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The Effect of Mathematical Anxiety and Self-Concept on Mathematical Critical Thingking Abilities Through Self-Efficacy

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ABSTRACT

This study aims to: (1) analyze the influence of mathematical anxiety on the self-efficacy of class VIII students of MTsN 6 Malang; (2) analyze the influence of self-concept on the self-efficacy of class VIII students of MTsN 6 Malang; (3) analyze the influence of mathematical anxiety on the mathematical critical thinking ability of class VIII students of MTsN 6 Malang; (4) analyze the influence of self-concept on the critical thinking ability of class VIII students of MTsN 6 Malang; and (5) analyze the influence of self-efficacy on the critical thinking ability of class VIII students of MTsN 6 Malang. This study uses an ex post facto quantitative approach. The research population was all class VIII students of MTsN 6 Malang consisting of 10 classes, while the research sample was taken using cluster random sampling technique in classes VIII D, VIII E, and VIII G. Data collection was carried out through questionnaires to measure mathematical anxiety, self-concept, and self-efficacy, as well as test questions to measure students' mathematical critical thinking ability. The data were analyzed using path analysis with the help of SPSS 25 and SmartPLS software. The results of the study showed: (1) The direct effect of mathematical anxiety on the self-efficacy of grade VIII students of MTsN 6 Malang was -0.295; (2) The direct effect of self-concept on the self-efficacy of grade VIII students of MTsN 6 Malang was 0.503; (3) The direct effect of mathematical anxiety on the mathematical critical thinking ability of grade VIII students of MTsN 6 Malang was -0.252; (4) The direct effect of self-concept on the mathematical critical thinking ability of grade VIII students of MTsN 6 Malang was 0.213; (5) The direct effect of self-efficacy on the critical thinking ability of grade VIII students of MTsN 6 Malang was 0.603.

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INTRODUCTION

Education is a learning process that every individual (student) undergoes so they can understand, appreciate, and achieve maturity, as well as develop critical thinking skills. Education not only serves as preparation for the future but also plays a vital role in supporting the lives of current students as they journey towards adulthood (BP et al., 2022).

Students' knowledge can be channeled through various subjects at school. One subject that serves as a foundation of knowledge in education is mathematics. Mathematics learning in the 21st century emphasizes the importance of developing four core competencies known as the 4Cs: critical thinking, communication, collaboration, and creativity (Fajriyah, 2022). One of the essential prerequisites for students to develop 21st-century skills is the ability to think critically at a global level and be prepared to face the various challenges of the 21st century. This statement supports the opinion of Patras et al. (2024) that the development of education in the 21st century demands the presence of various thinking skills, such as critical, logical, analytical, and creative thinking. Therefore, students need to be accustomed to continuously developing critical thinking skills as provisions in facing various life challenges.

In mathematics learning, critical thinking skills help students solve various problems systematically, logically, and analytically. Therefore, developing critical thinking skills is an aspect that requires special attention (Minangkabau, 2024). Practicing critical thinking skills in students can help them analyze various problems they face in everyday life. This ability also makes students more sensitive to their surroundings, enabling them to filter and evaluate the information they receive more wisely (Khoirunnisa & Malasari, 2021). Safira (2021) explains that mathematical critical thinking is a student's ability to carry out reasoning processes to make decisions and solve problems by examining, analyzing, and evaluating the information obtained to find the right solution.

Facione (in Prajono, 2022) stated that the basic concepts of critical thinking include the ability to interpret, analyze, evaluate, draw conclusions, provide explanations, and have self-confidence. Therefore, in developing mathematical skills, particularly critical thinking skills, students need to have confidence and trust in their abilities, also known as self-efficacy. This statement aligns with research by Sukma & Priatna (2021). Self-efficacy relates to students' beliefs in their abilities to complete various school assignments. The level of self-efficacy influences the extent to which students can utilize their existing skills, including critical thinking skills. Albert Bandura defines self-efficacy as an individual's belief in their abilities and potential to plan, manage, and complete a specific task effectively to achieve desired goals and outcomes (Yanisa et al., 2022). Students who lack confidence, self-belief, and pessimism when answering questions will experience difficulties in completing assignments, which can lead to excessive anxiety. This finding is supported by research by Mangampang (2023), which found that the higher a person's self-efficacy, the lower their math anxiety. Mathematical anxiety is a feeling of discomfort that arises when someone is faced with things related to

mathematics, whether in learning activities, when facing mathematics exams, or in daily activities that require calculation skills (Dina et al., 2022).

