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## **The Role of Self-Efficacy and Optimism on Academic Stress Towards Industrial Engineering Students at Universitas Ahmad Dahlan, Yogyakarta Batch 2017-2019**

Baiq Yani Permata Sakti<sup>a\*</sup>, Siti Urbayatun<sup>b</sup>, Ciptasari Prabawanti<sup>c</sup>

<sup>a,b,c</sup>*Universitas Ahmad Dahlan Yogyakarta, Indonesia*

<sup>a</sup>*Email: baiqyanijustone@gmail.com*

<sup>b</sup>*Email: siti.urbayatun@psy.uad.ac.id*

<sup>c</sup>*Email: ciptasari.prabawanti@psy.uad.ac.id*

### **Abstract**

This study aimed to determine the role of self-efficacy and optimism on academic stress toward Industrial Engineering students at Universitas Ahmad Dahlan, Yogyakarta. This research applied quantitative methods. Stratified cluster sampling was also used as the sampling technique. Besides, the data collection employed the scale of academic stress, self-efficacy, and optimism while the number of participants in this study consisted of 120 Universitas Ahmad Dahlan's students majoring Industrial Engineering. The analysis in this study adopted multiple linear regression with the assumption test including normality test, multicollinearity linearity test and hypothesis test. The results showed that two of the three hypotheses proposed were significant or accepted, and another one was insignificant or rejected. Based on the results of the study, it can be concluded that the first hypothesis showed significant role of self-efficacy and optimism on academic stress with a value of  $p = 0,000$  ( $<0.01$ ) and an R square value of 0.200. It showed an effective contribution of 20%. The second hypothesis revealed a high significant role of self-efficacy on academic stress with a value of  $p = 0.01$  ( $\leq 0.01$ ). Eventually, the third hypothesis did not indicate role of optimism on academic stress.

**Keywords:** academic stress; self-efficacy; and optimism.

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\* Corresponding author.

## **1. Introduction**

University is an educational institution performing a role in society, is responsible for developing human resources and improving the quality of highly competitive individuals through activities which advance knowledge and scholarships and provide professional education [1]. College life will demand students to deal with complex academic tasks such as completing assignments, having exams, doing internships, and undergoing more complex theories. Some problems may occur such as emotional problems and incompatibility between expectations and reality. Students are faced with high demands, and they are not able to understand the problem and adjust well so that they are vulnerable to stress [2]. College students experience stress caused by demands of academic life beyond the limits of their ability. Stress is a depressed state both physically and psychologically. Academic competition, difficult college assignments, demands from parents and the close relationship between students and lecturers are stressors for them [3]. Stress effected by academics is called academic stress. Academic stress is an under-pressure condition as a result of students' perceptions and judgments about academic stressors related to the number of assignments, strict deadline assignments, and others [4]. Academic stress encountered in a long period of time can reduce academic achievement, a barrier of individuals' ability to involve themselves in college life, misuse of nature and other destructive behaviors [5,6]. The negative effects of stress can be in the form of cognition, emotions, physiology, and behavior. Cognitive impacts lead the difficulty to concentrate, recall and understand lessons. Then, emotional impacts show anxiety, sensitivity, low self-motivation, sadness, and depression. Physiological effects indicated health problems, the decrease of immune-system, often dizzy, the sensation of lethargic and weak body, and insomnia. Lastly, the effects of behavior show the procrastinated behavior in completing tasks, slothful to attend the college classes, and even leading the use of drugs. Awkwardness, insufficient time to study, workload every semester, low motivation, unprepared exams, and high expectations from family can cause academic stress. Besides, fear and failure are the main sources of stress [7]. Several factors that can affect academic stress according to research results are self-efficacy [8,9,10], optimism [11,12,13], gender [14,15,16], self-esteem [17,18], resilience [19,20], relationships with parents [21], hardiness personality [22,23], social support [24,25,26]. The research was conducted by using self-efficacy factors and optimism. One of the factors that cause academic stress is self-efficacy. [27] self-efficacy is a belief about the extent to which individuals estimate their ability to carry out tasks or perform an action that is needed to achieve the desired results [3]. Self-efficacy is considered as an ability to reduce stress. The results found that there was a significant negative relationship between self-efficacy, achievement motivation and academic postponement with academic stress [10]. Reference [9] soft skills and self-efficacy have a significant influence on academic stress. Another factor that can affect stress is optimism. Optimism is an overall view, sees good things, thinks positively, and easily shows self-meaning [28]. The results found that there was a significant negative relationship between optimism and academic stress [12]. In addition, optimism and resilience significantly affect academic stress. The aim of this study was to examine the role of self-efficacy and optimism towards academic stress [13]. The hypotheses in this study are 1) there is a role for self-efficacy and optimism together with academic stress. 2) there is a role for self-efficacy in academic stress. 3) there is a role for optimism for academic stress.

