Proceedings Series on Social Sciences & Humanities, Volume 25
Proceedings of International Conference on Social Science (ICONESS)
ISSN: 2808-103X

Students' Mathematical Problem-Solving Ability Profiles Reviewed from the Level of Confidence in the Circle Material

Evi Triyana[1], Gunawan[2]
[1,2]Magister Pendidikan Matematika, Universitas Muhammadiyah Purwokerto

ARTICLE INFO

Article history:

DOI:
10.30595/pssh.v25i.1680

Submited:
July 22, 2025

Accepted:
August 11, 2025

Published:
August 24, 2025

Keywords:

Mathematical Problem-Solving; Students'; Level of Confidence

ABSTRACT

This study aims to analyze students' mathematical problem-solving abilities based on their level of self-confidence. The research uses a qualitative descriptive method with data collection through problem-solving tests, confidence questionnaires, and interviews. The results of the questionnaire are grouped into three categories, namely high, moderate, and low. Respondents were taken by purposive sampling technique as many as one student each in the self-confidence category. Data analysis consists of data reduction, presentation of research results, and drawing conclusions. The results of the study show that students with high self-confidence are able to fulfill their problem-solving skills systematically and completely, including proper problem identification, effective strategy planning, accurate solution implementation, and thorough evaluation of results. Students with moderate levels of self-confidence demonstrate varied problem-solving abilities with major weaknesses in the consistency of strategy implementation and evaluation of work results. Students with low self-confidence have difficulty understanding problems and choosing appropriate approaches so they often fail to solve problems properly.

Corresponding Author:
Evi Triyana
Magister Pendidikan Matematika, Universitas Muhammadiyah Purwokerto
Jl. KH. Ahmad Dahlan, Kec. Kembaran, Kabupaten Banyumas, Jawa Tengah 53182
Email: khairanurzahrani@gmail.com

1. INTRODUCTION

Problem-solving skills are key skills that students must master in the 21st century era, given their high relevance to the development of critical, creative, collaborative, and communication (4C) competencies (Guven & Alpaslan, 2022; Rahman, 2019). These skills include not only mastery of mathematical concepts, but also the ability to think analytically, logically, and creatively in the face of complex and multidimensional challenges (Herlinawati et al., 2024; Saad et al., 2024). Mathematical problem-solving skills involve several stages, such as understanding the problem, designing solutions, implementing strategies, and evaluating results (Yapatang & Polyiem, 2022)). Problem-solving skills are also very relevant in building an adaptive and logical mindset that is a major need in the modern era (Hikayat et al., 2020; Ngang et al., 2014). The rapid development of technology and access to information has encouraged the world of education to produce individuals who are able to solve problems effectively and innovatively (Mishra & Mehta, 2017). In this context, problem-solving activities provide students with the opportunity to integrate critical thinking, creativity, and collaboration skills, which are essential in both academic and work-related contexts (Chai & Kong, 2017). In addition, Schoenfeld's theory asserts that mathematical problem-solving requires reflective, creative, and evidence-based thinking for analysis and decision-making (Nuraini et al., 2019; Schoenfeld, 2013). This ability is also a reflection of students' success in

integrating the knowledge that has been gained with new experiences according to the 21st century educational paradigm (Rosli et al., 2022). In the learning process, the cognitive aspect, including problem-solving, is of course influenced by several affective factors. One of them is confidence.

Self-confidence is a significant affective factor in influencing students' mathematical problem-solving abilities. Confidence is defined as an individual's belief in his or her ability to complete a particular task or challenge and plays an important role in determining how students respond to mathematical problems (Liu et al., 2023). Students with high levels of confidence tend to be more persistent, reflective, and creative during the problem-solving process. Students are more confident in exploring different solutions strategies, testing hypotheses, and revising their approach if needed. Strong confidence allows students to stay focused and solution-oriented, despite facing obstacles or mistakes during the process (Putra & Masrukan, 2024). In contrast, students with low confidence levels often experience math anxiety that can interfere with their logical thinking and decision-making processes (Liu et al., 2023). This anxiety triggers feelings of indecision, inhibits the exploration of creative ideas, and worsens the ability to solve complex problems. In the long run, low self-confidence can affect students' motivation to learn, thereby reducing their involvement in in-depth mathematical learning. Good self-confidence also supports students' reflective abilities, allowing them to learn from mistakes and improve their performance at the next opportunity (Fardani et al., 2021). However, many traditional education systems still lack attention to affective aspects, including student confidence. The over-emphasis on cognitive outcomes and test-based assessments often overlooks the crucial role of confidence in the mathematical learning process. This creates an imbalance in the development of balanced learning between cognitive and affective aspects (Rosli et al., 2022).

