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Analyzing Students' Contextual Problem-Solving on the Pythagorean Theorem Based on Learning Styles

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Abstract: This study aims to explore the problem-solving processes of students in solving contextual problems related to the Pythagorean Theorem based on their learning styles. This study uses a qualitative descriptive approach involving three students representing visual, auditory, and kinesthetic learning styles. Data were collected through written tests and semi-structured interviews, and analyzed through data reduction, data display, and conclusion drawing. The results show that students demonstrate different ways of thinking in constructing problem-solving processes. Visual learners tend to use diagrams and visual representations to organize information. Auditory learners demonstrate a sequential problem-solving process through verbal reasoning and internal dialogue. Meanwhile, kinesthetic learners engage with the problem through physical and spatial imagination using movement and gestures. Although some parts of the process are expressed through different forms, such as verbal explanation or mental reflection, the findings show that students construct understanding and connect mathematical concepts with contextual situations. These results emphasize that differences in learning styles are reflected in how students think, represent, and process problems.

INTRODUCTION

In this increasingly competitive era of modern education, the ability to solve problems is one of the most important skills to be possessed by students. Based on the Program for International Student Assessment (PISA) 2022 survey, Indonesia ranked 69th out of 80 participating countries. Although this ranking shows an improvement of 5 to 6 positions compared to PISA 2018, Indonesia's average score has decreased in all areas assessed, particularly in Mathematics, down 12 points from 2018. The data further shows that almost no Indonesian students reached Level 5 or 6 in the PISA math test, while students at these levels should be able to model complex situations mathematically as well as select and apply appropriate solution strategies. So, it can be concluded that the low number of students at this level indicates the weak ability of students to solve mathematical problems. According to Polya, problem solving is not just solving routine problems, but involves the ability to understand the problem, design a solution strategy, apply it, and look back at the results (Polya), especially solving problems that are contextual in nature. One of the basic concepts that is key in solving various contextual problems that often appear in international assessments, especially on the topic of geometry and measurement is the Pythagorean Theorem. Furthermore, recent studies (Rosa et al., 2025; Pratiwi et al., 2025; Rahmawati et

al., 2025; Choirudin et al., 2025; Pujilestari & Juliangkary, 2025) emphasize that students' difficulties in solving contextual problems are often influenced by their learning styles. These studies suggest that individual tendencies in processing information, whether visual, auditory, or kinesthetic, not only affect how students interpret contextual scenarios but also how they formulate strategies and communicate solutions effectively. This reinforces the need to explore the interplay between learning styles and students' contextual problem-solving abilities, particularly in geometry topics such as the Pythagorean Theorem.

The Pythagorean Theorem states that in a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides. However, even though this concept is fairly basic, the *Trends in International Mathematics and Science Study* (TIMSS) 2019 international study states that only about 23% of Grade 8 students globally managed to correctly answer Pythagorean Theorem-based questions that required them to identify appropriate mathematical expressions in the context of building roofs.

In practice, the *National Council of Teachers of Mathematics* (NCTM, 2020) revealed that students often have difficulty in connecting geometry concepts with contextual problems. This condition encourages the need for more relevant strategies, as shown in research by Sari & Pramudiani (2022) showing that contextual strategies can increase students' understanding and interest in geometry because students feel that what they learn is relevant to their lives. In addition, several recent studies have shown that contextual problems that connect mathematical concepts with everyday situations can improve analysis and problem solving skills. For example, a study by Putri and Wulandari (2021) found that contextual questions improved students' ability to develop strategies for solving Pythagorean Theorem problems in a more creative and adaptive way. In addition, Ramadhani et al. (2022) emphasized that contextual problems encourage deeper cognitive engagement, because learners must interpret information and adapt mathematical formulas to the real context presented.

However, one of the things that needs to be considered is the learning style of each student. Everyone has different ways of understanding and processing information. In problem-solving activities, learning styles play a role in how individuals interpret situations, choose approaches, and structure the steps of resolution. Some students may be more inclined to learn through visuals, while others are more effective through auditory or practical experience (kinesthetic). According to research conducted by Zhang et al. (2022), "Recognizing students' individual learning styles can improve their engagement and understanding of teaching materials" (p. 100). In addition, study by Suryadi et al. (2021) states that these tendencies affect the effectiveness of the strategies used in solving mathematical problems. Learning styles also bring out potential strengths and obstacles in responding to various forms of problems, including in geometry contexts such as the Pythagorean Theorem.

