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The Effect of Self-Regulated Learning on Academic Procrastination in Mathematics of Public Junior High School Students in Pekanbaru City

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Abstract

This study aims to determine the effect of self-regulated learning on academic procrastination in mathematics of junior high school students in Pekanbaru City. This study is a quantitative study with a causal associative research type. The population in this study were all junior high school students in Pekanbaru City, while the sample in this study amounted to 393 students consisting of 3 junior high schools in Pekanbaru City, namely SMP Negeri 18 Pekanbaru, SMP Negeri 33 Pekanbaru, and SMP Negeri 10 Pekanbaru with a sampling technique of cluster random sampling. Data were collected using a questionnaire and analyzed using a simple linear regression analysis technique with the SPSS version 26.0 program. The results showed a Sig. value of 0,000<0,000 < 0,05) and t_{count} > t_{table} (−) (20,730> 1,966) with a negative influence direction, meaning that the higher the self-regulated learning, the lower the academic procrastination and vice versa. Self-regulated learning has an R Square value of 0,524, which means that the contribution of self-regulated learning to academic procrastination is 52,4% and the remaining 47,6% is influenced by other factors. Thus, it can be concluded that there is an influence of self-regulated learning to academic procrastination in mathematics of junior high school students in Pekanbaru City.

Keywords: Academic Procrastination; Junior High School; Mathematics; Self-Regulated Learning.

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1. Introduction

Education as a determinant in improving human resources in a nation. Quality human resources are certainly based on educational values instilled in society (Sanga & Wangdra, 2023). In the education process, all individuals can improve their quality as human resources that are useful and beneficial for life. The quality of education is the main basis for increasing insight and knowledge that will shape the character of the nation's successors who are ready to face any situation (Hermanto, 2020). Given this, education is very important in human life, so the process of developing human resources must be carried out by increasing knowledge, skills, and positive attitudes (Widiansyah, 2018).

Learning is the activity of organizing the environment optimally and connecting it with students to facilitate the learning process (Hamdan & Juwita, 2020). Interaction with the learning environment influences students' perspectives, helping them adapt to the changes they face (Widyanto & Wahyuni, 2020). One aspect of learning is mathematics, which is difficult to understand because of its abstract and systematic nature (Adrian & Apriyanti, 2019). This is because mathematics requires a lot of energy, thought, and time to complete (Maula, 2019). In learning, students must follow the teacher's rules, including submitting assignments. Good learning rules can prevent the behavior of postponing assignments or academic procrastination.

Academic procrastination is a behavioral tendency to delay the implementation or completion of academic tasks that are carried out continuously, be it short-term delays, delays some time before the deadline for submitting assignments, or long-term delays that exceed the deadline for submitting assignments so that they interfere with performance in a limited time frame by replacing activities that are not so important (Darmawan, 2018; Susilowati, 2021). Postponement in completing academic assignments is done within the desired time period or postponing completing assignments until the final deadline (Wolters, 2003). According to Steel (2007) academic procrastination is the deliberate postponement of assigned tasks, even though the individual is aware of the negative impacts. This behavior hinders learning because it tends to waste time and results in tasks being neglected or completed at the last minute with less than optimal results (Lestari et al 2021; Ramadhani et al 2020). According to Ferrari et al (1995) aspects of academic procrastination include delays in starting or completing assignments, delays in completing assignments, time gaps between plans and actual performance, and doing other more enjoyable activities. In the context of mathematics, academic procrastination includes the habit of putting off math assignments, avoiding studying, and not focusing enough on learning the material.

The high level of academic procrastination is because students cannot manage their time between studying and playing. When students feel that they do not have the

desire to do the assignments, they will ignore or postpone the assignments until they feel the desire to do them (Permana, 2019). According to Santika & Sawitri (2016) many students do assignments only one day before the deadline for submitting assignments, which makes them rush and results in less than optimal quality assignments or assignments that do not meet expectations. The burden of assignments from various subjects also adds to the pressure, with students preferring to study for tests rather than completing assignments that are considered less important (Lestari et al 2024).

