Research Article



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# Self-Efficacy and the Ability to Think Creatively by Prospective Mathematics Teachers Based on Learning Barriers

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***Abstract***

*The ability to innovate and be creative in student learning is influenced by many factors, including learning barriers (internal and external to students). This learning barrier implies student self-efficacy in dealing with mathematics learning problems and working on math test questions. This study aims to analyze the relationship between self-efficacy, barriers to student learning and academic achievement from learning outcomes. Specifically, analyzed students' creative thinking abilities for each selected group for learning barriers and self-efficacy. The population in this study was drawn from the mathematics education students as many as 154 students. Analysis of learning barriers and self-efficacy on academic achievement statistically used Structural Equation Modelling (SEM). The discussion of the research results was carried out descriptively and qualitatively from the results of the SEM processing and the results of the students' written tests, to provide comprehensive conclusions from the selected subjects. From the population, four subjects were selected, namely the subject with the very unobstructed category, the subject with the obstructed category, the subject with the quite obstructed category and the subject with the obstructed category. The quantitative research results show that learning barriers have a negative effect on student self-efficacy. Meanwhile, self-efficacy has a significant positive effect on student academic achievement. Meanwhile, qualitatively students with learning disabilities in the very unhindered category can improvise creativity in solving problems better than other categories.*

***Keywords:*** *internal learning barriers, external learning barriers, self-efficacy, the ability to think creatively*

## 1. Introduction

Mathematical creativity is dynamic. Creativity can develop knowledge and skills to increase mathematical creativity (Ayele, 2016). An idea arises when students can follow lessons well. So that the teacher must convey the material. According to (Al-Sehli & Maroof, 2020), language and mathematics are different but interrelated things. Good oral explanations can increase students' awareness. So that students can pay attention to the factors that can improve their abilities in mathematics. Language is used to communicate in learning. This is in line with the opinion (Kisanga, 2019) that communication barriers are the main barrier to effective learning.

Mathematics is often referred to as the science of numbers and formulas. Mathematical creativity in critical and creative thinking is difficult to define. So that the potential for students' mathematical creativity cannot be measured (Akgul & Kahveci, 2016). However, divergent thinking, creativity scale, flexibility, and authenticity of students' answers include mathematical creativity. So that mathematical creativity becomes the basis for logical thinking, problem formation, and spatial thinking. Divergent thinking generates several ideas, while logical thinking evaluates the suitability of each idea (Haavold, 2018). In the context of mathematics, the rules and structures of mathematics, as well as the context of the problem are the relative basis for each truth and suitability of ideas. Divergent thinking is easier to define when compared to convergent thinking. Divergent thinking moves in several different directions, whereas convergent thinking moves in one direction. So that it shows the relationship between creativity and knowledge.

In students' mathematical creativity, the teacher plays a role in choosing math tasks that must be done with students (Levenson, 2013). Creativity in class does not refer to absolute creativity but relative creativity. Relative creativity considers the creativity associated with a particular reference group. Flexibility can be evaluated by determining whether different solutions use strategies based on different representations (eg algebraic and graphical representations), properties or branches of mathematics. Several studies investigated teachers' perceptions of creativity. Some teacher characteristics associated with creative students are cognitive, such as high intelligence and being original thinkers.

The development of mathematical creativity is often seen as a means and goal of education. Educational research efforts are often oriented towards proposing a framework for assessing creativity, particularly through problem-posing and problem-solving. Four factors that can be done to solve problems include mastery experience, social beliefs, physiological/somatic responses, and experiences (Dagdag et al., 2020). This framework relies on the concept of cognitive flexibility, which is described in the following terms: cognitive variation, cognitive novelty, and change in a cognitive framework. In the problem-posing context, the researcher assumes that a student manifests cognitive flexibility when proposing a new problem that is different from the input given, produces a new proposal that is far from the original item and can change his mental framework in solving the problem. Thus, cognitive flexibility appears as a complex and non-dimensional interaction. As a result, the construction of cognitive flexibility opens up a variety of possible ways to be creative (Singer et al., 2017).

