

The Influence of Growth Mindset on Grit among University Students: A Quantitative Study

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Abstract

Grit refers to a condition in which university students persist in pursuing long-term goals, accompanied by perseverance that enables them to remain resilient when facing challenges or failures throughout the process. This study aimed to examine the effect of growth mindset on students' levels of grit. A quantitative approach was employed in this research. The sample consisted of 380 students from nine faculties at University X, selected using a convenience sampling technique. Data were collected using two psychological scales: a grit scale comprising 26 items ($\alpha = 0.918$) and a growth mindset scale comprising 18 items ($\alpha = 0.909$). Both instruments had been tested for validity and reliability. The results of the analysis showed a significance value of 0.000, indicating that growth mindset has a significant effect on grit. The correlation coefficient ($R = 0.751$) indicates a strong positive relationship, suggesting that the two variables are positively associated. These findings are beneficial for educational institutions in designing growth mindset development programs to enhance students' resilience and perseverance in dealing with academic challenges.

Keywords: grit; growth mindset; university student

Abstrak

Grit merupakan suatu keadaan di mana seorang mahasiswa mempertahankan sesuatu yang akan diraih dalam jangka panjang yang harus didampingi dengan ketekunan agar tidak putus asa ketika menghadapi tantangan maupun kegagalan dalam proses tersebut. Penelitian dilakukan dengan tujuan untuk melihat pengaruh *growth mindset* terhadap tingkat grit yang dimiliki mahasiswa. Pendekatan kuantitatif dengan digunakan dalam penelitian ini. Sampel yang digunakan terdiri dari 380 mahasiswa dari 9 fakultas di Universitas X dengan menggunakan teknik *convenience sampling*. Data dikumpulkan menggunakan dua skala, yaitu skala grit yang terdiri dari 26 butir soal dengan $\alpha = 0,918$ dan skala *growth mindset* yang terdiri dari 18 butir soal dengan $\alpha = 0,909$. Kedua skala tersebut telah melewati uji validitas dan reliabilitas. Hasil analisis menunjukkan signifikansi 0,000 yang memiliki arti terdapat pengaruh *growth mindset* terhadap grit. Nilai $R = 0,751$ sehingga terdapat korelasi positif dengan makna hubungan antara kedua variabel searah. Temuan ini bermanfaat bagi lembaga pendidikan untuk merancang program pengembangan *growth mindset* sebagai upaya meningkatkan ketahanan dan ketekunan mahasiswa dalam menghadapi tantangan akademik.

Kata kunci : ketangguhan; mahasiswa; pola pikir bertumbuh

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Introduction

Higher education, as regulated by Law of the Republic of Indonesia Number 12 of 2012, is the level of education pursued after secondary education. Its purpose is to enhance the nation's competitive capacity by advancing science and technology and by developing human resources who are creative, resilient, and possess strong character. Data from the Central Statistics Agency ([Badan Pusat Statistik, 2024](#)) indicate that there are 8,467,714 active university students in Indonesia, underscoring the strategic role of students in national development. University students are not only required to master scientific knowledge but also to develop personality, independence, and critical as well as reflective thinking skills. To fulfill these roles, students must also possess the ability to persist in the face of various academic and non-academic challenges in order to achieve long-term goals. This capacity is commonly referred to as grit.

Students with high levels of grit are characterized by perseverance and strong enthusiasm in pursuing long-term academic goals, even when confronted with difficulties or failure. They tend to demonstrate effective planning skills, good time management, and resistance to unproductive distractions. Consequently, grit plays a crucial role in supporting student success, as students recognize that achievement depends not only on intelligence but also on long-term commitment and sustained effort. A preliminary survey conducted by the researchers involving 24 students from a public university in Malang City, using a Google Form, revealed a tendency toward low levels of grit. Of the 24 participants, 87.5% reported completing assignments close to deadlines, 95% worked efficiently only under pressure, and 95.8% were easily distracted by social media when working on difficult tasks. These findings further highlight the importance of examining factors that may influence students' grit.

