RANGE : Jurnal Pendidikan Matematika
e-ISSN :2685-2373

Volume 7, Nomor 1, Juli 2025, pp. 298-313

Profile of Ninth Grade Junior High School Students' M athematical Problem-Solving Ability in View of Adversity Quotient

Suci Charolina [1]*, Suhendra [2]
[1] Department of Mathematics Education, Universitas Pendidikan Indonesia, Indonesia
[2] Department of Mathematics Education, Universitas Pendidikan Indonesia, Indonesia
*Correspondence: sucicharolina03@upi.edu

Received: May 19th 2025. Accepted: July 23rd 2025. Published: July 31st 2025

ABSTRACT

The Adversity Quotient (AQ) is the individual's ability to recognize challenges, use intelligence to face them, and turn them into solvable problems. The low ability of students to solve mathematical problems is a significant issue that needs to be examined from the AQ perspective. The novelty of this study lies in the analysis of the mathematical problem-solving abilities of ninth-grade junior high school students using Polya's stages in the context of two-variable linear equation systems (SPLDV), as reviewed from the characteristics of Adversity Quotient (AQ). This study aims to analyze and describe students' mathematical problem-solving abilities based on AQ, categorized as climber, camper, and quitter. This qualitative research used a case study method conducted on ninth grade students at a junior high school in Bandung, with a total of 31 respondents. The research subjects consisted of three students representing each AQ category. Data were collected through questionnaires, tests, and interviews. The data were then analyzed using the Miles and Huberman model, which includes data reduction, data display, and conclusion drawing/verification. The results showed that there are differences in mathematical problem-solving abilities based on the three AQ categories. Students in the climber category demonstrated excellent problem-solving abilities by fulfilling all four indicators: identifying the problem, devising a strategy, implementing the strategy, and reviewing the solution. Camper-category students showed moderate ability, meeting three indicators: identifying the problem, devising a strategy, and implementing the strategy. Meanwhile, quitter-category students demonstrated low ability and were only able to fulfil one indicator, namely identifying the problem. The implication of these findings is the importance of designing learning models that are responsive to students' AQ characteristics.

Keywords: Adversity Quotient, Problem-Solving Ability, Polya Steps

How to Cite: Charolina, S. & Suhendra (2025). Profile of Students' Mathematical Problem-Solving Ability in View of Adversity Quotient. *Range: Jurnal Pendidikan Matematika*, 7(1), 298-313.

Introduction

Mathematics is an exact science that is connected to various other disciplines and plays an important role in life, ranging from daily activities such as measuring and calculating to proving theorems (Farisuci et al., 2019). Therefore, every individual is expected to be able to master problem-solving skills effectively and systematically. This ability involves the effort to find solutions to challenges in order to achieve goals that cannot be attained instantly (Polya, 1957). In everyday life, including in the world of education, especially at the junior high school level, these skills are highly needed. Mathematics lessons encourage students to think critically and analytically, not just to calculate

(Nesa et al., 2024). At this level, mathematics serves as the foundation for the formation of students' thinking patterns, starting from understanding concepts, planning strategies, implementation, to evaluating results. Thus, students are shaped to be able to solve various problems they encounter.

Problem-solving is an important competency in mathematics learning. However, students' mathematical problem-solving abilities in Indonesia are still relatively low. Meika et al (2021) found that the average score of students was only 58.0, far below the minimum competency standard of 70.0. Asok and Hasanah (2021) also reported that this low ability was due to students not being accustomed to planning solutions, difficulty entering data into formulas, and carelessness in calculations. Sriwahyuni and Maryati (2022) added that this was caused by a lack of practice with non-routine problems, making it difficult for students to tackle unfamiliar problems.

Based on the results of the 2022 PISA (Program for International Student Assessment) survey, 82% of Indonesian students have not reached level 2 in mathematics, which is the minimum level required to succeed in the 21st century (OECD, 2022). For the record, the questions in PISA are related to problem-solving. These questions are designed to measure students' ability to apply mathematical concepts to solve real problems, which require critical, analytical thinking and application of knowledge in relevant contexts. This situation indicates that Indonesian students' mathematical problem-solving skills remain relatively low. In other words, most students still struggle with solving simple mathematical problems and applying mathematical knowledge in everyday life.

This problem also occurs in one of the junior high schools in Bandung City, West Java Province. Specifically, the results of an interview with one of the mathematics teachers showed that students' mathematical problem-solving skills were still very low and needed to be improved. This is caused by the fact that the average students' ability is still below the Minimum Competency Criteria (KKM) that has been established. When students face math problems in the form of stories (non-routine issues), only a small number of students are able to solve them effectively, while most continue to struggle with the problem. These students have difficulty understanding the problem, converting it into a mathematical model, and obtaining the answer to the given situation.

Various factors can affect problem-solving ability, one of which is an individual's Adversity Quotient (AQ). AQ is an individual's intelligence in dealing with various difficulties, which is often associated with the spirit to overcome challenges (Ilmi, 2024). The character of each student in finding solutions to the problems faced is likely to be different. Stoltz (2000) says that AQ is the ability a person has to recognize challenges, apply his intelligence to these challenges, and turn them into problems that must be solved. Furthermore, according to Supardi (2013), student success in learning depends on how students face and overcome difficulties that arise. This ability makes a person successfully find a solution to his problem by giving a positive response to the difficulties faced. So, a person's intelligence in dealing with difficulties is very likely to vary.