Mathematics is a lesson that must be learned from an early age (Andini & Jupri, 2016). However, in learning mathematics in creative thinking, students often experience several obstacles. Barriers to learning refer to rules, policies or other events that prevent teachers from using student knowledge with student learning styles (Mangwende & Maharaj, 2020). Barriers are usually difficulties in understanding the problem, not being able to understand the keywords in the problem, and not being able to understand sentences. This often makes students confused. This difficulty occurs due to several factors. One of these factors is the teacher teaching factor that does not involve students 'activeness in confronting students' minds to solve problems.

Student learning barriers are a significant (quite high) problem in schools which includes various factors, namely student absence from school and late arrival at school (Martinez et al., 2016). Thus, these obstacles are associated with poor academic results. Lack of discipline is a major concern. So that teachers must be more concerned with establishing closeness with students so that it is easier to develop effective school interventions. This attention will reduce student learning barriers through social. Besides, students will also get used to being positive in social behaviour. The learning barriers faced by students are ontogenic and epistemological constraints (Cesaria & Herman, 2019).

Not only students who experience obstacles in learning, but also obstacles experienced by students. The obstacles experienced by students include learning difficulties related to difficulties in applying concepts, learning difficulties related to visualizing geometric objects, learning difficulties related to difficulties in determining principles, learning difficulties related to understanding problems, and related difficulties in mathematical proof (Noto et al., 2019). Students must reconsider the conceptual understanding of the material being studied (Erlisa & Prabawanto, 2019). So that barriers to learning in the field of measurement need to be overcome as well as the modelling process (Gurjanow & Ludwig, 2020). Barriers are classified into three categories, namely social, pedagogical and systematic barriers. However, the most common obstacles were a lack of motivation on the part of students and a lack of parental support for education. Human information processing systems include various processing resources that are interrelated (Sharit & Czaja, 2020).

Learning in today's digital era can improve education delivery and reduce barriers to learning. Therefore, the use of e-learning is needed to expand the scope of the existing literature by highlighting the main obstacles in supporting this technology (Al-Azawei et al., 2016). The results of the literature review also revealed 12 major hindering factors for e-learning, all of which originated from students' self-aspects. So that technology can be both an advantage and a disruption to the learning process (Mills, 2020).

Mathematics is a process of arithmetic, so math skills are needed (Sevgi & Arslan, 2020). Mathematical skills and mathematical knowledge develop when learning is shaped by the environment. So that there is a reaction that leads to the development of attitudes towards mathematics. Mathematics learning is one of the most difficult fields for students since primary education (Castro et al., 2020). Many students have difficulty carrying out activities that are requested or understood. So that students feel problems are arising from the teacher. Underperformance situations in mathematics lead to beliefs of low efficiency. Thus, persuasion as evaluative feedback can have a promoter effect or weaken self-efficacy. Gao (Gao, 2019) states that students not only have different experiences but also have different points of view about the effects of math self-efficacy. Thus, the difference between students with high self-efficacy and students with low self-efficacy was also seen. Low self-efficacy indicates that students receive more negative feedback than praise. Therefore, they appreciate praise and make it an encouragement in the advancement of their potential. This is in line with self-efficacy as a moderating role in peer relationships (Li et al., 2020). Peers influence motivation to increase self-efficacy and gain benefit from peer groups.

Mathematical anxiety is a phenomenon that makes learning mathematics difficult for many different reasons. This is because mathematics that is not studied also affects students' perceptions of self-efficacy. The perception of self-efficacy is one of the determinants of mathematics success in a person. People with high self-efficacy in mathematics will be more comfortable with problems and solving them. However, individuals with low mathematical self-efficacy are less likely to be able to provide the required efficiency. If students are successfully taught various activities and increased self-confidence, self-efficacy will also develop.

According to Aghazade (Aghazade & Moheb, 2017) that the self-efficacy of students in school activities has a significant relationship with emotion. Meanwhile, according to Skaalvik (Skaalvik et al., 2015), student self-efficacy greatly affects student learning motivation. Meanwhile, other research states that teachers play an important role in teaching and student efficacy (Julaihi et al., 2020). Student self-efficacy is a student's confidence in his ability to influence student abilities (Simamora et al., 2019). This is made clear by Lishinski (Lishinski et al., 2016) that self-efficacy is a person's belief in regulating behaviour in facing challenges to get the desired results. Self-efficacy is closely related to self-confidence. An example is the student's sense of independence in mathematics.

