
The attitude of procrastination and the desirable difficulties on the motivation to achieve independent learning goals in junior high school students in Karawang, West Java, Indonesia

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ABSTRACT (Times New Roman, bold, 10)

This study aims to determine the extent to which the desirable attitude of procrastination and difficulty affects the goals of independent learning. A stratified random sampling procedure was used to obtain 347 respondents from junior high school students from a population of 88.576 students. Motivation of independent learning goals as measured in the SELLMO scale test, procrastination attitude as measured by the Procrastination Scale Test (TPS, Tuckman). Mathematics lessons became subject the desirable difficulties of measured with a self-made instrument (Cronbach's Alpha = .82). The results of the study: There is a simultaneous significant effect of the attitude of procrastination and the desirable difficulty on the motivation of independent learning goals. Further findings there are differences in attitudes of procrastination and desirable difficulty between men and women, where women are higher than men in the motivation of independent learning goals.

Keywords (Times New Roman, bold, 9)

Keywords: attitude of procrastination, desirable difficulties, motivation to achieve independent learning goals

Introduction

Independent learning is a learning strategy through developing independent attitudes by diagnosing learning difficulties, and evaluating cognitive processes so as to encourage more active, creative learning and mastery of learning materials (Schunk, 2012; Sari & Zamroni, 2019). Meanwhile, the motivation for achieving independent learning goals is the attitude of students' tendencies to learn more deeply than related learning materials (Ngussa & Mbuti, 2017). There are two types of motivation to achieve goals, namely; mastery goal motivation and performance goal motivation (Elliot & Dweck, 1988). Mastery goal motivation reflects the drive to understand and master the learning content associated with the inherent task incentives, in addition to pursuing deeper learning with a long-term orientation. Meanwhile, performance goal motivation is an incentive to demonstrate competence related to personal achievement and result incentives ((Elliot, 2005; Weissgerber, et al, 2016; Jie. et all, 2020). The tendency of students who have higher mastery goal motivation will like tasks a difficult learning task than an easy task. However, for the purpose of material mastery to arise, it is necessary to use

the desirable difficulty related to the material (Tickle, 2001; Valentini & Rudisill, 2006). Desirable difficulty is a strategic challenge that can promote deep learning, invest long time in learning to support permanent improvements in understanding, and study harder (Bertsch, Pesta, Wiscott, & McDaniel, 2007). The positive effect of applying the desirable difficulty on strong understanding as a reflection of learning content, through processing new information associations, fostering links to broader applications, and mapping prior knowledge (Bjork, 1994; Roediger & Karpicke, 2006). Students' attitudes toward the desirable difficulties in independent learning are conditions of cognitive effort that subjectively make learning more difficult than simply receiving information, but require active and varied content creation (Bertsch, Pesta, Wiscott, & McDaniel, 2007). However; if the student's attitude is to avoid work or be late for academic assignments, or neglect studying preparation for exams, it is the impact of procrastination attitudes (Reinecke et al., 2018, Sudarman, 2022). Procrastination is the behavior of students in delaying doing tasks that causes the failure to achieve independent learning goals (Sudarman, 2022).

Literature Review

Motivation to Achieve Independent Learning Goals

The motivation for achieving independent learning goals is an encouragement to direct students' attitudes to master the material more deeply by applying the desirable difficulties to related tasks, and become an important determinant in achieving independent learning goals (Wigfield et al., 2016; Weissgerber et al., 2016). Previous research stated motivation for achieving learning goals as a potential moderator to influence mental engagement and cognitive resources that are intrinsically motivated to engage in stronger deep learning (Pintrich & Garcia, 1994; Ramsden, 2003). There is a relationship between goal achievement motivation and desirable difficulty, it can be explained that through deeper elaboration of learning content, and cognitive engagement, students are interested in learning more deeply, and invest more time in independent learning (Elliot, 2005; Steinmayr R, Weidinger AF, Schwinger M and Spinath B, 2019). Similar findings state that mastery goal motivation affects students' mental involvement to master in-depth learning content, explore content so as to gain satisfaction and experience (Pintrich & Garcia, 1994; Lina Natalya, 2018). Similar findings state that this achievement goal motivation predicts students' cognitive engagement, interest in a task to understand content through effective learning strategies that focus on elaboration, critical thinking, and metacognitive self-regulation (Maehr & Midgley, 1996; Kadioglu & Kondakci, 2014). Motivation to achieve independent learning goals is measured based on four indicators: related learning goals, approach performance goals, avoidance performance goals and tendencies to avoid work assignments (Weissgerber, et al, 2016).