Previous research has been conducted by several researchers, including Gunawan et al. (2022), found the results of research on self-confidence which is the main aspect in producing creative ideas. In his research, high confidence is able to provide a stimulant for improving students' creative thinking skills. In addition, the connection aspect is a trigger in creating unique/different settlement ideas. The research of Hendriana et al., (2018) explains the findings about the correlation between self-confidence and mathematical problem-solving skills. The two variables have a high correlation. Self-confidence is able to make a positive contribution to improving problem-solving skills. In contrast to the findings of Gursen Otacioglu (2008) explaining different results that self-confidence and problem-solving have a negative relationship, meaning that the two variables do not affect each other's improvement. Furthermore, the research of Surya and Putri (2017) explains that contextual approaches can affect the improvement of problem-solving skills and confidence. Providing contextual problems is one of the alternatives in developing these two variables. In addition, strong initial knowledge will give students confidence in solving math problems correctly and precisely. Thus, contextual approaches and early ability strengthening need to receive attention from teachers in mathematics learning.

Based on preliminary studies that have been conducted through literature analysis and systematic review of 10 national and international articles related to confidence and problem-solving skills (between 2018–2024), a consistent relationship pattern was found between high levels of self-confidence and the quality of mathematical problem-solving strategies. This study also shows that self-confidence affects aspects such as focus, creativity, and self-evaluation in solving math problems. The review is carried out by a theme-based narrative review method from journals that have gone through a peer-review process. Therefore, this research is built on the basis of these conceptual and empirical findings. Although no formal preliminary quantitative studies have been conducted, preliminary observations in the classroom show that students with low confidence often have difficulty implementing systematic problem-solving measures. The findings reinforce the urgency of qualitative exploration of the profile of students' problem-solving abilities based on their confidence level.

This study describes the profile of mathematical problem-solving ability reviewed from confidence. The relationship between self-confidence and problem-solving skills is interesting and is described clearly and in detail. Although many previous studies have examined the relationship between self-confidence and problem-solving skills quantitatively, there is still very limited research that describes in depth the profile of students based on the category of confidence in solving contextual math problems, particularly in circle material. In addition, there is a lack of studies that exploratically explore how the thinking strategies of students with high, medium, and low confidence in each stage of problem solving are important gaps to be filled. Therefore, this study seeks to fill this gap by describing in depth the characteristics of students' mathematical problem-solving based on their confidence level, in order to enrich the understanding of affective factors in mathematics learning. Based on the background and identification of the gap, the research question asked is: "How is the profile of students' mathematical problem-solving ability reviewed from the level of confidence in the circle material?" so that the purpose of this study is to describe the profile of the problem-solving ability reviewed from the belief rather than the circle material. The results of the research can provide complete and real information as the basis for taking innovative learning strategies applied in mathematics learning.

This research is expected to contribute in three main aspects. Empirically, this study provides concrete field data on student profiles in solving mathematical problems based on confidence levels. Methodologically, the

results of this research can be a reference for teachers or other researchers in designing data collection instruments and strategies based on qualitative case studies. Meanwhile, theoretically, the findings of this study enrich the literature review on the relationship between affective factors, especially self-confidence, and students' mathematical problem-solving skills. These three contributions are expected to be able to provide a basis for the development of a more adaptive learning strategy centered on student characteristics.

2. METHOD OF THE RESEARCH

This study adopts a qualitative approach with a case study design to explore the influence of confidence level on students' mathematical problem-solving abilities. The subjects involved in this study were grade VIII students of Junior High School. The material used for the research is a circle.

Data collection techniques were carried out through confidence questionnaires, problem-solving ability tests, and interviews. All students are asked to fill out the confidence questionnaire that has been provided. The items of statements on the questionnaire are arranged with signs of confidence indicators. Based on the results of the questionnaire, students were grouped into three categories, namely high, medium, and low. Respondents were selected by purposive sampling based on interviews and observations conducted with teachers who identified students with high, medium, and low confidence levels. The participants in this study were three junior high school grade VIII students who were selected using the purposive sampling technique. The selection of this limited number was based on consideration of qualitative case study design characteristics that emphasize the depth of exploration rather than the breadth of data coverage. The main focus is to get a thorough picture of each of the confidence categories: high, medium, and low.

