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The Relationship between Self-Confidence and Analytical Thinking Skills of Fifth-Grade Elementary School Students Regarding Two-Dimensional Shapes

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Abstract

Although self-confidence and analytical thinking are both essential to higher-order learning, limited research has examined their relationship in elementary mathematics, particularly in the context of two-dimensional shapes. This study aimed to determine the relationship between self-confidence and analytical thinking skills among fifth-grade students at SDN 86 Singkawang during mathematics learning on two-dimensional shapes. A quantitative correlational design was employed, involving 54 students selected through total sampling. Data were collected using a self-confidence questionnaire and an essay test measuring analytical thinking skills. The instruments were subjected to validity testing before administration, and the data were analyzed using descriptive statistics, the Kolmogorov–Smirnov normality test, Spearman's rank correlation, and the coefficient of determination with SPSS version 17. The findings indicate that students' self-confidence was in the high category, with a mean score of 41.45, whereas their analytical thinking skills were in the moderate category, with a mean percentage of 55.66%. Spearman's rank analysis demonstrated a positive and statistically significant relationship between self-confidence and analytical thinking skills ($r = .416$, $p = .002$), indicating that students with higher self-confidence tended to demonstrate stronger analytical thinking skills. The study concludes that self-confidence is moderately associated with the development of analytical thinking in elementary mathematics. These findings extend the literature on the relationship between affective and cognitive dimensions of

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mathematics learning and are consistent with Bandura's theoretical proposition that beliefs in personal capability influence cognitive performance. Practically, the results suggest that teachers should cultivate supportive learning environments through discussion, collaboration, and problem-based activities that strengthen students' confidence and analytical engagement. Further research should involve larger and more diverse samples and examine additional variables, including learning motivation, learning styles, and instructional models.

Keywords: Analytical Thinking Skills; Elementary Mathematics; Self-Confidence; Two-Dimensional Shapes; Upper Elementary Students

INTRODUCTION

Mathematics is a key school subject capable of shaping character, instilling values, developing problem-solving skills, and enhancing students' existing abilities. It can be defined as a discipline expected to foster the development of students' thinking processes. Arends(in Hidayah et al. 2019) states that the implementation of mathematics instruction using the "Think-Pair-Share" strategy is a form of cooperative learning characterized by explicitly applied procedures, wherein students are given ample time to think, respond, and assist one another. (Hidayah et al., 2019) Thus, it can be concluded that the "Think-Pair-Share" strategy in mathematics instruction enhances students' problem-solving skills by encouraging them to approach mathematical problems through collaborative and reflective thinking.

Thinking skills can be developed by working through sample problems in mathematics lessons. Consequently, these skills are a crucial aspect to cultivate as students learn to solve mathematical problems. state that from primary through secondary school, students must study mathematics to develop logical, analytical, systematic, critical, and creative thinking skills, as well as the ability to solve the problems they will encounter.(Syam, n.d.) This statement highlights analytical thinking as one of the key skills that must be developed to enable students to solve problems.

Analytical thinking ability is a key learning objective designed to support students in making decisions, enhancing problem-solving skills, and finding solutions in their daily lives. According to Dawati (dalam Kartikasari, D, 2022)), analytical ability is a learning objective across all fields of study; it is essential for students not only to comprehend learning material

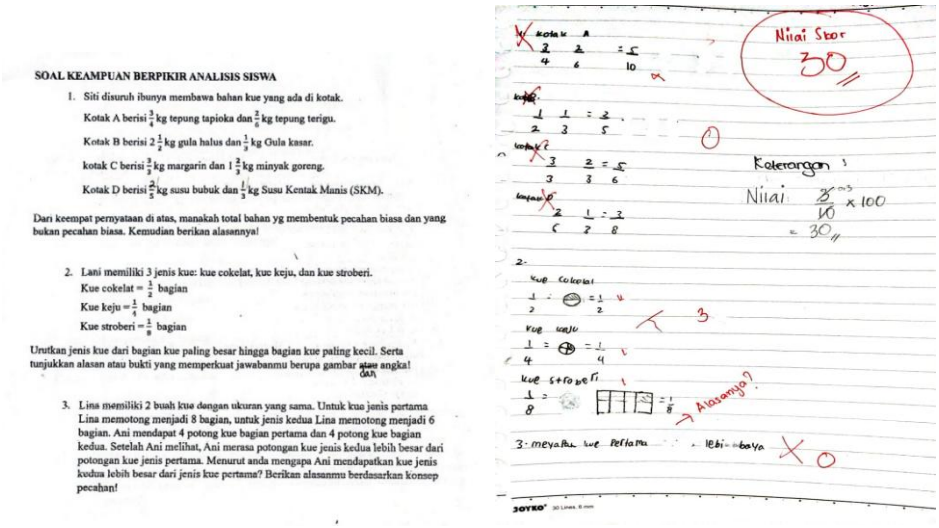
but also to identify problems, seek solutions, and devise ways to resolve issues encountered in everyday life.(Kartikasari, 2021)

Beyond the need to solve real-life problems, it is important to recognize that analytical thinking is a component of higher-order thinking skills. Anderson and Krathwohl (as cited in Syahri & Ahyana, 2021) indicate that students' mathematical analytical abilities are closely linked to Higher-Order Thinking Skills (HOTS), particularly when solving context-based problems. Thus, analytical thinking is integral to HOTS and plays a crucial role in the learning process, especially in problem-solving. Ilmiyatni et al. (2019) state that analytical thinking falls under the category of higher-order thinking skills required for problem-solving, decision-making, and knowledge acquisition; by developing analytical thinking, individuals are encouraged to seek the truth, analyze problems effectively, and think both systematically and independently when resolving issues.