Desirable difficulties

The desirable difficulty is a trigger for the encoding process of retrieval, understanding, remembering that supports independent learning, by applying the desirable difficulty to independent learning the tendency to increase the achievement of learning objectives (Bjork, R.A., & Bjork, E. L., 2020). Previous research stated that there was a relationship between mastery learning goal

motivation and desirable difficulty, namely, deeper content elaboration, increased cognitive engagement, and long-term skill development efforts rather than short-term performance outcomes; persist in the face of adversity (Elliot & Dweck, 1988). There is a significant positive relationship between desirable difficulty and mastery goal motivation, it is explained that students strive in learning tasks, and are persistent when facing obstacles (Elliot, McGregor, & Gable, 1999; Diseth & Kobbeltvedt, 2010; Soderstrom & Bjork, 2015). The research findings state that there are five indicators of measuring difficulty that we want to influence the motivation to achieve independent learning goals, namely: 1) learning materials, and content; 2) problem solutions are inferred from the learning content; 3) self-test of learned information; 4) distribute learning content across time rather than mass learning of material; 5) inserting topics rather than blocking similar learning content (Weissgerber, et all, 2016).

Attitude of procrastination

The attitude of procrastination to complete students' academic tasks is known as academic procrastination (Parantika, et all, 2020, Sudarman, 2022). The attitude of procrastination shows subjective discomfort, causing them stress and low academic achievement (Ferrari, J. et all., 1995). Several studies have stated that there is a significant relationship between procrastination with Desirable difficulty and achievement goal motivation, and directly affects low academic achievement because students procrastinate on homework, preparing projects and preparing for exams (Rozenal & Carlbring, 2014; Reinecke et al., 2018).

There is a negative correlation between the motivation for achieving independent learning goals with procrastination attitudes such as the tendency to avoid school assignments (Weissgerber, et all, 2016; Sudarman 2022). Likewise, there is a correlation between procrastination attitudes and Desirable difficulties, such as avoiding difficulties in exams, slow acting behavior. and always trouble others (Marian, & Roseanu, 2012; Parantika, et all, 2020). There are differences in procrastination attitudes between male and female students, where males are higher

than females in procrastination behavior, and there is a significant negative relationship between procrastination and the achievement of learning goals and directly affects the achievement of learning goals (Reinecke et al., 2018; Parantika, et al, 2020; Sudarman, 2022).

Objectives

The main purpose of this study was to determine the relationship between procrastination attitudes, the use of the desirable difficulty with the motivation to achieve independent learning goals. The assumption of this research is that the motivation for achieving independent learning goals is influenced by the attitude of procrastination and the desirable difficulty (Weissgerber et al, 2016; Parantika et al, 2020; Sudarman, 2022). Research questions: (1) is there a significant simultaneous effect of the attitude of procrastination and desirable difficulty on the motivation to achieve independent learning goals? (2) is there significant differences in procrastination attitudes in male and female students on the motivation to achieve independent learning goals? (3) is there significant differences in desirable difficulties attitudes in male and female students on the motivation to achieve independent learning goals?.