The participant recruitment process was carried out by first distributing confidence questionnaires to all grade VIII students at partner schools. Furthermore, the results of the questionnaire were confirmed through preliminary interviews and observations involving mathematics teachers. Teachers are asked to identify students who have high, medium, and low confidence characteristics, based on observations during the learning process. Students who meet the criteria are then contacted directly and given an explanation of the research objectives and procedures. Consent for participation is obtained voluntarily from students, thus ensuring that access to participation is carried out in an ethical and transparent manner.

A total of 3 students were selected as respondents to participate in this study. A total of three students were selected as participants based on the purposive sampling technique by considering the results of triangulating data from questionnaires, teacher observations, and initial interviews. Each student represents a high, medium, and low confidence category, which has been systematically identified through questionnaire scoring and clarification from the classroom math teacher. To facilitate the analysis process, the three high, medium, and low respondents were given initials or codes K1, K2, and K3, respectively. The test consists of one question and is arranged based on indicators of problem-solving ability. Data was collected through in-depth interviews with teachers to determine children with high, medium and low levels of confidence. In addition, interviews with students also aim to obtain in-depth information about their experience in solving math problems based on problem-solving indicators.

The development of instruments in this study refers to conceptual indicators that have been determined based on relevant theories. The confidence questionnaire was prepared based on the self-confidence dimension of Bandura's theory, which included the perception of competence, courage to face challenges, the ability to survive when experiencing difficulties, and reflection on learning outcomes. The problem-solving test was developed by referring to the problem-solving stages of Polya (understanding the problem, devising a plan, carrying out the plan, and looking back). Meanwhile, the interview guidelines are prepared to delve deeply into the students' thinking process in solving problems, based on indicators from the two theories. All of these instruments have gone through the content validity test (expert judgment) by two expert lecturers in the evaluation of mathematics learning. The results obtained were that the research instrument was declared valid.

Data analysis was carried out with a thematic analysis approach to identify patterns and themes related to the relationship between students' confidence and their achievement in solving mathematical problems. The stages of data analysis include data reduction, presentation of data through images or tables, and providing a final interpretation in the form of conclusions. This study aims to provide a more comprehensive insight into the profile of psychological factors, especially confidence in problem-solving indicators, namely understanding problems, planning strategies, implementing strategies and evaluations.

3. RESULT AND DISCUSSION

Based on the results of the mathematical problem-solving ability test, table 1 below is presented with the results of identifying the profile of students' mathematical problem-solving abilities based on confidence. Indicators used to identify problem-solving abilities are understanding problems, planning strategies, implementing strategies, and providing evaluations.

Table 1. Results of Identification of Problem-Solving Skills Based on Self-Confidence

Initials	Category Confidence	Indikator			
		Understanding the Problem	Planning a Strategy	Implementing Strategy	Evaluation
K1	High	Clear	Systematic, Measurable	Detail, Clear	Complete, Clear
K2	Medium	Clear	Complete, Appropriate	Detail, Clear	Complete, Clear
K3	Low	Clear	Incomplete	No Details, Wrong	Incomplete

Based on the identification of Table 1, the following will describe the characteristics of students' mathematical problem-solving abilities reviewed from high, medium, and low confidence.

