

Academic Self-Efficacy and Future Time Perspective Predict Academic Procrastination: The Mediating Function of Academic Self-Control

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Quantitative Study

Abstract

Background: Background: Academic procrastination is increasingly recognized as a detrimental factor that negatively affects student success, achievement, and mental health. This study aims to investigate the factors contributing to academic procrastination by employing the Temporal Decision Model (TDM) of procrastination. Specifically, it examines how academic self-control mediates the relationship between future time perspective, academic self-efficacy, and academic procrastination in university students.

Method: The study included 517 university students (414 females and 103 males) who participated in a survey measuring academic procrastination, future time perspective, academic self-efficacy, and academic self-control. The data were analyzed to explore the mediating role of academic self-control in the relationship between future time perspective, academic self-efficacy, and academic procrastination.

Results: Findings indicate that both academic self-efficacy and future time perspective have an indirect effect on academic procrastination through academic self-control. Specifically, academic self-control significantly mediates the relationship between these two factors and academic procrastination, with a stronger mediation effect observed between academic self-efficacy and academic procrastination in college students.

Conclusion: This study contributes to the understanding of academic procrastination by highlighting the mediating role of academic self-control. These findings suggest that enhancing academic self-control may help reduce procrastination among students by leveraging their self-efficacy and future time perspective. The insights provided by this study offer valuable guidance for students, educators, and counselors in addressing procrastination through targeted interventions.

Keywords: Academic procrastination; University students; Academic self-efficacy; Future time perspective; Academic self-control

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Introduction

Self-created habits have a significant role in determining a student's success; on the one hand, good habits will hasten academic progress, while unpleasant habits will impede it. Students who can complete academic tasks have academic achievement. Students are able to understand about physical, social, and cognitive development (Susanto et al., 2023). Besides that, students are also required to be able to think critically, creatively, to be able to solve problems (Matitaputty et al., 2024). However, different things happen to students who have delaying behaviour in doing and completing tasks. In the academic world, the term academic procrastination is defined as the behaviour of students who postpone an academic task that impacts student academic achievement. The main consequence of academic procrastination is poor academic achievement and negative emotional feelings, such as guilt and shame (Safari and Yousefpoor, 2022).

Academic procrastination is an obstacle to academic achievement (Steel and Klingsieck, 2016; Asri et al., 2017; Rusdi et al., 2020; Hidajat et al., 2020). Procrastination positively correlates with stress, mental wellness, and subjective well-being (Klingsieck, 2013; Suhadianto et al., 2020). In the case of students, psychological health is critical (Aulia et al., 2021). 14% of students in the high category and 72% in the medium category must work on their academic work (Khoirunnisa et al., 2021). According to a meta-analysis, eighty to ninety-five per cent of college students delay their assignments (Kim and Seo, 2015). Moreover, 90% of students are thought to put off assignments for more than an hour each day (Rahimi et al., 2016), and this phenomenon is increasingly common. A serious problem with the spread of student academic procrastination needs to be studied scientifically. This is quite worrying, with various reasons for students to procrastinate and cause threats to students themselves and universities.

Academic Self-Efficacy and Academic Procrastination

The Temporal Decision Model (TDM) is a theoretical model of the cognitive mechanisms underlying procrastination. TDM focuses on the specific behavioural mechanisms that lead to delayed decision-making and procrastination. It shows how perceived task aversiveness and expected outcome value cause people to make asymmetrical decisions between the present and the future, which helps explain why people procrastinate tasks (Zhang and Feng, 2019). TDM explains why individuals are reluctant to do a task in the present but expect to be willing to do it in the future (Zhang and Feng, 2019). A student's perseverance and effort in carrying out the complete learning plan are higher than those with high academic self-efficacy (Bandura, 1977). An additional study found that academic self-efficacy can positively predict academic self-control and is strongly connected with academic self-control (Ein-Gar and Steinhart, 2017; Chen et al., 2019).

Academic self-efficacy on procrastination has a direct influence (Kandemir, 2014; Özer and Yetkin, 2018; Attia et al., 2020). Research conducted by Li et al. and demonstrated that academic procrastination is influenced by self-efficacy. Still, varied outcomes were also observed when considering the impact of academic self-efficacy on academic procrastination through the mediation of other variables, specifically approach goals and avoidance goals (Zhou and Kam, 2017), academic motivation (Malkoç and Mutlu, 2018), adaptive and maladaptive perfectionism (Kurtovic et al., 2019), academic intrinsic motivation (Bozgun and Baytemir, 2021), academic self-control (Liu et al., 2020). Previous studies on the relationship between academic procrastination and academic self-efficacy have produced inconsistent findings.