Furthermore, Fitriyani & Miatun (2022) explain that one factor contributing to low critical thinking skills in students is anxiety. As anxiety increases, critical thinking skills decline. This means that mathematical anxiety not only impacts self-efficacy but also students' critical mathematical thinking skills.

Self-efficacy is strongly influenced by a person's self-concept, particularly in an academic context. Academic self-concept describes how students assess their abilities in the learning process, including understanding, skills, and academic achievement. This self-assessment will determine how they behave, act, and build confidence when facing various tasks or challenges in the school environment. In other words, the more positive a student's academic self-concept, the stronger their belief in their own ability to complete academic tasks effectively (Ma'rifah, 2024). Math anxiety is a feeling of tension or anxiety that can interfere with students' performance in the mathematics learning process (Santoso, 2021).

According to Marsh (in Pristaningsih & Yosef, 2021), academic self-concept can foster an individual's self-confidence and belief in their abilities, because this concept includes how a person thinks, feels, and assesses their own academic abilities. Self-concept plays a role as an internal factor influencing the development of students' critical thinking skills. Through self-concept, individuals can understand and recognize themselves, including physical, social, psychological, and moral and ethical aspects (Werdiningsih & Anawati, 2023).

The results of research by Marwani & Purnama (2022) stated that there is a positive relationship between self-concept and higher-order thinking skills. This means that the better a person's self-concept, the higher their higher-order thinking skills. This is because individuals with a positive self-concept tend to have a positive view of themselves, thus fostering self-confidence to develop their potential and abilities. This also means that self-concept not only influences self-efficacy but also goes hand in hand with influencing students' critical mathematical thinking skills. According to Hetiie in Wulandari et al. (2023), academic self-concept, especially in mathematics, is a student's assessment of their own abilities and their level of liking or interest in mathematics.

Based on the results of initial observations conducted by researchers at MTsN 6 Malang, it was found that students' mathematical critical thinking skills still need attention. This is evident in the mathematics learning process, where some students still experience difficulties in identifying important information in problems, providing reasons for their answers, and developing systematic problem-solving strategies. Furthermore, based on the results of discussions with mathematics teachers, it was

discovered that some students tend to feel less confident when facing mathematical problems that require higher-order thinking processes. This condition indicates that psychological aspects such as mathematical anxiety, self-concept, and self-efficacy have a possible relationship with students' mathematical critical thinking skills.

Several previous studies have examined the relationship between self-efficacy and mathematical critical thinking skills, as well as mathematical anxiety and students' thinking skills. However, research examining the relationship between several psychological factors simultaneously, particularly mathematical anxiety and self-concept, on mathematical critical thinking skills with self-efficacy as a mediator, is still relatively limited. Therefore, this study is novel in developing an analytical model that explains how mathematical anxiety and self-concept can influence mathematical critical thinking skills through the role of students' self-efficacy. This study is expected to provide a more comprehensive picture of the internal factors that play a role in the development of students' mathematical critical thinking skills.

Based on the description, it can be seen that the three factors, namely self-efficacy, mathematical anxiety, and self-concept, are related in influencing students' mathematical critical thinking abilities. Therefore, through initial observations, the researcher formulated several hypotheses to be tested using path analysis:

1) There is an effect of mathematical anxiety on the self-efficacy of eighth-grade students at MTsN 6 Malang.
2) There is an effect of self-concept on the self-efficacy of eighth-grade students at MTsN 6 Malang.
3) There is an effect of mathematical anxiety on the mathematical critical thinking skills of eighth-grade students at MTsN 6 Malang.
4) There is an effect of self-concept on the critical thinking skills of eighth-grade students at MTsN 6 Malang.
5) There is an effect of self-efficacy on the mathematical critical thinking skills of eighth-grade students at MTsN 6 Malang.

