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The Relationship Between Self-Concept and Students' Mathematical Connection Ability

Elia Damayantie Ulfah[1*], Supratman[2], Hetty Patmawati[3]
[1,2,2]Universitas Siliwangi, Jawa Barat, Indonesia
E-mail*: 212151040@student.unsil.ac.id

Abstract

This study is conducted to explore how self-concept correlates with mathematical connection skills among eight-grade students at SMPN 14 Tasikmalaya. The research method used is a survey method with a deskriptive quantitative approach. The population used in this study was all eight-grade students at SMPN 14 Tasikmalaya. This study applied simple random sampling, resulting in a sample of 36 students. Data collection was conducted through the distribution of self-concept questionnaires and mathematical connection ability tests. The research instruments used were self-concept questionnaires and essay questions to measure mathematical connection ability. The data analysis technique used to test the hypothesis was the Pearson product-moment correlation test, preceded by prerequisite analysis tests, namely normality and linearity tests. The results of the data analysis showed that there was a positive and significant correlation between self-concept and students' mathematical connection abilities. Students' self-concept was categorized as moderate, and their mathematical connection abilities was also in the moderate category. These findings indicate that the more positive the self-concept of students, the higher their mathematical connection abilities

Keywords: correlation; mathematical connection ability; self-concept

INTRODUCTION

Mathematics is a major one of a great importance that changes and shapes human life. This is one of the reasons why mathematics concepts are incorporated into different fields such as science, technology, economics and decision making (Ulya et al., 2016). Regardless of whether it is used in managing home expenses, interpreting data, or in the creation of intricate technological systems, mathematics is at the heart of the necessary logical and analytical thinking skills. Based on this fact, investing in the mathematical skills of the youth is undoubtedly a way of ensuring that they are able to confront and solve problems arising from contemporary and rapid global changes. Unfortunately, most of the time, mathematics teachings in schools are more centered on procedural fluency. Students are exposed to presentations of instructions on performing calculations, the following of algorithms, or the memorizing of formulas. These competencies are part of the essentials, but by themselves, they do not result in a deep conceptual understanding. Learning in a meaningful way is achieved through understanding the principles that form the basis of mathematical concepts and noticing the relationships between them. The change involved in this emphasizes that the development of mathematical connection ability should be the main goal of mathematics education, especially in the facilitation of higher-order thinking and problem-solving skills.

Mathematical connection ability is the students' capacity to relate mathematical concepts, procedures, and ideas from one context to another. It involves making connections within mathematics, linking mathematics to other academic disciplines, and using mathematical reasoning in everyday life situations (Tasni & Susanti, 2017). Instead of learning mathematical topics as separate units, students are required to see mathematics as a logical and interrelated system. Rivki and Bachtiar (2000) describe three features of mathematical connection ability: (1) connecting concepts across mathematical topics, (2) relating mathematical ideas to other subject areas, and (3) applying mathematical concepts to real-life context. Kenedi et al., (2019), also say that students who have these skills are more capable of creating meaningful understanding and using mathematics in a practical way.

According to National Council of Teachers of Mathematics (NCTM), mathematical connections are one of the main concepts in math learning. The use of these connections is seen as a powerful means in raising the level of understanding and the development of logical thinking skills, especially in dealing with contextual problems (Ayunani et al., 2020). Furthermore, in the period of Industrial Revolution 4.0, the skill of mathematical connections has become even more significant. Students are required not only to grasp the abstract concepts but also to use them in different interdisciplinary and real-world scenarios such as digital technology, economical reasoning, and scientific inquiry (Mone et al., 2022). As a result, it is essential to develop mathematical connection skills as a means of training students to meet the global molition and be active members in the society.

Research reveals that in Indonesia, students have relatively low abilities to make mathematical connections even though this skill is recognized as very important. The 2022 Programme for International Student Assesment (PISA) reported that Indonesian students achieved an average score of 366 for mathematics, and only 18% of students reached the minimum proficiency level, which is much lower than the OECD average 69% (OECD, 2023). This finding implies that students have trouble applying mathematical knowledge in non-routine exercises. The research of Andriani and Aripin (2019) and Sukmaningthias et al., (2022) likewise point to the fact that students frequently find it difficult to connect mathematical concepts with daily life and they use rote procedural strategies more often. Furthermore, the international research argues that lack of sufficient exposure to contextualized learning activities is one of the factors that lead to low levels of mathematical connection ability (Sari et al., 2020).