The importance of students possessing analytical thinking skills is not reflected in the actual results achieved; various studies indicate that these skills remain at a low level. Indonesia participated in the most recent TIMSS (Trends in International Mathematics and Science Study) assessment in 2015, and the results showed that the average mathematics achievement scores of Indonesian students remained low. This level of performance indicates that, on average, Indonesian students are only capable of recognizing basic facts but are not yet able to effectively communicate the nature of the problems. TIMSS research in Indonesia is linked to students' thinking abilities—specifically problem-solving—revealing that Indonesian students currently lack sufficient thinking skills, a shortcoming that needs to be addressed, according to Hadi & Novaliyosi (cited in Hanifah, 2023). In addition to problem-solving, TIMSS employs an assessment design that measures Higher-Order Thinking Skills (HOTS); the questions are designed to evaluate various levels of cognitive ability—ranging from factual recall and the application of concepts to complex reasoning and problem-solving—all of which rely on analytical thinking skills.(Hanifah, S. N., 2023)

The low level of analytical thinking among students is further evidenced by research from Mufit et al. (2020), which indicates that 70% of Indonesian students perform at the lower level regarding higher-order thinking skills. Similarly, research by Ilma (2017) highlights that only 5% of students possess analytical thinking skills; consequently, to improve these skills, students must be accustomed to solving problems that require analysis.

Issues regarding analytical thinking skills were also observed among fourth-grade students at SDN 86 Singkawang. This was identified through preliminary research in which students were given questions designed to assess indicators of analytical thinking. The assessment covered three indicators: (1) differentiating (maximum score of 3 points), (2) organizing (maximum score of 3 points), and (3) attributing (maximum score of 3 points). An excerpt of a student's response from this preliminary research is shown in Figure 1



SOAL KEAMPUAN BERPIKIR ANALISIS SISWA

1. Siti disuruh ibunya membawa bahan kue yang ada di kotak.
   Kotak A berisi $\frac{2}{4}$ kg tepung tapioka dan $\frac{2}{6}$ kg tepung terigu.
   Kotak B berisi $2\frac{1}{2}$ kg gula halus dan $\frac{1}{3}$ kg Gula kasar.
   kotak C berisi $\frac{2}{3}$ kg margarin dan $1\frac{2}{3}$ kg minyak goreng.
   Kotak D berisi $\frac{2}{5}$ kg susu bubuk dan $\frac{1}{3}$ kg Susu Kental Manis (SKM).

   Dari keempat pernyataan di atas, manakah total bahan yg membentuk pecahan biasa dan yang bukan pecahan biasa. Kemudian berikan alasannya!

2. Lani memiliki 3 jenis kue: kue cokelat, kue keju, dan kue stroberi.
   Kue cokelat = $\frac{1}{2}$ bagian
   Kue keju = $\frac{1}{4}$ bagian
   Kue stroberi = $\frac{1}{8}$ bagian

   Urutkan jenis kue dari bagian kue paling besar hingga bagian kue paling kecil. Serta tunjukkan alasan atau bukti yang memperkuat jawabanmu berupa gambar atau angka!

3. Lina memiliki 2 buah kue dengan ukuran yang sama. Untuk kue jenis pertama Lina memotong menjadi 8 bagian, untuk jenis kedua Lina memotong menjadi 6 bagian. Ani mendapat 4 potong kue bagian pertama dan 4 potong kue bagian kedua. Setelah Ani melihat, Ani merasa potongan kue jenis kedua lebih besar dari potongan kue jenis pertama. Menurut anda mengapa Ani mendapatkan kue jenis kedua lebih besar dari jenis kue pertama? Berikan alasanmu berdasarkan konsep pecahan!

Figure 1. Analytical Thinking Skills Test Questions and Student Answers

Based on the sample answers shown in Figure 1, it appears that the students lack strong analytical thinking skills. In the first problem, students were presented with four statements and asked to distinguish between ordinary fractions and non-ordinary fractions. However, when solving the problem, the students did not first analyze the results to differentiate between the two types of fractions. Instead, they proceeded directly to calculations without considering the fraction type, resulting in incorrect answers; only about 30% of the 28 students were able to correctly distinguish between ordinary and non-ordinary fractions. Consequently, the students' responses did not demonstrate the "differentiating" indicator—the ability to identify distinctions between pieces of information. In the second problem, students were asked to order cake portions from largest to smallest and to provide supporting reasons or visual evidence. While the students correctly ordered the portions from largest to smallest, they failed to provide reasoning that linked the fractions, meaning the relationships between them were not made apparent. This indicates a lack of proficiency in "organizing"—the ability to identify relationships between pieces of information and

arrange them logically. Only about 50% of the 28 students were able to connect the pieces of information and arrange them in a logical order.