In addition, the level of academic procrastination of junior high school students in Indonesia varies, as shown in several studies including Nurdiawan et al (2019) who found that 77% of 30 students at SMP Cianjur had high levels of academic procrastination. Research by Munawaroh et al (2024) revealed that the problem of academic procrastination was still experienced by students at SMP Muhammadiyah 9 Yogyakarta by 17,2%. Meanwhile, Fadhillah et al (2023) noted that out of 198 students at SMP Negeri 18 Pontianak, 12 students or 6% showed academic procrastination behavior. This shows that academic procrastination is a serious concern if it continues to be done, it will become a habit for students and have a negative impact on them.

Efforts to reduce academic procrastination are carried out by directing students to become independent, which requires a learning process in order to achieve self-regulated learning (Kurnia & Warmi, 2020). Self-regulated learning is an effort to generate and monitor one's own thoughts, feelings and behavior in order to achieve a goal (Santrock, 2008). Self-regulated learning is defined as self-activity in metacognition, motivation and behavior in the learning process and to achieve personal goals (Pintrich & Groot, 1990). Self-regulated learning increases individual beliefs in self-efficacy abilities, which directly affect the expectancy component, where when students are confident in their ability to complete a task (high expectancy), intrinsic motivation increases and the tendency to procrastinate decreases. In addition, self-regulated learning helps students identify the relevance and benefits of tasks (task value), thereby increasing the value component, where high perceived task value makes academic activities more meaningful, reducing reluctance to start (Steel & König, 2006) . This is supported by Wahyuni (2019) who said that one of the efforts that can be made is to improve the learning process in the classroom, so that educational goals can be achieved and self-regulated learning also increases. Self-regulated learning allows students to combine academic learning with self-control, thereby increasing their motivation to learn in order to achieve learning goals independently, take responsibility for themselves in learning, and build their unique learning goals (Abror, 2022; Asri, 2018; Nufus et al 2024; Nurvicalesti & Ratnasari, 2023). According to (in Kristiyani, 2016) aspects of self-regulated learning include metacognitive, motivational, and behavioral. In the context of mathematics, self-regulated learning is related to students' self-control so that they do not feel inferior when facing mathematical problems (Zetriuslita et al 2020). Self-regulated learning is very important in mathematics learning activities because it is useful for reducing students' dependence on others which is increasingly complex in everyday life (Bungsu et al 2019).

There are several studies related to this study conducted by Fathoni & Indrawati (2022) which state that self-regulated learning has an effect on academic procrastination because students with this ability are able to control and regulate themselves. This is in accordance with the research of Arum & Konradus (2022) which states that self-regulated learning affects academic procrastination behavior because students who have the ability to regulate themselves can reduce the behavior of postponing academic tasks. This is further emphasized by research conducted by Maijoita (2020) which states that the higher the self-regulated learning possessed by students, the lower their academic procrastination and vice versa. However, this result contradicts the research Erwinda et al (2023) which found a significant positive influence between self-regulated learning and academic procrastination, where students who are overconfident in their ability to learn independently often underestimate the amount of time needed to complete tasks, thus increasing academic procrastination. This difference in findings is what made researchers then try to fill the research gap by comparing and further reviewing the results of previous studies.

Based on the description above, the formulation of the problem in this study is whether there is an effect of self-regulated learning on academic procrastination in mathematics of junior high school students in Pekanbaru City?. This study aims to determine the effect of self-regulated learning on academic procrastination in mathematics of junior high school students in Pekanbaru City. The hypothesis in this study is that there is an effect of self-regulated learning on academic procrastination in mathematics of junior high school students in Pekanbaru City. This study is expected to provide a deeper understanding of the effect between self-regulated learning and the tendency of academic procrastination.