Several studies on Adversity Quotient (AQ) have shown varying findings regarding students' mathematical problem-solving abilities. Yustiana et al (2021) found that students with the quitter type were only able to understand the problem, campers were able to proceed up to the execution stage, while climbers were able to complete all four stages: understanding, planning, executing, and evaluating. Baharullah et al (2022) reinforced these findings, showing that climbers met all indicators of problem-solving ability, campers met three indicators, and quitters only one. However, Aisyah et al (2021) reported that all types experienced difficulties at various stages of problem-solving, including climbers. Meanwhile, Naimnule et al (2022) stated that climbers could complete all stages of Polya's process effectively, campers up to the execution stage, and quitters could only understand the problem. Nugroho et al (2022) added that quitters were unable to solve problems systematically, while campers were fairly effective although still unable to conduct a thorough evaluation.

Based on the various findings described, the Adversity Quotient (AQ) has a significant influence on students' mathematical problem-solving abilities. However, the varying results from each study indicate differences in how AQ influences students, whether in terms of AQ type or problem-solving ability measured through Polya's steps. The novelty of this study lies in the analysis of the mathematical problem-solving abilities of ninth-grade junior high school students using Polya's stages in the context of two-variable linear equation systems (SPLDV) as reviewed from the characteristics of AQ.

This study aims to analyze the mathematical problem-solving ability profile of ninth-grade junior high school students in view of Adversity Quotient (AQ). AQ, which represents students' resilience in facing challenges, is considered to play an important role in the mathematical problem-solving process. Problem-solving ability is one of the essential competencies in mathematics learning, making it important to examine its relationship with non-cognitive aspects such as AQ. Through this study, it is expected to obtain a comprehensive picture of students' mathematical problem-solving abilities on the topic of Two-Variable Linear Equation Systems (SPLDV) based on their AQ levels.

Methods

a. Research Design

The research approach employed is a qualitative case study method. This qualitative approach is grounded in a theoretical framework that serves as the foundation for studying research problems that explore the meaning individuals or groups attribute to a phenomenon or issue.

b. Research Subject

This study was conducted on ninth-grade students at a junior high school in Bandung, West Java Province. The research subjects were selected based on their Adversity Quotient (AQ) scores obtained through an AQ questionnaire distributed to all students. After completing the questionnaire, the students took a mathematical problem-solving test. Based on the questionnaire results and the quality of answers in the test, students were categorized into AQ types. The research subjects were selected purposively to represent each AQ category proportionally.

c. Data Collection

In this study, the data collection technique used was triangulation. Triangulation involves both test techniques. In the test technique, students were given a mathematical problem-solving test related to the material on systems of linear equations with two variables (SPLDV), followed by interviews with the students.

The research instruments used consisted of an Adversity Quotient (AQ) questionnaire based on a Likert scale, a test instrument in the form of essay questions on the material of Two Variable Linear Equation Systems (SPLDV), and semi-structured interview guidelines. The AQ questionnaire was adapted from Fahrani (2023) research by adjusting the wording to suit the level of understanding of junior high school students. These instruments were then validated by three lecturers specializing in mathematics education and one junior high school mathematics teacher to ensure the content and indicators used were appropriate.

Furthermore, interview guidelines were developed to support and complement the data obtained from the questionnaire and tests, so as to obtain a more in-depth picture of students' abilities and thought processes in solving mathematical problems. The mathematical problem-solving test instrument has also undergone validation by experts and was empirically tested to determine its validity, reliability, discriminative power, and difficulty level. Data processing from the instrument's pilot test was conducted using Microsoft Excel. The following are the results of the testing:

***Table 1**. Summary of Results of Mathematical Problem-Solving Ability Test Instruments*

Question No	**Item Validity**		**Reliability**	**Discrimination Index**		**Difficulty Index**	
	Valid	**Interpretation**		**Valid**	**Interpretation**	**Valid**	**Interpretation**
1	0,74	Valid	0,89 (High)	0,50	Good	0,70	Easy
2	0,86	Valid		0,55	Good	0,64	Moderate
3	0,78	Valid		0,43	Good	0,68	Moderate
4	0,93	Valid		0,65	Good	0,67	Moderate

Based on the recapitulation of the validity calculation results, it was found that the collected data was valid, with high reliability of 0.89. The discriminating power of each question was in the good category, and the difficulty index showed varying levels of difficulty, ranging from easy to moderate. Therefore, these questions can represent the research indicators and can be used as a test to measure mathematical problem-solving ability.

The data collection process consisted of three steps: (1) completing the AQ questionnaire by 31 students, then selecting three students to represent the quitter, camper, and climber categories; (2) administering a mathematical problem-solving skills test; and (3) conducting interviews to explore students' mathematical problem-solving skills in greater depth.

d. Data Analysis

The data analysis technique used in this study employed the interactive analysis model developed by Miles & Huberman (2014), which consists of three stages: data reduction, data presentation, and conclusion drawing.