Categories of High Confidence Students

Kategori Siswa Kepercayaan Diri Tinggi

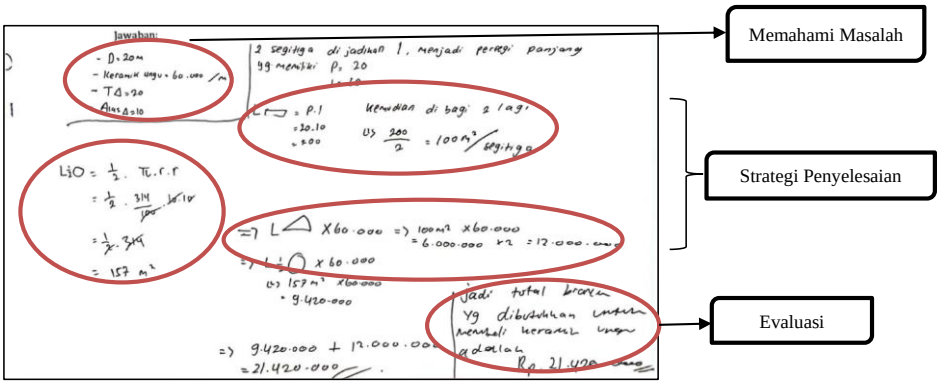

Figure 1. K1 Subject Work Results

Based on Figure 1., the K1 respondent can understand the problem well shown by writing down some important information regarding the length and width of the rectangular flat building. To solve the problem, the right strategy is needed. It can be seen that the respondents use the concept of rectangular area then the area obtained is divided into two. Later it will be recalculated to answer the problem. The next step is for the respondents to apply the concept of circle area and some algebraic operations. In the use of the circle area formula, respondents were able to use it well and there were no mistakes. In addition, in some of the algebraic operations carried out, no calculation errors or errors in writing mathematical symbols were found. At the end, after the calculation was done correctly, the respondent gave a final conclusion sentence as a reaffirmation that the final result obtained was in accordance with what was asked. In addition, respondents also double-checked the entire work process before the work was collected. This activity is usually done by respondents in solving mathematical problems. These results are also in accordance with interviews regarding the problem-solving process. Here are the results of the interview.

R : Do you have any difficulty in understanding the problem?
K1 : No, sir. I already understand what the question is asking for.
R : What mathematical concepts are used.
K1 : The concept of the area of a circle and some algebraic operations such as division, multiplication, addition, and subtraction.
R : Once you find the right answer, do you double-check the process?
K1 : Yes, sir, I always regularly check the steps along with the final answer whether they are in accordance with what was asked or not.

Category of Medium Confidence Students

Kategori Siswa Kepercayaan Diri Sedang

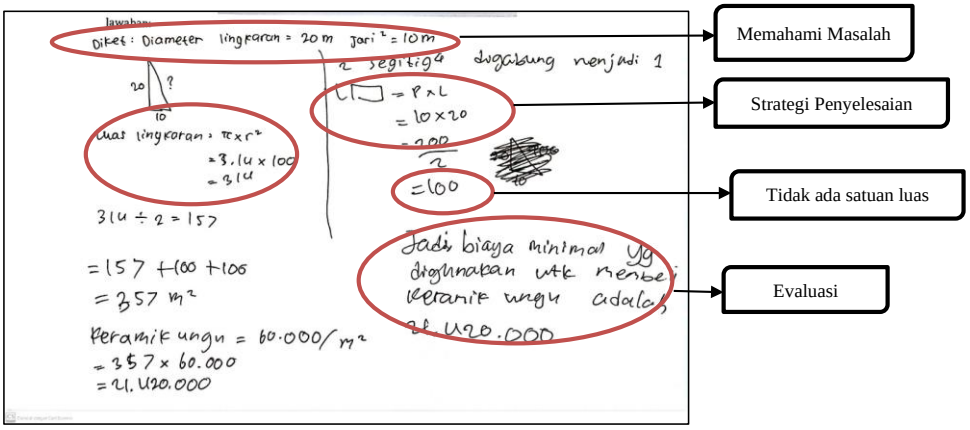

Figure 2. Work Results of K2 Subjects

Figure 2. shows that the K2 subject is able to write down the initial information that is known. K1 writes down the information on the diameter of the circle and the radius. The subject also wrote an illustration in the form of a right triangle image with a base size and height of 10 m and 20 m, respectively. This can help the subject in understanding the core of the question in the question. To solve problems, the mathematical concepts used are the area of a triangle, the area of a circle, and the area of a rectangle as well as simple algebraic operations. This shows that there is a settlement strategy that will be carried out by the subject. Next, the subject applies those concepts to the problem. Based on Figure 2, the concept implementation process is correct and the calculation process does not find any errors. It's just that the area of a rectangle is not written in full as a unit of area m2. The settlement flow is also clear, starting from calculating the area of the circle and continuing to calculate the area of the rectangle and ending with calculating the costs that must be incurred for ceramic financing. This activity shows that the indicator implements the strategy correctly and correctly. At the end of the answer, the K2 subject writes the final conclusion on the results of the work that has been done. The conclusions given are relevant to the matter asked in the question. In addition, K2 subjects re-examine the entire process and final results to ensure that the work that has been done is in accordance with the core questions. The results of interviews with the subjects showed information that was not much different, including that the subjects understood what was asked in the question about the total cost incurred to buy ceramics and the habit of K2 subjects who re-checked the results of the work every time they finished doing the math problem.