In the third problem, students were required to explain—based on the concept of fractions—why the second type of cake Ani received was larger than the first. The students were unable to answer this question. This indicates that they lacked the ability to attribute meaning—specifically, the capacity to determine the intent or purpose behind specific information. Only about 15% of the 28 students were able to identify the purpose or meaning of the information provided.Low analytical thinking skills stem from several factors. According to Hayati & Setiawan (2022), students' critical thinking abilities (including analysis) are influenced by two types of factors: internal and external. Hayati & Setiawan (cited in Rofi'ah, S., & Rokhmaniyah, R., 2024)further specify that internal factors include student characteristics, reading and writing abilities, learning motivation, and habits, while external factors encompass the teacher's instructional delivery and the habits the teacher fosters in students.(Rofi'ah & Rokhmaniyah, 2024) Regarding student characteristics specifically psychological ones notes that attributes such as intrinsic motivation, self-esteem, and self-confidence impact student learning.(Nafira et al., 2025)

Consequently, self-confidence is viewed as a psychological factor that plays a crucial role in the student learning process. Hannula, Maijah, and Pohkonen (cited in Purwasih, 2015:19) state that students with strong self-confidence are more likely to succeed in learning mathematics. Furthermore, Amri (dalam Safitri 2024) states that individuals with high self-confidence are more resilient in facing failure or obstacles, viewing challenges as opportunities to learn and grow. Self-confidence and self-concept encourage individuals to take proactive and bold actions in achieving their goals. V. Safitri & Prabawa, 2024)Conversely, students with low self-confidence often experience doubt and a fear of making mistakes, and they lack the courage to make decisions when solving mathematics problems. Puspitasari, dkk (2024) adds that individuals lacking self-confidence exhibit behaviors distinct from the norm—such as frequently doubting their abilities, hesitating to carry out tasks, and refraining from speaking without support. (Puspitasari et al., 2024)These behaviors can lead to students becoming passive in class, experiencing a decline in academic achievement due to a reluctance to try, and struggling to collaborate with peers.(Puspitasari et al., 2024)

The low level of student self-confidence is further corroborated by findings from the Trends in International Mathematics and Science Study (TIMSS) (cited in Zuhur Fardani, 2021), which reported that self-confidence levels among Indonesian students remain low—specifically, below 30%—indicating a lack of high self-confidence in the context of mathematics.(Fardani et al., 2021) According to TIMSS, self-confidence in this context entails possessing mathematical competence, the ability to learn mathematics quickly and persevere, confidence in one's own mathematical abilities, and the capacity for realistic thinking. reveals that only 17.24% of students possess high self-confidence, while 22.42% fall into the moderate category and 60.34% have low self-confidence; this indicates that the majority of students still lack an adequate level of self-confidence.(Jola Pedi et al., 2026) This low self-confidence manifests as a reluctance to express opinions, a lack of active participation in the learning process, and low academic achievement motivation. Furthermore, findings indicate that every indicator falls within the low category: 60% for belief in one's own abilities, 61% for acting independently in decision-making, 58% for possessing a positive self-concept, and 50% for the courage to express opinions. (Yuratni & Anas, n.d.)These figures suggest that student self-confidence remains at an average level and is subject to fluctuation.

Observations and interviews with Mrs. Nurhayati further indicate that the majority of students still appear hesitant to express their opinions or take an active role in learning activities. Thus, it can be concluded that self-confidence is an important attribute for students to possess. Self-confidence can be fostered through group work or discussions, as these methods require students to explore and discover the mathematical concepts they are studying on their own.

Low self-confidence in mathematics learning impacts students; such low self-confidence hinders an individual's ability to solve problems and prevents them from fully realizing their potential. (S et al., 2025) Furthermore, interviews with teachers at SDN 86 Singkawang revealed specific consequences of low student self-confidence, such as a reluctance to perform or speak in front of the class and a tendency to copy classmates' work.

Based on the background information provided, and considering the importance of students possessing or mastering analytical thinking skills, it is necessary to identify the factors that influence these skills. Therefore, this study aims to determine whether a relationship exists between students' self-confidence and their analytical thinking skills.

Consequently, the researcher is interested in conducting a study titled: "The Relationship between Self-Confidence and Analytical Thinking Skills of Fifth-Grade Elementary School Students regarding Two-Dimensional Shapes."

METHODS

This study employs a quantitative approach with a correlational research design. A quantitative approach was selected because the study aims to examine the relationship between students' self-confidence and their analytical thinking skills regarding the topic of 2D shapes. A correlational design was deemed appropriate as the objective was to determine the strength of the relationship between the independent variable (self-confidence) and the dependent variable (analytical thinking skills) without administering any intervention to the participants.

The research was conducted at SDN 86 Singkawang in November 2025. The study population comprised all fifth-grade students at the school. Given the relatively small population size, all 54 students participated in the study using a total sampling technique. This technique was chosen to ensure that every member of the population was represented, thereby providing a more comprehensive picture of the relationship between the two variables.

Data collection involved the use of two research instruments. The first instrument was a self-confidence questionnaire consisting of 16 statements covering four indicators: personal ability, social interaction, self-concept, and the courage to express opinions. The questionnaire utilized a four-point Likert scale comprising both positive and negative statements. The second instrument was an essay test designed to measure students' analytical thinking skills based on three indicators adapted from the revised Bloom's Taxonomy: differentiating, organizing, and attributing. Prior to use, both instruments underwent expert judgment and were pilot-tested on students at SDN 90 Singkawang to verify their validity before implementation in the actual study.