Therefore, this study aims to analyze how students' learning styles shape the way they solve contextual problems related to the Pythagorean Theorem. This research is expected to

provide insight for readers regarding how students understand and approach contextual problems and how learning styles influence their problem-solving processes. In addition, the results of this study can be used as a reference for educators in designing materials and exercises that encourage students to apply problem-solving strategies in different ways. Unlike previous studies that focused mainly on either contextual problems or learning styles separately, this study combines both perspectives by exploring how different learning styles shape students' approaches in solving contextual problems related to geometry. This integrated focus offers an understanding and responds to recent research recommendations (Rosa et al., 2025; Pratiwi et al., 2025) to address persistent challenges in mathematical problem solving.

METHOD

This study uses a qualitative descriptive approach. The subjects of this study were three eighth-grade junior high school students who had studied the Pythagorean Theorem. The participants consisted of one student with an auditory learning style, one with a visual learning style, and one with a kinesthetics learning style.

The analysis of students' problem-solving processes refers to Polya's stages of problem solving, which include (1) understanding the problem, (2) device a plan, (3) carrying out the plan, and (4) looking back. The indicators of problem solving based on Polya's stages are as follows:

Table 1. Problem Solving Indicators According to Polya

Indicator	Description	Code
Understand the Problem	The subject understands what is known and asked in the given problem	UP01
Device a Plan	The subject is able to determine the formula / method / method to solve the problem given	DP02
Carry Out the Plan	There is a solution, the calculation process is correct and the final result is correct.	CP03
Look Back and Conclusion	The subject re-corrects the answers that have been given in solving the problem to ensure that the answers are correct.	LB04

The instruments used in this study were a three-item Pythagorean Theorem problem solving ability test sheet and interview guidelines to strengthen the written data of student answers. The test question instruments are presented in the following table, namely:

Table 2. Problem Solving Ability Test

Problem	
A technology company is developing a specialized drone to deliver medicines to mountainous areas that are difficult to reach due to bad roads. In the test, the drone flew flat to the North and dropped a package from a height of 6 meters above the ground. The package was targeted to fall exactly on the target point which was 8 meters horizontally on the ground from the initial position when it was released. However, during the test, an obstacle arose: the wind was blowing from North to South.	
Questions	**Code**
Calculate the distance traveled by the package from the drone to the target point using a suitable mathematical approach. Justify your method and explain how this calculation helps in ensuring the package hits the target point accurately!	Q001

Do you think the package will still fall exactly at the target point if there is a wind blowing from North to South? Explain your reasoning mathematically and logically.	Q002
If the package is displaced by the wind, propose a solution so that the package can still reach the target point. Explain your idea!	Q003

The interview guideline made several questions to reveal the description of students' problem-solving skills which would later be compared with the results of the test work. The interview guidelines are presented in the following table, namely:

Table 3. Problem Solving Ability Interview Guidelines

Questions	Code
What was your first thought when you read the question about drones and drug delivery?	IG001
Can you tell me how you tried to solve the problem? For example, what steps did you take, what calculations did you make, or did you draw anything?	IG002
After working on the problem, how do you think you did? Are you sure your answer is right? If you have other ways that you thought of but didn't use, can you tell me about them?	IG003

The research data were analyzed and validated using triangulation techniques by comparing data obtained from written tests and structured interviews. The data analysis followed the stages of data reduction, data display, and conclusion drawing.

RESULT AND DISCUSSION

This study aims to analyze how students with different learning styles construct and apply problem-solving processes when solving contextual problems on the Pythagorean Theorem. The analysis focuses on how students interpret problems, represent information, and connect mathematical concepts based on their learning preferences.