Thus, there is a gap in the empirical data about how academic self-efficacy impacts academic procrastination.

Future Time Perspective and Academic Procrastination

Personal differences in procrastination are associated with abnormalities in the structure and spontaneous changes in metabolism in the prefrontal and parahippocampal cortex, as is accepted in the TDM, which focuses on cognitive mechanisms that also examine the brain at the neural level (Hu et al., 2018; Liu and Feng, 2017; Zhang et al., 2016). The impacts of different personality factors on procrastination, such as future time perspective and regulatory mode, may be mediated by different parahippocampal pathways (Liu and Feng, 2019; Zhang et al., 2017a). Sources of self-control and the impact of academic pressure on academic procrastination reduce at high levels of future time perspective (Song et al., 2022). Future time perspectives relate to academic procrastination (Andre et al., 2018; Fang and Zhang, 2019).

Future time perspective directly influences academic procrastination (Taylor and Wilson, 2016; Kim et al., 2017; Zabelina et al., 2018; Liu and Feng, 2019; Yousef, 2020; Brenlla et al., 2022). Other research reveals differently that future time perspective has no direct effect on academic procrastination (Jin et al., 2019; Song et al., 2022), but future time perspective moderates its relationship with academic procrastination and research conducted by Li et al. (2023), in the relationship with other mediators between future time perspective and academic procrastination. There is an empirical gap regarding the impact of future time perspectives on academic procrastination, even if the results of earlier investigations were more consistent.

Academic Self-Efficacy, Academic Self-Control, and Academic Procrastination

According to TDM, the fundamental process of procrastination is deciding what to finish now or later, and one of the main variables impacting this decision-making process is self-control (Zhang et al., 2019). Numerous research has shown a relationship between academic self-efficacy, academic self-control, and future time perspective. Self-efficacy predicts procrastination (Kurtovic et al., 2019; Attia et al., 2020; Silva et al., 2020). Academic self-efficacy had a negative correlation with academic procrastination and a positive correlation with academic self-control, according to Liu and Feng's (2019) study, which also revealed self-efficacy in the academic context. According to Liu and Feng's explanation, academic self-control completely mediates the impact of academic self-efficacy on academic procrastination.

Future Time Perspective, Academic Self-Control, and Academic Procrastination

According to TDM, self-control is the primary factor influencing the decision-making process associated with procrastination. Self-control is regulating an individual and controlling unpleasant urges or acts to achieve distant goals (Baumeister et al., 2007). Future time perspective and self-control are closely related. Future-oriented people are more self-controllable (Kim et al., 2017; Dreves and Blackhart, 2019). Because self-control and future time perspective have a strong connection, several studies have found that self-control mediates the impact of future time perspective on mental health issues, such as procrastination (Kim et al., 2017). The self-control research that Meng et al. 2021 did shows that self-control may regulate its relationship with future time perspectives, which can help create specific strategies to prevent procrastination connected to certain health behaviours. Exercising self-control prevents spontaneous acts or reactions that could discourage people from achieving their objectives (Vohs and Baumeister, 2017). High levels of self-control and future time perspectives are positively associated with and become

more proactive toward goal attainment, which includes academic and other health behaviours (Gellert et al., 2012; Tangney et al., 2004).

The Present Study

Many studies have been conducted on academic procrastination, demonstrating various factors that affect academic procrastination. Hence, this study seeks to summarize the role of future time perspective, academic self-efficacy, and academic self-control on academic procrastination. Correspondingly, exploring the factors that can influence academic procrastination, which reduces academic procrastination in college students, is essential to know. Thus, researchers need to examine the role of academic self-control on academic procrastination as a mediator variable in this study and choose two independent variables that affect academic procrastination: future time perspective and academic self-efficacy. Academic self-control is viewed as a mediator of academic procrastination in college students. However, researchers have yet to find a model of academic procrastination that holistically includes future time perspective, academic self-efficacy, and academic self-control in a study. Our research hypothesis is

1. Future time perspective has a negative and significant impact on academic procrastination.
2. Future time perspective affects academic procrastination through academic self-control.
3. Academic self-efficacy has a negative and significant impact on academic procrastination.
4. Academic self-efficacy impacts academic procrastination and academic self-control as a mediator.