Meanwhile, according to Ugwuanyi (Ugwuanyi et al., 2020) emotional intelligence, self-esteem, and self-efficacy are part of the psychological factors that determine student academic and achievement in mathematics. This happens because student success depends on the level of emotional intelligence, self-esteem, and student efficacy. If students increase their emotional intelligence factor, students will encourage self-esteem between students and teachers. This will result in student academic improvement. To make students believe in their abilities. Also, student efficacy will increase. Self-confidence is one of the factors that is expected to be a solution to learning difficulties in mathematics. Confidence in learning mathematics can be seen in student self-efficacy (Wulantina et al., 2020).

According to Carney (Carney et al., 2014) in increasing self-efficacy, not only students play a role, but teachers must also have self-efficacy so that there is a strong correlation between student achievement, student environment, and their abilities. Therefore, professional development can influence and increase teacher self-efficacy in learning practices. Adhikari (Krishna Prasad Adhikari, 2020) states that teachers' mathematical and pedagogical knowledge is the main component for mathematics teachers. Factors such as the school environment, workload, interpersonal relationships, teacher position in the school and community, and teacher professional involvement are also important for the development of self-efficacy beliefs in teachers. So, according to McMinn (McMinn et al., 2020) states that by improving the mathematics learning environment, self-efficacy for teaching subjects can be improved.

This article discusses the effect of self-efficacy on student creativity in learning. Student learning outcomes are examined in terms of their creative thinking abilities in terms of the learning barriers they face. Barriers to learning consist of internal learning barriers from within students and external learning barriers (from outside students).

## 2. Research Methods

### *2.1 Confirmatory Analysis*

Participants in this study were 154 mathematics education students. All students were given a self-efficacy questionnaire and learning barriers. The variables tested in this study are unobserved variables whose measurements cannot be carried out directly. Therefore, this study develops and adopts indicators from previous studies. To determine the accuracy of the indicators as a measuring tool (validity) and the ability of indicators to produce consistent measurements (reliability), a confirmatory analysis was carried out. A confirmatory analysis is carried out using the confirmatory analysis approach by evaluating the factor weights (standardized regression weight and probability values) as well as the reliability construct and the variance extracted.

### *2.2 Evaluation of Factor Weights*

Evaluation of factor weights in the confirmatory analysis is carried out through analysis of the value of standardized regression weight and probability using the following test criteria:

a. If the standardized regression weight indicator value is more than 0.5 and the significance value is less than 0.05, it means that the indicator is the right measuring tool to measure the variable in question or the indicator can reflect the variable being measured.
b. If the standardized regression weight indicator value is less than 0.5 and the significance value is greater than 0.05, it means that the indicator is not an appropriate measuring tool to measure the variable in question or the indicator is unable to reflect the variable being measured.

After analyzing the level of unidimensionality of the dimensions or indicators forming latent variables tested by confirmatory factor analysis, the next step is to carry out the analysis of Structural Equal Modeling (SEM) as a whole (full model).

In the series of empirical models developed and tested in this study, five hypotheses are also tested for the significance or significance of their effects. Hypothesis testing is done by analyzing the CR (Critical Ratio) value and probability with the following test criteria:

a. If the CR value is more than 1.98 and the probability is less than 0.05, it means that the influence between variables can be proven or not statistically acceptable
b. If the CR value is less than 1.98 and the probability is more than 0.05, it means that the influence between variables cannot be proven or cannot be statistically accepted

### 2.3 *Analysis of Creativity*

The next stage is analyzing the ability to think creatively (an indicator of flexibility) based on the results of the work in answering questions of differential equations. In this stage, four subjects were selected. The first subject (S1) is students with learning disabilities in the very unobstructed category. The second subject (S2) and namely students in the category are not hampered. While the S3 subject is students in the quite obstructed category, and the fourth subject (S4) is students in the obstructed category (Table 1).