2. Methods

The type of research used in this study is causal associative with a quantitative approach. The quantitative approach was chosen because it has the advantage of using numerical data that allows statistical analysis so that the research results are more measurable, objective, and can be generalized to a wider population. However, the disadvantage of the quantitative approach is that it is sometimes less able to capture the context and deep meaning of complex social phenomena because of its focus on numbers and statistical data. Meanwhile, the type of causal associative research was chosen because of its ability to test the causal relationship between variables without the need for direct manipulation of the variables. However, the disadvantage is the limitation in ensuring the causal relationship absolutely because there is no full control over other variables that may affect the results, so the risk of confounding variables. The population in this study were all students of Junior High Schools in Pekanbaru City totaling 23.202. While the sample in this study was obtained using the Slovin (in Firdaus, 2021) formula as follows:

$$n = \frac{N}{1+N(e)^2}$$

$$n = \frac{23.202}{1+23.202(0,05)^2}$$

$$n = 393{,}2 \approx 393$$

Information:
n = Samples size
N = Population size
e = error rate (%)

The sampling technique used in this study is cluster random sampling, where samples are taken if the object being studied or the data source is very broad (Siregar, 2021). The sampling method is by randomizing the sample area which is grouped based on its sub-district from 36 Public Junior High Schools in Pekanbaru City. So that the sample obtained in this study amounted to 393 students consisting of 3 public junior high schools in Pekanbaru City, namely SMP Negeri 18 Pekanbaru, SMP Negeri 33 Pekanbaru, and SMP Negeri 10 Pekanbaru with the criteria of student inclusion registered as active students at public junior high schools in Pekanbaru City who are willing to become respondents and give consent to participate in the research and exclusion to students who were not present at the time of data collection or did not complete the research instrument.

The data collection technique in this study was carried out by distributing a Likert scale questionnaire. The Likert scale in this study consists of favorable and unfavorable statements. The instrument used in this study was a questionnaire with a self-regulated learning scale and an academic procrastination scale, each consisting of 30 statement items. Before the questionnaire was distributed, it was first validated by experts in their fields, namely lecturers of mathematics education at the Islamic University of Riau. The researcher asked the experts for judgment to assess the suitability of the statement items with the theoretical constructs used. In this process, there were no statement items that had to be corrected or discarded, but the experts directed to conduct a readability test of the instrument to students. The readability test was conducted on 3 students by giving a readability questionnaire to see whether the subjects understood or not the language or sentences that had been made in each statement. The results of the readability test obtained 1 item from the self-regulated learning variable and 3 items from the academic procrastination variable that were difficult for the subject to understand, so the researcher replaced them with the right words and made changes to the sentences in these items.

The instrument was tested on 90 students, after the trial was conducted, it was found that out of 30 statement items, there were 2 statement items that were dropped, which were known after conducting a validity test and item discrimination analysis, so that the dropped items were removed from each self-regulated learning and academic procrastination variable. To find out which items were dropped, a validity test was conducted by looking at the significance value, where if the Sig. value < 0,05 then it is valid, and if the Sig. value > 0,05 then it is invalid (Sugiyono, 2021). The results of the validity test of the two variables can be seen in Table 1 below.

Table 1 – Validity Test

Variable	Initial Items	Invalid Items	Invalid Items Number	Valid Items
Self-Regulated	30	1	24	29

Learning				
Academic Procrastination	30	1	19	29

Based on Table 1 above, it is known that from each variable there is 1 invalid item, so that 29 valid items remain. After the validity test was conducted, the researcher conducted an item discrimination power analysis which aims to see the ability of the item to differentiate subjects with high and low traits. Item discrimination power analysis was conducted with a discrimination power index limit of 0,3. The results of the item discrimination power analysis of the two variables can be seen in Table 2 below.

Table 2 – Item Discrimination Power Analysis

Variable	Initial items	Discarded items	Discarded items number	Indiscarded items
Self-Regulated Learning	30	2	10 dan 24	28
Academic Procrastination	30	2	19 dan 21	28

Based on Table 2 above, it is known that from each variable, there are 2 items that are discarded. If seen from one of the discarded item numbers above, the validity test results are invalid. So, from the 30 statement items, only 28 statement items are then used as research instruments in this study. Next, a reliability test was conducted on the research instrument to ensure that the instrument used can provide consistent results. The reliability test was conducted using Cronbach's Alpha, where the questionnaire can be said to be reliable if the Cronbach's Alpha value is > 0,6 (Sugiyono, 2021). The results of the reliability test of the two variables can be seen in Table 3 below.