METHOD

This study used a quantitative research method with a correlational design. Correlational research is a research approach used to examine the relationship between variables based on naturally occurring conditions. In this study, researchers did not manipulate the variables, but instead observed the interrelationships and levels of relationships between variables through the data obtained (Hasbi et al., 2023). This design was used to determine the relationship between mathematical anxiety, self-concept, self-efficacy, and students' mathematical critical thinking skills. Furthermore, data analysis

was conducted using path analysis. Path analysis is a method used to examine causal relationships. Path analysis is used to examine the pattern of relationships between variables to determine the extent of direct and indirect influence of a number of exogenous variables on endogenous variables (Purnomo et al., 2022). In this study, path analysis was used to analyze the influence of mathematical anxiety and self-concept on mathematical critical thinking skills through self-efficacy as an intervening variable.

The population in this study was all students of class VIII MTsN 6 Malang consisting of 10 classes. However, based on school policy and permission, the research could only be conducted in three classes designated as sample classes. These three classes were then used as data sources to obtain information on the variables being studied. Meanwhile, the samples used in this study were classes VIII D, VIII E, and VIII G, consisting of 82 students. Class VIII D was the trial class with 26 students, and classes VIII E and VIII G were the research classes, consisting of 56 students. The sampling technique used in this study was cluster random sampling where the sampling technique is used when the research object or data source has a very broad scope, so that the sample selection is carried out randomly (Pasaribu et al., 2024). In determining this cluster sampling, the classes that were randomized were from class VIII-A to VIII-J.

In this study, the data collection process used two types of instruments, namely non-test instruments and test instruments. The non-test instrument was a questionnaire and the test was a mathematical critical thinking ability test. The questionnaire instrument consisted of 15 mathematical anxiety statements (X_1), 15 self-concept statements (X_2), and 15 self-efficacy statements (Y_1). The answers to the questionnaire were arranged based on a Likert scale. According to Maskhuliah (2025), the Likert scale is used to measure attitudes, opinions, and perceptions of individuals and groups towards a particular social phenomenon. The test instrument consisted of 5 mathematical critical thinking ability questions (Y_2). A questionnaire is declared valid if the instrument is able to measure according to the measurement objectives, and is able to produce accurate data and is in accordance with the variables studied. In the trial of this research instrument, 26 students were determined as test subjects. For the analysis, item analysis was used with the help of SPSS 25 and the results of the calculation of the validity of each item can be seen in the Corrected Item-Total Correlation column. Based on the r table for db = 26-2 = 24, r_{tab} = 0.2598 is obtained. The validity of a questionnaire item is determined by comparing the r_{tab} and r_{hit} values. Validity assessment is carried out using certain criteria which form the basis for determining the final decision as follows.

a) If $r_{hit} > r_{tab}$, then the questionnaire items are valid.
b) If $r_{hit} < r_{tab}$, then the questionnaire items are invalid.

Based on the validity analysis results obtained from the SPSS output, if during the testing process, several questionnaire items are found to not meet the validity criteria, then these items will not be included in the next analysis stage. Therefore, only data from questionnaire items declared valid will be used in the analysis process, as presented in the following section.

Table 1. Number of Valid and Invalid Items

Mathematical Anxiety (X_1)		**Self-Concept (X_2)**		**Self-Efficacy (Y_1)**	
Question No.	**r_{hit}**	**Question No.**	**r_{hit}**	**Question No.**	**r_{hit}**
1	0,468	1	0,521	1	0,353
2	0,360	2	0,611	2	0,682
3	0,339	3	0,388	4	0,717
4	0,445	4	0,619	5	0,345
5	0,452	6	0,452	7	0,363
6	0,539	7	0,581	8	0,779
7	0,559	8	0,337	9	0,708
8	0,760	9	0,507	10	0,465
10	0,405	11	0,393	11	0,534
11	0,491	12	0,381	12	0,482
12	0,707	13	0,715	13	0,340
14	0,604	14	0,398	15	0,672
15	0,522				

Note: If the $r_{hit} > 0.2598$ the statement is valid.
If the $r_{hit} < 0.2598$ the statement is invalid

Based on these results, it was determined that two items related to mathematical anxiety (X_1) and three items related to self-concept (X_2) and self-efficacy (Y_1) were invalid. Therefore, these invalid items were not included in the subsequent analysis.