Data were analyzed using descriptive and inferential statistics with the aid of SPSS software (version 17). Descriptive statistics were used to characterize the students' levels of self-confidence and analytical thinking skills through mean scores, percentages, and categorical classifications. Prior to hypothesis testing, a normality test was conducted using the Kolmogorov–Smirnov test. The results indicated that the self-confidence data were

normally distributed, whereas the analytical thinking skills data were not. Therefore, the hypothesis was tested using the Spearman Rank correlation test to determine the relationship between the two variables. Subsequently, the coefficient of determination (R^2) was calculated to identify the contribution of self-confidence to students' analytical thinking skills.

RESULTS

Result 1 about Students' Self-Confidence Levels

Based on the research procedures carried out, the researcher obtained data in the form of self-confidence questionnaire scores from fifth-grade students at SDN 86 Singkawang. The study involved 54 students as respondents. To assess self-confidence, students were administered a self-confidence questionnaire, the results of which were subsequently processed and calculated. The study evaluated self-confidence based on four indicators: personal ability, social interaction, self-concept, and the courage to express opinions.

Data from the student self-confidence questionnaire categorizes students into four levels: very high, high, moderate, and low. The results indicate that nine students fall into the "very high" self-confidence category, demonstrating a strong belief in their own abilities. This is evident in their willingness to answer the teacher's questions, their lack of fear regarding making mistakes during explanations, and their ease in collaborating with peers on assignments. Students in this category generally possess a strong conviction that they are capable of overcoming various learning challenges.

The high-level category comprises 36 students, representing the largest group identified in this study. This indicates that the majority of students possess a good level of self-confidence. These students are generally quite confident in their abilities, capable of correctly calculating the area and perimeter of triangles, willing to attempt explanations, and demonstrate good social interaction skills. However, in some instances, they still require encouragement or motivation from the teacher to undertake certain tasks.

There are 8 students in the "moderate" category; while these students possess a reasonable level of self-confidence, their confidence is inconsistent. Although they may occasionally have the courage to answer questions or solve problems, they often harbor doubts or lack conviction in their abilities, tending instead to wait for direction from the

teacher or their peers. Meanwhile, one student falls into the "low" category, indicating a lack of confidence in their own abilities; this is evident in their fear of making mistakes when explaining how to calculate the area of a triangle, a reluctance to participate in discussions, and a feeling of being less capable than their classmates. The overall average score from the scale indicates that the self-confidence of Grade V students at SDN 86 Singkawang during the first semester of the 2025/2026 academic year falls into the "high" category, signifying that a significant portion of the students possess a strong sense of self-confidence.

The calculated scores for the personal capability indicator reveal that the majority of students possess a strong belief in their own abilities. This is evidenced by their capacity to complete tasks independently, their persistence in solving assigned problems, and their confidence in successfully engaging with learning activities. Consequently, the students' personal capability can be categorized as high. The social interaction indicator yielded the highest percentage among all indicators, demonstrating that the students excel in interacting with their peers; they communicate effectively, collaborate well in groups, and feel at ease during classroom learning activities. This high percentage indicates that the students are quite confident in establishing social relationships within the school environment.

Regarding the self-concept indicator, although it showed the lowest percentage compared to the others, it still fell within an acceptable range. This suggests that while some students understand their identities and are aware of their strengths and weaknesses, others remain hesitant or unsure of their abilities. Therefore, the self-concept indicator requires further development to boost student confidence. As for the indicator regarding the courage to express opinions, the data indicates that the majority of students possess the confidence to offer responses, answer questions, and share their views during learning activities. This demonstrates that students have a high level of confidence in articulating their thoughts and ideas in the classroom.

Although the social interaction indicator showed the highest percentage and the self-concept indicator the lowest relative to the others, overall, all indicators fell into the "high" category; this suggests that the fifth-grade students at SDN 86 Singkawang possess a significant level of self-confidence in the learning process.

This finding aligns with the which indicates that the majority of respondents possess a high level of self-confidence, with an average score of 4.19.(Ariawan, A. R. T. (2025). TINGKAT SURVEI SIKAP KEPERCAYAAN DIRI TERHADAP SISWA YANG

MENGIKUTI EKSTRAKURIKULER DI SMK INDOBARUNA. Jurnal Prestasi Olahraga, 8(4), n.d.)It is further supported by Safitri & Sutiarso (2023), who stated that students with high self-confidence demonstrate superior thinking skills, the courage to express opinions, and greater effectiveness in problem-solving during learning activities. (R. M. Safitri & Sutiarso, 2023)Based on the research results above, it is evident that the fifth-grade students at SDN 86 already possess a healthy level of self-confidence. Regarding the personal ability indicator, students are capable of self-development, are not overly dependent on others, and recognize their own capabilities. As for the social interaction indicator, students are able to adapt to their environment, practice tolerance, accept the opinions of others, and show respect for others. Regarding the self-concept indicator, students are able to view and evaluate themselves—whether positively or negatively—and are aware of their own strengths and weaknesses.