Therefore, any effort to enhance mathematical connection ability should not only focus on cognitive capacities but also on affective factors. One of these affective variables which has quite a lot of research focus recently is self-concept. Self-concept is an inclusive term that denotes a person's perception and assessment of their self, these being also beliefs about one's abilities, emotions, and relations with other people (Hartanti, 2018). In school settings, self-concept is the main influencer of the student's behavior in academic tasks, following challenges, and involvement in the social sphere.

Generally, the mathematical self-concept is more likely to result in seeing the students concerned to be creative and energetic toward the task of learning which engages them in the process of learning math with full commitment and an open-minded attitude. The effect of self-concept on them translated into the behavioral tendencies of them being the confident in problem-solving, cooperating in learning social activities, and communicating their suggestions and ideas to others. Furthermore, activities help students realize the importance of learning mathematics. Sumarmo et al., (2017) have identified the indicators of mathematics self-conceppt as follow: (1) Being serious, interested, and enthusiastic about the study of mathematics; (2) having a sense of personal qualities both positive and negative; (3) being confident when doing mathematical exercise; (4) cooperation and tolerance in social learning; (5) gaining the skill of respecting others opinion as well as one's own; (6) ability to work with others and being able to adjust in the social environment; and (7) realizing the importance of learning mathematics. Studies reveal that students with a good mathematical self-concept are more likely to be persistent in complex problem solving they also more willingly use numerous strategies, and experience less anxiety. On the other hand, students with low self-concept are usually not confident, they avoid doing task that challenge them, and they show a limited level of engagement (Passiatore et al., 2023; Widyastuti et al., 2020).

Various studies indicate that male students generally show a lower mathematical self-concept than female students, which can lead a difference in mathematical performance and cognitive engagement in the male students (Reschke et al., 2023). n addition, research-self-concept has been identified by the previous research as being linked to students' motivation and cognitive performance, and it is acknowledged as a significant factor in the acquisition of mathematical concept understanding (Yumiati & Haji, 2018). According to Wang (2023), mathematical self-concept is a major factor that could reduce mathematics anxiety and increase cognitive persistence. Ridwan and Kusnadi (2025) elaborate that self-concept is an internal source of motivation that energizes the development of mathematical connection ability in academic and real-life contexts.

Spanning the multiple studies, researchers have been curious about the link self-concept has to the performance in the mathematics field. The study of Fadliansyah (2021) is one of the primary significant works to mention, where he found the correlation between self-concept and mathematical written communication skills, which is mainly students' capability to provide written expression of mathematics ideas and self-concept involvement in that skill. Meanwhile, this study explores how students use math concepts to explain real-life situations instead of how they simply write about these ideas. Additionally, Yuliani and Zaenal (2023) carried out descriptive research revealing self-concept as a factor that affects the ability of mathematical connection. Still, they didn't perform any quantitative measurements to establish the degree of this relationship. Since the subjects and places of research were different from those of the studies, there might be a difference between self-concept and the ability of mathematical connection which has to be reseached further. Hence, this study uses a quantitative approach to confirm the findings objectively and to be able to generalize them to a larger population.

The purpose of this research is to examine the association between self-concept and students' mathematical connection ability at the junior high school level through a quantitative approach. The results are anticipated to be instrumental in the creation of teaching strategies that involve both the cognitive and the affective domains. Encouraging students' self-concept may lead to their increased involvement, better understanding of concepts, and ability to link mathematical ideas in different contexts. As a result, by elevating these elements, the goal of improving the quality of mathematics education in Indonesia and equipping students to deal with the complexities of an interconnected and rapidly changing world can be realized.

METHOD

This study employed a survey design with a descriptive quantitative approach to investigate the correlation of students' self-concept with their mathematical connection skills. The authors of this paper deemed this method as the most appropriate one because it allows researchers to describe naturally happening phenomena and to examine the relationships between variables without giving specific interventions to the participants (Sugiyono, 2019).

The study's population were the eight-grade students of junior high schools in Tasikmalaya. A simple random sampling technique was used to get the sample, thus each student had an equal opportunity to be selected. As a result of this work, 36 students from a few randomly selected classes were chosen as the research participants.