## **2. Research Methods**

### ***2.1 Population and Sample***

The population in this study consisted of all Industrial Engineering students at Ahmad Dahlan University. The number of subjects used in this study were 120 students of the Industrial Engineering batch 2017-2019 at Ahmad Dahlan University. The research sampling technique applied stratified cluster random sampling technique

### ***2.2 Measurement Instruments***

Academic stress was revealed by using an academic stress scale that referred to aspects of academic stress, namely physiological, emotional, cognitive, and behavioral aspects [3]. Self-efficacy is indicated by self-efficacy scale that referred to aspects of task difficulty level (magnitude), the strength of confidence (strength) and (generality) [27]. Optimism is exhibited by adopting the optimism scale in referring to the dimension of permanence, pervasiveness, and personalization [28].

### ***2.3 Validity and Reliability of Measurement Instruments***

Measurement instruments were tested on 40 students of Industrial Engineering at Dahlan University. The self-efficacy scale consisted of 42 items. After testing the scale, the obtained corrected item-total correlation moved between 0.878 to 0.902. Based on these results, the self-efficacy scale could be used as a valid and reliable data collection tool. The scaling model employed in the self-efficacy scale was Likert scaling model. The optimism scale consisted of 42 items. After testing the scale, the obtained corrected item-total correlation moved between 0.887 to 0.941. Based on these results, the optimism scale could be applied as a valid and reliable data collection tool. The scaling model used on the optimism scale was Likert scaling model.

### ***2.4 Data Analysis***

The parametric statistical method was used to analyze the research data. Data analysis was performed using SPSS 20 through multiple regression test techniques. It is a statistical analysis technique to determine the role of two independent variables (self-efficacy and optimism) with one dependent variable (academic stress). The assumption test conducted before the hypothesis test was normality test, linearity test and multicollinearity test.

## **3. Results and Discussions**

### ***3.1 Prerequisites Test***

Normality test

The normality test aimed to see whether the distribution of the subject's score is normal or not on the variables of academic stress, self-efficacy, and optimism. The normality test was undertaken by using one sample-Kolmogorov-Smirnov test. The analysis showed that all three variables revealed normal distribution presented

in table 1 below.

**Table 1:** Distribution Normality Test

Variable	K-S Z	P	Qualification
Self-efficacy	0,909	0,381	Normal
Optimism	1,030	0,239	Normal
Academic stress	0,819	0,514	Normal

#### Linearity test

The results of the linearity test were considered by p-linearity values of 0,000 ( $p < 0.05$ ) and p-deviations of 0.290 and 0.843 ( $p > 0.05$ ) respectively. Hence, it can be summarized that between each independent variable and dependent variables had the linearity. The results of the linearity test were shown in table 2 below.

**Table 2:** Linearity Test

Variable	Linearity		Deviation from Linearity		Qualification
	F	Sig. (p)	F	Sig. (p)	
Self-Efficacy with Academic Stress	30,322	0,000	1,166	0,290	Linier
Optimism with Academic Stress	14,373	0,000	0,659	0,843	Linier

#### Multicollinearity test

The multicollinearity test intended to ensure that there was no multicollinearity relationship between the two independent variables. Based on table 4 below, it denoted that the two variables have a value of tolerance = 0.345 ( $> 0.1$ ) and VIF value = 2.895 ( $< 10$ ). This can deduce that there was no multicollinearity toward the two independent variables.