Research Result

The results of this study were obtained from a learning style assessment conducted through an online platform, https://akupintar.id/mp/tes-gaya-belajar. Each student completed the assessment to identify their dominant learning style. The initial classification was based on the results of the online test. To ensure the validity of this classification, the researchers confirmed each student's learning style through observation and interviews, ensuring consistency between the test results and students' behavior during the problem-solving process. Based on this classification, three students representing auditory, visual, and kinesthetic learning styles were selected as research subjects. The selected students were then given problem-solving tasks, followed by individual interviews to explore their thinking processes. The following three research subjects were selected based on the learning style identification:

Table 4. Initials of Research Subjects' Names

Subject	Type of Learning Style	Code
RZ	Visual	V0RZ
AD	Auditori	A0AD
DF	Kinestetic	K0DF

The following are the results of the analysis of the Pythagorean Theorem problem solving ability test and the interview with the subject, namely:

Pythagorean Theorem Problem Solving Ability with Visual Learning Style Subject Code V0RZ

The visual learner approached the problem by constructing a visual representation of the situation. When reading the problem, the student immediately transformed the contextual information into a diagram in the form of a right triangle. This visualization was used by the student to identify key elements such as vertical and horizontal distances and organize known and unknown information.

In the planning stage, the student relied on the visual model to determine the mathematical concept used, namely the Pythagorean Theorem. The diagram functioned not only as a representation tool but also as a thinking aid that guided the sequence of steps taken.

During the execution stage, the student consistently referred back to the drawing while referring to the representation during the calculation process. Additionally, when responding to the wind condition, the student extended the visual model by adding directional elements, indicating how the student connected mathematical reasoning with real-world context.

However, the student's reflective thinking was not expressed in written form, although interview data revealed that the student reflected on the situation and considered alternative conditions.

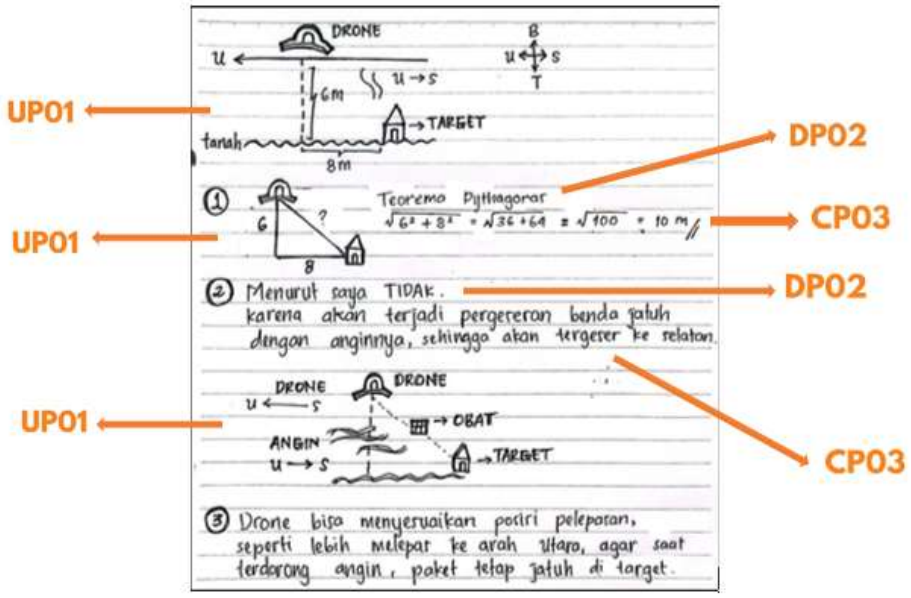

Figure 1. Problem Solving Results of Problem Q001, Q002, Q003 Subject Code V0RZ

The results of the interview with the subject code V0RZ in solving problem Q001, Q002, Q003, namely:

IG001 : Well, when you first read the question about the drone that delivered the medicine, what immediately came to your mind?