Category of Low Self-Confidence Students

Kategori Siswa Kepercayaan Diri Rendah

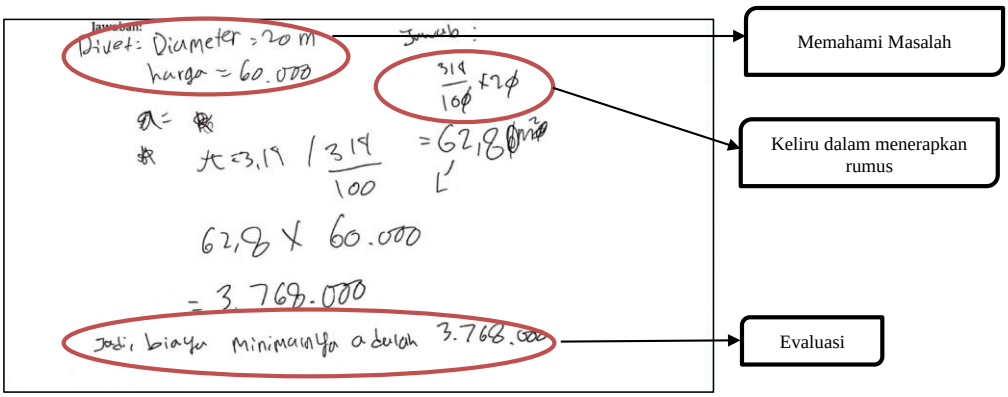

Figure 3. Work Results of K3 Subjects

K3 subjects begin the problem-solving process by writing down known information in the form of circle diameter and price per m2. This shows the activity of understanding the problem. In addition, the subject is also

able to explain what is asked in the question. In working on these problems, it can be seen in Figure 3. The subject uses the rule of the area of a circle and an algebraic operation of multiplication. Both concepts will be used to solve problems. Figure 3 describes the process of working on the subject in finding the amount of cost that must be incurred to buy a certain amount of ceramics. It begins with the use of the wrong circle area formula. The subject is not able to apply the concept correctly so the results obtained are also wrong. Furthermore, from the calculation results, a multiplication operation was carried out with the price of ceramics per m2. Because the initial results obtained were wrong, the calculation results also produced wrong numbers. This activity proves that K3 subjects are not able to apply the concept implementation indicators correctly. At the end, the subject gives a conclusion sentence about the nominal number obtained. The results of the interviews showed other information that the subjects did not re-examine the work process. The subject said that he was not used to re-checking and the available time had also run out.

Students with high levels of confidence have better ability to analyze mathematical problems, especially in breaking problems into logical elements. Students can identify important information in the problem as well as understand the relationships between the elements, which makes it easier for them to design effective and efficient solutions (Zheng et al., 2023). Confidence has a significant contribution to students' mathematical problem-solving abilities, where confident students are better able to maintain focus and perseverance when facing complex problems (Fitayanti et al., 2022). This shows that confidence is not only a psychological attribute, but also an important factor in the formation of the high-level thinking skills required in mathematics. In addition, students who are highly confident tend to be more proactive in learning. Siiswa is not afraid to come up with ideas or ask questions when faced with confusion, which enriches their understanding of the subject matter. This confidence also motivates students to take the initiative in finding creative solutions, even for problems that do not have a clear pattern of solving (Ningsih & Warmi, 2021). On the other hand, students who have high confidence are more resistant to pressure, such as exams or sudden assignments, and are able to maintain consistency in their performance. This is in contrast to students who have low self-confidence, who are often easily affected by anxiety and environmental pressures.

Students with moderate confidence levels show unique characteristics in the math learning process. Students are generally able to understand the material and solve problems well, but sometimes still face doubts in facing new challenges or more complex problems. Confidence that is at a moderate level can make students tend to be cautious and need additional encouragement to take initiative in the learning process. Confidence is also able to have a significant impact on student learning achievement (Nurhasanah et al., 2023). Although this percentage may seem small, it shows that confidence is one of the factors that affect learning outcomes, in addition to other factors such as learning interests and teaching methods.