Methods

This study uses a quantitative approach with an explanatory research design. It employs the purposeful sampling method, and the sample consists of 517 students who have attended public universities in Surabaya city for at least the third semester.

This study uses a survey method with a psychological scale through a Google form distributed to respondents directly to find out the respondent's self-report related to future time perspectives, academic self-efficacy, academic self-control, and academic procrastination, which is then processed using descriptive and quantitative analysis tools. The scale used is the Pure Procrastination Scale (PPS) (Svartdal and Steel, 2017), totalling 12 items; the future time perspective scale from Husman and Shell (2008) consists of 27 items; the College Academic Self Efficacy Scale (CASES) consists of 33 items and the Brief Self-Control Scale (Tangney et al. 2004), which consists of 13 items. According to Beaton, et al. (2000) Instrument adaptation consists of multiple steps: translation, synthesis, reverse translation, expert committee, and trial test. The term "instrument adaptation" in this study refers to these processes.

The Pure Procrastination Scale (PPS) has a reliability of 0.92. The future time perspective scale has Cronbach's alpha coefficient values greater than 0.70 for all four subscales, indicating good internal reliability. The College Academic Self-Efficacy Scale (CASES) had an estimated internal consistency of 0.85. The Brief Self-Control Scale, derived from the 36-item full-item self-control scale, had good internal consistency across studies (α study 1 = 0.89, α study 2 = 0.89).

From January to March 2024, the researcher collected the data for the present study. Respondents were informed, understanding, before answering, that their

involvement in the study would remain private and only be utilized for research. They would not be penalized if they stopped or stopped participating at any moment. The time needed to answer the questionnaire was 30 minutes. Structural equation modelling (SEM) analytic techniques-quantitative and inferential descriptive analysis techniques with the aid of SPSS and LISREL software-were utilized to evaluate the multivariate relationship of the four variables in this study.

Results

The results of the descriptive analysis of research respondents provide an overview of the sample's condition in terms of gender, semester, and age. The analysis technique used is frequency and percentage.

Based on the research respondent data presented in table 1 shows that the total number of respondents is 517 students. The responses from males and females were either equal to or equal to. As a result, there were more female responders than male respondents. The descriptive analysis's findings indicate how much students who participated in this study procrastinate in their academic work (N = 517 students), as many as 414 female students (80.08%) and 103 male students (19.92%), with details of female students who are in moderate academic procrastination by 37.19%, 20.53% in the high category and 42.27% in the low category. Male students were 19.41% in the high category, 36.89% in the medium category, and 43.68% in the low category.

An overview of academic procrastination, academic self-control, future time perspective, and academic self-efficacy, as well as the overall results, are presented in the following mean scores. Related to the Academic Procrastination variable, it shows that the average answers of respondents are as follows: The average response from respondents to the Academic Procrastination (PA) variable is 2.69 overall, with the moderate group comprising the majority of the values. The average value of 3.75 respondents constitutes the high group provided for the Academic Self-Control variable (KDA). The average value of respondents' responses regarding the Future time perspective (PMD) variable is 3.71, including in the high category. Furthermore, the Academic Self-Efficacy (EDA) variable has an average value of respondents' responses of 3.65, including in the high category.

The next stage is testing the level of fit between the data and the model. Table 2 lists parameters to test the model's overall feasibility.

The next stage is testing the level of fit between the data and the model. The parameters to test the overall goodness of fit index model are listed in table 2, according to Hair et al. (2014), using 4-5 goodness of fit criteria is considered sufficient to assess the goodness of fit model.

The following are the results of the structural model fit evaluation (Goodness of Fit) on the model in this study, showing that the model has a value of NFI = 0.934 (≥ 0.90), CFI = 0.944 (≥ 0.90), NNFI = 0.930 (≥ 0.90), IFI = 0.944 (≥ 0.90), RFI = 0.917 (≥ 0.90), PGFI = 0.622 (≥ 0.60), PNFI = 0.747 (> 0.09). It is acceptable to conclude that the overall model fit is fit based on these results, which indicate that 7 measures indicate model fit.

Table 1. Gender-Based Respondents

No	Gender	Frequency	Percentage
1	Male	103	19.92
2	Female	414	80.08
N		517	100

Source: data processed by SPSS (2024).

