

The Influence of the Super Item Learning Model on Students' Mathematical Connection Ability and Self-Efficacy

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ABSTRACT

This study aims to analyze the influence of the Super Item learning model on students' mathematical connection ability and self-efficacy at MTs Al Munawwarah Medang Deras. The research was motivated by the low mathematical connection ability and self-efficacy of students in mathematics learning. The study employed a quantitative approach with a quasi-experimental design using a Nonequivalent Control Group Design. The research population was Grade VIII students of MTs Al Munawwarah Medang Deras, with a sample of 32 students in the experimental group and 32 students in the control group. The sampling technique used was random sampling. Data collection techniques included tests, questionnaires, and statistical data processing tools covering validity, reliability, and analysis, as well as the *Independent Sample t-Test* for hypothesis testing using Microsoft Excel. The results showed a significant difference in mathematical connection ability, with the experimental class scoring higher than the control class. The t-test results showed that $t\text{-count} > t\text{-table}$ ($2.859 > 1.999$) and a $p\text{-value}$ (*two-tail*) of $0.04194 < 0.05$, indicating a significant difference between the experimental and control classes. This study also showed a significant difference in students' self-efficacy between the experimental class using the Super Item learning model and the control class using conventional learning. Based on the *Independent Sample t-Test*, $t\text{-count} > t\text{-table}$ ($3.355 > 1.999$) and a $p\text{-value}$ (*two-tail*) of $0.001355 < 0.05$, indicating a significant difference between the two groups. The research results prove that the Super Item learning model has a positive effect on improving students' mathematical connection ability and self-efficacy in learning mathematics. The application of Super Item not only strengthens cognitive aspects but also makes an important contribution to affective aspects, namely students' confidence.

Keywords: Super Item Learning Model, Mathematical Connection Ability, Self-Efficacy.

INTRODUCTION

Education is one of the most important and inseparable parts of human life, because through education humans will strive to develop themselves to face every change that occurs due to the advancement of science and technology. In Indonesia, the importance of education is stated in Law on the National Education System Number 20 of 2003, General Provisions Article 1, namely education is a conscious and planned effort to realize a learning atmosphere and learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. Education is

a place in which it consists of students and educators, who carry out a learning process. In the world of education, learning includes the process of interaction between students and educators who have a reciprocal relationship. A learning process will take place if there are roles between teachers and students, students with teachers, learning resources, and the learning environment. This two-way communication process is an activity that is deliberately arranged or programmed which has the goal of creating students who learn actively, innovatively, and meaningfully. The government strives to improve the quality of school education, namely improving the quality of teaching and learning processes.

One effort to improve the ability to master science and technology is to improve their abilities in the field of mathematics. Mathematics is one component of a series of subjects that has an important role in education (Indriani & Noordyana, 2021). Mathematics is the foundation of various disciplines because every science contains mathematics in it (Nugraha & Basuki, 2021). Mathematics in the education curriculum in Indonesia is a subject that must be studied by students from the level of basic education, secondary, to higher education (Aisyah & Madio, 2021). However, in reality, mathematics becomes the most feared subject by students, one of the reasons is that students' mathematical connection abilities are still low (Rhamdania & Basuki, 2022). According to NCTM, if students are able to connect mathematical ideas, their mathematical understanding will be deeper and last longer because students are able to see relationships between topics in mathematics and contexts outside mathematics, mathematics with everyday life experiences.

Mathematics is a structured science, which is arranged from simple to more complex. This statement states that there is a relationship between mathematical concepts. Mathematics is a symbolic language whose practical function is to express quantitative and spatial relationships while its function is to facilitate thinking.

One important aspect in learning mathematics is mathematical connection ability. Mathematical connection ability is a skill that must be built, because with good mathematical connection ability it will help students in knowing the relationship between concepts in mathematics and outside mathematics (Hendriana et al., 2017). According to Lestari and Yudhanegara (2018), mathematical connection ability is the ability to link mathematical concepts/rules with one another, with other fields of study or with real-world applications. García-García and Dolores-Flores (2018) emphasize that intra-mathematical connections made by students in performing mathematical tasks are essential for developing deep conceptual understanding, while García-García and Dolores-Flores (2019) further explored mathematical connections of pre-university students through tasks involving rates of change, demonstrating the importance of connecting mathematical concepts to real-world contexts.

