skills and apply them in solving problems. Teachers can choose learning strategies that increase students' self-efficacy level and proportional reasoning ability, and provide unfamiliar practice problems, such as PISA problems, to train students' proportional reasoning ability. Future research is expected to focus on effective interventions to improve students' proportional reasoning ability and self-efficacy.

CONCLUSION

From the results of the research and discussion, it is concluded that the proportional reasoning ability of students in solving PISA questions on quantity content in terms of self efficacy, namely students who have self efficacy cannot fulfill the indicators of proportional reasoning and tend to consider the problem as a challenge and give up easily for fear of failure, students do not try to find new ideas to find solutions and students are only able to answer by guessing. Students with moderate self efficacy are able to understand proportional problems by identifying proportional quantities, but have not been able to convert quantities to different forms, are able to use the right strategy but are still hesitant and there are errors in calculating, students with moderate self efficacy are eager to work on problems, but they give up easily if they work on difficult problems. On the other hand, students still try to find solutions even though they still doubt their abilities.

Students with high self efficacy are able to fulfill proportional reasoning indicators even though their abilities are still limited. Students who have high self efficacy tend to have motivation, high enthusiasm and have confidence in their abilities, students will try to find new ideas to solve problems.

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