

Self-Efficacy and Academic Stress among Indonesian Undergraduate Students of the Strawberry Generation: The Moderating Role of Peer Academic Support

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Students from the strawberry generation frequently face significant academic pressure, necessitating an examination of the impact of self-efficacy and peer academic support on stress management. This study investigated the relationship between self-efficacy and academic stress among Indonesian undergraduate students, commonly referred to as the strawberry generation. Through a quantitative approach, this study is a correlational design with no experimental application to test whether the self-efficacy of strawberry generation students influences their academic stress and how academic support from peers increases or decreases the influence of the variables. Data were collected from 1,251 undergraduate students aged 18–23 years via an online questionnaire assessing self-

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efficacy (SE), academic stress (AS), and peer academic support (PAS). Data analysis utilized simple regression and ANOVA-based moderation regression within JASP software version 19.3.0. The results revealed a significantly, albeit weakly, negative association between self-efficacy and academic stress, suggesting that students with higher self-efficacy tend to report lower levels of academic stress. Despite a small explained variance ($R^2 = 0.007$), this finding underscores self-efficacy as a relevant psychological resource rather than a primary determinant of academic stress. Moderation regression analysis indicated that the interaction between self-efficacy and peer academic support was not significant ($p = 0.105$). This study contributes to a clearer understanding of the limited yet meaningful role of self-efficacy and questions the stress-buffering function of peer academic support.

Introduction

Strawberry Generation refers to the younger generation in Taiwan, born after the industrialisation of the 1970s and early 1980s (Murphy, 2018). This stereotype emerged in response to the perception that this generation is less persistent and more fragile than preceding generations (Murphy, 2018). More recently, the label has been loosely associated with Generation Z, particularly within Asian contexts, including Indonesia, where rapid socio-economic change, digitalization, and academic competition shape students' educational experiences (Prakash & Tiwari, 2021; Claretta, Rachmawati, & Sukaesih, 2022). Contemporary scholars argue that the "Strawberry Generation" does not imply inherent weakness but rather reflects heightened emotional sensitivity and contextual vulnerability within demanding educational systems, particularly in higher education. This generation is frequently perceived as being prone to mental health challenges and lacking persistence in the face of environmental pressures (Maribeth et al., 2024). In Indonesia, this narrative has gained increasing prominence in both public discourse and academic discussions, particularly within the context of higher education.

Generation Z faces numerous obstacles that compel them to demonstrate their abilities while challenging the stereotype of being the strawberry generation," particularly in higher education. Increasing academic pressure experienced by Generation Z students is linked to the complexity and competitive nature of contemporary higher education (Pante-Salas et al., 2025). Students contend with a heavy workload, demanding time constraints, and increasingly complex learning materials (Naidoo-Chetty & du Plessis, 2021; Pante-Salas et al., 2025). These pressures frequently manifest as academic stress, negatively impacting students' mental well-being and academic performance (Bakker & Mostert, 2024).

Academic stress refers to the psychological strain that arises when academic demands exceed an individual's perceived coping resources (Ramachandiran & Dhanapal, 2018). Contributing factors include high study pressure, demands to maintain academic performance, financial burdens, competition among students, and familial pressure (Ramachandiran & Dhanapal, 2018; Dikeç et al., 2023; Khairiyah et al., 2024). Academic stress affects individuals not only mentally but also physically. This stress affects individuals both mentally and physically; students experiencing it may exhibit symptoms such as fatigue, sleep disorders, loss of appetite, and digestive disorders (Ramachandiran & Dhanapal, 2018). Psychologically, academic stress is associated with increased anxiety and burnout (Dmitrović et al., 2024; Khairiyah et al., 2024). Untreated, academic stress can be significantly disruptive to students.



One important factor shaping individual resilience to pressure is self-efficacy. The ability of Generation Z students to handle the academic challenges they encounter, will also be faced with self-efficacy in managing their stress. Students with high self-efficacy tend to be more optimistic, demonstrate greater persistence, and employ adaptive coping strategies when facing academic challenges. Existing research indicates that self-efficacy can improve various psychological and academic dimensions, including speaking proficiency, academic performance, learning strategy development, and self-regulation (Purnomo et al., 2024; Alhadabi & Karpinski, 2020). Conversely, self-efficacy also plays a role in preventing deviant behaviors, such as academic dishonesty, reducing academic burnout, and enhancing problem-solving skills in everyday life (Honicke & Broadbent, 2016). Students with self-efficacy are better equipped to adapt to challenges encountered during lectures.

Self-efficacy is not formed instantaneously but can be developed and enhanced by various factors. Peer academic support is one external factor influencing its development (Yuri, Yendi, & Ardi, 2020). This support encompasses emotional assistance, information, and motivation provided by peers to facilitate academic success (Zander et al., 2018; Altermatt, 2019). Research indicates that students perceiving academic support from peers demonstrate higher levels of self-efficacy and greater resilience to educational stress (Altermatt, 2019; Yuri et al., 2020; Asici et al., 2024).