Results and Discussion

The results of this study describe the findings obtained by the researchers from the three supporting instruments used, namely the adversity quotient questionnaire, problem-solving test, and interviews related to the adversity quotient. The following is a description of the results obtained in this study. Based on the results of the Adversity Quotient (AQ) questionnaire analysis, it was found that 9 students (29%) were in the climber category, 14 students (45%) in the camper category, and 8 students (26%) in the quitter category. These findings indicate that the majority of students have a fairly good fighting spirit. Students with the camper type are generally able to persevere in the face of challenges, but have not shown optimal efforts to achieve the highest level of success. This condition reflects that most students are able to overcome the difficulties they face, but tend to be satisfied with the existing conditions and do not yet have a strong drive to continue developing to their full potential.

After categorization based on AQ, one subject was selected to represent each category of climber, camper, and quitter. This selection aimed to ensure that the subjects truly reflected the characteristics of each AQ category before the problem-solving test stage was conducted. The selected subjects in this study are S1, S2, and S3. To facilitate analysis, codes are used in the interview excerpts: "P" for the interviewer, "S1" for the climber, "S2" for the camper, and "S3" for the quitter. The following is a discussion of each subject based on these indicators.

Effective learning requires appropriate methods, models, and strategies that consider students' Adversity Quotient (AQ), as it relates to their persistence in facing difficult tasks. Research indicates that students' mathematical problem-solving abilities tend to remain low. Many can identify given information but fail to grasp its meaning, hindering problem-solving. This aligns with Polya (1957), who emphasized the importance of a deep understanding in solving problems. Lerner and Kline (2006) also noted that difficulties in processing information, language, and anxiety are key barriers to learning mathematics. This indicates that understanding the information in the problem is crucial for effective problem-solving, and such difficulties can act as barriers for students in understanding and solving mathematical problems.

If analyzed further, previous research on students' mathematical problem-solving processes shows that students' ways of thinking vary or differ in answering questions. This can be seen from students' ability to rely more on memorized or routine steps. This aligns with Polya (1957), which states that mathematical problem-solving requires a deep understanding of the information in the question. Students who only rely on memorized steps without sufficient knowledge of basic concepts tend to have difficulty solving mathematical problems effectively. In addition, according to Bransford (1984), effective problem-solving involves understanding the situation thoroughly and connecting relevant concepts. Students relying only on memorized steps without deep understanding will have difficulty applying mathematical concepts to more complex problems. Meanwhile, according to Schoenfeld (1980), mathematical problem-solving involves planning, organizing, and evaluating the steps taken, which cannot be achieved by simply memorizing procedures without a broader understanding.

Based on the results of research on the mathematical problem-solving abilities of students, which vary, there must be a reference appropriate to the psychological level of students, one of which is the adversity quotient. The same point was also raised by Pangma et al (2009), who stated that the factors influencing the problem-solving process are the adversity quotient, which is an individual's ability to overcome existing problems. AQ significantly influences problem-solving ability, indicating that students can address existing problems. The following discussion presents the research findings based on students' Adversity Quotient categories: Climber, Camper, and Quitter.

Mathematical Problem Solving Ability of Subject Climber (S1)

Figure 1 presents the answers to the written test for climbers (S1) in the problem identification stage.

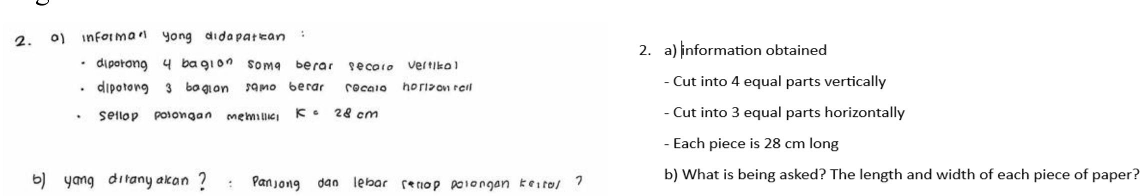
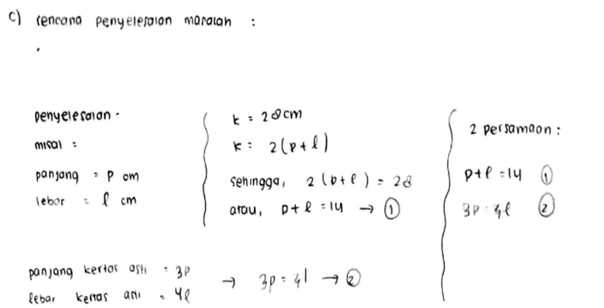


Figure 1. *Written Test Answers for S1 Subjects in the Problem Identification Stage*

Figure 1, shows that subject S1 can understand the problem by writing down the known information, its value, and the requested information. Thus, in this case, there is a similarity between the interview notes and the written test answers previously completed by S1. The answers given by



undergraduate students at the stage of developing a solution strategy are as follows:

Figure 2. *Written test answers of S1 subjects a*

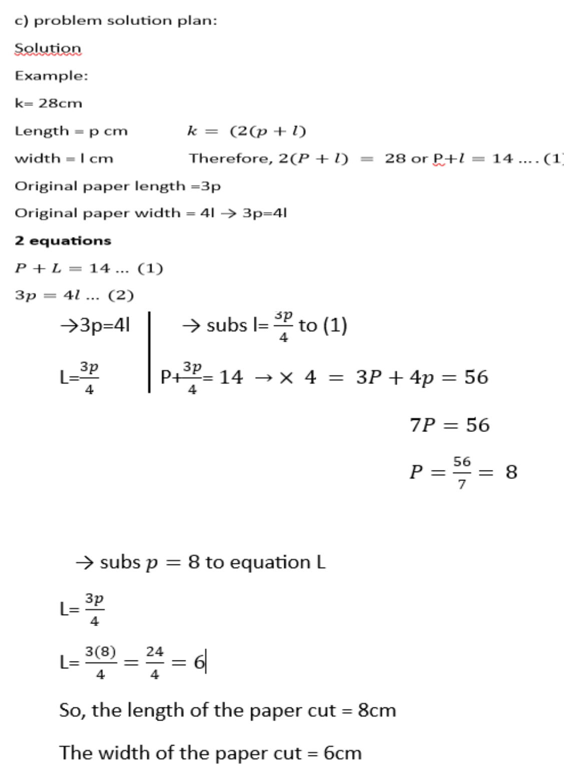
Based on Figure 2, the test results show that subj

length as p and width as l. Subject S1 also wrote down n

$3p = 4l$. Although subject S1 did not write down the

reveal the strategy used during the interview. Furtherm

answers regarding the implementation of the solution stra



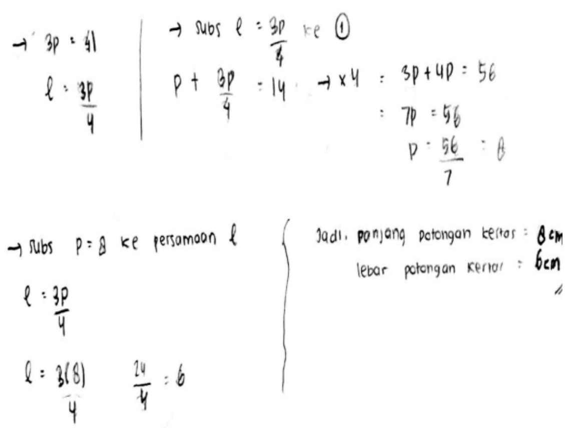
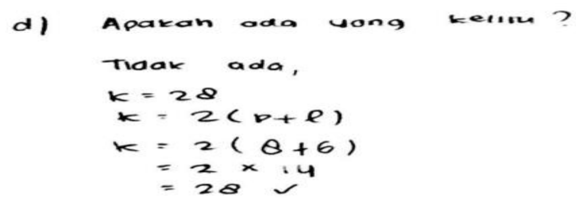


Figure 3. *Written Test Answers of S1 Subjects in The Strategy Implementation Stage*

Based on Figure 3, Subject S1 was able to create a mathematical model correctly and determine the variables. S1 also solved the given problem by following the plan that had been prepared, using the substitution method to solve the problem, and finally obtaining the correct result. Furthermore, Figure 4 presents the written test results for the S1 subject in terms of checking the answers.



d) "Is there anything wrong?"

"No, there isn't."

$K = 28$

$K = 2(p + l)$

$K = 2(8 + 4)$

$= 2 \times 14$

$= 28$

Figure 4. *Written Test Answers of S1 Subjects at the Stage of Checking the Answers*

Figure 4, shows that subject S1 double-checked the answer by providing the correct proof, namely by using the substitution method to check the correctness of the result obtained, and subject S1 also believed in the correctness of the answer obtained.

Student with a Climber-type Adversity Quotient (AQ), such as Subject S1, demonstrate excellent mathematical problem-solving abilities. They can understand problems, develop plans to solve them, and review their solutions. Subject S1 met nearly all problem-solving indicators in four questions, showing confidence in interpreting information, creating models, planning carefully, and staying persistent even when the problems required a long time to complete. They were also able to verify their answers and attempted new problems with confidence. This aligns with the Climber character, who is highly motivated, persistent, and process-oriented. Therefore, they achieved maximum scores and consistently demonstrated a never-give-up attitude and strong adversity quotient in facing challenges.

Subject S1, identified as having a Climber-type Adversity Quotient (AQ), demonstrated strong mathematical problem-solving skills. He was able to understand problems, plan and implement strategies, and thoroughly review results. S1 met nearly all problem-solving indicators, showed confidence, formed mathematical models, and solved problems carefully, even if it took time. He also verified his answers and tackled unfamiliar problems, reflecting typical Climber traits. This aligns with Farisuci et al (2019) and Naimnule et al (2022), who state that Climber-type individuals are persistent, process-oriented, and motivated to overcome challenges. Therefore, Climber-type students tend to excel in Polya's problem-solving stages, achieve high performance, and exhibit a high adversity quotient.

Based on the results of the questionnaire and interview with student who have a Climber Adversity Quotient (AQ), they exhibit a habit of perseverance and not giving up when solving problems, as evidenced by their commitment to working through problem-solving tasks until completion, even if it takes a considerable amount of time, and their efforts to find alternative solutions to the mathematical problems they face. Furthermore, the questionnaire results show that students always put in their best effort when working on math assignments or problems. The instrument results also indicate that these students have a habit of asking questions and seeking clarification on things they do not understand, as well as applying prior knowledge to new situations, such as when they encounter a problem they have never solved before, and relate it to the material they have learned previously.