Table 2. Goodness of Fit Parameters

Goodness of Fit Index	Cut-off value	Result	Conclusion
Chi-Square	P-value > 0.05	0.000	Not Fit
RMSEA	RMSEA < 0.05	0.096	Not Fit
NFI	NFI ≥ 0.90	0.934	Fit
CFI	CFI ≥ 0.90	0.945	Fit
NNFI	NNFI ≥ 0.90	0.931	Fit
IFI	IFI ≥ 0.90	0.945	Fit
RFI	RFI ≥ 0.90	0.918	Fit
GFI	GFI ≥ 0.90	0.888	Not Fit
AGFI	AGFI ≥ 0.90	0.840	Not Fit
PGFI	PGFI ≥ 0.60	0.622	Fit
PNFI	PNFI > 0.09	0.747	Fit
RMR	Standardized RMR < 0.05	0.061	Not Fit

Source: (Ghozali and Fuad, 2005; Hair et al., 2010; Hair et al., 2014; Byrne, 2016) and the results of LISREL data processing (2024)

This section evaluates coefficients or parameters demonstrating the influence or causal relationship between two latent variables. In conclusion, the following equation summarizes the findings of the computation of these coefficients:

The following is the structural model equation:

$$PA = -0.2201 \cdot KDA - 0.1281 \cdot PMD - 0.2389 \cdot EDA, \text{ Errorvar.} = 0.7688, R^2 = 0.2312$$

$$\begin{matrix} (0.07596) & (0.04647) & (0.07517) & (0.05690) \\ -2.8978 & -2.7556 & -3.1781 & 13.5099 \end{matrix}$$

$$KDA = 0.1038 \cdot PMD + 0.7144 \cdot EDA, \text{ Errorvar.} = 0.4414, R^2 = 0.5586$$

$$\begin{matrix} (0.04093) & (0.04876) & (0.04934) \\ 2.5352 & 14.6526 & 8.9471 \end{matrix}$$

The results of this estimation can also be seen in the figures 1 and 2.

Based on a critical point value of 1.96, the SEM testing criteria evaluate if a parameter value is statistically significant if the t-value is more than or equal to the crucial point (t-value ≥ 1.96). In this research model, there are direct effects and indirect effects. The following is the output of both direct and indirect effects results.