Table 3 – Reliability Test

Variable	Cronbach'Alpha	N of items
Self-Regulated Learning	0,900	28
Academic Procrastination	0,909	28

Based on Table 3 above, it is known that the Cronbach's Alpha value of the self-regulated learning variable is 0,900 > 0,6 and 0,909 > 0,6 for the academic procrastination variable, which means that both variables used as instruments in this study are reliable. Thus, it can be stated that the self-regulated learning and academic procrastination questionnaires can be used to collect research data.

The data obtained from the questionnaires filled out by the respondents were then analyzed using simple linear regression analysis techniques. However, before conducting a simple linear regression analysis to test the research hypothesis, a normality test and linearity test were first carried out by the researcher using the SPSS version 26.0 program.

The normality test is one of the important classical assumption tests in statistical analysis, especially in linear regression by ensuring that the data or residuals are

normally distributed or not. The normality test in this study uses Kolmogorov-Smirnov data analysis with the basis for decision making if the Sig. value > 0.05 then the data is normally distributed. However, if the Sig. value < 0.05 then the data is not normally distributed.

Meanwhile, the linearity test is carried out to determine whether there is a significant linear relationship between the independent variables and the dependent variables in the regression model. The linearity test as a classical assumption test is important before conducting a linear regression analysis. The linearity test is carried out by looking at the significance value of the deviation from linearity with the basis for decision making if the Sig. value > 0.05 then there is a linear relationship. However, if the Sig. value < 0.05 then there is no linear relationship.

Furthermore, simple linear regression analysis as a hypothesis test in this study is used to conclude the causal relationship and direction of the relationship between the two variables through a simple linear regression equation model. The general equation in a simple linear regression test is as follows:

$$\hat{Y} = a + bX$$

Information:
$\hat{Y}$ = dependent variable
X = independent variable
a = constant value
b = regression coefficient value.

3. Results and Discussion

This study was conducted on 393 students of public junior high schools in Pekanbaru City consisting of 3 public junior high schools in Pekanbaru City, namely SMP Negeri 18 Pekanbaru, SMP Negeri 33 Pekanbaru, and SMP Negeri 10 Pekanbaru. The results of this study can be seen in Table 4 below.

Table 4 – Frequency Distribution of Research Variables

Category	Self-Regulated Learning		Academic Procrastination	
	Frequency	Percentage	Frequency	Persentage
Very Low	33	8,4%	29	7,4%
Low	99	25,2%	96	24,4%
Medium	140	35,6%	155	39,4%
High	97	24,7%	81	20,6%
Very High	24	6,1%	32	8,1%
Total	**393**	**100%**	**393**	**100%**

Based on Table 4 above, it can be seen that most students have self-regulated learning and academic procrastination which are both in the medium category. Where each percentage of the two variables, namely self-regulated learning and academic procrastination, is 35,6% and 39,4%. In addition, to clarify the findings in this study, data visualization is presented in the form of a histogram which can be seen in Figure 1 below.