**Table 3:** Multicollinearity Test

Variabel	Tolerance	VIF	Qualification
Self-efficacy	0,345	2,895	There was no multicollinearity
Optimism	0,345	2,895	There was no multicollinearity

**Table 4:** The results of the regression analysis

Variabel	F	Sig
Academic stress	14,623	0,000
Self-efficacy		
Optimism		

Based on the table above, it presented the value of  $F = 14,623$  and a significant level of  $p = 0,000$  ( $p < 0.01$ ) which meant that there was a high role of self-efficacy and optimism toward academic stress. According to the results of the analysis in general, the major hypotheses put forward were considered true as there was a strong significant role between self-efficacy and optimism toward academic stress. The contribution of independent variables to the dependent variable can be recognized from the results of the regression determination in the following table:

**Table 5:** Test results of determination coefficient analysis

Model	R	R square	Adjusted r square	Std. Error of the estimate
Analysis of determination coefficient	0,447	0,200	0,186	3,618

Based on the table above, it can be identified that R square was of 0.200 in percentage ( $0.273 \times 100\% = 20\%$ ) meaning that both self-efficacy and optimism contributed to academic stress by 20% while the remaining 80% was influenced by other factors, and they were not examined in this study.

**Table 6:** Hypothesis test results for self-efficacy variables on academic stress

Variable	T	Sig	Beta	Zero Order
Self-efficacy	3,549	0,001	0,499	0,445

Based on the table, it revealed the significant level of  $p = 0.001$  ( $p \leq 0.001$ ) and t value of 3.549, which means that there was a highly significant role between self-efficacy and academic stress. The effective contribution of the self-efficacy variable to academic stress was calculated by the formula  $SE = \beta \times \text{zero} \times 100\%$  with a value of  $SE = 0.499 \times 0.445 \times 100\% = 22.20\%$ . Thus, the self-efficacy variable played its role on academic stress. The total effective contribution was 22.20%. Therefore, self-efficacy was a variable that played a significant role with academic stress in Industrial Engineering students at Ahmad Dahlan University.

**Table 7:** Hypothesis test results for optimism on academic stress

Variable	T	Sig	Beta	Zero Order
Optimism	-0,473	0,637	-0,067	0,337

The aforementioned table appointed the significance level of  $p = 0.637$  ( $p > 0.05$ ) and  $t$  value of  $-0.473$  which means there was no role of optimism on academic stress. The minor hypothesis submitted was untested, and the obtained data proved that there was no role of optimism on academic stress. The results of the regression test analysis indicated that there was a highly significant role of self-efficacy and optimism towards academic stress with a value of  $p = 0,000$  ( $p < 0.01$ ) and a value of  $F = 14,623$ . The regression analysis results of the two independent variables, namely self-efficacy, and optimism on student academic stress found that self-efficacy and optimism simultaneously contributed to student academic stress. The results indicated that the first hypothesis was accepted so that academic stress variables could be predicted based on self-efficacy and optimism. Together with the two independent variables, they have an  $R$  square value of  $0.200$  with a contribution of  $20\%$  to academic stress and the remaining  $80\%$  can be influenced by other variables. The second hypothesis showed  $p = 0.637$  ( $p > 0.05$ ) and  $t = -0.473$ . There was no significant role between optimism on academic stress in students of Industrial Engineering at Ahmad Dahlan University. This was consistent with the results of previous studies. The results found that there was no role of optimism with stress reactivity [29]. In the third hypothesis, it was obtained that the value of  $p = 0.001$  ( $p < 0.01$ ) and  $t$  value =  $3.549$  meaning that there was a high significant role between self-efficacy on academic stress. Hence, the hypothesis was accepted. In the second hypothesis proposed, there was a highly significant role between self-efficacy on academic stress so that the hypothesis was also accepted. In addition, the results of the study discovered that there was a significant negative correlation of self-efficacy, achievement motivation and academic postponement with academic stress [10]. Soft skills and self-efficacy had a significant influence on academic stress [9]. Self-efficacy was considered as one of the abilities to reduce stress, able to work hard, persevere to complete the work [3]. Therefore, the role of self-efficacy is needed about the belief in dealing with problems. Lastly, self-efficacy has an important role in reducing stress.

#### **4. Conclusions**

Based on the results of data analysis, the study recapitulated that 1) There was a role of self-efficacy and optimism that are significant toward the academic stress experienced by Industrial Engineering students at Ahmad Dahlan University. 2) There was an incredibly significant role of self-efficacy on the academic stress of students of Industrial Engineering Study Program at Ahmad Dahlan University. 3) There was no role of optimism toward academic stress of Industrial Engineering students at Ahmad Dahlan University, Yogyakarta.

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