The low ability of students in mathematics that is still felt is mathematical connection ability. This is in accordance with the results of a study in Permatasari and Nuraeni (2021) that student learning outcomes to date are still not encouraging, especially in the aspect of mathematical connection. According to Hendriana et al. (2017), several important reasons for the importance of students' mathematical

connection ability include: (1) Mathematical connections are contained in the objectives of mathematics learning including understanding mathematical concepts and their relationships and applying them in problem solving appropriately and carefully; (2) NCTM argues that mathematical connections are a basic mathematical competency that needs to be developed in secondary school students; (3) In essence mathematics is a structured science, arranged from simple to more complex. This statement describes the existence of links or relationships between mathematical concepts; (4) Mathematics as an auxiliary science shows that mathematical concepts are widely used in the development of other fields of study and solving everyday problems; (5) Basically the possession of good mathematical connections provides opportunities for meaningful mathematics learning.

Mathematical connection ability is an important aspect in learning mathematics that affects motivation and academic achievement. Research exploring the influence of learning models on self-efficacy will be very useful for learning strategies oriented towards increasing student motivation. Self-efficacy is a person's belief in regulating and directing their abilities to change and face situations. Self-efficacy is also an important aspect in learning mathematics. Self-efficacy is a person's belief in their ability to complete tasks or achieve goals. High self-efficacy will encourage students to study harder and strive to improve students' mathematical connection abilities. According to Pajares (1996), self-efficacy beliefs in academic settings play a crucial role in influencing students' motivation, persistence, and academic achievement. Schunk (1991) further emphasized that self-efficacy is a key determinant of academic motivation, influencing the choices students make, the effort they expend, and their persistence in the face of difficulties. Usher (2009) conducted a qualitative investigation into the sources of middle school students' self-efficacy in mathematics, while Usher and Pajares (2009) validated the sources of self-efficacy in mathematics, identifying mastery experiences, vicarious experiences, social persuasions, and physiological states as key sources.

From the description above, it is known that connection ability and self-efficacy have an important role in learning mathematics. However, based on initial surveys conducted on Tuesday, October 24, 2023, it is known that the results show that in the learning process there are problems faced, namely students are less enthusiastic and active during the learning process, students prefer to chat with friends rather than pay attention to the teacher when explaining lessons, students think mathematics is a difficult subject and is not important for life. In addition, the learning model applied by teachers is still conventional, and in applying problems teachers rarely link real life and the use of media or teaching aids. This statement is supported by the results of interviews by researchers with Mr. Rojali, S.Pdi as the mathematics subject teacher for class VIII at MTs Al Munawwarah Medang Deras. From the interview, information was obtained that in the mathematics learning process, students often experience difficulties in working on story problems, often there are no answers when getting story problems. In addition, the teacher has also received complaints from students about the difficulty of mathematics because there are so many formulas that must be memorized. From the interview, it is also known that of the questions given by the teacher during learning,

consisting of 30 students and those above the KKM are only 7 students which if calculated in percentage is 23.33%. While students who have not passed the KKM or their scores are below the KKM are 23 students and if calculated in percentage is 76.6%.

Not only the teacher, the researcher also asked students about mathematics. It turned out that of the 5 students asked, 1 student felt happy in learning mathematics. The majority preferred to say that mathematics is a difficult subject because it memorizes formulas. The researcher also observed mathematics learning in class, there are still some students busy chatting in the back row, there are also students who are daydreaming when the teacher explains the material. This condition is concerning considering that active learning has been shown to significantly increase student performance in science, engineering, and mathematics (Freeman et al., 2014). Johnson and Johnson (2009) emphasize that cooperative learning, based on social interdependence theory, has been proven to be an educational psychology success story in improving student outcomes. Slavin (2014) further demonstrates that cooperative learning and academic achievement are strongly linked, explaining why group work is effective in educational settings.