The research instruments consisted of two parts. The first was a self-concept questionnaire, developed based on seven indicators of self-concept in mathematics learning, and comprised 18 valid items from a previous pilot study involving 35 students. Each item employed a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree). Content validity was obtained through the judgment of a mathematics education expert, while empirical validity was analyzed using item-total correlations with the help of SPSS version 24. Items were declared valid if the calculated r value was greater than the table r value at a significance level of 5%. The reliability of the questionnaire was tested using Cronbach's Alpha coefficient, with the criterion that the instrument was considered reliable if $\alpha \geq 0.70$.

The second instrument was a mathematical connection ability test, consisting of three essay questions, each representing one of the following indicators according to the National Council of Teachers of Mathematics (2000): (1) connections between mathematical topics, (2) connections with other subject areas, and (3) connections with real-life situations. Each question is scored based on a scoring rubric with a range of 0 to 4, where a score of 4 indicates a correct and complete answer that is able to relate concepts, while a score of 0 indicates no answer or an inability to relate concepts at all.

The ordinal data from the self-concept questionnaire were transformed into interval data using the Successive Interval (MSI) technique to allow for parametric statistical analysis. This step was necessary because ordinal data are qualitative in nature and are not presented in numerical form but rather as phrases or expressions. In contrast, interval data are quantitative and expressed numerically. Scores from the mathematical connection ability test were calculated based on the cumulative total from the three items. To identify the correlation between self-concept and students' mathematical connection abilities, the Pearson Product Moment formula was applied. Prior to conducting the correlation analysis, data normality was tested through the Shapiro–Wilk approach. If the data were found to be normally distributed, parametric correlation analysis was carried out using SPSS version 24. The interpretation of correlation results is based on significance values ($p < 0.05$) and relationship strength criteria according to (Sugiyono, 2019):

Table 1 Interpretation of Correlation Coefficients

Correlation Coefficient	Correlation Level
$0{,}00 \leq r_{xy} < 0{,}19$	Very low
$0{,}20 \leq r_{xy} < 0{,}39$	Low
$0{,}40 \leq r_{xy} < 0{,}59$	Moderate
$0{,}60 \leq r_{xy} < 0{,}79$	High
$0{,}80 \leq r_{xy} < 1{,}00$	Very high

Table 1 displays the categories that were used to understand the level of interaction between the students' self-concept and their mathematical connection ability. The correlation coefficient is a number that can take a value from 0 to 1. The values that are near 1 signify a stronger positive relation and the values that are near 0 signify a weaker relation. Hence, the outcomes of the analysis will determine how strongly students' self-concept is related to their ability to establish mathematical connections.

RESULTS

This research outcomes are visually represented by charts, tables, and explanatory narratives to give a complete picture of the information and to back the next analysis. Thirty-six students in total were the sample. The data gathered were about to main variables: students self-concept and their mathematical connection abilities. The self-concept scores between 51 and 76, whereas mathematical connections abilities had scores ranging for 4 to 12. The following table elaborates these data in detail.

Table 2 Statistic Description

	N	Range	Min	Max	Sum	Mean	Std. Deviation	Varians
Self-Concept	36	25	51	76	2129	60.89	6.159	37.930
Mathematical Connection Ability	36	67	4	12	301	8.36	1.944	3.780
Validity (listwise)	36							

Descriptive statistical analysis of the self-concept scores showed tah mean value was 60.89, and the standard deviation was 6.159. This indicates that student self-perceptions in mathematics learning were fairly in agreement, as there we're not extremely low or high scores. On the other hand, the mean score of mathematical connection ability was 8.36, which according to the secret criteria, is at a moderate level. To know more about the association between self-concept and mathematical connection ability a Pearson correlation test was performed, and the results are shown in Table 2.

Table 2 displays the descriptive statistic of student scores which were used as the basis for the correlation analysis. The data indicates that students generally demonstrate a moderate level of self-concept and mathematical connection ability, which establishes the foundation for further correlational analysis between these two constructs.