Hypothesis

H₁: There is a simultaneous effect of the attitude of procrastination and desirable difficulty on the motivation to achieve independent learning goals

H₂: There are significant differences in procrastination attitudes in male and female students on the motivation to achieve independent learning goals

H₃: There are significant differences in desirable difficulties attitudes in male and female students on the motivation to achieve independent learning goals

Methods

Population

The target population in this study were junior high school students in Karawang for as many as 88 576 students from 202 junior high schools in Karawang district (89 public schools and 113 private schools).

Samples and Sampling Procedures

According to Navarro & Maldonado (2007), sample size, confidence level and confidence interval for a random sample, from a population of 88.576 junior high school students were accessible. Multistage sampling technique was used in the selection of samples by initial stratification of the area into urban, suburban and rural areas. A purposive sampling technique was used to select 28.470 students in grade 9 from each school. While proportional random sampling technique was used to select a sample size of 360 students, and 347 students could be analyzed.

Instrument

The instruments used in this study include the following three tests:

(1) Academic Procrastination Test adapts the Tuckman Procrastination Scale (TPS) with 35 items (Tuckman, 1991) with a Cronbach Alpha score of 0.83. Indicators used are like: I neglect schoolwork to spend more time playing games; When I have a deadline, I wait until the last minute; I always manage to find an excuse not to do something.

(2) The motivational test of learning achievement goals using the SELMO scale consists of 11 items that evaluate the orientation of learning objectives at the junior high school level (Spinath, Stiensmeier-Pelster, Schöne, & Dickhäuser, 2002). Items presented statements on a 5-point Likert-type scale (1: strongly disagree, 5: strongly agree). Examples of items "I like tasks that I have to think about the most"; "I want to master deep learning content"; "I like exploring new content"; "I study harder to gain satisfaction and experience"; "I study independently to achieve knowledge and competence ", with Cronbach's Alpha score = 0.80.

(3) The desirable instrument of difficulty in mathematics subjects at the junior high school level in independent learning. The instruments are produced by themselves because until now there is no standard size. Measurements are made on the basis of five types of desirable difficulty: (1) self-generated information, learning materials, and content; (2) independent generation of predictions and inferred problem solutions from learning content; (3) self-examination of learned information; (4) distributing learning content across time rather than mass learning of materials;

(5) insert topics rather than block similar learning content. Items presented statements on a 5-point Likert-type scale (1: strongly disagree, 5: strongly agree). As many as 10 items desirable instrument of difficulty in mathematics subjects, examples of instrument items: "I found a solution to the transformation material through problem cases independently"; "I can conclude the curved side space material from the module given by the teacher"; "I do trial & error in solving equations and quadratic functions solutions"; "I prefer to distribute learning content across time rather than working on repetitive problems"; "I can insert new topics in congruence and similarity materials", with Cronbach's Alpha score = 0.82.

Data Analysis

The first stage is tabulation of the list of junior high schools and the number of junior high school students in Karawang, there are 202 state high schools with a sample of 360 students, and 347 students can be analyzed. The second stage is the distribution of the Tuckman Procrastination Scale (TPS) instrument as many as 35 items, the SELLMO instrument as many as 11 items and the desirable instrument of difficulty in mathematics subjects as many as 10 items. The third stage was

data analysis which was carried out using the multivariate covariance analysis method (MANCOVA), the data was tested based on Kolmogorov Smirnov normality and homogeneity test using Levene's test. Hypothesis testing using multiple linear regression summary model and t-Separated Test Variance with the help of software SPSS v23.

Results

Table 1. Shows that there is a significant negative relationship between procrastination and motivation on independent learning ($r = -0.812$; $p < .000$) and there is a significant negative relationship between procrastination and desirable difficulty ($r = -0.796$; $p < .000$) while desirable difficulty and motivation on independent learning had a significant positive relationship ($r = 0.773$; $p < .000$). This is still in line with previous research which states that desirable difficulties have a positive relationship with motivation to achieve independent learning goals, meanwhile previous research states that procrastination attitudes have a negative relationship with motivation on independent learning (Parantika et all, 2020; Sudarman, 2022).