V0RZ001 : When I read the question, I immediately imagined the drone flying over the target house, ma'am. Then I thought, "This must be about distance." You see, there is a downward distance of 6 meters and a horizontal distance of 8 meters. Well, because I'm a very visual child, I immediately drew it first to make it more imaginable. Because if I just imagine it in my head, sometimes I get confused, hehe

IG002 : Okay, then how did you do the steps?
V0RZ002 : First, I drew the situation. So, I made a triangle from the drone position to the target, one side is 6 meters, the other side is 8 meters. From there, I used the Pythagorean Theorem to find the oblique distance, which shows the actual distance from the drone to the target. So, I calculated: the root of 6 squared plus 8 squared, the result is 10 meters. But when I got the distance, I thought again: "After all, there is a wind from north to south." So, I immediately said in the answer that in my opinion, the medicine wouldn't fall right on the target because it would be shifted to the south by the wind. That's why I drew the wind conditions again, and then I gave suggestions too, like the drone should release the medicine a bit to the north so that when the wind pushes it, it can fall right on the target.
IG003 : Wow, you think it's quite complex too. Do you think the result is okay yet?
V0RZ003 : I think it's good, sis. Because I have tried drawing, calculating, and thinking about the logic too. But if there is another way that is more accurate, for example using the formula for motion or physics, the result might be different. But I just use the method that I understand first, as long as it makes sense. Besides, pictures help me more, so that's what helped me understand and solve this problem.

Pythagorean Theorem Problem Solving Ability with Auditory Learning Style Subject Code A0AD

The auditory learner demonstrated a problem-solving process characterized by verbal reasoning and sequential explanation. When interpreting the problem, the student processed the information by internally "talking through" the situation and imagining the movement of the drone while describing it verbally.

In the planning stage, the student identified the use of the Pythagorean Theorem by articulating the relationship between the given distances. The thinking process appeared in the form of verbal narration, where each step was explained in sequence.

During the execution stage, the student combined calculation with ongoing verbal explanation, showing that verbal explanation was used as a strategy to organize thoughts. The student also used analogies from daily experience to connect abstract concepts with real situations.

In the evaluation stage, the student expressed conclusions and reasoning in both written and verbal forms, reflecting a tendency to externalize thinking processes through language.

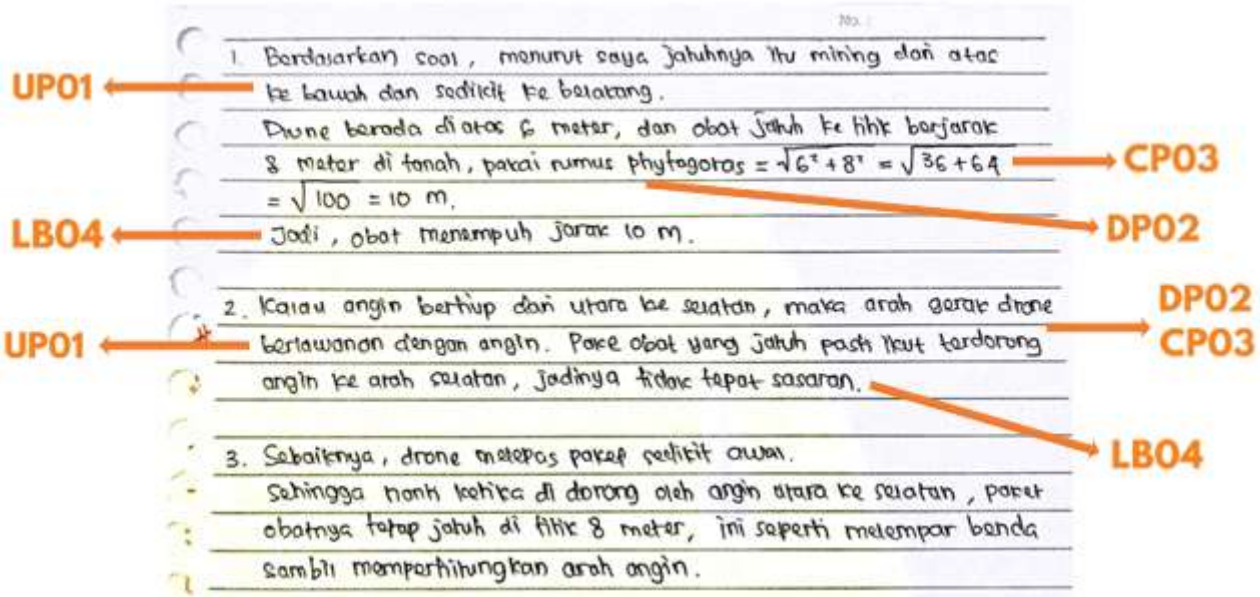

Figure 2. Problem Solving Results of Problem Q001, Q002, Q003 Subject Code A0AD

The results of the interview with the subject code A0AD in solving problem Q001, Q002, Q003, namely:

IG001 : When you first read the question about the drone that delivers the medicine, what did you immediately think of?
A0AD001: Hmm... when I first read it, I immediately imagined the drone flying above, then dropping the medicine down, but not straight, sis, like a little tilted backwards. So, I immediately thought this must have something to do with the distance and direction of the fall.
IG002 : Then how did you do it? Are there certain steps you used?
A0AD002: Yes, sis. I immediately thought of using Pythagoras. It was mentioned that the drone was above 6 meters, and then the medicine fell 8 meters from the drone's point on the ground. So, I imagined the shape of a right triangle, and the hypotenuse is the distance traveled by the medicine. I calculated it like this: the root of 6 squared plus 8 squared, so the root of 100, so 10 meters. I was talking to myself while calculating, because I like it better when it's explained while being listened to.
IG002 : Well, that's okay too. Did you also think about the wind direction?
A0AD002: Yes, sis. I imagined that if the wind was from north to south and the drone was traveling in the opposite direction, the medicine would be pushed by the wind to the south. So, the drop could be shifted and not match the desired point.
IG002 : Then you gave a solution too?
A0AD002: Hehe, yes, sis. I just wrote, I think the drone should throw the medicine a little earlier. So, when the wind pushes it, it falls right at that 8 meter point. It's like we're throwing things but while thinking about the direction of the wind too. If not, it could miss.
IG003 : Well, do you think your answer is okay yet? Are you sure?
A0AD003: I think it's okay, sis. Because I've used calculations, and I also thought about the wind factor.

Pythagorean Theorem Problem Solving Ability with Kinestetic Learning Style Subject Code K0DF

The kinesthetic learner approached the problem through physical and spatial imagination. When reading the problem, the student used gestures such as pointing and hand movements to simulate the position and motion of the drone. This shows that the student constructed understanding through bodily experience and movement.

In the planning stage, the student translated these physical simulations into a mental model of a right triangle, which was used to represent the problem using the Pythagorean Theorem.

During the execution stage, the student combined calculation with ongoing physical imagination, showing that movement was used as part of the thinking process.

Although the written responses were brief, interview data revealed that the student demonstrated a reasoning process involving multiple stages, including consideration of contextual factors such as wind direction. This reflects a tendency for kinesthetic learners to rely on experiential processing rather than detailed written explanations.

The results of the interview with the subject code K0DF in solving problem Q001, Q002, Q003, namely:

IG001 : When you first read about drones and drug delivery, what immediately came to mind?
K0DF001 : What immediately came to my mind was imagining the drone flying in the air and dropping the medicine. I reflexively pointed up and pretended to point my hand down, like I was looking at the position of the drone and the direction it was falling. So, I thought, 'Wow, this fall must not be straight, it must be tilted because the drone is walking and then dropping things.' From there I immediately thought of the right triangle and Pythagoras.
IG002 : Okay, then how did you do the steps?