Regarding the indicator of the courage to express opinions, students are able to articulate their inner thoughts and feelings to others without coercion or impediments. This aligns with research by Siagian et al. (cited in Ismawandari, 2026), which states that self-confidence is a key asset. for students in developing their academic and social potential. Students with self-confidence tend to be more active, willing to voice their opinions, and resilient against environmental pressures.(Ismawandari & Lathifatul Fajriyah, 2026)

Tabel 1. Hasil Perhitungan Skor Angket Kepercayaan Diri Siswa

No	Kriteria	Rentang	Jumlah Siswa	Rata-Rata
1	Rendah	16 < KDS ≤ 28	1	27
2	Sedang	28 < KDS ≤ 40	8	32,25
3	Tinggi	40 < KDS≤ 52	36	44
4	Sangat Tinggi	52 ≤ KDS≤ 64	9	59,55
Rata-Rata Keseluruhan				41,45
Kriteria Keseluruhan				Tinggi

Based on Table 1, it is evident that nine students—approximately 16.66% of the total—possess a "very high" level of self-confidence; students in this category demonstrate a strong belief in their own abilities. This is reflected in their willingness to answer the teacher's questions, their lack of fear regarding making mistakes during explanations, and their ease in collaborating with peers on assignments. Generally, students in this category hold a firm conviction that they are capable of facing various challenges in their learning.

The "high" category comprised 36 students (66.66%), representing the largest group identified in this study. This indicates that the majority of students possess a good level of self-confidence. These students are generally confident in their abilities, capable of correctly calculating the area and perimeter of triangles, willing to attempt explanations, and demonstrate good social interaction skills. However, in some instances, they still require encouragement or motivation from the teacher to undertake specific tasks.

Eight students (14.81%) fell into the "moderate" category; while these students possessed a reasonable level of self-confidence, their confidence was inconsistent. Although they were sometimes willing to answer questions and could solve problems, they remained hesitant or unsure of their abilities, often preferring to wait for direction from the teacher or their peers. Meanwhile, one student (1.85%) fell into the "low" category, demonstrating a lack of confidence in their own abilities. This was evident in their fear of making mistakes when explaining how to calculate the area of a triangle, a reluctance to participate in discussions, and a feeling of being less capable than their classmates.

The overall average score from the scale indicates that the self-confidence of fifth-grade students at SDN 86 Singkawang during the odd semester of the 2025/2026 academic year falls into the high category, meaning that a portion of the students possess a strong belief in themselves.

Next, self-confidence questionnaire scores were calculated based on four indicators: personal competence, social interaction, self-concept, and the courage to express opinions. Analyzing these specific indicators aimed to determine the students' level of self-confidence. Thus, the research findings not only reflect overall self-confidence but also provide a more detailed picture of the students' standing regarding each self-confidence indicator. The scores calculated for each indicator are presented in the following table.

Tabel 2. Hasil Perhitungan Skor Tiap Indikator Angket Kepercayaan Diri Siswa

No	Indikator	Jumlah Skor Perindikator	Rata-Rata Persentase Perindikator
1	Kemampuan Pribadi	615	71%
2	Interaksi Sosial	679	79%
3	Konsep Diri	594	69%
4	Berani Mengungkapkan Pendapat	542	77%

Based on Table 2, it can be concluded that the first indicator—personal capability—shows a percentage of 71%, indicating that the majority of students possess a significant level of confidence in their own abilities. This is evidenced by their ability to complete tasks independently, their effort in resolving assigned problems, and their confidence in successfully participating in learning activities; consequently, the students' personal capability can be categorized as high. The second indicator, social interaction, recorded the highest percentage at 79%, demonstrating that students excel in interacting with their peers; they communicate effectively, collaborate well in groups, and do not feel awkward when participating in classroom learning activities. This high percentage indicates that students are quite confident in building social relationships within the school environment.

Third, the self-concept indicator stands at 69%—the lowest among the indicators, though still within a reasonable range. This suggests that while some students understand who they are and recognize their strengths and weaknesses, others remain hesitant or unsure of their abilities. Consequently, the self-concept indicator requires further development to boost student confidence. Fourth, the indicator regarding the courage to express opinions stands at 77%; this figure indicates that the majority of students possess the confidence to offer responses, answer questions, and voice their views during learning activities. This demonstrates that students have a high level of confidence in sharing their thoughts and ideas in the classroom.

The social interaction indicator shows the highest percentage among the four indicators, whereas the self-concept indicator shows the lowest. However, overall, all indicators fall into the high category, indicating that the fifth-grade students at SDN 86 Singkawang possess a considerable level of self-confidence in the learning process.

Result 2 about Students' Analytical Thinking Ability Level

Following the self-confidence questionnaire, the next step involved administering a test on analytical thinking skills to 54 fifth-grade students at SDN 86 Singkawang. To gather data on these skills, the test was distributed to the 54 students. Their responses were scored and classified into four categories: very high, high, moderate, and low. The results indicated that students in the "high" category demonstrated strong analytical thinking skills when solving the problems. This was evidenced by their ability to identify key information within the questions, distinguish between different components, organize the information they

gathered, and draw accurate conclusions based on that information. Students in this group also tended to possess a deeper understanding of the problems and provided correct answers.

Students in the "medium" category possess analytical thinking skills, though these are not yet fully developed. While they can identify relevant information within a problem and attempt to analyze it, they sometimes struggle to connect information, organize ideas systematically, or draw accurate conclusions. Consequently, continued practice and instruction emphasizing higher-order thinking are necessary to further enhance the analytical thinking capabilities of students in this group.