**Table 1.** Learning Barriers

| Score | Learning barriers |
|---|---|
| 20-36 | Very inhibiting |
| 37-52 | Inhibit |
| 53-68 | Pretty Inhibiting |
| 69-84 | Not inhibit |
| 85-100 | Very Not Inhibiting |

## 3. Results and Discussion

The results of the evaluation of factor weights for each research variable indicator are presented in Table 2 and Table 3.

**Table 2.** Evaluation of Internal Barriers Variable Factors Weights

| | | | C.R. | P |
|---|---|---|---|---|
| X1 | <--- | Internal Barriers | | |
| X2 | <--- | Internal Barriers | 3.217 | .001 |
| X3 | <--- | Internal Barriers | 4.609 | *** |
| X4 | <--- | Internal Barriers | 4.156 | *** |
| X5 | <--- | Internal Barriers | 4.160 | *** |
| X6 | <--- | Internal Barriers | 3.618 | *** |
| X7 | <--- | Internal Barriers | 4.438 | *** |
| X8 | <--- | Internal Barriers | 3.504 | *** |
| X9 | <--- | Internal Barriers | 4.206 | *** |
| X10 | <--- | Internal Barriers | 4.211 | *** |
| X11 | <--- | Internal Barriers | 3.983 | *** |
| X12 | <--- | Internal Barriers | 4.298 | *** |
| X13 | <--- | Internal Barriers | 3.705 | *** |
| X14 | <--- | Internal Barriers | 4.215 | *** |
| X15 | <--- | Internal Barriers | 4.458 | *** |
| X16 | <--- | Internal Barriers | 4.546 | *** |
| X17 | <--- | Internal Barriers | 4.079 | *** |
| X18 | <--- | Internal Barriers | 3.543 | *** |
| X19 | <--- | Internal Barriers | 4.513 | *** |
| X20 | <--- | Internal Barriers | 2.235 | .025 |
| X21 | <--- | Internal Barriers | 4.360 | *** |
| X22 | <--- | Internal Barriers | 2.520 | .012 |
| X23 | <--- | Internal Barriers | 3.784 | *** |
| X24 | <--- | Internal Barriers | -.146 | .884 |
| X25 | <--- | Internal Barriers | 4.352 | *** |

Analysis of internal learning barriers in this study using 25 indicators (X1-X25). Evaluation of factor weights for the indicators of forming internal resistance variables (Table 2) resulted in six standardized regression weight values of more than 0.5 with a significance value of less than 0.05. These indicators are the X3, X15, X16, X19, X21, and X25 indicators. This means that the six indicators are appropriate measures for the internal resistance variable. Meanwhile, other indicators are used as supporting indicators.

**Table 3.** Evaluation of the Weights of External Barriers Variable Factors

| | | | C.R. | P |
|---|---|---|---|---|
| X26 | <--- | External Barriers | | |
| X27 | <--- | External Barriers | -5.789 | *** |
| X28 | <--- | External Barriers | 4.367 | *** |
| X29 | <--- | External Barriers | 4.792 | *** |
| X30 | <--- | External Barriers | .939 | .348 |
| X31 | <--- | External Barriers | 2.570 | .010 |
| X32 | <--- | External Barriers | 4.572 | *** |
| X33 | <--- | External Barriers | 4.237 | *** |
| X34 | <--- | External Barriers | 3.617 | *** |
| X35 | <--- | External Barriers | 3.634 | *** |
| X36 | <--- | External Barriers | 3.043 | .002 |
| X37 | <--- | External Barriers | -5.951 | *** |
| X38 | <--- | External Barriers | -6.213 | *** |
| X39 | <--- | External Barriers | -6.161 | *** |
| X40 | <--- | External Barriers | -6.336 | *** |
| X41 | <--- | External Barriers | -6.254 | *** |
| X42 | <--- | External Barriers | -5.943 | *** |
| X43 | <--- | External Barriers | 3.524 | *** |
| X44 | <--- | External Barriers | 2.387 | .017 |
| X45 | <--- | External Barriers | .967 | .333 |

Table 3 shows the evaluation of the factor weights for the indicators forming the external barrier variables. The number of indicators of variable external learning barriers, namely 20 indicators. Evaluation of factor weights obtained seven standardized regression weight values of more than 0.5 with a significance value less than 0.05, namely indicators X27, X37, X38, X39, X40, X41 and X42. So that seven indicators can be used as an appropriate measure for the external resistance variable.