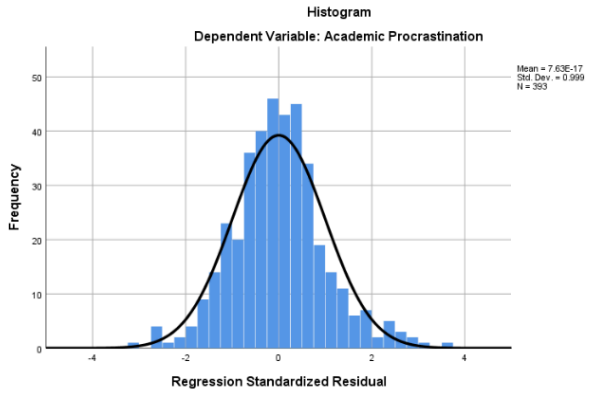

Figure 1 Histogram of Research Variables

Based on Figure 1 above, this histogram displays the distribution of standard residuals from the regression model used to analyze the effect of self-regulated learning on academic procrastination in mathematics. The histogram shows a symmetrical shape and resembles a normal curve. The mean residual value is very close to zero, and the standard deviation is close to one. This indicates that the regression model is not biased and the residuals are well standardized, and there are no extreme spikes or deviations at either end of the histogram, indicating no significant outliers in the residuals.

Before conducting a simple linear regression analysis to test the hypothesis, a normality test was first conducted to determine whether the two variables, namely the self-regulated learning variable and academic procrastination, were normally distributed or not. The results of the normality test of the two variables can be seen in Table 5 below.

Table 5 – Normality Test

Variable	Significance
Self-Regulated Learning	0,200
Academic Procrastination	0,200

Based on Table 5 above, it is known that the results of the normality test of both variables are both 0,200 this indicates that the significance value of 0,200 > 0,05. So it can be interpreted that the data tested is normally distributed and the regression analysis has met the assumption of normality. In addition, to clarify the findings in this study, data visualization is presented in the form of a p-p plot which can be seen in Figure 2 below.

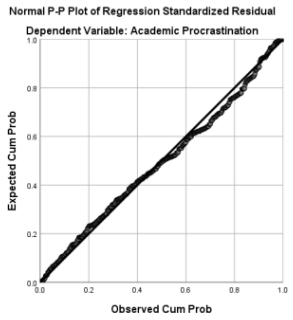

Figure 2 Normal P-P Plot of Research Variables

Based on Figure 2 above, it shows that the dots are on a straight line, which means that the random error comes from a normal distribution or in other words the normality assumption is met. Next, a linearity test was conducted to determine whether the two variables, namely the self-regulated learning variable and academic procrastination, have a linear relationship or not. The results of the linearity test of the two variables can be seen in Table 6 below.

Table 6 – Linearity Test

Variable	Significance
Self-Regulated Learning Academic Procrastination	0,282

Based on Table 6 above, it is known that the results of the linearity test of the two variables are 0,282, this indicates that the significance value of 0,282 > 0,05. So it can be interpreted that there is a significant linear relationship between the variables of self-regulated learning and academic procrastination. So the requirements for the linearity test have been met. In addition, to clarify the findings in this study, data visualization is presented in the form of a scatterplot which can be seen in Figure 3 below.

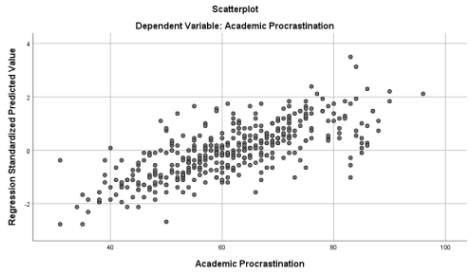

Figure 3 Scatterplot of Research Variables

Based on Figure 3 above, it can be seen that the data spreads from the bottom left straight towards the top right, which means that there is a linear relationship and the regression model is suitable for use.

After the normality and linearity tests are met, a simple linear regression analysis is then carried out to model the linear relationship between the two variables. However, at that time a correlation test was also carried out using Pearson product moment to determine the relationship between self-regulated learning and academic procrastination with the basis for decision making if the Sig. value < 0,05 then there is a relationship between self-regulated learning and academic procrastination. However, if the Sig. value > 0,05 then there is no relationship between self-regulated learning and academic procrastination. The results of the correlation test can be seen in Table 7 below.