In line with the results of the Programme for International Student Assessment (PISA) conducted by the Organisation for Economic Cooperation and Development (OECD), Indonesia obtained a score for mathematics in 2018 approaching 379 with an OECD average score of 487 (OECD, 2019). Meanwhile, if we look back at 2015, Indonesia obtained a score for mathematics reaching an average of 386. From this fact, it appears that there is a decline in the performance of Indonesian students' competence towards PISA results from 2015 to 2018. Not only that, Indonesian student achievement is also still in the low category. Therefore, there is a need for competency improvement from various fields, especially in the field of mathematics. PISA measures the performance of participants in three main fields, namely reading, mathematics, and science. PISA is part of the OECD (Organization for Economic Cooperation and Development) program, an organization engaged in economic cooperation and development.

Mathematical connection ability and self-efficacy have an important role in learning mathematics, but based on initial observations, it is known that students' mathematical connection ability and self-efficacy are still low. This may be caused by various factors, including teaching methods that are less effective in building student self-efficacy. Biesta (2009) argues that good education in an age of measurement requires reconnecting with the question of purpose in education, suggesting that educational practices should focus not only on measurable outcomes but also on the holistic development of students. To improve student self-efficacy in mathematics, there needs to be a change in the learning approach, such as the use of more interactive methods, providing positive feedback, and creating a supportive learning environment. In addition, linking mathematics with real life and showing its relevance can help increase students' perceptions of the importance of mathematics, which in turn can increase their self-efficacy. So there is a need for mathematics learning that is designed in such a way as to improve students' mathematical connection ability and self-efficacy.

The Super Item learning model offers a promising approach to address these challenges. According to Shoimin (2014), Super Item is a learning model that starts from the simplest task and then increases to more complex tasks by paying attention to student abilities. The Super Item learning model is designed to help students understand the relationships between concepts. This learning helps stimulate the maturity of student reasoning. This is done so that students can solve problems. Huda (2018) explains that the Super Item learning model is a learning model by giving tiered tasks from simple to complex and in the form of problem solving. According to Chick (1998), the SOLO taxonomy, which underlies the Super Item model, provides a framework for understanding cognition in formal modes, describing how student understanding develops from prestructural to extended abstract levels. This theoretical foundation supports the use of tiered questions in facilitating students' progression through increasingly complex levels of understanding. Research by Handayani (2020) showed that the application of the Super Item learning model is able to improve students' mathematical reasoning abilities. Although the study focused more on the habits of mind aspect, the improvement of mathematical reasoning cannot be separated from the existence of good self-efficacy.

RESEARCH METHOD

This study employed a quantitative approach with a quasi-experimental method using a Nonequivalent Control Group Design. According to Gopalan et al. (2020), quasi-experimental research designs have grown significantly in education research, offering promise and challenges for researchers seeking to establish causal relationships in real-world educational settings. The research was conducted at MTs Al Munawwarah, located at Jalan Lok Abdullah No. 109, Medang, Medang Deras District, Batu Bara Regency, North Sumatra Province.

The population in this study were all Grade VIII students of MTs Al Munawwarah Medang Deras, consisting of three classes (VIII-A, VIII-B, and VIII-C) with a total of 96 students. The sample consisted of 64 students selected using random sampling technique, divided into two groups: the experimental group (VIII-A, $n = 32$) that received mathematics learning through the Super Item learning model, and the control group (VIII-C, $n = 32$) that followed conventional learning.

Data collection was conducted through tests and questionnaires. The test instrument consisted of 5 essay questions measuring mathematical connection ability, while the questionnaire consisted of 20 items measuring student self-efficacy using a Likert scale. According to Sugiyono (2018), research instruments are tools used to measure observed natural and social phenomena. The research instrument was validated through expert judgment by qualified validators who assessed the instrument's construction, content, and external validity. The instrument was also tested for reliability, difficulty level, and discriminating power before being used in the research. As emphasized by Ananda and Rafida (2017), instrument validation is a crucial step in ensuring that research instruments accurately measure what they are intended to measure.

Data were analyzed using descriptive and inferential statistics including normality tests (*Liliefors test*), homogeneity tests (*F-test*), and *Independent Sample t-Test* for hypothesis testing. The analysis was conducted using Microsoft Excel. According to Jaya (2019), statistical analysis in educational research requires careful consideration of the assumptions underlying parametric tests. Nissen et al. (2018) compared normalized gain and *Cohen's d* for analyzing gains on concept inventories, providing guidance on appropriate effect size measures for educational research. The research was declared successful if it met a significance level below 0.05.