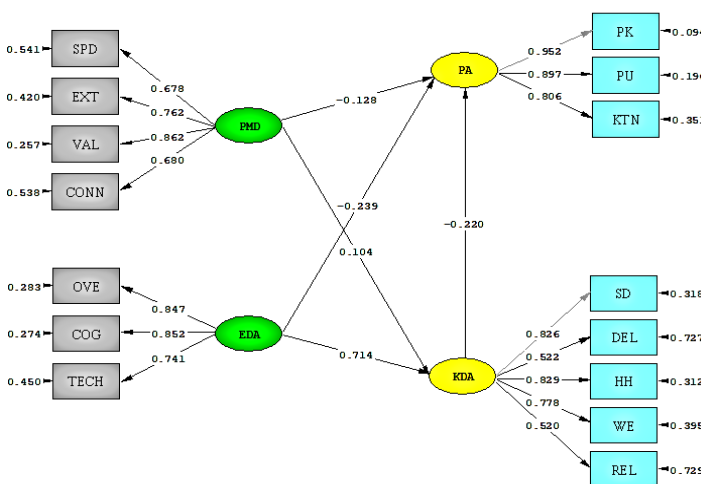


Figure 1. Standardized Coefficient Estimation Results

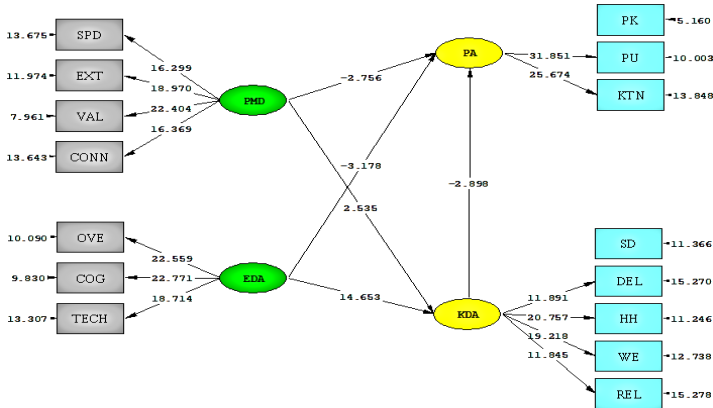


Figure 2. Estimation Results of T-values

Total Effects of KSI on ETA

PMD EDA

	PMD	EDA
PA	-0.1509 (0.0468)	-0.3962 (0.0477)
KDA	0.1038 (0.0409)	0.7144 (0.0488)
	2.5352	14.6526

Indirect Effects of KSI on ETA

PMD EDA

	PMD	EDA
PA	-0.0228 (0.0119)	-0.1573 (0.0547)
KDA	-1.9241	-2.8755
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According to the output results above, it is known that:

- Academic procrastination is negatively impacted by future time perspective by -0.151 or -15.1%, suggesting a negative contribution or effect. Therefore, academic procrastination and future time perspective are negatively correlated.
- Academic procrastination and academic self-efficacy have a negative correlation (a negative effect of -0.396 or -39.6%), indicating an adverse correlation between the two. Put another way, there is a negative correlation between academic procrastination and academic self-efficacy.
- Through academic self-control, the future time perspective indirectly affects academic procrastination by -0.023, or -2.3%.
- The indirect effect of academic self-efficacy on academic procrastination through academic self-control is -0.157 or -15.7%.

Table 3. Test Results of the Effect of Future Time Perspective on Student Academic Procrastination

Path coefficient	t _{count} value	H ₀	H ₁
-0.128	-2.756	Rejected	Accepted

According to the direct and indirect effects results, academic self-efficacy's indirect impact on academic procrastination (-0.157) was found to be more significant than the indirect effect of future time perspective on academic procrastination through academic self-control (-0.023). Thus, the combined impact of academic self-efficacy and future time perspective on academic procrastination through academic self-control is 23.1%. In comparison, 76.9% is the influence of other variables not examined in this study.

As shown in Table 3, the test results indicate a significant effect of future time perspective on student academic procrastination, suggesting that students with a stronger orientation toward future goals tend to procrastinate less academically.

Based on the test results, the path coefficient is -0.128 with a tcount value of -2.756. The future time perspective has a negative effect on students' academic procrastination, as indicated by the path coefficient of -0.128. This suggests that students procrastinate less academically the more optimistic their future time perspective is. Furthermore, because the tcount value $|-2.756| > t \text{ table } |-1.96|$, to accept H1, it was decided to reject H0. The test results indicate that students' academic procrastination is greatly impacted by their future time perspective.

Table 4 presents the test results of the effect of academic self-efficacy on student academic procrastination, revealing a significant negative path coefficient (-0.239) with a t-count value of -3.178, leading to the rejection of H0 and acceptance of H1. This finding suggests that higher academic self-efficacy is associated with lower levels of academic procrastination.

Based on the test results, the path coefficient is -0.128 with a tcount value of -3.178. Academic procrastination among students is negatively correlated with academic self-efficacy, as indicated by the path coefficient of -0.239, which suggests that the higher a student's academic self-efficacy, the lower their academic procrastination. Furthermore, because the value of tcount $|-3.178| > t \text{ table } |-1.96|$, in order to accept H1, it was decided to reject H0. The test results indicate that academic procrastination among students is highly influenced by academic self-efficacy.

The effect of future time perspectives on student academic procrastination through academic self-control is an indirect effect analysis. Analysis of indirect effects can determine whether or not intervening variables affect the path of influence of the independent variable on the dependent variable by using the Sobel test formula. The test results indicate that the zcount value is -2.208. After comparing zcount values of -2.208 and 1.96, $|-2.208| > t \text{ table } |-1.96|$ that future time perspectives significantly impact students' academic procrastination through academic self-control, leading to the rejection of H0 and acceptance of H1.

Furthermore, the effect of academic self-efficacy on student academic procrastination through academic self-control is an indirect effect analysis. Indirect effect analysis can determine whether the intervening variable affects the path of influence of the independent variable on the dependent variable by using the Sobel test formula. Based on the test results, the zcount value is -2.878. After comparing the zcount value of -2.878 with 1.96, the result is $|-2.878| > t \text{ table } |-1.96|$. Thus, academic self-efficacy significantly impacts student academic procrastination through academic self-control, leading to the rejection of H0 and the acceptance of H1.