The questionnaire reliability test using SPSS 25 was conducted simultaneously with the validity test. The r value used in the reliability test was the same as the r value used in the validity test. Based on the r table for db = 26 - 2 = 24, $r_{tab} = 0.2598$. The basis for determining whether the instrument is reliable is as follows.

a) If $Cr\ a > r_{tab}$, then the questionnaire is reliable.
b) If $Cr\ a < r_{tab}$, then the questionnaire is not reliable.

The results of the reliability test can be seen in the Cronbach's Alpha (Cr a) value listed at the end of the validity test output. Based on this value, the results are as presented in the following table.

Table 2. Reliability Test Results

Variable	*Cr a*	N
Mathematical Anxiety	0.852	26
Self-Concept	0.820	26
Self-Efficacy	0.856	26

Note: If the value of *Cr a* > 0,2598 then the questionnaire is reliable
If the value of *Cr a* < 0,2598 then the questionnaire is not reliable

Because the Cronbach's Alpha ($Cr\ a$) value for each variable was greater than the r tab value, it can be concluded that the questionnaire used in this study has a good level of reliability.

Before data analysis using path analysis techniques, the questionnaire data covering mathematics anxiety, self-concept, and self-efficacy, which were still in ordinal format, were first converted to interval data using the Method of Successive Intervals (MSI) with the aid of Microsoft Excel software. All research data obtained were then tested for normality to ensure they were normally distributed. Next, analysis to determine the influence between variables in this study was conducted using path analysis techniques with the aid of SPSS version 25 and SmartPLS software.

RESULTS AND DISCUSSION

All research data from the mathematical anxiety questionnaire (X_1), self-concept (X_2), and self-efficacy data (Y_1) and mathematical critical thinking ability (Y_2) were then tested for normality to fulfill the parametric statistical prerequisite tests using SPSS 25 software. Based on the results of the normality test analysis using the Shapiro Wilk method, on the data on mathematical anxiety, self-concept, self-efficacy, and mathematical critical thinking skills, a significant value of > 0.05 was obtained as shown in the following Table 3.

Table 3. Normality Test Results

Variable	N	Sig	Distribution
Mathematical Anxiety (X_1)	56	0.760	Normal
Self-Concept (X_2)	56	0.629	Normal
Self-Efficacy (Y_1)	56	0.828	Normal
Mathematical Critical Thinking Skills (Y_2)	56	0.061	Normal

Note: If the sig value > 0.05 then the data is normally distributed.
If the sig value < 0.05 then the data is not normally distributed.

Based on the results of the normality test in Table 3 on the data on mathematical anxiety (X_1), self-concept (X_2), self-efficacy (Y_1), and mathematical critical thinking

ability (Y_2), all sig values were obtained > 0.05, which means the data is normally distributed, so that the data is ready to be analyzed further to prove the research hypothesis using path analysis with the help of SPSS 25 and SmartPLS 4.0 software.

Based on the results of the path analysis carried out using Smart PLS software, a path diagram was obtained showing the path coefficient and p-value on the relationship between mathematical anxiety, self-concept, and self-efficacy on mathematical critical thinking skills, as shown in Figure 1.

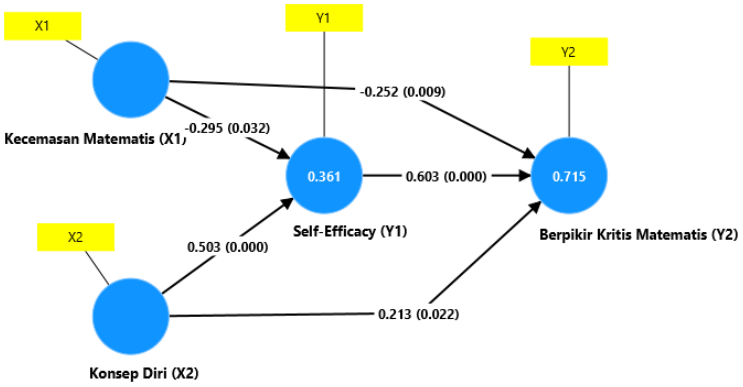

Figure 1. Path Coefficient and *P-Value* Between Paths

Based on Figure 1, two forms of influence were obtained direct effect and specific indirect effect. The results of the direct effect in this study are shown in Table 4.