Grit, as introduced by Duckworth et al. (2007), refers to the trait of perseverance and passion that enables individuals to continue striving toward their goals. Individuals with grit are able to endure challenges, failures, and setbacks while maintaining their interest and effort over extended periods of time. They view achievement as a marathon, in which stamina becomes the primary advantage for persisting until goals are achieved. Furthermore, grit has been shown to be positively associated with various adaptive outcomes among both adolescents and adults ([Credé et al., 2017](#)). Theoretically, grit consists of two main components: consistency of interest and perseverance of effort ([Duckworth et al., 2007](#)). This conceptualization is supported by Christopoulou et al. (2018) and Takiuddin and Husnu (2020), who emphasize the importance of these two aspects in sustaining students' motivation to pursue academic goals.

One factor that influences an individual's level of grit is growth mindset. This concept was first introduced by Dweck (2006) and refers to the belief that one's abilities can be developed through effort, learning, and experience. Students with a growth mindset tend to be more open to challenges, less likely to give up, and more inclined to view failure as part of the process toward success ([Hochanadel & Finamore, 2015](#)). Collaborative research by Duckworth and Dweck (as cited in [Christiana & Sembiring, 2017](#)) also confirms that a growth mindset can strengthen grit, whereas a fixed mindset toward failure may hinder academic success.

In line with this, numerous previous studies support the significant contribution of growth mindset to grit. Ibtihajmawati and Primanita R (2024) found that growth mindset contributed 51.4% to grit among students working on their undergraduate theses. Novanto (2023) also reported a positive effect of growth mindset on the grit of Islamic boarding school students. Additionally, research by Kaya and Yuksel (2022) reinforced these findings by demonstrating that individuals with higher levels of growth mindset are better able to persist and remain diligent when facing challenges. These results are consistent with studies by Christiana and Sembiring (2017), Khoiriyah Annisatul (2023), Hu et al. (2022), and Sethi and Shashwati (2019), all of which emphasize that growth mindset enhances motivation, resilience, and the ability to cope with failure. Furthermore, individuals with high levels of grit tend to possess greater determination, resilience, and focus, which contribute to higher levels of success compared to individuals with lower levels of grit (Eskreis-Winkler et al., 2014). Grit also encourages individuals to remain goal-oriented despite encountering obstacles (Rosyadi & Laksmiwati, 2018).

Based on the above discussion, Duckworth et al. (2007) identified two primary dimensions of grit: (a) perseverance of effort, defined as sustained effort despite obstacles, and (b) consistency of interest, defined as the ability to maintain interest in long-term goals. Meanwhile, Clark and Malecki (2019), as cited in Kidayani and Setyowibowo (2024), added three additional aspects: determination, resilience, and focus. Thus, grit can be understood as the foundation of academic perseverance, while growth mindset functions to strengthen this foundation by fostering the belief that abilities can continually develop.

Nevertheless, although previous studies have provided evidence of a positive influence of growth mindset on grit (Novanto, 2023; Ibtihajmawati & Primanita R, 2024; Kaya & Yuksel, 2022), most of these studies are limited to specific contexts, such as students writing undergraduate theses or students in Islamic boarding schools, and often involve relatively small sample sizes. This condition reveals a research gap regarding a broader understanding of how growth mindset contributes to student grit across diverse academic contexts. Therefore, the present study examines the impact of growth mindset on the grit of students at University X from various non-medical faculties, using a larger sample size. Accordingly, this study is expected to contribute to the enrichment of the literature on psychological factors supporting students' academic resilience, as well as to serve as a basis for universities in designing growth mindset-based personal development strategies.

Research Method

This study employed a quantitative research design aimed at examining the effect of growth mindset on students' grit. The research adopted a numerical approach that focuses on the statistical processing and analysis of quantitative data. The participants consisted of 380 non-medical undergraduate students, who were selected using a convenience sampling technique. Data were collected using two psychological measurement scales: a grit scale and a growth mindset scale. The grit scale was developed based on the theory proposed by Duckworth et al. (2007) and consisted of 26 items, demonstrating high internal consistency ($\alpha = 0.918$). Responses were rated on a four-point Likert scale ranging from Strongly Agree (SA), Agree (A), Disagree (D), to Strongly Disagree (SD).

The growth mindset scale was constructed based on Dweck's (2006) theoretical framework and consisted of 18 items, with a Cronbach's alpha coefficient of 0.909, indicating good reliability. Responses were measured using a six-point Likert scale: Strongly Appropriate (SA), Appropriate (A), Moderately Appropriate (MA), Less Appropriate (LA), Inappropriate (IA), and Strongly Inappropriate (SI). Data analysis was conducted using simple linear regression analysis, preceded by assumption tests as a preliminary step to ensure the suitability of the data for regression analysis.