However, while prior studies have established the independent roles of self-efficacy and peer support, the mechanism through which peer academic support may moderate the relationship between self-efficacy and academic stress remains underexplored. Drawing on the stress-buffering model and social support theory, it is theorized that social support reduces the negative impact of stress by enhancing individuals' coping resources. Specifically, peer academic support may strengthen the protective effect of self-efficacy against academic stress by providing reassurance, facilitating shared problem-solving, and offering emotional validation.

Strong peer support encourages students to persevere when facing high pressure and stress resulting from academic demands. Peer academic support (PAS) can serve as a foundational element in mitigating the consequences of academic stress experienced by undergraduate students. Consequently, a notable research gap remains regarding whether peer academic support functions as a buffering mechanism, modifying the relationship between self-efficacy and academic stress among undergraduate students within the Strawberry Generation. Previous investigations have predominantly focused on the characteristics of academic stress, self-efficacy, and academic burnout, without explicitly addressing the distinctive attributes of the Strawberry Generation (Xu et al., 2022). Chandraprakash et al. (2020) conducted a more detailed examination of academic stress, coping mechanisms, and self-efficacy. However, only a limited number of studies have comprehensively reviewed and explored the role of peer academic support (PAS) in strengthening the relationship between these variables. Conversely, other investigations have focused more on how academic self-efficacy possessed by individuals can mediate the relationship between academic stress and performance (Cabras, Pozo, Suárez-Falcón, Caprara, & Contreras, 2024), and have often overlooked the distinct perspective of the Strawberry Generation, failing to account for the influence of social support among peers as an interacting variable. Furthermore, a study by Valdez and Datu (2022), which examined social media and academic self-efficacy, primarily focused on the media use dimension without directly highlighting its impact on academic stress or PAS engagement. Therefore, there remains a significant need for research examining how self-efficacy impacts academic stress within the Strawberry Generation, with attention to peer

academic support as a variable that may strengthen or weaken the independent variable through moderation.

In the context of the so-called strawberry generation, Generation Z, characterized by uncertainty, rapid change, and high academic stress, it is important to understand how to manage academic stress and reduce stress well through self-efficacy. Furthermore, it is crucial to analyze how peer academic support influences the relationship between self-efficacy and academic stress. This understanding can inform the development of targeted intervention strategies to enhance the psychological well-being and academic achievement of undergraduate students, often referred to as the strawberry generation.

Therefore, this study seeks to explore how self-efficacy influences academic stress among college students of the strawberry generation and to analyse the moderating effect of peer academic support (PAS) on the relationship between variables. The findings are expected to contribute to educational psychology literature by clarifying the conditional role of peer support and by informing the development of more targeted academic stress intervention strategies for Generation Z students.

Hypothesis Development and Conceptual Framework

The framework is grounded in social cognitive theory and the stress-buffering perspective, which emphasizes the interaction between personal beliefs and social resources in coping with stress. Rather than depicting direct associations, the conceptual model proposes that academic stress is influenced by students’ beliefs in their own capabilities (self-efficacy) and by the social context in which these beliefs operate. The concept also provides an overview of how the moderating variable, namely peer academic support, becomes a variable that will strengthen or weaken the relationship between variables X and Y. Using this approach, this study seeks to offer a deeper understanding of the factors that reduce academic stress and how it can be reduced by enhancing self-efficacy and optimising social support received. Peer academic support is conceptualised as a contextual resource that may alter the strength of the relationship between self-efficacy and academic stress. When students perceive higher levels of peer academic support, their confidence in managing academic demands may be reinforced, thereby reducing their perceived stress.

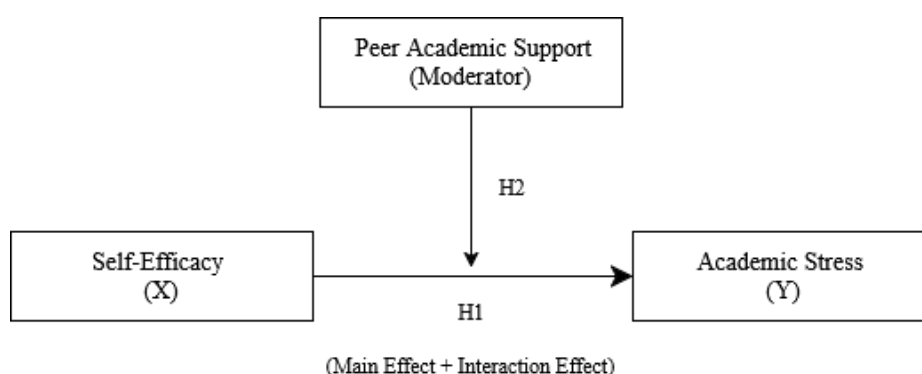


Figure 1. Conceptual Framework of Variables

Self-Efficacy and Academic Stress

Self-efficacy refers to an individual's belief in their capacity to plan and execute actions necessary to overcome challenging situations (Honicke & Broadbent, 2016). Within