Table 1. Descriptive statistic and correlations among variables

	Score Range	M	SD	Skew	Kurt	1	2	3
1. Procrastination	35-175	96,84	44,79	,310	-1,374	1		
2. Desirable difficulty	6-55	35,78	12,19	-,031	-1,301	-,769**	1	
3. Motivation on Independent learning	5-50	35,13	12,31	-,278	-1,467	-,812**	,773**	1

Table 2. Explains that the desirable difficulty and attitude of procrastination significantly predicts motivation in the achievement of independent learning goals, as evidenced by the standardized coefficients of multiple regression analysis (standardized coefficients beta): procrastination attitude ($\beta = -.534$, $p < .000$); and desireable difficulty ($\beta = .362$, $p < .000$). The standard predictive equation for motivation in the observed independent learning achievement goals is as follows: Motivation in independent learning achievement goals = -0.534 (procrastination) +

0.355 (desirabile difficulty). This finding is still relevant to several studies which show that procrastination influences and predicts motivation in achieving independent learning goals (Parantika et all, 2020 ; Sudarman, 2022). There is a relationship or influence between procrastination and the achievement of independent learning goals, when students procrastinate on tasks related to learning, achievement decreases due to depression and anxiety caused (Ferrari, et al. 1995; Rozental & Carlbring; Savithri, 2014).

Table 2. Coefficients of Standard Linear Regression of motivation to achieve independent learning

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	Beta	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	36,283	2,689		13,491	,000		
Procrastination	-,147	,012	-,534	-11,851	,000	,409	2,443
Desirable Difficulty	,366	,046	,362	8,025	,000	,409	2,443

Tables 3 and 4 describe the gender differences in the Desirable attitude of procrastination and difficulty indicated by the 95% confidence interval for the mean obtained; procrastination differences on male (lower bound Mean= 99.23, upper bound mean = 113.63); female (lower bound Mean= 82.05, upper bound mean = 94.04). It was found that there was a difference in procrastination attitudes between males and females, where males were higher than females (M = 99.23 > M = 94.04). Based on the hypothesis testing in table 4 using the separate t test formula at a significance level of 5% and degrees of freedom (dk) = 347-2 = 345, it is obtained that t count = 3.896 > t table = 1.960., Sig. (2-tailed) p < 0.000. This means that H2 is accepted, there is a significant difference in the attitude of procrastination in male and female

students in junior high schools in Karawang Regency.

Likewise, it was found that the desirable difficulty attitude obtained the mean on mele (lower bound Mean = 33.51, upper bound mean = 36.18); female (lower bound Mean= 34.50, upper bound mean = 37.07). Meanwhile, the attitude of women's desirable difficulty was higher than that of men (M = 34, 50 > M = 32,51). Based on the hypothesis testing in table 4 using the separate t test formula at a significance level of 5% and degrees of freedom (dk) = 347-2 = 345, it is obtained that t count = 2.118 > t table = 1.960., Sig. (2-tailed) p < 0.035. This means that H3 is accepted, there is a significant difference in the attitude of desirable difficulty in male and female students in junior high schools in Karawang Regency.

Tabel. 3 Descriptive Statistic Gender Differences in Attitude Procrastination and Desirable Difficulty

		N	Mean	Std. Dev	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Procrastination	Male	166	106,4337	46,98928	99,2328	113,6347
	Female	181	88,0497	40,88117	82,0537	94,0457
Desirable Difficulty	Male	166	34,3494	11,98528	32,5127	36,1861
	Female	181	37,1105	12,26145	34,5024	37,0768

Tabel. 4 Significance of the Difference Test between Male and Female in Procrastination and Desirable Difficulty

	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Procrastination	12,322	,001	3,896	345	,000	18,38401
Desirable Difficulty	1,277	,259	2,118	345	,035	2,76110

Hypothesis Testing

H₁: There is a simultaneous significant effect of the attitude of procrastination and the desirable

difficulty on the motivation to achieve the goals of independent learning. Multiple regression analysis and summary model showed that: There was a

significant effect of procrastination behavior, desirable difficulty on motivation to achieve independent learning goals (R square = 0.792; $F = 306.888$, $p = .000$), as evidenced by the standardized coefficient of multiple regression analysis (standardized coefficients beta): attitude of procrastination ($\beta = -.534$, $p < .000$); and desirable difficulty ($\beta = .362$, $p < .000$). So that hypothesis 1 is accepted.