RESULTS AND DISCUSSION

Results

Descriptive Statistics

Based on the research results, there were differences in the descriptive statistics of mathematical connection ability between the experimental and control classes. The following table presents the descriptive statistics for both variables:

Table 1. Descriptive Statistics of Mathematical Connection Ability and Self-Efficacy

Statistics	Mathematical Connection (Experimental)	Mathematical Connection (Control)	Self-Efficacy (Experimental)	Self-Efficacy (Control)
N	32	32	32	32
Minimum Score	29	45	51.25	62.50
Maximum Score	93	90	97.50	91.25
Range	64	45	46.25	28.75
Mean	66.84	63.44	80.43	76.84
Median	68.50	60.00	83.13	76.25
Standard Deviation	14.20	11.74	12.16	7.18
Variance	201.68	137.80	147.84	51.51
Sum of Scores	2,139	2,030	2,573.75	2,458.75

Based on Table 1, it can be seen that the average mathematical connection ability of students in the experimental class is higher than the control class, with an average difference of 3.40 points. For the self-efficacy variable, the experimental class obtained an average score of 80.43, while the control class obtained an average score of 76.84, with an average difference of 3.59 points. This shows that the average self-efficacy of students in the experimental class is higher than the control class.

Normality Test Results

The normality test was conducted using the *Liliefors test* to determine whether the data from both classes were normally distributed. The following table presents the normality test results:

Table 2. Normality Test Results (*Liliefors test*)

Variables	Class	N	Mean	Standard Deviation	L-count	L-table	Conclusion
Mathematical Connection	Experimental	32	66.84	14.20	0.0587	0.1542	Normal
Mathematical Connection	Control	32	63.44	11.74	0.1464	0.1542	Normal
Self-Efficacy	Experimental	32	80.43	12.16	0.1090	0.1542	Normal
Self-Efficacy	Control	32	76.84	7.18	0.1091	0.1542	Normal

Based on Table 2, it is known that the L-count value for the mathematical connection variable in the experimental class is 0.0587, the control class is 0.1464, while the L-count value for the self-efficacy variable in the experimental class is 0.1090 and the control class is 0.1091. The L-table value at the 5% significance level is 0.1542. The decision-making criterion in the *Liliefors test* is if $L\text{-count} \leq L\text{-table}$, then the data is normally distributed. Based on these results, all L-count values in the four data groups are smaller than L-table 0.1542. Thus, it can be concluded that the mathematical connection and self-efficacy data in both the experimental and control classes are normally distributed.

Homogeneity Test Results

The homogeneity test was conducted to determine whether the two groups have homogeneous variance. The following table presents the homogeneity test results:

Table 3. Homogeneity Test Results (*F-test*)

Variable	Experimental Variance	Control Variance	F-count	F-table	Conclusion
Mathematical Connection	114.51613	137.80242	0.8310168	1.82213229	Homogeneous

Based on Table 3, the variance of the experimental class was 114.51613 and the variance of the control class was 137.80. The calculation produced F-count of 0.8310168, while F-table at the 5% significance level was 1.822. The decision-making criterion states that if $F\text{-count} \leq F\text{-table}$, then the two groups have homogeneous variance. Because F-count is smaller than F-table, it can be concluded that the data from the experimental and control classes have homogeneous variance. Thus, the homogeneity assumption is met so that parametric statistical analysis can be continued.

Hypothesis Test Results

Mathematical Connection Ability

The following table presents the *Independent Sample t-Test* results for mathematical connection ability:

Table 4. *Independent Sample t-Test Results for Mathematical Connection Ability*

Statistics	Variable 1 (Control)	Variable 2 (Experimental)
Mean	63.75	66.84
Variance	132.2581	201.6845
Observations	32	32
Pooled Variance	166.9713	
Hypothesized Mean Difference	0	
df	62	
t Stat	-2.859	
P(T<=t) one-tail	0.17097	
t Critical one-tail	1.6698	
P(T<=t) two-tail	0.04194	
t Critical two-tail	1.9990	

Based on Table 4, the average of the experimental class was 66.84 and the control class was 63.75. The t-count value was -2.859 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value was 1.999. Because $t\text{-count} > t\text{-table}$ ($2.859 > 1.999$) and the significance value *p-value* (*two-tail*) was $0.04194 < 0.05$, there is a significant difference between the experimental and control classes. Thus, it can be concluded that the use of treatment in the experimental class provides a better influence on students' mathematical connection ability compared to the control class.