Evaluation of factor weights for indicators of self-efficacy variables produces eleven standardized regression weight values of more than 0.5 with a significance value of less than 0.05, namely indicators X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, and X56 (Table 4). Analysis of the self-efficacy variable in this study used 25 indicators. This means that the eleven indicators of the 25 indicators are the right measures for the self-efficacy variable.

**Table 4.** Evaluation of the Weights of the Self Efficacy Variable Factors

| | | | C.R. | P |
|---|---|---|---|---|
| X46 | <--- | Self_Efficacy | | |
| X47 | <--- | Self_Efficacy | 12.346 | *** |
| X48 | <--- | Self_Efficacy | 12.117 | *** |
| X49 | <--- | Self_Efficacy | 13.920 | *** |
| X50 | <--- | Self_Efficacy | 11.958 | *** |

| | | | C.R. | P |
|---|---|---|---|---|
| X51 | <--- | Self_Efficacy | 12.667 | *** |
| X52 | <--- | Self_Efficacy | 12.603 | *** |
| X53 | <--- | Self_Efficacy | 13.792 | *** |
| X54 | <--- | Self_Efficacy | 12.357 | *** |
| X55 | <--- | Self_Efficacy | 13.467 | *** |
| X56 | <--- | Self_Efficacy | 13.572 | *** |
| X57 | <--- | Self_Efficacy | -.442 | .658 |
| X58 | <--- | Self_Efficacy | -.245 | .807 |
| X59 | <--- | Self_Efficacy | .390 | .697 |
| X60 | <--- | Self_Efficacy | -.491 | .624 |
| X61 | <--- | Self_Efficacy | -.304 | .761 |
| X62 | <--- | Self_Efficacy | .773 | .440 |
| X63 | <--- | Self_Efficacy | .630 | .529 |
| X64 | <--- | Self_Efficacy | .539 | .590 |
| X65 | <--- | Self_Efficacy | .051 | .959 |

### *3.1 Research Model Feasibility Testing*

The results of the full model SEM analysis are described in Figure 1. Figure 1 is an indicator analysis of the variable barriers to learning, self-efficacy on test scores using Table 2, Table 3, and Table 4. Figure 1 shows the effect of learning barriers (internal learning barriers and learning bridges). external) towards self-efficacy and on student academic achievement (SK). The internal learning barrier indicators used are six indicators and seven indicators for external learning barriers. Meanwhile, eleven indicators are used for self-efficacy.

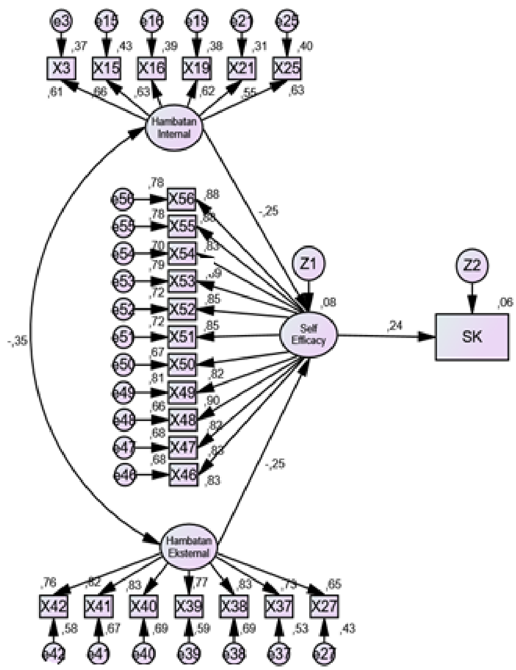


**Figure 1.** Structural Equation Modelling Factors affecting Test Score

The results of the empirical model test developed in this study carried out the goodness of fit test by evaluating the statistical and non-statistical values of the research results with the required values (Table 5).