H₂: There are significant differences in procrastination attitudes in male and female students in the motivation to achieve independent learning goals. Based on the separated t-test variance analysis of the procrastination on male and female formula at the significant level of 5% and degree of freedom (df) = $347-2 = 345$, it was found that $t \text{ count} = 3.896 > t \text{ table} = 1.960$ and Sig. $0.000 < 0.05$, it means that there are significant different of procrastination in male and female in junior high school in Karawang. So hypothesis 2 is accepted.

H₃: There is a significant difference in the desirable difficulty of male and female students in the motivation to achieve independent learning goals. based on the separate t-test variance analysis of male and female procrastination formulas at a significant level of 5% and degrees of freedom (df) = $347-2 = 345$, it was found that $t \text{ count} = 2.118 > t \text{ table} = 1.960$ and Sig. $0.035 < 0.05$, meaning that there is a significant difference from the desirable difficulty for male and female students in junior high school in Karawang. So hypothesis 3 is accepted.

Discussions

The results of research regarding the motivation for achieving independent learning goals are interesting to discuss. The findings of the first study stated: There was a simultaneous significant effect of the variable attitude of procrastination, the desirable difficulty on the motivation to achieve independent learning goals (R square = 0.792; $F = 306.888$, $p = .000$). Evidenced by the standardized coefficients of multiple regression analysis (standardized coefficients beta): procrastination attitude ($\beta = -.534$, $p < .000$); and desirable difficulty ($\beta = .362$, $p < .000$). Multiple correlation obtained that there is a significant negative relationship between procrastination and

motivation on independent learning ($r = -0.812$; $p < .000$) and there is a significant negative relationship between procrastination and desirable difficulty ($r = -0.796$; $p < .000$) while desirable difficulty and motivation on independent learning had a significant positive relationship ($r = 0.773$; $p < .000$). This finding are supported by research conducted by Ferrari, et al. (1995); Rozental & Carlbring; Savithri (2014) that there is a significant correlation between the motivation to achieve the goals of independent learning with the attitude of procrastination and the desirable difficulty. Attitude of procrastination and the desirable difficulty predict motivation in achieving independent learning goals with prediction equation as follows: Motivation in independent learning achievement goals = -0.534 (procrastination) + 0.355 (desirabile difficulty). This finding is still relevant to several studies which show that procrastination influences and predicts motivation in achieving independent learning goals (Parantika et al, 2020 ; Sudarman, 2022).

The results of the study stated that the motivation for achieving independent learning goals is an attitude of student learning tendencies that is deeper than the related learning material, which of course is obtained from the desirable difficulty strategy. This is due to the cognitive effort of students to make learning more difficult with longer time in processing new, wider associations of information, with active and varied content and mapping previous knowledge (Bertsch, Pesta, Wiscott, & McDaniel, 2007; Bjork, 1994; Roediger & Karpicke, 2006; Ngussa & Mbuti, 2017). Other research states that the attitude of procrastination and the desirable difficulty variable simultaneously significantly affect the motivation for achieving independent learning goals (Lina Natalya, 2018; Steel, 2007; Tuckman, 2003). The attitude of procrastination that accompanies it has a negative impact on the motivation to achieve independent learning goals, the behavior of students who procrastinate on doing assignments, avoid work or be late for academic assignments, or neglect studying preparation for exams, causing failure to achieve independent learning goals (Reinecke et al., 2018; Sudarman, 2022). Meanwhile, utilizing the