Table 5 summarizes the research hypothesis test results, confirming alignment between the theoretical model and empirical data.

According to the direct association test findings between the exogenous and endogenous variables, all hypotheses (H1, H2) are accepted.

Table 4. Test Results of the Effect of Academic Self-Efficacy on Student Academic Procrastination

Path coefficient	t _{count} value	H ₀	H ₁
-0.239	-3.178	Rejected	Accepted

Table 5. Research Hypothesis Test Results

No.	Hypothesis test results	Description
	There is a match between the theoretical model, which states the influence of future time perspectives and academic self-efficacy on student academic procrastination through academic self-control, and empirical data.	Accepted
H1	Future time perspective has a negative and significant impact on academic procrastination.	Accepted
H2	Future time perspective affects academic procrastination through academic self-control.	Accepted
H3	Academic self-efficacy has a negative and significant impact on academic procrastination.	Accepted
H4	Academic self-efficacy impacts academic procrastination and academic self-control as a mediator.	Accepted

There is a significant correlation between academic procrastination, academic self-efficacy, and future time perspectives. Moreover, academic procrastination and academic self-control are most strongly connected with academic self-efficacy.

In addition, academic self-control proved to be a mediator in the indirect relationship test results, which indicated a substantial correlation between academic self-efficacy and future perspective with academic procrastination (H3, H4). This indirect finding also shows that academic self-control can mediate between future time perspectives and academic self-efficacy with academic procrastination.

Discussion

The impact of academic self-efficacy and future time perspectives on students' academic procrastination through academic self-control is shown in this study. The deliberate but irrational delay of a desired action is known as procrastination (Steel, 2007). Academic procrastination postpones goals so long that they become improbable and cause psychological distress. However, there is no standard description for this issue in an academic setting (Ferrari et al., 1995). On the other side, Rothblum et al. (1986) defined the idea by its symptoms, which include delaying educational tasks and academic responsibilities like exam preparation. Some researchers also explain that academic procrastination is the continuous avoidance of academic tasks that leads to failure, unhappiness, and stress (Ferrari et al., 1995; Malkoç & Mutlu, 2018).

The level of academic procrastination of students who are respondents in this study, both men and women, is in the same category of academic procrastination. This is supported by research that shows no gender differences in academic procrastination (Ismail, 2016; Ajayi, 2020). However, some studies reveal the relationship between gender and academic procrastination that women who have a low future time perspective tend to engage in academic procrastination where they are hardly oriented towards long-term goal setting, making it more difficult for them than for men at the same level of future time perspective to avoid procrastinating and delay the completion of academic work activities (Balkis & Duru, 2019; Zhou, 2020). Furthermore, women are more likely than males to struggle with anxiety, tension, and low self-confidence, all of which are linked to reduced future time perspectives and can cause them to delay their academic work even longer (Asher et al., 2017; Gao et al., 2020; Helwig & Ruprecht, 2017). Further research validates noteworthy distinctions between male and female postgraduate students about how academic self-efficacy encourages academic procrastination via academic self-control (Liu et al., 2020).

Even experiencing a moment of relaxation can result from academic

procrastination. Students are concerned that they will not be able to succeed and that they will not be able to finish in time (Akabay & Delibalta, 2020). The critical thing to remember in this situation is that procrastination impacts and delays one's progress to success. Procrastination negatively affects students' subjective well-being, negatively impacting their health and academic achievement (Sirois and Pychyl, 2013; Steel and Klingsieck, 2016).

This result demonstrates how academic self-efficacy and future time perspective, based on the Temporal Decision Model (TDM), affect students' academic procrastination (Zhang et al., 2019) and can explain student academic procrastination well. This indicates that academic procrastination among students is related to elements or antecedents such as future time perspective, academic self-efficacy, and academic self-control. In line with the findings that academic self-efficacy and future time perspectives are motivating factors in procrastination, this study found that academic self-control and academic self-efficacy are antecedents of academic procrastination (Steel, 2007; Song et al., 2022) and self-control are essential elements that impact a person's decision-making when they procrastinate academic tasks (Zhang and Feng, 2019).

TDM focuses on the specifics of procrastination behaviour and delayed decision-making, where choosing whether to delay during the decision-making process is the primary action of procrastination. One of the main things influencing this decision-making process is self-control (Zhang and Feng, 2019). Several studies show that self-control negatively predicts procrastination (Digdon and Howell, 2008; Luczynski and Hanley, 2013; Kühnel et al., 2018; Przepiórka et al., 2019). When students begin a task, they will procrastinate and take longer to finish it if they lack the psychological resources and motivation to do it because they lack self-control.