Self-Efficacy

The following table presents the *Independent Sample t-Test* results for self-efficacy:

Table 5. *Independent Sample t-Test Results for Self-Efficacy*

Statistics	Variable 1 (Control)	Variable 2 (Experimental)
Mean	71.05469	76.83594
Variance	43.45861	51.51052
Observations	32	32
Pooled Variance	47.48456	
Hypothesized Mean Difference	0	
df	62	
t Stat	-3.35587	
P(T<=t) one-tail	0.000677	
t Critical one-tail	1.669804	
P(T<=t) two-tail	0.001355	
t Critical two-tail	1.998972	

Based on Table 5, the average (mean) of the control class was 71.05469 and the experimental class was 76.83594. The t-count value was -3.35587 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value was 1.999. Because $t\text{-count} > t\text{-table}$ ($3.355 > 1.999$) and the significance value *p-value* (*two-tail*) was $0.001355 < 0.05$, there is a significant difference between the two groups. Thus, it can be concluded that the treatment given to the experimental class has a significant effect on improving student self-efficacy compared to the control class.

Discussion

The Influence of the Super Item Learning Model on Mathematical Connection Ability

Based on the results of the *Independent Sample t-Test* on students' mathematical connection ability, there was a fairly significant difference in average (mean) between the experimental and control classes. The experimental class showed an average value of 66.84, while the control class obtained an average value of 63.44. This average difference indicates that the mathematical connection ability of students in the experimental class is higher than the control class.

Statistically, the t-test results show that the t-count value is -2.859 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value is 1.999. Because $t\text{-count} > t\text{-table}$ ($2.859 > 1.999$) and the significance value *p-value (two-tail)* is $0.04194 < 0.05$, there is a significant difference between the experimental and control classes. Thus, it can be concluded that the use of treatment in the experimental class provides a better influence on students' mathematical connection ability compared to the control class.

This result shows that the treatment given to the experimental class provides a positive and more effective impact in improving students' mathematical connection ability. The Super Item learning model is able to help students understand the relationship between mathematical concepts, both between topics in mathematics itself and their linkage to everyday life contexts. This is different from conventional learning which tends to emphasize one-way material delivery and routine problem solving, so that opportunities for students to build connections between concepts become more limited.

Furthermore, mathematical connection ability is one of the important aspects in learning mathematics, because this ability allows students to see the relationship between concepts that have been learned, connect new concepts with previous knowledge, and apply mathematical concepts in different situations. The Super Item learning model, through the presentation of tiered questions from simple to complex levels, provides opportunities for students to gradually build a coherent conceptual understanding. This process encourages students not only to understand procedures, but also the meaning behind the mathematical concepts being learned. As Ainsworth (2006) argues in the DeFT framework, learning with multiple representations requires learners to understand the connections between different representations, which is precisely what the Super Item model facilitates through its tiered structure.

The findings of this study are in line with the results of research conducted by Handayani (2020) which concluded that the application of the Super Item learning model significantly can improve mathematical reasoning ability. Although the study focused on reasoning rather than connection ability, the essence of the results of that study still emphasizes that the tiered question structure in Super Item has an important role in facilitating students to build connections between mathematical concepts. With systematic question stages, students can understand basic concepts first before moving on to higher levels of understanding. Rittle-Johnson and Star (2007) found that

comparing solution methods facilitates conceptual and procedural knowledge, supporting the notion that exposure to multiple representations and solution strategies, as provided by the Super Item model, enhances mathematical understanding.

In addition, the effectiveness of the Super Item learning model can also be explained through the Zone of Proximal Development (ZPD) theory and the concept of scaffolding. According to van de Pol et al. (2010), scaffolding in teacher-student interaction has been extensively researched over the past decade, demonstrating its importance in supporting student learning. In this context, the Super Item model presents questions gradually, so students are not immediately faced with complex questions, but are guided through simpler initial questions. This approach helps students gradually expand their cognitive abilities until they are able to solve more challenging problems.