Students with low self-confidence tend to only partially understand information. A lack of confidence in their abilities hinders thorough understanding, so students often start completion with irrelevant or even incorrect steps. This is exacerbated by math anxiety, which affects students' ability to focus on key elements in the question (Purba, 2023). Students with low self-confidence tend to avoid using tools such as diagrams or visualization of problems, because they feel insecure about their interpretive abilities. In contrast, students with high confidence are better able to use these tools to understand complex problem structures. Students with low confidence in this study showed a pattern of error consistent with the findings of previous research. These mistakes include the inability to understand the core of the problem, which causes students to fail to formulate the correct initial steps in solving the problem. In addition, a lack of understanding of the concepts or formulas to be used often leads students to use incorrect or irrelevant methods (Kuswanti et al., 2018; Azzahra & Pujiastuti, 2020). The habit of not double-checking answers is also a significant factor that increases simple errors, such as incorrect calculations or misinterpretations, which are not immediately corrected (Azzahra & Pujiastuti, 2020; Sihafudin & Tuhfatul Janan, 2023). Low confidence also has a wide impact on students' approach to math assignments. The anxiety and doubt that students with low self-confidence often experience reduce their ability to concentrate and focus during the problem-solving process (Azzahra & Pujiastuti, 2020). Lack of motivation to ask or ask for help worsens their understanding of the correct concepts and solutions. As a result, this condition not only affects learning outcomes directly but also further reinforces students' negative perceptions of mathematics, which is often considered a difficult and frightening subject (Kuswanti et al., 2018).

The results of the study on students with a high level of confidence show that they are able to complete each stage of problem solving in a complete and comprehensive manner, starting from recognizing important information, designing a solution strategy, to conducting a final evaluation of the solution provided. These findings are in line with the research of Hendriana et al. (2018) who stated that there is a significant positive relationship between confidence level and mathematical problem-solving ability. Furthermore, this is also in accordance with Bandura's theory of self-efficacy which states that individuals with confidence in their abilities tend to be persistent and reflective in facing challenges. In mathematics learning, high confidence not only

encourages students to search for the correct answers, but also facilitates logical, structured, and metacognin-based thought processes.

Meanwhile, students with a moderate level of confidence show a fairly good ability to solve problem-solving problems, despite inconsistencies in the implementation of strategies and evaluation stages. They can understand the initial information and choose an appropriate settlement strategy, but the implementation is often not optimal. This condition indicates that students with moderate confidence have sufficient cognitive capacity, but are still hampered by doubts in evaluating their work. This view is supported by Nurhasanah et al. (2023), who found that moderate confidence levels tend to have an unstable positive influence on student learning outcomes. Within the framework of Bandura's theory, this situation describes individuals with fluctuating self-efficacy, in which belief in one's abilities is influenced by previous context or experience. Consequently, the learning process becomes reactive—where students only perform optimally in familiar situations—rather than being proactive and adaptive to various conditions. Therefore, teacher support is needed through reflective reinforcement and scaffolding so that students are more confident and consistent in implementing completion strategies.

Students who have a low level of confidence tend to experience significant obstacles in each stage of problem solving, especially at the stage of understanding information and choosing the right strategy. Mistakes in the use of basic concepts such as applying incorrect formulas or failing to solve problems completely often occur in this group. In addition, they rarely evaluate or re-check the work process. These findings are reinforced by the research of Azzahra & Pujiastuti (2020) and Purba (2023), which states that low levels of confidence are closely related to high anxiety about mathematics, which further disrupts critical and logical thinking processes. In Bandura's perspective, students with low self-efficacy feel incapable of completing tasks independently and are more likely to avoid challenges. As a result, they become passive in the learning process and prone to fundamental mistakes. To address this, teachers need to create an emotionally safe learning environment as well as provide positive and constructive feedback. Learning approaches such as Problem Based Learning (PBL) and collaborative learning can be strategic alternatives to increase confidence while simultaneously developing students' critical thinking skills.

4. CONCLUSION

Self-confidence is a crucial factor that affects students' mathematical problem-solving skills. Students with high and medium levels of confidence demonstrate better ability to identify key elements of problems, formulate effective resolution strategies, and conduct reflective evaluations of their work. Confidence also encourages an optimistic attitude in the face of challenges, reduces math anxiety, and increases intrinsic motivation to learn. In contrast, students with low self-confidence tend to face difficulties in understanding problems thoroughly, choosing appropriate strategies, and evaluating problem-solving processes. This obstacle is often also influenced by anxiety and fear of failure, thus limiting students' active involvement in learning. In mathematics education, self-confidence acts as a catalyst that allows students to think critically, creatively, and logically, as well as solve problems with a systematic and solution-oriented approach. Therefore, educators or teachers need to pay special attention to developing students' confidence as an integral part of their learning strategies.