Table 4. Dirrect Effect

Variable	Direct Effect	p-value
Mathematical Anxiety (X_1) on Self-Efficacy (Y_1)	−0,295	0,032
Self-Concept (X_2) **on** Self-Efficacy (Y_1)	0,503	0,000
Mathematical Anxiety (X_1) on Mathematical Critical Thinking Skills (Y_2)Thinking Ability (Y_2)	−0,252	0,009
Self-Concept (X_2) on Mathematical Critical Thinking Ability (Y_2)	0,213	0,022
Self-Efficacy (Y_1) on Mathematical Critical Thinking Ability (Y_2)	0,603	0,000

Note: If the p-value is > 0.05 then the direct effect is significant
If the p-value <0.05 then the direct effect is not significant

Based on the results of the direct influence analysis in Table 4, it was found that:

1) That path analysis, it was found that mathematical anxiety (X_1) had a significant direct effect on self-efficacy (Y_1) (p-value = 0.032) with a path coefficient value of -0.295, indicating that there is an inverse effect, namely, if mathematical anxiety decreases, self-efficacy increases, and if mathematical anxiety increases, self-efficacy decreases.

This is in line with the opinion of Yakub (2022) that anxiety can affect mathematics learning achievement because this condition encourages students to stay away from activities that make them feel less confident in their abilities. This situation generally arises due to students' unpreparedness in participating in mathematics learning, which is related to a weak understanding of the concepts being learned. This situation ultimately contributes to low levels of student self-efficacy. When mathematical anxiety is high, the lower the self-efficacy in students and vice versa.

These findings imply that mathematics teachers need to create a learning environment that can reduce students' mathematical anxiety. Efforts include providing opportunities for students to try solving problems without fear of making mistakes, appreciating students' thinking processes, and avoiding excessive pressure during learning. A positive learning environment can help students build successful experiences, thereby increasing their self-efficacy.

2) The path analysis showed that self-concept (X_2) had a significant direct effect on self-efficacy (Y_1) (p-value = 0.000) with a path coefficient of 0.503, indicating a concomitant effect. This finding aligns with the findings of (Dewi & Mugiarso, 2020) who stated that the stronger a student's self-concept, the greater their confidence in solving a problem. Conversely, if a student's self-concept is low, their level of self-efficacy in facing and solving problems also tends to decrease.

   Based on these findings, mathematics learning needs to provide students with the space to recognize their own abilities and potential. Teachers can increase self-efficacy by gradually providing learning experiences tailored to students' abilities, providing constructive feedback, and helping students recognize the progress they have made. This way, students can develop a more positive self-concept and increase confidence in their mathematical abilities.

3) The results of the path analysis showed that mathematical anxiety (X_1) had a significant direct effect on mathematical critical thinking ability (Y_2) (p-value = 0.009) with a path coefficient value of -0.252, indicating that there was an inverse effect, namely, if mathematical anxiety decreased, mathematical critical thinking ability increased, and if mathematical anxiety increased, mathematical critical thinking ability decreased. This is in line with the opinion by (Alvariz & Miatun, 2023) that the higher the level of mathematical anxiety, the lower a person's critical thinking ability. Conversely, if mathematical anxiety is low, critical thinking ability tends to be at a higher level.

   Critical mathematical thinking skills require learning conditions that allow students to think openly, explore various alternative solutions, and reflect on their thinking processes. Therefore, high levels of mathematical anxiety can be a barrier to

developing these skills. The implications of these findings suggest that teachers need to pay attention to students' affective aspects in mathematics learning. Teachers can reduce mathematical anxiety by using a more interactive learning approach, providing exercises gradually from simple to complex levels, and building supportive communication so that students feel safe in expressing ideas and problem-solving strategies.