Results

The research respondents were non-medical undergraduate students from University X with the following characteristics:

Table 1. General Characteristics of Research Respondents

Characteristics	Frequency	Percentage
Gender:		
Male	139	37,2%
Famale	241	62,8%
Age:		
18 – 20	127	33,4%
21 – 23	220	56,8%
24 – 26	33	9,8%
Semester:		
2	51	13%
4	95	25%
6	152	40%
8	82	22%
Faculty:		
Psychology	49	12,8%
Economicsr & Buseness	67	17,3%
Educational Sciences	48	12,6%
Engineering	47	12,3%
Literature	36	9,5%
Mathematics & Natural Sciences	38	10,1%
Sports Sciences	29	7,8%
Social Sciences	48	12,6%
Vocational Studies	18	5%

Descriptive statistical analysis presented in Table 2 shows that, out of 380 respondents, 60 students (15.8%) were categorized as having high grit, 260 students (68.4%) were classified as moderate, and 60 students (15.8%) were classified as low. Regarding the growth mindset scale, 103 students (27.1%) obtained high scores, 217 students (57.1%) were in the moderate category, and 60 students (15.8%) were in the low category. These descriptive findings indicate that the majority of students at University X exhibit a moderate level of grit.

Table 2. Categorization of Research Respondents

Category	Grit			Growth Mindset		
	Guidelines	Number	Percentage	Guidelines	Number	Percentage
Very Low	X < 37,7	0	0	X < 38,25	0	0%
Low	37,7 – 62,9	60	15,8%	38,25 – 63,75	60	15,8%
Moderate	62,9 – 88,1	260	68,4%	63,75 – 89,25	217	57,1%
High	88,1 – 113,3	60	15,8%	89,25 – 114,75	103	27,1%
Very High	X > 113,3	0	0	X > 114,75	0	0%

The linearity test presented in Table 4 shows a significance value of 0.000, which is less than 0.05. This finding indicates that the relationship between growth mindset and grit is not linear.

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test		Unstandardized Residual
N		380
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	7,83339374
Most Extreme Differences	Absolute	,054
	Positive	,032
	Negative	-,054
Kolmogorov-Smirnov Z		1,047
Asymp. Sig. (2-tailed)		,223
a. Test distribution is Normal.		
b. Calculated from data.		

The linearity test presented in Table 4 shows a significance value of 0.000, which is less than 0.05. This finding indicates that the relationship between growth mindset and grit is not linear.

Table 4. Linearity Test

Source	Sum of Squares	df	Mean Square	F	Sig.
Linearity	29,261.138	1	29,261.138	549.973	0.000
Deviation from Linearity	6,017.916	54	111.443	2.095	0.000
Within Groups	17,238.304	324	53.205		
Total	52,517.358	379			

Based on the assumption tests, the relationship between growth mindset and grit was found to be non-linear. Therefore, non-linear regression analysis was applied using logarithmic, quadratic, and exponential regression models. To determine the most appropriate regression model, the R-square value and the standard error of the estimate were compared across models. Among the tested models, the exponential regression model demonstrated the highest explanatory power, with an R-square value of 56.4% and the smallest standard error of estimate (0.108). Consequently, the exponential regression model was selected for further interpretation.

The coefficient of determination shown in Table 5 indicates an R-square value of 0.564. This result suggests that growth mindset accounts for 56.4% of the variance in students' grit.

Table 5. Coefficient of Determination

Model Summary				
R	R Square	Adjusted R Square	Std. Error of the Estimate	
,751	,564	,563	,108	
The independent variable is Growth Mindset.				

The F-test results presented in Table 6 indicate a significance value of 0.000, which is less than 0.05. This finding confirms that growth mindset has a statistically significant effect on students' grit.

Table 6. F-Test Results

ANOVA						
	Sum of Squares	df	Mean Square	F	Sig.	
Regression	5,690	1	5,690	489,835	,000	
Residual	4,391	378	,012			
Total	10,081	379				
The independent variable is Growth Mindset.						

Table 7 presents the regression equation describing the relationship between growth mindset and grit. The regression equation is $Y = 36.461 + 0.009X$. This equation indicates that when growth mindset is zero ($X = 0$), grit remains at the constant value of 36.461. Furthermore, the regression coefficient of 0.009 suggests that for every one-unit increase in growth mindset, grit increases by 0.009 units.