It can be concluded that students with a Climber AQ persist in trying to understand how to solve problems. Students of this type do not give up easily when facing difficulties in solving problems; instead, they continuously strive to find the right strategy to reach a solution. This aligns with Stoltz (2000) Theory, which suggests that students with a Climber AQ have an optimistic and never-give-up attitude when facing challenges. A climber-type student always aims to solve mathematical problems until they reach their desired target. They approach the tasks seriously, never giving up, and attempt various methods to find solutions to the problems presented.

Mathematical Problem Solving Ability of Camper Subjects (S2)

Subject S2 did not record known information and information that was asked but instead wrote down the mathematical solution directly. However, subject S2 could understand the question well, that is, identify known information and information that was asked, even though this information was not written on the test answer sheet. The following is an excerpt from the interview:

P: What is the known information from this question?
S2: The paper is cut into four parts, and three parts become small rectangles with a perimeter of 28cm.
P: What is being asked in this question?
S2: To determine the length and width of each piece of paper.
In the indicator for planning a solution strategy, the S2 subjects did not write down their problem-solving plan. Subject S2 wrote the mathematical solution directly, but when interviewed, they could explain their solution plan. The following is an excerpt from the interview:
P: What strategy did you use to solve this problem?
S2: I used elimination and substitution, Ms.

Figure 5, presents the written test answers of the camper subject (S2) at the stage of implementing the solution strategy.

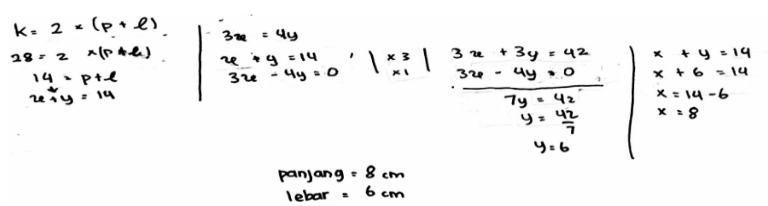


Figure 5. *Written Test Answers of S2 Subjects at the Strategy Implementation Stage*

Figure 5, shows the solution provided by subject S2. It can be seen that subject S2 performed the elimination and substitution processes after obtaining one of the variable values. Subject S2 obtained the correct final result. The student's response during the final review stage is as follows:

Figure 6. *Written Test Answers for S2 subjects at the Stage of Reviewing Completion Results*

Figure 6, shows that subject S2 felt that there was nothing wrong, so they did not provide evidence of the solution they had worked out.

Student with a Camper-type Adversity Quotient, namely the S2 subjects, almost met all problem-solving indicators. They could understand problems, plan solutions, and solve problems but could not check their answers. This finding is in line with Naimnule et al (2022) that Camper-type student is only able to carry out three steps of problem-solving, namely understanding the problem, planning solutions, and implementing the plan, but are unable to recheck the results and processes they have worked on. According to Fatmasari et al (2021), rechecking is important to avoid mistakes in finding solutions. According to Stolz's (2000) theory, campers are easily satisfied with what they have achieved without wanting to try harder to achieve maximum results in solving problems. It can be concluded that students in the camper category tend to only solve problems up to the planning and implementation stages without checking their results. This shows that they do not have sufficient motivation to achieve more optimal results. Therefore, learning strategies are needed to enhance students' motivation and perseverance in solving problems more comprehensively, enabling them to achieve more optimal results.

Based on the questionnaire results and interviews with students with an Adversity Quotient (AQ) Camper, subject S1 demonstrates an effort to solve problems but with certain limitations. They do not give up easily but do not actively seek alternative solutions when facing difficulties. They accept challenges as difficulties but still require external encouragement, such as guidance from a teacher or peers. As a result, Camper students engage in discussions with their friends to determine the best strategy for solving problems. They prefer to seek help rather than try to solve the problem independently for longer. This aligns with the findings of Septianingtyas and Jusra (2020),which suggest that Camper-type students are less optimal in problem-solving and tend to become satisfied quickly with their results. This is in line with Stoltz (2000) that Camper-type individuals tend to feel content with a certain achievement level and are unwilling to make sacrifices to reach a higher level. Nevertheless, they still show some initiative and enthusiasm.

Mathematical Problem Solving Ability of Quitter (S3)

The subject did not write down the known information and the information asked. Subject S3 directly wrote down the mathematical solution. The following is an excerpt from the interview:

P: What is the known information from this question?
S3: Susanti has a piece of paper with a surface area resembling a square, and the perimeter of the paper is 28 cm.
P: What is being asked in this question?
S3: What is the length and width of each piece of paper that Susanti cut, Ms?

Subject S3 was unable to write down a problem-solving strategy plan under the problem-solving planning indicator. The subject tended to jump directly into the mathematical solution without formulating the steps or strategy in writing. This is evident in the following interview excerpt, which illustrates how the subject approached the problem-solving strategy:

P: What strategy did you use to solve this problem?
S3: The variable method, I subtracted the variables, Ms.