Students in the "low" category demonstrate limited analytical thinking skills. This is evident in their difficulty comprehending problem information, distinguishing key elements of a problem, and correctly structuring solution steps. Furthermore, they tend to provide immediate answers without engaging in in-depth analysis. The overall average score indicates that the analytical thinking skills of Grade V students at SDN 86 Singkawang during the odd semester of the 2025/2026 academic year fall into the "medium" category. This suggests that while students possess the foundational ability to analyze problems, they have not yet reached an optimal level of proficiency. Therefore, greater instructional effort is required to foster students' analytical thinking skills; this can be achieved through activities involving higher-order thinking processes, problem-solving, and targeted problem sets.

Based on the calculated scores for each indicator, the first indicator distinguishing showed the highest percentage compared to the others; this indicates that some students were able to identify and distinguish important information within the problems such as differentiating between congruent and non-congruent shapes and explain their reasoning. However, this proficiency was not fully realized, as some students still struggled to grasp the distinctions in the information provided. Regarding the second indicator (organizing), the results show that some students were able to illustrate and describe the details of congruent 2D shapes specifically side lengths and angle measures though their capabilities remained limited; a number of students still faced difficulties in illustrating and explaining these details. As for the third indicator (attributing), the findings indicate that students could comprehend the problem content such as identifying shapes and calculating the perimeter of garden sections and draw conclusions or explain why the shapes were congruent; nevertheless, this skill requires further improvement. Some students failed to answer questions, calculate perimeters, or provide justifications based on the available information, resulting in analyses

that were not entirely accurate. Based on these three indicators, it can be concluded that the students' analytical thinking skills fall within the "sufficient" category. This classification indicates that students have mastered the fundamental skills needed to handle the problems such as distinguishing between congruent and non-congruent shapes and providing explanations yet these abilities are not yet fully developed and require additional practice and instruction.

The overall percentage scores indicate that the analytical thinking skills of students at SDN 86 Singkawang fall into the moderate category across all indicators. This result is consistent with previous research by Aggreani et al. (2025), which categorized students' analytical thinking skills as moderate,(Anggreani et al., 2025) and with Fadila, dkk (2025), who found that the analytical thinking skills of elementary school students also fall within the moderate range.(Zahra Fadila et al., 2025)

The fact that students possess analytical thinking skills in the moderate category indicates that their proficiency is neither fully high nor classified as low. Test results revealed that the majority of students were able to effectively evaluate mathematical problems; they would first examine the problem before determining the appropriate method to solve it. Furthermore, most students knew the correct approach to resolving the issues presented. However, despite these capabilities, there remain certain weaknesses in the students' analytical thinking skills.

Tabel 3. Hasil Perhitungan Skor Tes Kemampuan Berpikir Analisis Siswa

No	Kriteria	Rentang	Jumlah Siswa	Rata-Rata
1	Tinggi	$70 < Xs \leq 100$	9	86,41
2	Sedang	$60 < Xs \leq 70$	12	66,66
3	Rendah	$0 < Xs \leq 70$	33	43,43
Rata-Rata Keseluruhan				65,50
Kriteria Keseluruhan				Sedang

Based on Table 3, the scores fall into high, medium, and low categories. The table reveals that nine students achieved scores in the high category, with an average of 86.41 (approximately 16.66%); when solving problems, students in this group demonstrated strong analytical thinking skills. This was evidenced by their ability to identify key information within the problems, distinguish between components, organize the information they gathered, and draw accurate conclusions based on that information. Students in this group also tended to possess the ability to understand problems in greater depth and provide correct answers.

Twelve students fell into the "moderate" category, with an average score of 66.66 (approximately 22.22%). While students in this group possess analytical thinking skills, their proficiency is not yet fully developed. They are able to identify relevant information within the problems and attempt to analyze it, yet they sometimes struggle to connect information, organize ideas systematically, or draw accurate conclusions. Therefore, continued practice and instruction emphasizing higher-order thinking activities are essential to enhance the analytical thinking skills of students in this group.

Thirty-three students fell into the low-score category, with an average score of 43.43 (approximately 61.11%). Students in this group demonstrated limited analytical thinking skills, evidenced by difficulties in comprehending information within problems, distinguishing key elements of a problem, and correctly formulating solution steps. Furthermore, they tended to provide immediate answers without conducting in-depth analysis. The overall average score indicates that the analytical thinking skills of Grade V students at SDN 86 Singkawang during the odd semester of the 2025/2026 academic year fall within the moderate range. This suggests that while the students possess the foundational ability to analyze problems, they have not yet reached an optimal level of proficiency. Consequently, greater instructional effort is required to foster students' analytical thinking skills; this can be achieved through activities that incorporate higher-order thinking processes, problem-solving tasks, and challenging problems.

Subsequently, the students' analytical thinking skill scores were calculated based on three indicators: differentiating, organizing, and attributing. This indicator-by-indicator analysis aims to determine the level—high or low—of the students' analytical thinking skills. Thus, the research findings not only reflect overall analytical thinking ability but also provide a more detailed picture of the students' performance regarding each specific indicator. The calculated scores for each indicator are presented in the following table.