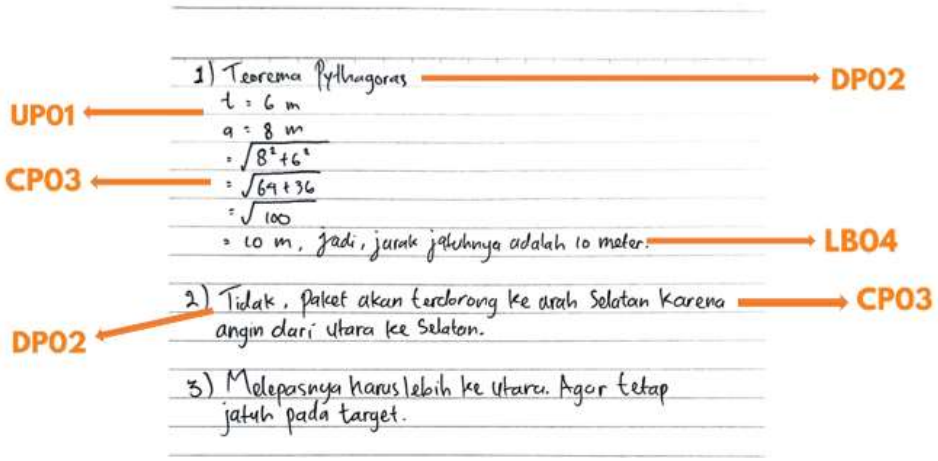

Figure 3. Problem Solving Results of Problem Q001, Q002, Q003 Subject Code K0DF

K0DF002 : I wrote that the height of the drone is 6 meters, then the horizontal distance is 8 meters. I used the Pythagorean formula to find the hypotenuse, so I calculated the root of 8 squared plus 6 squared. I got the root of 100, which means the distance is 10 meters. While doing this, I also moved my hands to imagine the drone moving forward while descending. So, I'm not just writing, but I'm also imagining the movement so that it goes better in my brain.

IG003 : That's cool, you can imagine the movement too. So, what do you think the answer will be? Are you sure?

K0DF003 : Yes, I'm sure, sis. Because the calculations matched, and I also understood the flow. But I didn't stop there, I also thought about the wind. The problem was that the question said the wind was from north to south. I thought, that means the drone shouldn't be released just above the target, but slightly to the north. So that the wind can push the package when it falls, and in the end, it still hits the target.

Discussion

The findings show that differences in learning styles are reflected in how students construct and apply problem-solving strategies rather than focusing on final answers. Each student demonstrates a unique way of interpreting, representing, and processing the problem.

The visual learner uses diagrams and visual representations to structure understanding and guide solution steps. The auditory learner demonstrates verbal reasoning by organizing ideas through sequential explanation and internal dialogue. Meanwhile, the kinesthetic learner engages in physical simulation and movement to build spatial understanding.

These differences show that problem solving is shaped by individual cognitive preferences. Students demonstrate different ways of engaging with problems, as reflected in how they think, act, and represent mathematical ideas.

Therefore, assessing students solely based on final answers may not capture their thinking processes. Evaluation can consider multiple forms of representation, including visual, verbal, and physical expressions

Table 5. Problem-Solving Characteristics

Subject Code	Question	Type of Learning Style	Observed Problem-Solving Characteristics
V0RZ	Q001	Visual	Uses diagrams to represent the problem, organizes information visually, and extends representation to contextual elements such as wind direction
	Q002		
	Q003		
A0AD	Q001	Auditory	
	Q002		

Subject Code	Question	Type of Learning Style	Observed Problem-Solving Characteristics
	Q003		Explains reasoning verbally and sequentially, uses internal dialogue, and connects concepts through spoken or written explanation
K0DF	Q001	Kinesthetic	Uses gestures and physical simulation, imagines movement, and processes spatial relationships through action
	Q002		
	Q003		

Subject with Visual Learning Style

The visual learner demonstrated a problem-solving process characterized by the use of visual representations. The student interpreted the problem by describing and sketching the context of the drone scenario, which was used to organize the given information such as vertical and horizontal distances.

In developing a solution, the student used diagrams to structure understanding and represent the problem using the Pythagorean Theorem. The use of visual representation functioned as a thinking tool used in organizing the sequence of problem-solving steps.

During the process, the student also extended the representation by incorporating contextual elements such as wind direction, showing how the student connected mathematical reasoning with real-world situations. Although the evaluation process was not expressed in written form, interview data showed that the student reflected on the solution internally and considered alternative conditions.

Subject with Auditory Learning Style

The auditory learner demonstrated a problem-solving process characterized by verbal reasoning and sequential explanation. The student interpreted the problem through internal dialogue, describing the situation and organizing information step by step.