The efficient use of self-control influences success in various areas of life. Improved psychological adjustment, improved grades, and enhanced interpersonal interactions are all positively correlated with higher levels of self-control (Tangney et al., 2004a). Most students who procrastinate often find it challenging to stick to their schedules due to a lack of self-control. Resources in other areas require less energy as self-control efforts in one area need much energy. Because they have fewer resources to devote to their sense of time, college students with poorer self-control are less likely to engage in time management activities. They could be better at controlling their time. When someone lacks self-control and begins working on a task without the psychological energy and motivation to finish it, they will procrastinate and take their time (Geng et al., 2018).

According to recent research, different parahippocampal circuits may modulate the impact of various personality qualities, such as future time perspective and regulatory mode, on procrastination (Zhang et al., 2017; Liu and Feng, 2019). The parahippocampal cortex, which depicts task aversiveness, may contribute to delay, while the hippocampus represents future rewarding rewards (Zhang, Becker, et al., 2019). The feature of future time perspective can be viewed as having a motivating component, and motivation helps to mitigate the negative consequences of depleting resources on self-control (Muraven et al., 2006), which reduces the depletion of self-control caused by various pressures, thereby reducing procrastination. Furthermore, a better future time perspective has a more potent motivating factor than a worse one, enabling people to exercise greater self-control and prevent themselves from putting things off (Song et al., 2022). According to Song et al., a more splendid future time perspective has a more potent motivating factor than a

lower one, enabling people to exercise more self-control and prevent procrastination because self-control resources are not being depleted. It also supports the research results of several previous studies, which report that there is a direct influence of future time perspective on academic procrastination (Taylor and Wilson, 2016; Kim et al., 2017; Zabelina et al., 2018; Liu and Feng, 2019).

Students with an excellent future time perspective can be told that they can set more perfect plans. Academic procrastination increases when people establish too large goals that require careful planning, which leads to failure to attain goals for the future (Taylor and Wilson, 2016). Different forms of procrastination will affect an individual's time perspective. Future time perspectives relate to academic procrastination (Andre et al., 2018; Fang and Zhang, 2019). The threshold for perceived procrastination decreases with increasing future time perspective (Ferrari and Diaz-Morales, 2007).

Academic self-control contributes as a mediator of the influence between future time perspectives and student academic procrastination. The study's findings confirm the results of Dreves and Blackhart (2019), who found that future time perspective is closely correlated with self-control. People with a longer-term outlook also exhibit greater self-control. According to the strong correlation between future time perspective and self-control, numerous studies have demonstrated that self-control mediates the impacts of future time perspective on mental health issues, including procrastination (Kim et al., 2017). Students with an extended future time perspective are more likely to be academically successful because they are better at managing their time and less likely to delay tasks.

Furthermore, students can reduce procrastination by having more specific future goals and solid behavioural commitments. This is because students with high academic self-control can resist the temptation to stick to the academic goals to be achieved. Additionally, Zhao et al. (2021) provides evidence that those with low self-control are at risk of procrastination because they get distracted and get by unrelated assignments, making it harder for them to complete assignments. People must develop self-control to decrease procrastination and enhance their general quality of life by improving their perspective on the future (Kim et al., 2017; Song et al., 2022). Several studies reveal that future time perspectives are related to academic procrastination (Andre et al., 2018; Fang and Zhang, 2019).

Academic self-efficacy is the variable that has the most significant influence on academic procrastination, followed by future time perspectives. This is because students need to believe in their abilities and take active actions related to academic tasks. High academic self-efficacy individuals are very persistent and put much effort into completing the learning plan (Bandura, 1977). The existence of strong beliefs in their abilities makes students able to complete challenges in academic tasks. Other studies also support the idea that academic self-efficacy negatively correlates with academic procrastination (Melton, 2013; Chang, 2017). Those conscious of pressure to perform well academically must have confidence in their skills and take initiative. Active procrastination is encouraged by strong self-efficacy, which will help prevent passive procrastination, which results in subpar performance. (Qian and Fuqiang, 2018).