Here are the results of subject S30's answers at the problem-solving strategy implementation stage:

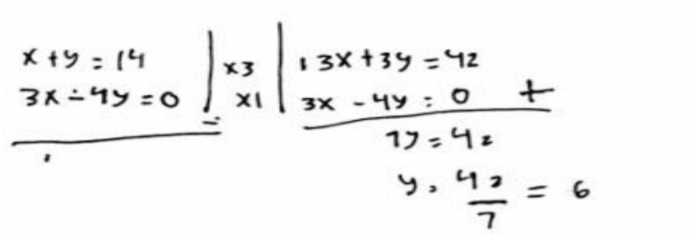


Figure 7. *Written Test Answers of S3 Subjects in the Strategy Implementation Stage*

Based on Figure 7, it can be seen that S3 still has difficulty solving problems correctly. Subject S3 was correct in constructing the mathematical model. Subject S3 performed the elimination process by multiplying 3 in the first equation and 1 in the second equation to equalize the value of variable x, then subtracting the two equations. However, there are several errors in the implementation, such as the incorrect use of the (+) sign in the elimination process. Nevertheless, the final result of the elimination is correct. The following is an excerpt from the interview:

P: How did you solve this problem?
S3: I equated the values of x and subtracted the variable x. Then I got $y = 6$, Ms
P: Where did you get $x + y = 14$ and $3x - 4y = 0$ from?
S3: From the problem statement, ma'am. Since the perimeter of the rectangle is given, I just plugged in the formula $28 = 2(p + l)$, then simplified it to get $x + y = 14$ and $3x - 4y = 0$, also from the problem statement, Ms.
P: Are the two equations added or subtracted at the second elimination stage?
S3: Subtracted, Ms.
P: Okay, once you've found the value of y, what do you do next?
S3: I didn't work it out to that point, ma'am, because I didn't know how to continue.

During the final check of the solution, subject S3 did not verify the answer by providing evidence or reasoning for the solution. Here is an excerpt from the interview:

P: Are you sure about your answer?
S3: No Ms.

The characterization of students' problem-solving abilities, as defined by the adversity quotient, shows that those in the climber category can understand problems, develop plans, implement solutions, and verify the accuracy of their answers. Students in the camper group can understand problems, develop plans, and implement solutions but cannot verify the answers they obtain. Students in the "quitter" category understand problems but cannot formulate plans, implement plans, and verify the results obtained.

Students with an adversity quotient quitter of S3 only met one problem-solving indicator: the ability to understand problems. These results are in line with those reported by Baharullah et al (2022), who found that students with an adversity quotient of S3 had less than adequate ability in solving mathematical problems, as they only showed few or one indicator in problem-solving. This is supported by Chabibah et al (2019) research, which found that students with a low Adversity Quotient Quitter score have low problem-solving abilities. Students with a quitter adversity quotient have difficulty comprehensively overcoming mathematical problems. They can only fulfill one aspect of the problem-solving indicators, namely understanding the problem at hand, but have difficulty continuing to the next stage, such as planning a solution strategy, implementing it, and checking their answers.

Based on the questionnaire and interview results, Subject S3 was not used to persevering through difficult math problems, struggled to determine appropriate strategies, rarely checked answers, and lacked the habit of reading and understanding question information. Although they attempted various methods, they often failed in both process and outcome. This may stem from limited experience in solving problems, which affects their mathematical problem-solving ability (Latifah & Afriansyah, 2021). Stoltz (2000) describes quitter-type students as easily giving up, lacking motivation, and quickly losing interest when facing difficulties. As a result, they tend to perform poorly and achieve unsatisfactory results. Therefore, quitter students generally experience difficulties in problem-solving due to low adversity quotient.

The way students approach problem-solving using Polya's method varies depending on their AQ category, which demonstrates the impact of AQ on their learning outcomes, particularly in math problem-solving assessments. Research supports Pertiwi et al (2019), who suggest that AQ plays a role in determining learning achievements. Students with higher AQ typically achieve better results in math, while those with lower AQ tend to have poorer outcomes. This highlights the importance for educators to understand their students' AQ categories, especially for those in the "quitter" category. Students with a "quitter" AQ should be provided with problem-solving exercises to help them develop a higher AQ in overcoming challenges and prevent them from giving up when faced with difficulties.

The results showed that the mathematical problem-solving ability of quitter students was in the poor category, while camper and climber students were in the good category. These categories of mathematical problem-solving ability were obtained from the scores or grades on the student's answer sheets. The scores or grades of quitter students were the lowest compared to those of camper and climber students. These research results are consistent with previous studies that have shown that climber students have the best mathematical problem-solving ability compared to quitter and camper students (Yustiana., Kusmayadi., Fitriana, 2021; Hasibuan, 2021; Febrianti., Zakiah., & Ruswana, 2022; Naimnule., Kehi., & Bone, 2022). This occurs because students with higher adversity quotient levels are less likely to give up and more capable of overcoming difficulties, while students with lower adversity quotient levels tend to view difficulties as the end of their efforts, leading to lower academic performance (Supardi, 2013). These findings support the results of previous studies (Yustiana., Kusmayadi., Fitriana, 2021; Hasibuan, 2021; Febrianti., Zakiah., & Ruswana, 2022; Naimnule., Kehi., & Bone, 2022), which state that AQ influences students' mathematical problem-solving abilities. The higher the students' AQ, the higher their mathematical problem-solving ability.