Furthermore, the learning pattern in the Super Item model is also in line with the SOLO (Structure of the Observed Learning Outcome) taxonomy. According to Chick (1998), the SOLO taxonomy provides a framework for understanding cognition in formal modes, describing how student understanding develops from prestructural, unistructural, multistructural, relational, to extended abstract stages. Through Super Item questions arranged in tiers, students are directed to move from shallow understanding to deeper and more abstract understanding. At the final stage, students are not only able to solve problems, but also able to link various mathematical concepts and use them to solve new problems. This aligns with the findings of García-García and Dolores-Flores (2018), who emphasized that intra-mathematical connections are essential for developing deep conceptual understanding in mathematics.

Thus, the application of the Super Item learning model is proven not only to improve learning outcomes quantitatively, but also contributes to developing higher-order reasoning abilities, especially students' mathematical connection ability. Therefore, the Super Item learning model deserves to be considered as one of the effective alternative learning models in mathematics learning, especially to improve students' ability to connect mathematical concepts systematically and meaningfully.

The Influence of the Super Item Learning Model on Self-Efficacy

The results of this study indicate that there is a significant difference in student self-efficacy between the experimental class using the Super Item learning model and the control class using conventional learning. This difference is proven through the *Independent Sample t-Test* results, which show that the t-count value is -3.35587 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value is 1.999. Because $t\text{-count} > t\text{-critical}$ ($3.355 > 1.999$) and the significance value *p-value* (*two-tail*) is $0.001355 < 0.05$, there is a significant difference between the two groups. Thus, it can be concluded that the treatment given to the experimental class has a significant effect on improving student self-efficacy compared to the control class.

This difference in self-efficacy shows that students in the experimental class have higher self-confidence in understanding material, solving math problems, and facing learning challenges compared to students in the control class. Self-efficacy is an individual's belief in their ability to complete certain tasks and achieve expected results.

In the context of learning mathematics, self-efficacy plays an important role because students who have high self-confidence tend to be more courageous to try, do not give up easily when facing difficulties, and are able to maintain effort until finding a solution. Therefore, increasing self-efficacy through the application of appropriate learning models becomes an important factor in improving the quality of mathematics learning.

The Super Item learning model makes a significant contribution to improving student self-efficacy because of its characteristics that present tiered questions from low to high difficulty levels. This learning pattern allows students to experience gradual success, starting from solving simple problems to more complex ones. This gradual success becomes a positive experience (mastery experience) that can strengthen students' beliefs in their own abilities. When students successfully complete one stage of the problem, they will feel more confident to continue to the next stage, so that student self-efficacy develops sustainably.

This research finding is in line with the results of research by Handayani (2020) which states that the application of the Super Item learning model is able to improve students' mathematical reasoning abilities. Although the study focused more on the habits of mind aspect, the improvement of mathematical reasoning cannot be separated from the existence of good self-efficacy. Students who have high self-confidence will be more confident in their thinking process, more courageous in expressing ideas, and more persistent in solving problems. Thus, the results of Handayani's (2020) study indirectly reinforce that the Super Item model not only affects cognitive aspects, but also has an impact on students' affective aspects, especially self-efficacy.

The effectiveness of the Super Item learning model in improving self-efficacy can also be explained through Bandura's social cognitive theory. According to Pajares (1996), self-efficacy beliefs in academic settings are shaped through four main sources: mastery experience, vicarious experience, social persuasion, and physiological and emotional states. The Super Item model, with its tiered question structure, provides students with repeated mastery experiences. Each time students successfully solve a problem at a certain level, they gain direct evidence of their ability to overcome academic challenges. This positive experience gradually builds and strengthens their belief in their ability to succeed in more difficult tasks. Usher and Pajares (2009) validated these sources of self-efficacy in mathematics, confirming that mastery experiences are the most influential source of self-efficacy beliefs.

In addition, the scaffolding provided by the teacher in the Super Item learning process also serves as a form of social persuasion that can strengthen student self-efficacy. When teachers provide constructive feedback, encouragement, and recognition of student efforts and achievements, students feel supported and valued. This creates a safe and conducive learning environment for students to take risks, try new strategies, and learn from mistakes without fear of being judged. Thus, the Super Item learning model creates a learning ecosystem that not only focuses on cognitive development but also pays attention to the affective needs of students. As van de Pol et al. (2010) demonstrated, scaffolding in teacher-student interaction is crucial for supporting student learning and development.