Prior to hypothesis testing, preliminary analysis were carried out to ensure the validity of the correlation test. The preliminary tests for this study include tests for normality and linearity. The data to be tested consist of scores from the mathematical connection ability test and the self-concept questionnaire.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Self-Concept	.153	36	.033	.946	36	.076
Kemammpuan Koneksi Matematis	.157	36	.025	.957	36	.175

Figure 1 Output SPSS Tests of Normality

Based on the figure, the results of the normality test of the student self-concept questionnaire at a significance level of 5% show a significance value of 0.076. Because the value $0.076 > 0.05$, the H_0 was accepted, indicating that the data follow a normal distribution. Meanwhile, the results of the normality test for the students' mathematical connection ability test data show a significance value of 0.175, which is also greater than 0.05, so H_0 is accepted, meaning that the data meets the normality assumption. Figure 1 confirms that both data sets are normally distributed, which fulfills one of the main assumptions for conducting Pearson correlation and regression analyses.

ANOVA Table

			Sum of Squares	Df	Mean Square	F	Sig.
Kemampuan Koneksi Matematis * Self-Concept	Between Groups	(Combined)	113.689	16	7.106	7.252	.000
		Linearity	84.255	1	84.255	85.990	.000
		Deviation from Linearity	29.434	15	1.962	2.003	.077
	Within Groups		18.617	19	.980		
	Total		132.306	35			

Figure 2 Output SPSS Tests of Linearity

Based on the figure above, the value $(Sig.)$ Deviation from linearity $0.77 > 0.05$, therefore H_0 is accepted and H_1 is rejected, indicating a linear relationship between self-concept and mathematical connection ability. This result confirm that the relationship between self-concept and mathematical connection ability is linear, justifying the use of Pearson correlation and simple linear regression for further analysis.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-6.978	1.997		-3.495	.001
	Self-Concept	.252	.033	.798	7.721	.000

Figure 3 Output SPSS Regression Analisys

Based on the output of the simple linear regression analysis, the following regression equation was obtained:

$$Y = -6.978 + 0.252X$$

This equation shows that every one-unit increase in self-concept will increase students' mathematical connection ability by 0.252 units. Meanwhile, the constant value of -6.978 is the predicted value of mathematical connection ability when self-concept is zero. Based on the results of the test in the table above, the Sig. value is $0.000 < 0.05$ and $t_{test} = 7.721 > t_{table} = 2.035$, so it can be concluded that H_1 is accepted, meaning there is a significant influence between self-concept and mathematical connection ability. Figure 3 illustrates the predictive strength of self-concept toward mathematical connection ability. The positive coefficient demonstrates that higher self-concept contributes to better mathematical connection ability, supporting the hypothesis of this study.

Based on the results of the normality tests, which indicate that the data for both students' self-concept and mathematical connection ability are normally distributed, the next step is to conduct a correlation analysis to examine the relationship between students' self-concept and their mathematical connection ability. The hypotheses used are:

H_0: There is no significant relationship between self-concept and mathematical connection ability

H_1: There is a significant relationship between self-concept and mathematical connection ability

Here is the interpretation of the correlation test result in Table 3:

Table 3 Output SPSS Correlation Self-Concept and Mathematical Connection Ability

		Self-Concept	Mathematical Connection Ability
Self-Concept	Pearson Correlation	1	.798**
	Sig. (2-tailed)		.000
	N	36	36
Mathematical Connection Ability	Pearson Correlation	.798**	1
	Sig. (2-tailed)	.000	
	N	36	36

In Table 3, it is observed that the variables of self-concept and mathematical connection ability obtained a significance (sig.) value of 0.000, which indicates that $0.000 < 0.05$. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted.

The correlation value of 0.798 indicates a strong and positive relationship between the two variables, namely self-concept and mathematical connection ability, because it falls within the interval 0.60–0.799 (Sugiyono, 2019). It can be infered that students who have positive self-concept are able to make better connections in mathematics. To corroborate the description given above, one may use

the coefficient of determination in order to describe the amount of influence self-concept has on mathematical connection ability. The coefficient of determination (R^2) is figure out by taking the square of the correlation coefficient, and hence with we get a value of 0.637 which denotes that 63.7% of the mathematical connection ability of the students is attribute able to their self-concept while the rest 36.3% is due to other factors that have not been taken into consideration in this research.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.798[a]	.637	.626	1.189	1.590

a. Predictors: (Constant), Self-Concept

b. Dependent Variable: Kemampuan Koneksi Matematis

Figure 4 Coefficient of Determination

Considering the data presented in Table 3 and Figure 4, the result demonstrate the existence of a strong linear correlation between the two variables. This means that self-concept is the primary factor that determines mathematical connection ability, highlighting the importance of affective factors in supporting students' cognitive performance in mathematics.