Based on the results and discussion, students' mathematical problem-solving abilities in SPLDV varied according to their Adversity Quotient (AQ) levels. Climber students completed all stages of Polya's method, campers reached the implementation stage, while quitters only managed to understand the problem. These differences highlight a strong link between AQ and problem-solving ability. Figure 1 illustrates this comparison across AQ categories based on Polya's stages.

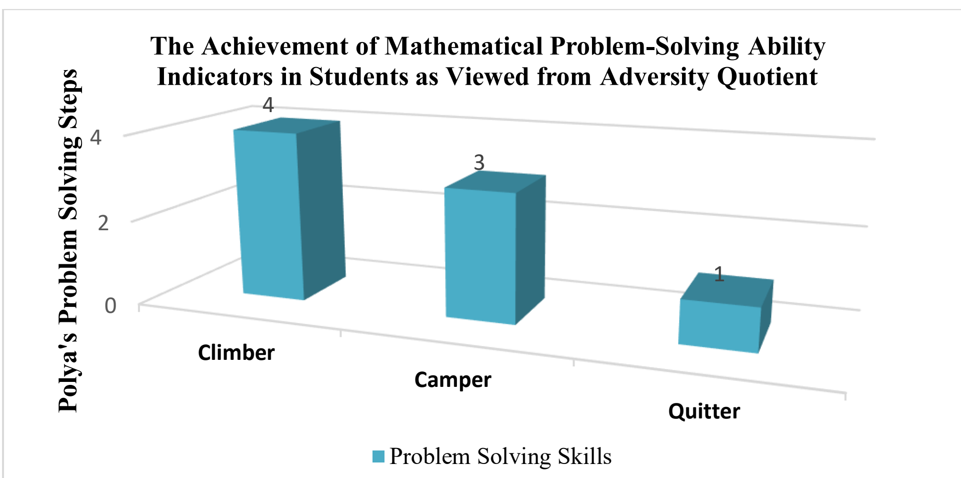


***Figure 8**. Written Test Answers of S3 Subjects in the Strategy Implementation Stage*

Figure 8 shows that students with the Adversity Quotient Climber type were able to meet all four indicators of mathematical problem-solving ability, namely: understanding the problem, planning a solution strategy, implementing the strategy, and checking the correctness of their answers. Students with the Camper type were able to meet three indicators: understanding the problem, planning a solution strategy, and implementing the strategy, but were unable to verify their answers. Meanwhile, students with the Quitter type were only able to meet one indicator: identifying or understanding the problem.

Conclusion

Based on the research and discussion, Climber students solving SPLDV problems can identify known and unknown information, develop effective strategies, solve problems accurately, and verify their solutions. Camper students can identify information, create strategies, and solve problems accurately, but struggle to verify their answers. Quitter students can identify information but cannot formulate effective strategies or verify their solutions, often leading to incorrect answers. These differences highlight the need for educators to give more support to Camper and Quitter students, especially in improving strategy use and solution verification.

The significance of this finding lies in its potential to provide educators with insights into the importance of fostering Adversity Quotient (AQ) in students, especially those who fall into the Camper and Quitter categories. By understanding these differences in AQ levels, teachers can design more targeted learning models to help students develop resilience, improve thinking strategies, and strengthen their ability to solve mathematical problems more effectively. However, this study is limited by its sample size and context, which may not fully represent broader student populations. Additionally, since the research focuses on a specific mathematical topic (SPLDV), further studies are needed to determine whether similar patterns appear across different areas of mathematics.

Acknowledgement

Author would like to thank all parties who have contributed to writing this article.

References

Aisyah, A. S., Riyadi, & Subanti, S. (2021). Description Of The Difficulty Of Students' Mathematics Problem Solving Assessed From Adversity Quotient (AQ). *Jurnal Aksioma*, *10*(2). https://doi.org/http://dx.doi.org/10.24127/ajpm.v10i2.3663

Asok, A. N., & Hasanah, A. (2021). Senior High School Students' Mathematical Problem Solving Of Three-Variable Linear Equation System. *JTAM (Jurnal Teori Dan Aplikasi Matematika)*, *5*(1), 254. https://doi.org/10.31764/jtam.v5i1.3929

Baharullah, wahyuddin, Usman, M. R., & Syam, N. (2022). Profil Kemampuan Pemecahan Masalah Matematika Siswa Ditinjau Dari Adversity Quotient (Aq). *Aksioma: Jurnal Program Studi Pendidikan Matematika*, *11*(2). https://doi.org/http://dx.doi.org/10.24127/ajpm.v11i2.4766

Bransford, J. (1984). *Teaching Thinking and Problem Solving*. Vanderbilt University.

Chabibah, L. N., Siswanah, E., & Tsani, D. F. (2019). Analisis kemampuan pemecahan masalah siswa dalam menyelesaikan soal cerita barisan ditinjau dari adversity quotient. *PYTHAGORAS: Jurnal Matematika Dan Pendidikan Matematika*, *14*(2).