4) The results of the path analysis showed that self-concept (X_2) had a significant direct effect on mathematical critical thinking ability (Y_2) (p-value = 0.022) with a path coefficient value of 0.213 which indicates that there is a concomitant influence, namely, if self-concept increases, mathematical critical thinking will also increase and if self-concept decreases, mathematical critical thinking ability will decrease. This is in line with the opinion by (Marwani & Purnama, 2022) that self-concept has a very important role in supporting the development of students' mathematical critical thinking abilities. A positive self-view provides a beneficial contribution to improving students' abilities in critical thinking in mathematics learning.

   Students with a positive self-concept will be more active in the learning process because they have the courage to ask questions, express opinions, and try various problem-solving strategies. This attitude supports the development of critical mathematical thinking skills, which involve analysis, evaluation, and decision-making. Based on these results, teachers can help improve students' self-concept through learning that provides opportunities for active participation. Teachers should also recognize student effort and progress, rather than solely focusing on the final result. This strategy can help students develop a positive perception of their own abilities in learning mathematics.

5) The path analysis results showed that self-efficacy (Y_1) had a significant direct effect on mathematical critical thinking ability (Y_2) (p-value = 0.000) with a path coefficient value of 0.603, indicating a concomitant effect: if self-efficacy increases, mathematical critical thinking ability will also increase, and if self-efficacy decreases, mathematical critical thinking ability will also decrease. This is in line with the opinion of (Fitriyani & Miatun, 2022) that the stronger a student's self-efficacy, the better their critical thinking ability. Conversely, students with low levels of self-efficacy tend to be less motivated, thus hindering their critical thinking ability.

   Students with high self-efficacy tend to believe they can solve problems, making them more active in exploring various solutions. This attitude supports the development of critical thinking skills because they are encouraged to analyze, justify their answers, and reevaluate their solution process. This finding has important implications for mathematics learning: improving critical thinking skills is not only achieved through

practice problems but also requires strengthening students' psychological well-being. Teachers can increase self-efficacy by providing successful experiences (mastery experiences), providing motivation, using problem-based learning strategies, and providing opportunities for students to present their thinking. With increased self-efficacy, students will be more confident in facing math problems that require higher-order thinking skills.

In addition to the direct effect, a specific indirect effect was also found in path analysis. The specific indirect effect is the longest path from one variable to another through the intervening variable. The results of the specific indirect effect calculation are explained in Table 5.

Table 5 Specific Indirect Effect

Longest Path EffectVariable	**Longest Path Coefficient**	***p-value***
Mathematical Anxiety (X_1) -> Self-Efficacy (Y_1) -> Mathematical Critical Thinking (Y2)	-0.178	0.064
Self-Concept (X_2) -> Self-Efficacy (Y_1) -> Mathematical Critical Thinking (Y_2)	0.303	0.003

Note: If the p-value is > 0.05 then the direct effect is significant
If the p-value <0.05 then the direct effect is not significant

Based on the results of the specific indirect effect analysis presented in Table 5, it can be seen that:

1) Mathematical anxiety (X_1) had a non-significant effect on critical thinking ability (Y_2) through self-efficacy (Y_1) with a path coefficient of -0.178 (p-value = 0.064). This result indicates that increasing mathematical anxiety will encourage increased self-efficacy, which in turn will impact increased critical thinking ability.
2) Self-concept (X_2) had a significant effect on critical thinking ability (Y_2) through self-efficacy (Y_1) with a path coefficient of 0.303 (p-value = 0.003). This result indicates that increasing self-concept will encourage increased self-efficacy, which in turn will impact increased critical thinking ability.