Tabel 4. Hasil Perhitungan Skor Tiap Indikator Tes Kemampuan Berpikir Analisis Siswa

No	Indikator	Jumlah Nilai Perindikator	Rata-Rata Persentase Perindikator
1	Memebedakan	106	65%
2	Mengorganisasi	82	51%
3	Mengatribusi	83	51%

Based on Table 4, it can be concluded that the first indicator—"distinguishing"—achieved the highest score at 65%. This indicates that some students are able to identify and distinguish important information within the problems—such as differentiating between

congruent and non-congruent shapes—and explain their reasoning. However, this proficiency is not yet fully established, as some students still struggle to grasp the distinctions in the information presented. Regarding the second indicator ("organizing"), which scored 51%, the results show that some students are capable of illustrating and explaining the details of congruent 2D shapes—specifically concerning side lengths and angle measures—though their proficiency remains limited; some students still encounter difficulties in illustrating and explaining these details.

Meanwhile, the third indicator (attributing) showed a percentage of 51%; this indicates that students were able to comprehend the content of the problems—such as identifying shapes and calculating the perimeters of garden sections—as well as conclude or explain why the plane figures were congruent, though this ability still requires improvement. Some students struggled to answer questions, calculate perimeters, and provide justifications based on the information available to them, resulting in analyses that were not entirely accurate. Based on these three indicators, it can be concluded that all indicators of analytical thinking skills fell within the "sufficient" category. This "sufficient" rating indicates that students had mastered the fundamental skills needed to handle the problems—such as distinguishing between congruent and non-congruent plane figures and providing explanations—yet these skills were not yet fully developed and required further practice and instruction.

Result 3 about The Relationship Between Students' Self-Confidence and Analytical Thinking Skills Regarding Plane Figures

Based on an analysis using the Spearman Rank test, a relationship was found between students' self-confidence and their analytical thinking skills regarding the topic of two-dimensional shapes. This is evidenced by a correlation coefficient (rxy) indicating a moderate level of correlation—implying that other factors such as family environment, learning motivation, and teaching methods also influence these variables—as well as a positive relationship, meaning that higher levels of self-confidence are associated with higher analytical thinking skills. Statistically, this relationship is significant, as the p-value (0.002) is less than 0.05. These findings align with research by Erayani et al., which states that self-confidence and mathematical ability are jointly related to mathematics learning outcomes (Erayani et al., cited in Febrianti, 2025). Furthermore, research by Setiyani et al. also identified

a correlation between self-confidence and mathematics learning outcomes.(Setiyani et al., 2024)

The results of this study are consistent with Nugraha (2025), who found that students' self-confidence levels are linked to their thinking abilities, including the analytical aspects of learning. Furthermore, according to Putri and Albina (2024), learning objectives at the cognitive level of analysis based on Bloom's Taxonomy aim to foster deep and sustained thinking skills, which constitute a crucial component of students' long-term learning capabilities.(Putri, S. A., & Albina, M. (2024). Analisis Teoritis Tujuan Pembelajaran Berdasarkan Taksonomi Bloom. QAZI: Journal of Islamic Studies, 1(2), n.d.)Consequently, students with high self-confidence in mathematics are likely to consistently exercise analytical thinking skills commensurate with the mathematical problems they encounter; thus, higher levels of self-confidence correlate with superior analytical thinking abilities.

In the context of this study, the social interaction indicator which achieved the highest score at 79% demonstrates that students possess excellent communication and collaboration skills and participate actively in group learning activities. This finding is linked to the analytical thinking indicator, specifically the aspect of differentiation, which also recorded the highest score at 65%. This connection is evident in the learning process, which involves student interaction; students have opportunities to exchange opinions, compare answers, solve problems, and identify differences in the information presented in the questions. Such activities directly cultivate students' ability to differentiate—for instance, by distinguishing between the characteristics of congruent and non-congruent plane figures based on side lengths and angles.

These findings are reinforced by research conducted by Safitri and Sutiarso (2023), which indicates that students' self-confidence in social interactions influences their thinking abilities; specifically, students who actively communicate and engage in discussions tend to be more adept at processing and analyzing information. Furthermore, a study by Siagian et al. (2023) demonstrates that positive social interaction during learning can enhance students' comprehension and problem-solving skills, as it facilitates the exchange of ideas and the clarification of understanding.Recent research by Nugraha (2025) further confirms the link between self-confidence and higher-order thinking skills including analytical ability noting that confident students are more willing to experiment, evaluate, and differentiate information when solving problems.

Students with high self-confidence in social interactions tend to be more active and unhesitant in expressing their opinions, thereby allowing their analytical thinking skills particularly the ability to differentiate to develop more optimally. Moreover, according to the revised Bloom's Taxonomy by Lorin Anderson and David Krathwohl (cited in Sholihah & Astuti, 2024), the ability to differentiate is a component of the cognitive process of analysis, requiring students to sort and compare information. This process is further enhanced when students actively participate in social interactions that foster the exchange of ideas.(Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Crusikhshank, K. A., Mayer, R. E., Pintrich, P. R., Raths, J., & Wittrock, 2023)

Thus, it can be concluded that there is a positive relationship between the indicator of social interaction and the ability to differentiate; specifically, the higher the students' social interaction, the better their analytical skills at the differentiation stage. However, this relationship falls into the "moderate" category, indicating that students' analytical thinking skills are also influenced by other factors that need to be developed concurrently.