Table 7. Results of the t-test calculation

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Growth Mindset	,009	,000	,751	22,132	,000
(Constant)	36,461	1,246		29,260	,000
The dependent variable is ln(Grit).					

Results

This study was conducted to examine whether there is an effect of growth mindset on the grit of students at University X. The results of the correlation test showed a coefficient of 0.751 with a significance level of 0.000, which is smaller than 0.05. This indicates a positive and significant correlation between growth mindset and grit. In other words, individuals with a high growth mindset tend to have higher levels of grit, whereas those with a low growth mindset tend to have lower grit. This finding is consistent with the study by Christiana and Sembiring (2017), which demonstrated that the correlation between growth mindset and grit is positive. Individuals with a growth mindset believe that basic abilities can be developed through effort. This belief encourages continuous learning and persistence, as they are confident that effort can improve their abilities. Such beliefs may influence students' levels of grit.

Ibtihajmawati and Primanita (2024) stated that students with a growth mindset tend to view their efforts more positively, are better able to overcome difficulties in academic tasks, and are more motivated in challenging situations, rather than relying solely on their existing abilities. Consequently, they are more

positive and develop strategies to exert greater effort when facing challenges, which reflects higher grit.

The F-test results showed a significance value of 0.000; therefore, it can be concluded that growth mindset has a significant effect on grit. These findings are in line with the study by Novanto (2023), which found a significant relationship between growth mindset and academic grit among Islamic boarding school students. A higher level of growth mindset is associated with a higher level of academic grit. Students with a growth mindset tend to be more persistent and willing to try new things and face challenges, as they believe that their potential can be developed. This is also consistent with the findings of Kaya and Yuksel (2022), which indicated that individuals with a growth mindset tend to be more persistent and demonstrate remarkable perseverance in achieving their goals. Possessing a growth mindset motivates individuals to continuously improve their abilities, which is an essential component of grit.

A meta-analysis of 66 studies involving more than 42,000 participants confirmed the association between growth mindset and grit (Lam & Zhou, 2025). Similarly, Wahidah and Royanto (2021) found a positive relationship between growth mindset and grit, showing that individuals with a stronger growth mindset tend to have higher levels of grit. This indicates that growth mindset can predict higher grit. Individuals with a growth mindset are more likely to possess resilience or grit, which ultimately makes them more persistent and capable of maintaining long-term focus. The coefficient of determination (R square) in this study was 0.564, indicating that growth mindset accounts for 56.4% of the variance in grit. The remaining 43.6% is influenced by other factors not examined in this study, such as interests, practice, goals, and expectations, as proposed by Duckworth (2016, cited in Tualeka & Bashori, 2023).

The practical implication of these findings highlights the importance of developing psychological intervention and educational programs that cultivate a growth mindset within the learning process. Universities and educators can design curricula that encourage students to view failure as part of the learning process and to value consistent effort in achieving goals. By doing so, students' grit can be enhanced, which in turn may promote academic achievement and overall psychological well-being. This study reinforces the understanding that growth mindset is not merely a theoretical concept but has tangible impacts that can empower students to become resilient, persistent, and adaptive individuals in facing various academic and life challenges.

Conclusions and Recommendations

Conclusions

Based on the formulation of the research problems and the hypothesis testing conducted, it can be concluded that growth mindset has an effect on grit. The results of the correlation analysis indicate a positive relationship between growth mindset and grit. The coefficient of determination shows a correlation value of 0.564, with an R square of 56.4%, indicating that growth mindset accounts for 56.4% of the variance in grit. The remaining 43.6% is influenced by other factors that were not examined in this study.

Recommendations

Based on the findings of this study, students are encouraged to continuously develop an open mindset toward challenges and failures as integral parts of the learning process, to maintain long-term motivation and commitment to their goals despite difficulties or setbacks, and to gradually shift their perspective on abilities from a fixed view to a more dynamic and developable one. Students are also encouraged to participate in training programs, seminars, self-development communities, or student activities that promote the strengthening of growth mindset and grit, in order to foster resilience, self-confidence, and continuous personal growth. For future researchers, it is recommended to include mediating or moderating variables, such as self-efficacy, resilience, or social support, to explore more complex mechanisms in the relationship between growth mindset and grit. Future studies may also employ longitudinal designs to examine how growth mindset and grit develop over time, as well as how changes in one variable may influence the other.

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