Table 7 – Correlation Test

		Self-Regulated Learning	Academic Procrastination
Self-Regulated Learning	Pearson Correlation	1	−0,724
	Sig. (2-tailed)		0,000
	N	393	393
Academic Procrastination	Pearson Correlation	−0,724	1
	Sig. (2-tailed)	0,000	
	N	393	329

Based on Table 7 above, it is known that the results of the correlation test of the two variables are both 0,000, this shows that the significance value of 0,000 < 0,05. So it can be interpreted that there is a significant relationship between self-regulated learning and academic procrastination. Meanwhile, the value of r = −0,724 is obtained, which means that there is a negative relationship. So it can be concluded that there is a negative relationship between self-regulated learning and academic procrastination.

Then a simple linear regression analysis was carried out to determine the value of the academic procrastination variable which depends on the self-regulated learning variable through a regression equation model which can make it possible to estimate changes in the academic procrastination variable (Y) when the self-regulated learning variable (X) changes. The simple linear regression equation model can be seen in Table 8 below.

Table 8 – Simple Linear Regression Equation Model

Model		Unstandardized Coefficients
1	(Constant)	127,444
	Self-Regulated Learning	−0,824

Based on Table 8 above, it is known that the constant value (a) is 127,444 while the regression coefficient value (b) is −0,824. So the regression equation can be written:

$$\hat{Y} = a + bX$$
$$\hat{Y} = 127{,}444 + (-0{,}824)X$$

From this equation it is known that if the value of X is increased by 1 unit, then the value of Y will decrease by 0,824 units. Likewise, if the value of X is decreased by 1 unit, then the value of Y will increase by 0,824 units. This means that there is a significant negative effect, where increasing self-regulated learning will decrease academic procrastination or the higher the self-regulated learning, the lower the academic procrastination.

After conducting a simple regression analysis, then a t-test was conducted to determine whether there was an influence of self-regulated learning on academic procrastination with a confidence level of α = 5% or 0,05 and N = 393 / df = 391 with based on decision making if $t_{count} > t_{table}$ and Sig. value < 0,05 then there was an influence of self-regulated learning on academic procrastination. However, if $t_{count} < t_{table}$ and Sig. value > 0,05 then there was no influence of self-regulated learning on academic procrastination. The results of the t-test can be seen in Table 9 below.

Table 9 – T-Test

Model		t	Sig.
1	(Constant)	39,761	0,000
	Self-Regulated Learning	-20,730	0,000

Based on table 9 above, it is known that the value $t_{count} > t_{table}$, namely (-) 20,730 > 1,966 with a significance value of 0,000 < 0,05, which means that there is a significant influence of self-regulated learning on academic procrastination.

Furthermore, to see the magnitude of the contribution of the self-regulated learning variable (X) to academic procrastination (Y), it can be seen through the determination coefficient value. The determination coefficient value can be seen in Table 10 below.

Table 10 – Determination Coefficient

Model	R	R Square
1	0,724	0,524

Based on Table 10 above, it is known that the R value is 0,802 where the number shows the degree of correlation between the self-regulated learning variable and the academic procrastination variable. Then the R Square value is obtained which shows the determination coefficient of 0,524 which means that the influence given by self-regulated learning on academic procrastination is 52,4% while the remaining 47,6% is influenced by other factors.

Based on the results of the research that has been conducted, it shows that self-regulated learning has a negative and significant effect on academic procrastination in mathematics of junior high school students in Pekanbaru City. This is based on the results of the t-test with statistical calculations showing $t_{count} > t_{table}$, namely (-) 20,730 > 1,966 with a negative coefficient indicating that the higher the self-regulated learning in students, the lower the academic procrastination carried out by students and vice versa, the lower the self-regulated learning in students, the higher the academic procrastination in students. The results of this study support previous research conducted by Atmojo et al (2024) which showed that individuals with higher self-regulated learning tend to show a lower tendency towards academic

procrastination. Thus, the hypothesis in this study is accepted because it shows that self-regulated learning can be considered as one of the factors that influence academic procrastination in students.