The results of data analysis using smart PLS 4.0 are stated in the path diagram in Figure 1 which is formed into two equations, namely:

1) $Y_1 = -0{,}295X_1 + 0{,}503X_2 + 0{,}799e_1, R^2 = 0{,}361, p - value = 0{,}000$

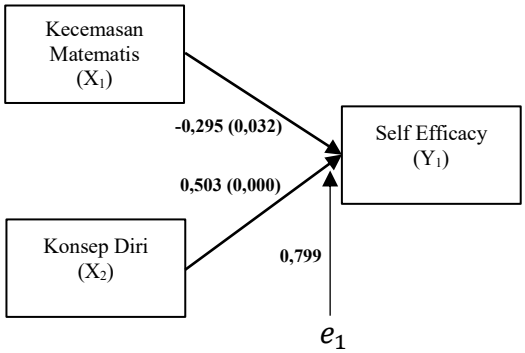

Figure 2. Equation Path Diagram 1

In the equation $Y_1 = -0{,}295X_1 + 0{,}503X_2 + 0{,}799e_1$, there is an , $R^2 = 0{,}361$, which means there is a direct effect of mathematical anxiety (X_1) and self-concept (X_2) on self-efficacy (Y_1) which is significant (p-value = 0.000) with a percentage of the effect of 0.361 x 100% = 36.1%. In this study, the remaining 63.9% of the variation in self-efficacy (Y_1) is influenced by variables other than mathematical anxiety (X_1) and self-concept (X_2) which are not included in the variables examined in this study.

Among the variables of mathematical anxiety (X_1) and self-concept (X_2), the ones that have the strongest influence, respectively, are mathematical anxiety (X_1) on self-efficacy (Y_1) and then self-concept (X_2) on self-efficacy (Y1).

2) $Y_2 = -0{,}252X_1 + 0{,}213X_2 + 0{,}603Y_1 + 0{,}514e_2, R^2 = 0{,}715, p - value = 0{,}000$

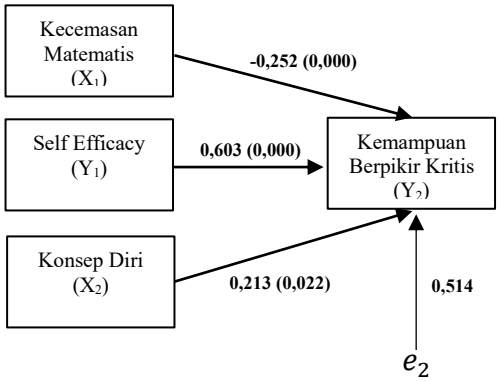

Figure 3. Equation Path Diagram 2

In the equation model $Y_2 = -0{,}252X_1 + 0{,}213X_2 + 0{,}603Y_1 + 0{,}514e_2$, there is an , $R^2 = 0{,}715$, which means there is a direct influence of mathematical anxiety (X_1), self-concept (X_2), and self-efficacy (Y_1) on mathematical critical thinking ability

(Y_2) which is significant (p-value = 0.000) with a percentage of the influence of 71.5%. In this study, 28.5% of the variation in mathematical critical thinking ability (Y_2) is influenced by variables other than mathematical anxiety (X_1), self-concept (X_2), and self-efficacy (Y_1) which are not included in the variables examined in this study.

Among the variables of mathematical anxiety (X_1), self-concept (X_2) and self-efficacy (Y_1) that have an influence on mathematical critical thinking ability (Y_2) from the strongest to the strongest respectively are self-efficacy (Y_1), mathematical anxiety (X_1), and self-concept (X_2).

CONCLUSION

Based on the research results, the researcher reached the following conclusions:

1. There is a significant effect of mathematical anxiety on the self-efficacy of eighth-grade students at MTsN 6 Malang with a p-value of 0.032.
2. There is a significant effect of self-concept on the self-efficacy of eighth-grade students at MTsN 6 Malang with a p-value of 0.000.
3. There is a significant effect of mathematical anxiety on the mathematical critical thinking skills of eighth-grade students at MTsN 6 Malang with a p-value of 0.009.
4. There is a significant effect of self-concept on the mathematical critical thinking skills of eighth-grade students at MTsN 6 Malang with a p-value of 0.022.
5. There is a significant effect of self-efficacy on the critical thinking skills of eighth-grade students at MTsN 6 Malang with a p-value of 0.000.

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