DISCUSSION

Analysis results confirm that self-concept is positively and significantly correlated with mathematical connection skills among eighth-grade students at SMPN 14 Tasikmalaya. This conclusion was derived from a series of statistical procedures, encompassing both desriptive and inferential analyses, which revealed that students' percpetions of themselves in mathematics learning sre closely linked to their ability to established connections across mathematical concepts eheter within different topics, across other disciplines, or in everyday context.

To gain a clearer understanding pf the characteristics of students' self-concept, a descriptive analysis was carried out using data from the self-concept questionaire, which had been converted into a 100 point scale. The results showed that the average self-concept score of students was 60.89, falling into the moderate category (based on the categories: $low < 59;\ 59 \leq moderate < 67;\ high \geq 68$). Out of 36 students, 6 students (16.7%) were categorized as high, 13 students (36.1%) as moderate, and 17 students (47.2%) as low. The highest score was recorded on the indicator of understanding the benefits of learning mathematics, particularly on the item "learning mathematics trains people to think carefully" (84.44%). Positive responses were also observed in the self-confidence indicator, such as the item "I am confident that I will get good grades in mathematics," which scored 72.78%. Conversely, the indicators of communication skills and social adaptation were relatively lower, such as the statement "I avoid answering difficult mathematics questions" (55%). These findings indicate that most students have a fairly strong affective foundation, although some students still need support to improve their self-confidence.

In line with this, the results of the analysis of the mathematical connection ability test show that students' mathematical connection ability also fell into the moderate category. The average mathematical connection score was 8.36, which falls into the moderate category ($6.67 \leq x < 9.33$). A total of 12 students (33.3%) were classified in the high category (score ≥ 9.33), 17 students (47.2%) in the moderate category, and 7 students (19.4%) in the low category. In more detail, the ability to connect between topics in mathematics has the highest achievement (79.86%), while connections between mathematics and other subjects (64.58%) and with daily life (64.58%) are still in the basic category. These results indicate that most students were able to connect mathematical concepts not only between topics within mathematics but also with real life contexts and other subject areas, although the level of ability still varied among students. (Rivki & Bachtiar, 2000).

Students with a high mathematics self-concept generally show greater confidence and persistence in understanding the interconnections between mathematical topics, such as linking the concepts of area

and volume. Self concept understood as an individuals perception of their competence in mathematics, has consistently been shown to have a positive correlation with overall mathematical performance. Zukhriya et al., (2024), for example, found that students with higher levels of self-confidence exhibited stronger problem solving abilities, suggesting that effective factors such as self-concept play a crucial role in shaping students engagement with mathematical tasks. When learners have the confidence in their math skills, they tend to dive deep into the concepts, make connections across various topics, and check how one idea supports the other. Consequently, in terms of the intertopic mathematical connections indicator, students having a high self-concept are likely to score better because they not merely follow the memorization of steps but also actively engage in understanding the conceptual relationships.

Regarding the indicator of connections between mathematics and other subject areas like science, students with a positive self-concept are better at recognizing such relationships. Being good at math makes them see that it can be used in so many different ways. And this willingness opens them up to using math beyond just the pure math field. Supporting this, Ridwan and Kusnadi (2025) found that affective variables, especially confidence, have the most significant impact on students' ability to relate mathematics to other disciplines. Therefore, students with a strong self-concept are more likely to connect mathematics to science because they see mathematics as a handy tool rather than a separate, abstract subject.

Yuliana and Waluyo (2024) are also extending the point by saying that mathematical beliefs and the affective side of the students which includes self-concept, strongly influence their ability to execute higher-order mathematical tasks. This is consistent with the view that positive self-concept not only facilitates cognitive engagement but also elevates students' readiness to form deep connections across different mathematical topics and to use mathematics in various contexts.