In developing a solution, the student articulated the relationship between known values and used the Pythagorean Theorem to represent the problem through verbal reasoning. The process was accompanied by continuous verbal explanation, showing that language was used to organize thoughts.

The student also connected the problem to everyday experiences, such as considering wind direction, to connect the situation with the problem context. The evaluation stage was expressed through both written and verbal explanations, reflecting a tendency to externalize thinking processes through language.

Subject with Kinesthetic Learning Style

The kinesthetic learner demonstrated a problem-solving process that involved physical and spatial imagination. The student interpreted the problem by using gestures and body movements to simulate the position and motion of the drone, showing that the student constructed understanding through action.

In developing a solution, the student translated these physical simulations into a mental representation, which was used to represent the problem using the Pythagorean Theorem. The thinking process was accompanied by movement and spatial imagination, showing that physical engagement was used as part of the thinking process.

Although the written responses were brief, interview data showed that the student engaged with the problem through physical and spatial reasoning, including consideration of contextual factors such as wind direction. This reflects a tendency for the student to rely on experiential processing rather than detailed written explanation.

CONCLUSION AND SUGGESTIONS

This study concludes that students with different learning styles demonstrate distinct problem-solving processes when solving contextual Pythagorean problems. The differences lie in how students interpret problems, represent information, and construct solution processes.

Visual learners tend to use diagrams and visual representations, auditory learners use verbal reasoning and sequential explanation, and kinesthetic learners engage in physical simulation and spatial imagination.

These findings highlight the importance of understanding students' thinking processes rather than focusing solely on final answers, and indicate the need for instructional and assessment approaches that accommodate diverse ways of thinking.

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REFERENCES

Andini, R., & Kusuma, A. (2024). Pengaruh penyesuaian soal kontekstual dan gaya belajar terhadap efektivitas strategi pemecahan masalah matematika. *Jurnal Pendidikan Matematika*, 15(1), 45-60.

Andriani, S., & Suparman, D. (2022). Hubungan antara gaya belajar dan keberhasilan menyelesaikan soal kontekstual matematika. *Jurnal Ilmiah Pendidikan*, 8(3), 120-130.

Fadhila, R., & Isnarto, D. (2023). Hubungan gaya belajar dengan indikator kemampuan pemecahan masalah matematika pada siswa SMP. *Jurnal Pendidikan dan Pembelajaran*, 10(2), 75-87.

Farahani, A., Hosseini, S., & Mohammadi, M. (2021). The impact of problem-solving activities on mathematical understanding. *Journal of Mathematics Education*, 14(4), 332-345.

Naibaho, T. B., Hutauruk, A., & Simanjuntak, R. M. (2023). Analisis kemampuan pemecahan masalah ditinjau dari gaya belajar siswa pada materi teorema Pythagoras. *Innovative: Journal of Social Science Research*, 3(4), 102–113.

Irfan, M. M., Safaria, S. A., & Sangila, M. S. (2022). Analisis kesulitan belajar matematika siswa konsep teorema Pythagoras ditinjau dari gaya belajar. *Jurnal Ilmiah Pendidikan Matematika Al Qalasadi*, 6(1), 45–54.

National Council of Teachers of Mathematics (NCTM). (2020). Principles to actions: Ensuring mathematical success for all. Reston, VA: NCTM.

Polya, G. (2004). How to solve it: A new aspect of mathematical method (2nd ed.). *Princeton University Press*.

Putri, S., & Wulandari, T. (2021). Pengaruh soal kontekstual terhadap kreativitas strategi pemecahan masalah teorema Pythagoras. *Jurnal Pendidikan Matematika Indonesia*, 6(3), 200-210.

Ramadhani, L., Hartono, Y., & Kusuma, F. (2022). Keterlibatan kognitif siswa melalui soal kontekstual pada materi teorema Pythagoras. *Jurnal Inovasi Pendidikan*, 7(4), 150-162.

Ramadhani, L., Sari, R., & Wahyudi, T. (2023). Gaya belajar dan pemilihan strategi representasi dalam pemecahan masalah matematika. *Jurnal Pendidikan dan Pembelajaran Matematika*, 12(1), 33-48.