Desirable difficulty is important to support independent learning (Bjork, R. A., & Bjork, E. L., 2020). Similar findings state that there is a significant positive relationship between Desirable difficulty and mastery goal motivation, it is explained that students try hard in completing learning tasks, and are persistent when facing obstacles (Elliot, McGregor, & Gable, 1999; Diseth & Kobbeltvedt, 2010; Soderstrom & Bjork, 2015). The next finding states that there is a strong and significant relationship between the motivation to achieve mastery goals with the attitude of using the desirable difficulty (Weissgerber; Reinhard; Schindler; 2016; Mzomwe Yahya Mazana, Calkin Suero Montero Respickius Olifage Casmir, 2019).

The findings of the second study stated: There are significant differences in procrastination attitudes in male and female students in independent learning. It was found that there was a difference in the attitude of procrastination between male and female, where male was higher than female ($M_{\text{male}} = 99.23 > M_{\text{Female}} = 94.04$) and from the separated t-test variance that $t \text{ count} = 3.896 > t \text{ table} = 1.960$ and $\text{Sig. } 0.000 < 0.05$. This finding is still consistent with the results of previous studies which stated that there are significant differences in academic procrastination between male and female students at Kompyang Sujana Cluster of Elementary School in North of Denpasar (Parantika et al, 2020). The difference in attitude of academic procrastination between male and female student certainly cannot be ruled out from the development of characteristic and learning style possessed by each student in doing an assignment. Differences from the beginning in male and female (conditioning matrix) which can be considered as a biological basis that allows the two gender to develop different procrastination behaviors (Monk, 2002).

The findings of the third study stated: There are significant differences in desirable difficulty in male and female students in independent learning. It was found that there was a difference in desirable difficulties between males and females, where females were higher than males ($M_{\text{Female}} = 34,50 > M_{\text{Male}} = 32,51$) and from separated t-test variance that $t \text{ count} = 2.118 > t \text{ table} = 1.960$ and $\text{Sig. } 0.035 < 0.05$. This finding is supported by

research conducted by (Elliot, McGregor, & Gable, 1999; Diseth & Kobbeltvedt, 2010; Soderstrom & Bjork, 2015) that there is a significant difference in desirable difficulties between male and female students in using the level of difficulty in carrying out learning tasks, and when faced with obstacles. Learning strategies using the Desirable difficulty can increase motivation to achieve learning goals (Zepeda, C. D., Martin, R. S., & Butler, A. C., 2020).

Conclusion

This study analyzes the attitude of procrastination and the desirable difficulties on the motivation to achieve independent learning goals in junior high school students in Karawang, West Java, Indonesia. Research findings show that the desirable difficulty and attitude of procrastination has a significant effect on the motivation to achieve independent learning goals. The second research finding show that it was found that there was a difference in procrastination attitudes between males and females, where males were higher than females in the motivation to achieve independent learning goals. The third finding is found that there are differences in desirable difficulties between male and female, where female is higher than male in motivation to achieve independent learning goals.

Limitations and Future Studies

This research theoretically can be used as information for teachers and students about the use of independent learning strategies by utilizing the desirable difficulty. The relationship with the attitude of academic procrastination has a negative impact on the motivation to achieve independent learning goals, especially at the junior high school level. Practically, this research is useful for teachers and students in choosing independent learning strategies, and as information material for teachers in activities to improve student discipline when working on assignments so as not to be delayed and at the same time foster a habit for students to complete assignments on time. The limitations of this study are that the selected participants are 9th grade junior high school students, this would be complete if the researcher

involved all 8th and 7th grade students, both boys and girls. In addition, for the purposes of further research policy in the future, the results of this study provide information about the attitude of academic procrastination and the desirable difficulties between boys and girls that affect the achievement of learning objectives in the classroom.

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