As to connections between mathematics and daily life, learners with a high level of self-concept are normally more willing to demonstrate the reality of math concepts in the world around them. A positive image of their mathematical abilities gives them a powerful motivation to apply math in real situations thereby deepening math's connection to everyday life. This agrees with the research of Hardi et al.,(2022), who emphasized that mathematical connection skills entail the capacity to change real life problems into mathematical representations and use concepts in practical situations. Therefore, having a strong self-concept not only impacts the cognitive side of math but also the affective and motivational aspects, which, in turn, help learners to see math as a living thing integrated into their life rather than just abstract symbols on a board.

Before figuring out how the variables are related through the research, the scientific men make sure that the figures comply with the conditions for parametric tests. According to the Shapiro Wilk test, the distribution of the data was normal (self-concept $\rho = 0.076$, mathematical connections $\rho = 0.175$). Moreover, the test for linearity showed that the two variables were significantly correlated, thereby the data were fit for further examination through parametric statistical methods.

The simple linear regression analysis produced the equation $Y = -6.978 + 0.252X$, which suggests that for every one point increase in self-concept, mathematical ability increases by approximately 0.252 points. The obtained t-value of 7.721 with sig. = 0.000 confirms that self-concept significantly influences students' mathematical connection skills. The f-test also verified the significance of the regression model ($F = 59.618; sig. = 0.000$). Also, the coefficient of determination was 0.637, meaning that 63.7% of the variation in ability to make mathematical connections can be traced back to self-concept, while the remaining 36.3% is due to other factors such as motivation, interest, learning strategies, and environmental support.

The Pearson correlation test revealed that the coefficient was 0.798 with $sig. = 0.000$, indicating a strong and statistically significant relationship between self-concept and the ability to make mathematical connections. The finding is in line with the assertion of Yuliani and Zaenal (2023), whose research result have shown that students with a positive self-concepts have good performance in mastering mathematical connection indicators. In the same manner, Andriani and Aripin (2019) noticed that students who are higly confident are more enthusiastic in solving problems that require interconnections between concepts.

Previous research has also emphasized the brother link between self-concept and academic achievement, especially in areas of higher order thinking skills. Güzeller and Akın (2017) demonstrated that mathematical self-efficacy and self-concept are more powerful predictors of achievement than anxiety, interests, or demographic variables. Along this line, students with high self concept usually show perseverance, positive attitudes, and resilience when they are confronted with challenges, even those related to mathematical connections (Granello et al., 2025; Passiatore et al., 2023).

Moreover, the association between self-concept and various mathematical skills has been supported by differnet research. Fadliansyah (2021) observed that self-concept has a positive correlation with mathematical communication skills which are highly dependent on connection skills. Similarly, Ardhini et al., (2022) emphasized that students with a strong self-concept have the ability to go through the entire mathematical thinking process from clarifying problems to designing strategies for solution whereas students with low self-concept only get to the very first stages.

Overall, these results indicate the importance of considering the emotional side of education when teaching mathematics. Oftentimes, students who possess low self-concept even in situations where they have an adequate cognitive understanding do not show mathematical connection skills due to their lack of confidence. This is in line with educational theories about self-concept and self-efficacy that imply those students who have a negative self-perception are likely to disengage from complex tasks (Passiatore et al., 2023).

The necessary outcome of this fact is that educators should engage in the activity of deliberately encouraging students to have a positive image of themselves. One way to do this is by producing the atmosphere of the classroom which is psychologically beneficial for the learners, giving them feedback that supports their development, and using both local and collaborative learning strategies. In addition to that, it is very significant for one to recognize and praise the students not only when they succeed, but also when they make efforts. This will be instrumental in the students gaining more confidence and becoming motivated (Yuliyanti et al., 2019). Hence, it is not only beneficial but also necessary to consider the promotion of a positive self-concept as a part of the math curriculum, since it helps to develop not only intellectual mastery but also emotional resilience and lifelong engagement with mathematics.

CONCLUSION

The analysis results reveal a strong and significant correlation between students' self-concept and their mathematical connection abilities. A correlation coefficient of 0.798 with a significance value of 0.000 indicates that students with higher self-concept are likely to have stronger mathematical connection skills. This is supported also by the simple linear regression analysis which identifies that that 63.7% of the variance in mathematical connection ability is due to self-concept, while the remaining 36.3% is influenced by other factors unkown to the study

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