This research has several limitations that need to be considered. First, the limited number of participants to three students meant that the results of the study could not be generalized to the wider population. Second, the context of the material is focused only on circles at the junior high school level, so the findings do not reflect variations in other mathematical contexts. In addition, the qualitative approach used emphasizes more on the depth of the data than the breadth of coverage, so further quantitative studies are needed to strengthen the generalization of the results.

Therefore, it is recommended that the next study involve a larger number of participants as well as variations in class levels and mathematics materials. Follow-up research can also use a mixed methods approach to combine qualitative exploration with quantitative data. In addition, the development of confidence-building interventions, such as project-based learning or contextual problems with local wisdom, is also an important direction for further research.

Further research needs to be explored related to strategies on how to increase student confidence. Because considering the importance of building student confidence in learning, it is necessary to have innovative strategies that are implemented, for example, problem-based learning with the context of local wisdom. This strategy can also foster students' literacy skills in a cultural context and will become more interesting if research is carried out on the profile of problem-solving and literacy skills.

REFERENCES

Azzahra, R. H., & Pujiastuti, H. (2020). Analisis kemampuan pemecahan masalah siswa pada materi sistem persamaan linear tiga variabel. Transformasi: Jurnal Pendidikan Matematika Dan Matematika, 4(1), 153-162. https://doi.org/10.36526/tr.v4i1.876

Chai, C. S., & Kong, S.-C. (2017). Professional learning for 21st century education. Journal of Computers in Education, 4(1), 1–4. https://doi.org/10.1007/s40692-016-0069-y

Fardani, Z., Surya, E., & Mulyono, M. (2021). Analisis Kepercayaan Diri (Self-Confidence) Siswa Dalam Pembelajaran Matematika Melalui Model Problem Based Learning. Paradikma: Jurnal Pendidikan Matematika, 14(1), 39–51. https://doi.org/10.24114/paradikma.v14i1.24809

Fitayanti, N., Rahmawati, A., & Asriningsih, T. M. (2022). Pengaruh Self-Confidence Terhadap Kemampuan Pemecahan Masalah Matematika Siswa. JPMI (Jurnal Pembelajaran Matematika Inovatif), 5(2), 335. https://doi.org/10.22460/jpmi.v5i2.9678

Gunawan, Kartono, Wardono, & Kharisudin, I. (2022). Analysis of mathematical creative thinking skill: In terms of self confidence. International Journal of Instruction, 15(4), 1011-1034. https://doi.org/10.29333/iji.2022.15454a

Gursen Otacioglu, S. (2008). Prospective Teachers' Problem-Solving Skills and Self-Confidence Levels. Educational Sciences: Theory and Practice, 8(3), 915-923.

Guven, İ., & Alpaslan, B. (2022). Investigation of the Effects of Interdisciplinary Science Activities on 5th Grade Students' Creative Problem Solving and 21 st Century Skills. TOJET: The Turkish Online Journal of Educational Technology, 21(1).

Hendriana, H., Johanto, T., & Sumarmo, U. (2018). The Role of Problem-Based Learning to Improve Students' Mathematical Problem-Solving Ability and Self Confidence. Journal on Mathematics Education, 9(2), 291-300. https://doi.org/10.22342/jme.9.2.5394.291-300

Herlinawati, H., Marwa, M., Ismail, N., Junaidi, Liza, L. O., & Situmorang, D. D. B. (2024). The integration of 21st century skills in the curriculum of education. Heliyon, 10(15). https://doi.org/10.1016/j.heliyon.2024.e35148

Hikayat, C., Suparman, Hairun, Y., & Suharna, H. (2020). Design of realistic mathematics education approach to improve critical thinking skills. Universal Journal of Educational Research, 8(6). https://doi.org/10.13189/ujer.2020.080606

Kuswanti, Y., Sudirman, & Nusantara, T. (2018). Deskripsi kesalahan siswa pada penyelesaian masalah sistem persamaan linear tiga variabel (SPLTV). Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan, 3(7), 865–872.