Sari, D., & Pramudiani, S. (2022). Strategi pembelajaran kontekstual untuk meningkatkan pemahaman dan minat siswa terhadap geometri. *Jurnal Pendidikan Matematika*, 14(2), 99-110.

Suryadi, D., Nugroho, B., & Setiawan, A. (2021). Pengaruh gaya belajar terhadap efektivitas strategi pemecahan masalah matematika. *Jurnal Pendidikan dan Pembelajaran*, 9(3), 250-265.

Wijaya, B., Wibowo, A., & Putra, I. (2020). Soal kontekstual dan kemampuan berpikir kritis siswa dalam matematika. *Jurnal Pendidikan dan Kebudayaan*, 25(1), 70-82.

Yuliana, T., & Ganda, F. (2023). Pemecahan masalah sebagai keterampilan abad ke-21 dalam pembelajaran matematika. *Jurnal Pendidikan dan Pembelajaran*, 13(1), 15-29.

Zhang, L., Chen, Y., & Lee, K. (2022). Understanding individual learning styles to enhance engagement and comprehension. *International Journal of Educational Psychology*, 18(2), 95-105.

Alnar, A., Minggi, I., Mahmud, R. S., Syamsuadi, A., & Arriah, F. (2023). Profil pemecahan masalah teorema Pythagoras ditinjau dari perbedaan gaya kognitif siswa. *Jurnal Riset Guru Indonesia*, 3(2), 88–96.

Ramaditya, A. P., Rosyana, T., & Afrilianto, M. (2023). Penggunaan pendekatan contextual teaching and learning untuk meningkatkan kemampuan pemecahan masalah matematis siswa SMP kelas VIII pada materi teorema Pythagoras. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 6(1), 14–23.

Rosa, K. W., Nurhanurawati, N., & Suryadinata, N. (2025). Students' mathematical reflective thinking ability with guided discovery learning on Pythagorean theorem material. *Jurnal Pendidikan Matematika dan Sains, 13*(1), 132–139.

Pratiwi, A. A., Roza, Y., & Murni, A**.** (2025). Development of student worksheet based on contextual problems to facilitate students' mathematical problem-solving skills in flat-sided space VIII SMP/MTs. *Journal of Educational Sciences, 9*(2), 699–708.

Rahmawati, N. D., Waluya, B., Mulyono, & Iqbal Kharisudin**.** (2025). Analyzing mathematical creative thinking processes in higher education: A learning style perspective in graph problem solving. *Hipotenusa: Journal of Mathematical Society, 7*(1), 146–160.

Choirudin, C., Lubis, M., & Masuwd, M. A. (2025). Enhancing high school students' mathematical problem-solving skills through interactive media: A classroom action research approach. *Journal of Teaching and Learning Mathematics, 2*(2), 104–121.

Pujilestari, P., & Juliangkary, E. (2025). Realistic Mathematics Education as a contextual approach in overcoming learning difficulties: Circle material. *JUPE: Jurnal Pendidikan Mandala, 10*(2), n.p.

Taamneh, M. A., Díez-Palomar, J., & Mallart-Solaz, A. (2024). Examining tenth-grade students' errors in applying Polya's problem-solving approach to Pythagorean theorem. Eurasia Journal of Mathematics, Science and Technology Education, 20(12), Article em2551.

Frontiers in Education. (2025). Influence of students' learning style and personality characteristics on mathematics problem-solving skills: A study across elementary and junior high schools. *Frontiers in Education*.

Jaruška, H., & Černý, I. (2025). Systematic analysis of learning styles and mathematics achievement: A comparative review. *Pedagogical Research, 10*(1), Article em0232.

Maquiling, E. E., & Desabella, R. V. (2025). Relationships between VARK learning styles, critical thinking, and mathematics performance among college students in the Philippines. *Edelweiss Applied Science & Technology, 9*(6), 821–834.

Achyar, M. Z., Nugraha, Y., & Syawahid, M. (2025). Translational representation in understanding Pythagorean theorem reviewed from student learning styles. *Alifbata: Jurnal Pendidikan Dasar, 5*(1), 41–52.