Furthermore, the Super Item learning model also supports the development of metacognitive strategies. As students move through the question levels, they learn to reflect on their own thinking processes, identify effective strategies, and evaluate their approach. These metacognitive skills not only improve their mathematical connection ability but also contribute to increased self-efficacy. Students become more aware of their ability to control their own learning process, which further increases their confidence in facing mathematical tasks. When students feel they have control over their learning, they tend to be more motivated, more persistent, and more confident in facing academic challenges. Panadero (2017) reviewed self-regulated learning models and directions for research, emphasizing the importance of metacognitive skills in academic success.

It is important to note that the effectiveness of the Super Item model in improving mathematical connection ability and self-efficacy does not happen automatically. Careful implementation and appropriate teacher support are essential. Teachers need to ensure that the questions in the Super Item are well-designed, provide appropriate scaffolding, and create a supportive classroom environment where students feel safe to take risks and learn from their mistakes. In addition, teachers also need to pay attention to individual differences among students and adjust the level of difficulty of the problems according to each student's readiness. As Nurarfiansyah et al. (2022) emphasize, improving teacher professional competence is essential for effective implementation of innovative learning models.

The Super Item learning model offers a promising approach to improve both mathematical connection ability and student self-efficacy. By presenting problems in meaningful contexts, building understanding gradually, and providing appropriate challenges, this model supports the development of deep mathematical skills and strong self-confidence. As educators continue to explore and refine the use of the Super Item model, we can expect to see significant improvements in how students understand, connect, and apply mathematical concepts, as well as in their belief in their own ability to succeed in mathematics.

The findings of this study provide practical implications for teachers and schools in designing mathematics learning. Teachers are advised to integrate the Super Item learning model as one of the alternative learning strategies in the classroom. This model can help students improve mathematical connection skills while building self-confidence in learning. In addition, schools need to provide support in the form of training or workshops for teachers so that they are more skilled in designing and implementing Super Item-based learning, so that its implementation can be optimal and sustainable.

For students, it is recommended to be more active and confident in participating in learning using the Super Item model. The gradual process in solving problems can be utilized to train independence, courage, and the ability to connect mathematical concepts. Meanwhile, for future researchers, this study is still limited to mathematical connection ability and self-efficacy. Therefore, it is recommended to examine the influence of Super Item on other variables, such as critical thinking skills, mathematical

creativity, or learning motivation, so that the scope of benefits of this model can be known more broadly.

CONCLUSIONS

Influence of the Super Item learning model on students' mathematical connection ability. The statistical test results show that the t-count value is -2.859 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value is 1.999. Because $t\text{-count} > t\text{-table}$ ($2.859 > 1.999$) and the significance value *p-value* (*two-tail*) is $0.04194 < 0.05$, there is a significant difference between the experimental and control classes. Thus, it can be concluded that the use of treatment in the experimental class provides a better influence on students' mathematical connection ability compared to the control class. This shows that students who learn using the Super Item learning model obtain a higher average mathematical connection score compared to students who learn with the conventional model. This proves that Super Item is able to facilitate students in connecting various mathematical concepts, both between topics and their application in everyday life. There is an influence of the Super Item learning model on student self-efficacy. The analysis results show that the t-count value is -3.35587 with degrees of freedom (df) of 62. At the 5% significance level, the t-table (*two-tail*) value is 1.999. Because $t\text{-count} > t\text{-table}$ ($3.355 > 1.999$) and the significance value *p-value* (*two-tail*) is $0.001355 < 0.05$, there is a significant difference between the two groups. This shows that students in the experimental class have a better level of self-efficacy compared to the control class. The Super Item model provides a challenging but gradual learning experience, thus fostering self-confidence, belief, and a resilient attitude in facing mathematical problems.

The implications of this study for educational practice are substantial. Teachers should utilize the Super Item learning model as an alternative learning strategy in the classroom. This model can help students improve mathematical connection skills while building self-confidence in learning. Schools need to provide support in the form of training or workshops for teachers to be more skilled in designing and implementing Super Item-based learning. Parents should provide opportunities for children to practice solving problems independently and provide positive feedback to build their confidence. Future researchers are advised to examine the influence of Super Item on other variables, such as critical thinking skills, mathematical creativity, or learning motivation, so that the scope of benefits of this model can be known more broadly.

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