**Table 5.** The goodness of Fit Test Research Model

| The goodness of Fit Indeks | Cut off Value | Results | Model Evaluation |
|---|---|---|---|
| Chi-Square (df = 272) | < 311.467 | 516.425 | Not good |
| Probability | ≥ 0.05 | 0.000 | Not good |
| CMIN/DF | ≤ 2.00 | 1.899 | Good |
| GFI | ≥ 0.90 | 0.730 | Not good |
| AGFI | ≥ 0.90 | 0.678 | Not good |
| TLI | ≥ 0.95 | 0.897 | Not good |
| CFI | ≥ 0.95 | 0.907 | Not good |
| RMSEA | ≤ 0.08 | 0.079 | Good |

Based on the results of the feasibility test of the model presented in Table 5, it shows that the calculated Chi-Square value does not meet the predetermined criteria, namely the calculated Chi-Square value (516,425) more than Chi-Square table (311,467) which means the model is not fit. However, it should be noted that the Chi-Square value is very vulnerable to the number of samples so it is necessary to evaluate another index value. The results of the research model test show that the CMIN / DF and RMSEA index values meet the fit criteria. RMSEA (The Root Mean. Square. Error of. Approximation) is another test tool showing the goodness-of-fit that can be expected if the model is estimated in the population. RMSEA value that is less than or equal to 0.08 is an index for the acceptance of a model that shows a close fit of the model based on the degrees of freedom. Based on this study, the RMSEA value obtained was 0.079. Thus, this model is considered a very good fit because the RMSEA value is less than 0.08.

Meanwhile, CMIN/DF (The Minimum Sample Discrepancy Function Divided with Degree of Freedom) is an indicator to measure the fitness level of a model. In this case, CMIN/DF is nothing but statistic-Chi-Square, $\chi^2$ divided by its DF so it is called relative $\chi^2$. A relative value of Nilai2 less than 2.0 or less than 3.0 is an indication of an acceptable fit between the model and data. The CMIN/DF value of this research model is 1.899. Thus this model is a very good fit because the CMIN/DF value is less than 2.0. Thus, based on the RSMEA and CMIN/DF values, this model is in a good category so that it can be used as a basis for concluding that the empirical model developed is a fit model following the estimated population.

### *3.2 Hypothesis test*

After conducting an assessment of the assumptions that exist in SEM, then testing the hypothesis. The testing of the four hypotheses proposed in this study was carried out by analyzing the value of the Critical Ratio (CR) and the probability of a causality relationship (Table 6).

**Table 6.** Regression coefficient values and t count (shown in column CR)

| | | | C.R. | P |
|---|---|---|---|---|
| Self_Efficacy | <--- | Internal Barriers | -2.316 | .021 |
| Self_Efficacy | <--- | External Barriers | -2.574 | .010 |
| SK | <--- | Self_Efficacy | 2.837 | .005 |

### 3.3 *The Effect of Internal Barriers to Self -Efficacy*

Testing the influence on the variable internal learning barriers and self-efficacy produces a CR value of -2.316 less than 1.98 (from the t table) with a significance value of 0.021 less than 0.05. These statistical results indicate that there is a significant effect that internal learning barriers are statistically proven to have a significant negative effect on self-efficacy. It has a negative effect because when students are not very obstructed in learning, they have good (high) self-efficacy.

### 3.4 *The Effect of External Barriers to Self-Efficacy*

Furthermore, testing the influence on the variable external learning barriers and self-efficacy resulted in a CR value of -2.574 less than 1.98 with a significance value of 0.010 less than 0.05. These statistical results indicate that there is a significant effect that external learning barriers are statistically proven to have a significant negative effect on self-efficacy. The results of this test yield the same conclusions as to the effect of internal learning barriers on self-efficacy.

### 3.5 *Effect of Self-Efficacy on Test Score*

Testing the influence on the self-efficacy variable and self-test scores resulted in a CR value of 2.837 more than 1.98 with a significance value of 0.005 less than 0.05. These statistical results indicate that there is a significant effect that self-efficacy is statistically proven to have a significant positive effect on the test score (SK). The increase in student self-efficacy has an impact on the increase in academic learning outcomes. Students who have good and high self-efficacy academically have a high test score or a learning achievement.