The ability of a student to believe that they can succeed in a specific academic activity, goal, or task becomes crucial for them to finish their assignments and responsibilities (Bozgun and Baytemir, 2021). Students who think they cannot complete the assigned tasks within a certain period will postpone their

responsibilities and use procrastination to avoid the feeling of failure. In general, students who have good self-efficacy will be able to understand existing social situations, listen and pay attention to academic themes that are considered problematic, and have good technical skills. Thus, students can conduct self-assessments of their abilities and act to carry out and achieve the learning goals set (Liu et al., 2020). Additionally, procrastinating behaviour, characterized by a fear of failing and a lack of confidence to finish the work, indicates low self-efficacy (Moshtaghe & Moayyedfar, 2014).

The findings of this study support Melton's (2013) findings that academic procrastination and academic self-efficacy are significantly correlated. In addition to supporting the conclusions, Kandemir (2014) and research Chang (2017) showed that academic procrastination negatively correlates with academic self-efficacy. Additionally, the meta-analysis demonstrated that self-efficacy significantly and consistently predicts academic procrastination (Steel, 2007). Academic procrastination and academic self-efficacy are closely related, according to other research findings that are mostly consistent. Specifically, academic procrastination and academic self-efficacy are significantly negatively correlated (Zhou & Kam, 2017; Ziegler & Opdenakker, 2018; Przepiórka et al., 2019; Attia et al., 2020; Bozgun & Baytemir, 2021).

In addition to the future time perspective, academic self-control also significantly contributes as a mediator of the influence of academic self-efficacy on student academic procrastination. Liu and Feng (2019) has a comparable study that found a negative impact on academic procrastination and academic self-control and a positive correlation between academic self-efficacy and academic self-control. This shows that the association between academic procrastination and academic self-efficacy is mediated by academic self-control.

The investigation results show that high levels of academic self-efficacy contribute to students' confidence in achieving specific performances, which is a critical component of their academic success. Students who do not think they can finish a task are less likely to begin and stick with it. Balkis (2011) found that individuals who procrastinate have low perceived self-efficacy, and improving self-control skills will increase the perceived self-efficacy. This is associated with previous research showing that low levels of self-efficacy lead to academic procrastination (Kurland & Siegel, 2016; Özer & Yetkin, 2018; Gün et al., 2020). Similar research was also conducted by Arık (2019), which examined a relationship between academic procrastination behaviour and perceived self-efficacy, showing that procrastination behaviour is more common among students with low self-efficacy. The correlation between self-control and self-efficacy is well-established.

Students are less likely to begin and stick with an activity if they do not think they can finish it. However, individuals with high levels of self-efficacy are more confident, which makes them more driven to work harder to accomplish their goals, more assertive in the face of challenges, and more likely to finish their academic tasks on time rather than putting them off (Bakar & Khan, 2016). Students can constantly adjust their study behaviour with perseverance and effort or self-control to complete time goals and avoid procrastination. Academic self-efficacy can positively predict academic self-control, and there is a positive correlation between the two (Ein-Gar & Steinhart, 2017; Chen et al., 2019).

These findings suggest that the concept of academic procrastination with academic self-control mediates the Temporal Decision Model (TDM) from Zhang et al. (2019) is suitable for explaining the academic procrastination of students in Indonesia.

Conclusion

The theoretical model of academic procrastination among Surabaya City students has been empirically confirmed based on empirical evidence. This indicates that academic self-control influences student academic procrastination through future time perspective and academic self-efficacy. Academic self-efficacy is negatively connected with academic procrastination, and future time views also negatively affect it. Academic procrastination is also significantly impacted by future time perspectives and academic self-efficacy, which are mediated by students' academic self-control.

According to theory, this study's findings could influence how the Temporal Decision Model (TDM)based theory of academic procrastination is developed. Academic self-control, a mediator between academic self-efficacy and future time perspective, precedes students' academic procrastination. This finding is important because it provides information to students, lecturers, and universities on ways to reduce the sources of academic procrastination, and it is recommended that intervention programs or planned training to improve students' academic self-efficacy be made a top priority. Followed by intervention programs to enhance students' future time perspectives and academic self-control to reduce academic procrastination. Intervention programs focusing on cognitive skills such as time management and motivation are successful. Success depends on developing psychoeducational programs to reduce academic procrastination among college students. Other essential factors are academic self-efficacy, self-confidence, and planning daily activities.

Conflict of Interests

Authors have no conflict of interests.

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