According to (Zimmerman, 2008) self-regulated learning as an individual's ability to actively regulate and control the learning process, which involves metacognitive, motivational, and behavioral aspects, meaning that effective learning does not only depend on cognitive abilities, but also on students' ability to manage time, effort, learning environment, and self-motivation systematically in order to achieve learning goals. Individuals must actively direct their behavior and cognition in learning, including monitoring, evaluating, and regulating the learning strategies used. Individuals who have good self-regulated learning are individuals who have metacognition and motivation that are able to plan, regulate, and mobilize themselves in every task they undertake. Self-regulated learning emphasizes the importance of the role of teachers in helping student development, so that learning becomes a constructive and independent process. Teachers need to help students develop learning strategies that include planning, monitoring, and self-evaluation during the learning process. For example, teachers can teach students how to set clear learning goals, make learning plans, and monitor their own progress. Teachers need to motivate students by connecting learning materials with students' personal interests and goals, and helping them manage emotions and laziness to stay motivated in learning. Teachers must organize a conducive learning environment, such as managing time, providing adequate learning resources, and encouraging students to organize their physical and social environment to support independent learning processes.

Students who have self-regulated learning are able to control, plan and independently direct their thoughts, motivations and behavior towards their goals in learning so that they tend not to commit academic procrastination (Wardani, 2021). This is in line with the opinion of Arum & Konradus (2022) who says that individuals who have good self-regulated learning are able to control and plan their time management strategies so that they avoid procrastination behavior. According to Rachmaningtyas & Khoirunnisa (2022), individuals like this are not only able to manage their learning process independently, but also actively monitor, evaluate, and adjust the learning strategies used to suit the goals they want to achieve. The emergence of academic procrastination behavior in students is because many carry out learning activities without planning, monitoring, controlling, and evaluating their own learning (Mufidah, 2019) . According to Kartikasari et al (2022), self-regulated learning plays an important role in reducing procrastination by increasing motivation and time management. Therefore, the development of self-regulated learning skills needs to be a primary concern in an effort to reduce the level of academic procrastination among students. The amount of contribution given by self-regulated to academic procrastination in this study was 52,4%, while the remaining 47,6% was influenced by other factors not examined in this study, such as individual physical condition factors, parenting patterns, low self-control, low self-supervision and low intrinsic motivation.

The limitations of this study are that the variables studied only focus on self-regulated learning and academic procrastination, while other factors that also have an influence such as motivation, self-efficacy, anxiety, and learning environment are not discussed in the analysis. For further researchers, it is recommended to add other variables such as academic anxiety, learning motivation, and environmental support as moderating or mediating variables in order to provide a more comprehensive picture of the factors that influence academic procrastination.

4. Conclusions

This study provides an important contribution in understanding the influence of self-regulated learning on academic procrastination in mathematics of public junior high school students in Pekanbaru City. Based on the results of the research and discussion that have been carried out, it can be concluded that there is a significant negative influence between self-regulated learning on academic procrastination in mathematics of public junior high school students in Pekanbaru City. This means that the higher the self-regulated learning, the lower the academic procrastination that will be carried out by students and vice versa, the lower the self-regulated learning, the higher the academic procrastination carried out by students and the easier it will be for students to delay doing activities related to the academic field. The amount of contribution or influence given by self-regulated learning on academic procrastination is 52,4% and the remaining 47,6% is influenced by other factors. These findings contribute significantly to the development of educational science by strengthening the understanding of the important role of self-regulated learning in reducing academic procrastination, especially in mathematics. These results encourage educators to develop learning strategies that improve students self-regulated learning abilities, so as to minimize procrastination behavior and improve learning achievement.

Practical implications, the results of this study can be used by educators and educational policy makers to design programs that encourage the development of self-regulated learning in students. Such as self-directed learning training for teachers that focuses on self-directed learning strategies and the development of self-regulation skills as provisions for teachers who can more effectively guide students in managing time and tasks independently. Educational policy makers should design and implement programs that encourage students to develop self-regulated learning skills with learning modules, workshops, or supporting applications that help students plan, monitor, and evaluate their learning process. Thus, this study not only provides theoretical insights but also offers real solutions to overcome the problem of academic procrastination among students.

Conflict of Interest

The authors declare no conflicts of interest.

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