Fahrani, R. N. (2023). *Analisis Kemampuan Berpikir Kritis Matematis Siswa Sma Ditinjau Dari Self-Efficacy Dan Adversity Quotient*. Universitas Pendidikan Indonesia.

Farisuci, R. M., Budiman, & Lukmawati. (2019). Motivasi Berprestasi Dengan Adversity Quotient Pada Siswa Madrasah Aliyah Di Kota Palembang. *Psikis: Jurnal Psikologi Islami*, *5*(1), 74–82. https://doi.org/https://doi.org/10.19109/psikis.v5i1.3195

Fatmasari, H. R., Waluya, S. B., & Sugianto. (2021). Mathematical problem-solving ability based on self-efficacy in junior high school. *Journal of Physics: Conference Series*, *1918*(4). https://doi.org/10.1088/1742-6596/1918/4/042120

Febrianti, T., Zakiah, N. E., & Ruswana, A. M. (2022). Profil Kemampuan Pemecahan Masalah Matematis Siswa Smp Pada Materi Lingkaran Ditinjau Dari Adversity Quotient (AQ). *JKIP: Jurnal Keguruan Dan Ilmu Pendidikan*, *3*(2).

Hasibuan, N. A. (2021). *Analisis Kemampuan Pemecahan Masalah Matematis Siswa Smp/Mts Ditinjau Dari Adversity Quotient*. Universitas Pendidikan Indonesia.

Ilmi, L. R. (2024). Analysis of Students Algebraic Reasoning Levels in Solving PISA Model Problems in View of Adversity Quotient. *Nternational Conference on Education in Mathematics, Science and Technology*, 15–30.

Latifah, T., & Afriansyah, E. A. (2021). Kesulitan Dalam Kemampuan Pemecahan Masalah Matematis Siswa Pada Materi Statistika. *Journal of Authentic Research on Mathematics Education (JARME)* , *3*(2).

Lerner, J. W., & Kline, F. (2006). *Learning disabilities and related disorders*. Houghton Mifflin Company.

Meika, I., Ramadina, I., Sujana, A., & Ratu Mauladaniyati. (2021). Kemampuan Pemecahan Masalah Matematis Siswa Dengan Menggunakan Model Pembelajaran SSCS. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *5*(1), 383–390.

Miles, M. B., & Huberman, A. M. (2014). *Qualitative Data Analysis, A Methods*. Sage Publications.

Naimnule, M., Kehi, Y. J., & Bone, D. (2022). Analisis Kemampuan Pemecahan Masalah Matematis Berdasarkan Langkah-Lang Kah Polya Ditinjau Dari Adversity Quotient Tipe Quitter, Camper Dan Climber Pada Siswa Kelas VIII SMP. *Jurnal Eduscience (JES)*, *9*(2). https://doi.org/https://doi.org/10.36987/jes.v9i2.2957

Nesa, M. Z. Z., Mulyanti, Y., & Setiani, A. (2024). Analisis Kemampuan Pemecahan Masalah Matematika Siswa Ditinjau Dari Tingkat Adversity Quotient. *Jurnal Pendidikan Matematika, 7*(2), 132–143. https://doi.org/https://doi.org/10.36277/defermat.v7i2.96

Nugroho, M., Kartono, & Isnarto. (2022). Analysis Of Student Mathematics Problem Solving Ability Reviewed from Adversity Quotient (Aq) With Dynamic Assessment. *Unnes Journal of Mathematics Education Research*, *11*(1).

OECD. (2022). *PISA 2022 Mathematics Framework*.

Pangma, R., Tayraukham, S., & Nuangchalerm, P. (2009). Causal factors influencing adversity quotient of twelfth grade and third-year vocational students. *Journal of Social Sciences*, *5*(4), 466–470.

Pertiwi, N. L. C., Wiarta, I. W., & Ardana, I. K. (2019). Hubungan Antara Adversity Quotient (Aq) Dengan Hasil Belajar Matematika. *Journal of Education Technology*, *3*(2), 73–80.

Polya, G. (1957). *How To Solve It: A New Aspect of Mathematical Method*. Princeton University Press.

Schoenfeld, A. H. (1980). *Problem Solving in School Mathematics*. NCTM.

Septianingtyas, N., & Jusra, H. (2020). Kemampuan Pemecahan Masalah Matematis Peserta Didik Berdasarkan Adversity Quotient. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *4*(2), 657–672.

Sriwahyuni, K., & Maryati, I. (2022). Kemampuan Pemecahan Masalah Matematis Siswa pada Materi Statistika. *Plusminus: Jurnal Pendidikan Matematika*, *2*, 335.

Stoltz, P. (2000). *Adversity Quotoient, Mengubah Hambatan Menjadi Peluang*. PT Gramedia Widiasarana Indonesia.

Supardi, U. (2013). Pengaruh adversity qoutient terhadap prestasi belajar matematika. *Jurnal Formatif*, *3*(1), 61–71.

Yustiana, Y., Kusmayadi, T. A., & Fitriana, L. (2021). Mathematical problem solving ability of vocational high school students based on adversity quotient. *Journal of Physics: Conference Series*, *1806*(1). https://doi.org/10.1088/1742-6596/1806/1/012092