### 3.6 *Student Creativity*

The subjects of qualitative analysis in this study were taken four, namely S1, S2, S3, and S4. While the subject because for the subject with the very obstructed category, there is no. A qualitative discussion of the answers to student test results using differential equations with problems with population growth (Figure 2):

> The annual population growth rate of a country is 0.1 times its current population.
> a. Suppose the current population is 100 inhabitants, what will be the population after 50 years?
> b. If the current population is 150 inhabitants, then in 2030 a disease outbreak occurs so that 5000 people die, what will the population be in 2050?

**Figure 2.** Problem of Mathematics

Mathematical steps are used by S1 subjects (very unobstructed) to determine the answer to population growth problems. This subject presents the mathematical imagination in the form of a differential equation model along with the steps for its solution. The questions submitted provide relatively much information and solutions. Also, the questions provide communicative information. The completion of S1 subjects is different from other subjects because other subjects focus more on trying directly in finding solutions to problems that have been given. Almost all subjects can provide ideas to answer the problem well. Apart from the S2 subject (not obstructed), other subjects gave the final answer in the form of a number because that subject translated the results of the calculation into numerical form. Unlike the S2 subject where the S2 subject gives the final result only in a mathematical form. Therefore, even with the same initial value of e, each subject has a different calculation. This different calculation becomes an interesting thing. As in the S1 subject explicitly determines the value of $e = 2.72$

(exponential value), while other subjects do not. This is indicated by the final calculation as the result of different numbers but the process of working out is mathematically correct. Therefore, students have poor calculation skills and tend to be in a hurry. Also, the subject is still not maximal in terms of accuracy and evaluating answers. Especially in terms of decimal determination and truncation. So that the results of the calculation of many populations are not correct at the time (t + 50), $t_1$, and $t_2$. This is because the subject uses inappropriate tools in calculations.

It appears that no subject has given a different answer. This means that all subjects have an answer in the same way and have one alternative answer. The background of mathematical problems is generally presented by the S1 subject. Then the subject develops the background of the problem into a mathematical model of differential equations. So that the subjects S1, S3, and S4 solve problems by explaining the stages. Meanwhile, mathematical operations in determining the final model are directly carried out by the S2 subject. In contrast to the subjects S3 (quite obstructed) and S4 (hampered) by explaining the stages of completion but did not provide a detailed and complete explanation and narrative as in the S1 subject. In performing calculations by providing information at each stage it is more mathematical and operational. So that students only focus on calculations to determine the final solution or answer. However, information related to the problem and its solution is not completely conveyed. This shows that the explanation and calculation results are only mathematical narrative. So that students in answering are also determined by the presentation of the questions given and the form of mathematical problems. With contextual questions, it can provide a challenge for students to present a variety of information. The explanation above explains that students have different imaginations according to their understanding. This has an impact on the information conveyed by students with different results. So that a good image by providing creative descriptions and many are shown by the S1 subject.

## 4. Conclusion

Student learning outcomes both inside and outside the classroom are influenced by many things. Among them are learning barriers experienced by students (derived from internal barriers to students and barriers originating from the learning environment). Another factor is the student's self-efficacy in overcoming the learning process. In this study, student learning barriers did not have a positive effect on student self-efficacy. When students experience obstacles (internal and external) in carrying out learning activities, the student's self-efficacy decreases, conversely when students do not experience obstacles, the student's self-efficacy in learning is better. Meanwhile, self-efficacy has a positive effect on learning outcomes. This shows that the achievement of student learning outcomes is higher when the self-efficacy is higher. Student academic achievement is not low when self-efficacy is not low. From the selected subjects, the results of observations on the written test description and interviews showed that student creativity was influenced by self-efficacy. Subjects with the very category are not hampered in solving math problems (differential equations) provide a lot of information on the results of the answers to the questions. On the other hand, for students who are in the category of lack of obstruction, the information in providing answers is limited. The only solution is to answer questions.

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