DISCUSSION

The research results indicate a significant relationship between self-confidence and the analytical thinking skills of fifth-grade students at SDN 86 Singkawang regarding the topic of 2D shapes. The Spearman Rank test yielded a correlation coefficient of 0,416 with a significance value of 0,002 (<0,05). This value indicates a moderate, positive relationship between the two variables; in other words, higher student self-confidence tends to be associated with better analytical thinking skills. Although the relationship is not classified as strong, these findings demonstrate that self-confidence is a factor that contributes to supporting students' analytical thinking skills.

The research results also indicate that the students' average self-confidence falls into the high category. The social interaction indicator achieved the highest percentage at 79%, demonstrating that the majority of students are capable of communicating effectively, collaborating within groups, and feeling at ease during learning activities. Meanwhile, the students' analytical thinking skills fall into the moderate category, with an overall percentage of 55,66%. Among the three indicators of analytical thinking skills, the "differentiating" indicator achieved the highest percentage at 65%. This suggests that most students are able to distinguish important information within problems such as identifying congruent and non-

congruent 2D shapes even though they still encounter difficulties during the stages of organizing and attributing information.

When these factors are linked, the students' high level of social interaction is thought to influence their ability to differentiate information. Students who actively participate in discussions and confidently express their opinions have greater opportunities to exchange ideas, ask questions, and compare answers with classmates. This process helps students better understand the concepts of 2D shapes, thereby making it easier for them to identify the differences and similarities between shapes. Thus, effective social interaction can support the development of analytical thinking skills, particularly regarding the ability to differentiate.

The findings of this study align with research by Safitri and Sutiarso (2023), which indicates a positive relationship between self-confidence and students' critical thinking skills. Students with high self-confidence tend to be more willing to express their opinions, participate actively in discussions, and solve problems more effectively.(R. M. Safitri & Sutiarso, 2023) These results are also supported by Nugraha (2025), who states that self-confidence is linked to higher-order thinking skills including analytical abilities in mathematics learning. Furthermore, Siagian et al. (2023) explain that self-confidence serves as a crucial asset for students to participate actively in learning and develop their thinking skills.

These findings also accord with Bandura's self-efficacy theory, which posits that an individual's belief in their own abilities influences their thinking patterns, effort, and persistence in completing tasks. Students who believe in their capabilities are more likely to attempt solving problems, avoid giving up easily, and actively seek solutions when facing difficulties. Additionally, according to the revised Bloom's Taxonomy by Anderson and Krathwohl, analytical thinking is a higher-order thinking skill involving the processes of differentiating, organizing, and connecting information. Therefore, affective aspects such as self-confidence act as factors that can facilitate the development of students' analytical thinking skills.

The findings of this study imply that teachers need to foster not only students' cognitive abilities but also their affective aspects, particularly self-confidence. Teachers can provide opportunities for students to engage in discussions, collaborate in groups, and express their opinions, while also offering positive reinforcement to boost students' confidence in their own abilities. It is anticipated that increased self-confidence will lead to

improved analytical thinking skills when solving mathematics problems, specifically those involving two-dimensional shapes.

This study has certain limitations. It was conducted at a single school with a sample of 54 students; therefore, the findings cannot be generalized to a broader population. Furthermore, the study examined only the relationship between self-confidence and analytical thinking skills, whereas numerous other factors—such as learning motivation, prior knowledge, family environment, and the teaching models employed—can influence students' analytical thinking capabilities. Consequently, future research should ideally involve larger samples across multiple schools and incorporate additional variables to provide a more comprehensive understanding of the factors influencing students' analytical thinking skills.

CONCLUSION

This study demonstrates a positive and significant relationship between self-confidence and the analytical thinking skills of fifth-grade students at SDN 86 Singkawang regarding the topic of 2D shapes. Analysis using the Spearman Rank test yielded a correlation coefficient of 0.416 with a significance value of 0.002 ($p < 0.05$), indicating that higher student self-confidence correlates with better analytical thinking skills, although the strength of the relationship falls into the "moderate" category. These findings are supported by descriptive analysis showing that student self-confidence falls into the "high" category, while analytical thinking skills fall into the "moderate" category. Social interaction emerged as the self-confidence indicator with the highest percentage, whereas the ability to differentiate was the most prominent indicator of analytical thinking skills. These results suggest that students who actively interact, communicate, and collaborate during the learning process are more capable of identifying, comparing, and differentiating information when solving mathematics problems involving 2D shapes. Thus, this study contributes to the understanding that affective aspects specifically self-confidence are factors that support the development of students' analytical thinking skills in elementary school mathematics learning.

This study has several limitations. It was conducted at a single school with a sample of 54 students; therefore, the findings cannot be generalized to a broader population. Furthermore, the study examined only the relationship between self-confidence and analytical thinking skills, without considering other factors that could potentially influence students' analytical thinking such as learning motivation, prior mathematical knowledge,

instructional strategies, or the learning environment. Consequently, future research should involve larger samples drawn from various schools with diverse characteristics and incorporate other relevant variables to provide a more comprehensive overview of the factors influencing students' analytical thinking skills. Future studies could also develop or test instructional models designed not only to enhance analytical thinking skills but also to strengthen students' self-confidence in mathematics learning.

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