Liu, J., Jin, H., Xu, G., Lin, M., Wu, T., Nour, M., Alenezi, F., Alhudhaif, A., & Polat, K. (2023). Aliasing black box adversarial attack with joint self-attention distribution and confidence probability. Expert Systems with Applications, 214. https://doi.org/10.1016/j.eswa.2022.119110

Mishra, P., & Mehta, R. (2017). What We Educators Get Wrong About 21st-Century Learning: Results of a Survey. Journal of Digital Learning in Teacher Education, 33(1). https://doi.org/10.1080/21532974.2016.1242392

Ngang, T. K., Nair, S., & Prachak, B. (2014). Developing Instruments to Measure Thinking Skills and Problem Solving Skills among Malaysian Primary School Pupils. Procedia - Social and Behavioral Sciences, 116, 3760–3764. https://doi.org/10.1016/j.sbspro.2014.01.837

Ningsih, S. P., & Warmi, A. (2021). Analisis Kepercayaan Diri (Self-Confidence) Pada Pembelajaran Matematika Siswa SMP. Maju, 8(2), 621–628.

Nuraini, D. R., Kusmayadi, T. A., & Fitriana, L. (2019). Mathematics problem solving based on Schoenfeld in senior high school students. Journal of Physics: Conference Series, 1318(1). https://doi.org/10.1088/1742-6596/1318/1/012093

Nurhasanah, N., Sripatmi, S., Salsabila, N. H., & Azmi, S. (2023). Pengaruh Kepercayaan Diri terhadap Prestasi Belajar Matematika Siswa Kelas VIII SMP Negeri 1 Sakra. Griya Journal of Mathematics Education and Application, 3(4), 571–581. https://doi.org/10.29303/griya.v3i4.404

Purba, P. B. (2023). Kecemasan Matematika pada Mahasiswa Pendidikan Matematika. Jurnal Pendidikan Tambusai, 7(2), 5629-5636.

Putra, I. M., & Masrukan, M. (2024, February). Telaah Kemampuan Berpikir Kreatif Matematis Siswa Ditinjau Dari Self-Confidence Pada Pembelajaran LAPS-Heuristik. In PRISMA, Prosiding Seminar Nasional Matematika (pp. 670-675).

Rahman, M. M. (2019). 21st Century Skill "Problem Solving": Defining the Concept. Asian Journal of Interdisciplinary Research, 2, 64–74. https://doi.org/10.34256/ajir1917

Rosli, M. S., Saleh, N. S., Md. Ali, A., Abu Bakar, S., & Mohd Tahir, L. (2022). A Systematic Review of the Technology Acceptance Model for the Sustainability of Higher Education during the COVID-19 Pandemic and Identified Research Gaps. In Sustainability (Switzerland) (Vol. 14, Issue 18). MDPI. https://doi.org/10.3390/su141811389

Saad, A., Elbashir, A., Abdou, R., Alkhair, S., Ali, R., Parangusan, H., Ahmad, Z., & Al-Thani, N. J. (2024). Exploring of the gender variations in 4Cs skills among primary students. Thinking Skills and Creativity, 52. https://doi.org/10.1016/j.tsc.2024.101510

Schoenfeld, A. H. (2013). Reflections on problem solving theory and practice. Mathematics Enthusiast, 10(1–2), 9–34. https://doi.org/10.54870/1551-3440.1258

Sihafudin, & Tuhfatul Janan. (2023). Analisis Kesalahan Siswa Dalam Menyelesaikan Soal Persamaan Kuadrat. PANDU : Jurnal Pendidikan Anak Dan Pendidikan Umum, 1(3), 160–169. https://doi.org/10.59966/pandu.v1i3.484

Surya, E., & Putri, F. A. (2017). Improving mathematical problem-solving ability and self-confidence of high school students through contextual learning model. Journal on Mathematics Education, 8(1), 85-94. https://doi.org/10.22342/jme.8.1.3324.85-94

Yapatang, L., & Polyiem, T. (2022). Development of the Mathematical Problem-Solving Ability Using Applied Cooperative Learning and Polya's Problem-Solving Process for Grade 9 Students. Journal of Education and Learning, 11(3), 40. https://doi.org/10.5539/jel.v11n3p40

Zheng, X., Tang, C., Wan, Z., Hu, C., & Zhang, W. (2023). Multi-Level Confidence Learning for Trustworthy Multimodal Classification. www.aaai.org