social cognitive theory, self-efficacy influences students appraisal of academic demands, their coping mechanisms for challenges, and their regulation of emotional responses (Alhadabi & Karpinski, 2020). However, empirical findings regarding the strength of the relationship between self-efficacy and academic stress remain inconsistent, suggesting that contextual and individual factors may differentially shape this association across populations. Individuals with high self-efficacy possess a strong conviction in their ability to resolve problems, both present and anticipated. In an academic setting, students with greater self-confidence demonstrate resilience when encountering obstacles, exhibiting enhanced perseverance and emotional control (Xu et al., 2022). According to social cognitive theory, individuals with stronger self-efficacy beliefs are more likely to perceive academic challenges as manageable rather than threatening, thereby mitigating stress (Alhadabi & Karpinski, 2020). They are confident that any challenges in their education they will be able to face and pass with ease. In contrast, the academic demands felt by students with low self-efficacy make them more vulnerable to feelings of being overwhelmed, anxiety, and stress (Zander et al., 2018). They feel that academic demands are too much for them to handle. A consistent inverse relationship between self-efficacy and academic stress has been observed across numerous studies (e.g., Chandraprakash et al., 2020; Cabras et al., 2024), indicating that bolstering students' self-efficacy may reduce their perceived levels of academic stress.

H1: Self-efficacy negatively influences academic stress among the strawberry-generation college students.

The Moderating Role of Peer Academic Support

The encouragement, guidance, and emotional support provided by fellow students in academia is termed peer academic support (Altermatt, 2019). Within a stress-buffering framework, social support is theorized to mitigate the negative impact of stress by enhancing individuals' perceived coping resources. From this perspective, peer academic support may strengthen the protective role of self-efficacy by reinforcing confidence, facilitating shared problem-solving, and normalizing academic difficulties. Nevertheless, empirical evidence on whether peer academic support functions as a moderator, rather than merely a direct predictor, remains limited and inconclusive, particularly among Generation Z students in non-Western contexts. Peer academic support offers additional resilience for students to navigate difficulties due to social support (Ji, Liu, Deng, Zhang, & Zhao, 2023). The presence of robust academic peer support (PAS) can also increase an individual's self-efficacy, which, in turn, reduces academic stress. Conversely, this effect may be diminished by insufficient academic peer support (PAS). This suggests a potential interaction effect, wherein the effect of self-efficacy on academic stress is contingent upon the level of support provided by peers within peer academic support.

H2: Peer academic support moderates the relationship between self-efficacy and academic stress among first-generation college students, such that the negative relationship is stronger when peer academic support is high.

Methods

Research design

This study employed a quantitative, non-experimental correlational design to examine the associations among self-efficacy, academic stress, and peer academic support. This design

allows for statistical examination of relationships between variables but does not permit causal inference, as no experimental manipulation was involved. Non-experimental research aims to describe and test the relationship between variables without manipulating specific conditions or variables (Jannah, 2018). A simple descriptive correlation approach was chosen to estimate the extent of the relationship between the independent variables and the dependent variable. Self-efficacy was treated as the independent variable, academic stress as the dependent variable, and peer academic support as a moderating variable. The analytical focus was on estimating effect sizes and interaction patterns rather than establishing causal mechanisms, aligning with the study's exploratory objectives. This method was selected primarily to achieve the study's goal of assessing how academic stress is affected by self-efficacy among Strawberry Generation students and to explore the extent to which peer academic support (PAS) influences this relationship.

Sample

The research was conducted at a university in Indonesia, focusing on active undergraduate students aged 18 to 23 years. One inclusion criterion was prior participation in online learning. An inclusion criterion was prior participation in online learning, implemented to ensure respondents had comparable exposure to contemporary academic learning contexts, particularly those involving digital platforms and reduced face-to-face interaction. Online learning was not treated as an analytical variable and was excluded from hypothesis testing or the conceptual framework. The sampling technique employed was incidental sampling, defined as a method that relies on individuals meeting the criteria and volunteering to participate. While this approach facilitated the collection of a large sample, it limited the generalizability of the findings and is acknowledged as a methodological limitation. Ethically, the research received approval from relevant parties, including experts at the institution and the Institute for Research and Community Service. All respondents provided informed consent prior to participation, confirming their willingness to contribute to the study. Despite facilitating the collection of a large sample (N = 1, 251), this approach inherently limits generalizability and is therefore acknowledged as a methodological limitation. Respondents consisted of 66.19% female students and 33.81% male students (see Table 1). Although participants represented various academic years and fields of study, detailed distributions by age group, year of study, and academic major were not analyzed. This limitation should be considered, as academic stress may vary across academic stages and disciplinary contexts.

Table 1. Frequency gender

Sex	Frequency	%
Male	423	33.81
Female	828	66.19
Total	1251	100

Data collection tools

All instruments were adapted to the Indonesian context through a translation and content review process to ensure linguistic clarity and cultural relevance. Self-efficacy was measured using the General Self-Efficacy scale, adapted from Yudhistira, Deasyanti, & Muzdalifah (2021), comprising 10 items rated on a four-point Likert scale. These items assessed psychological/emotional state, indirect experience, experience of personal success, and social support (Yudhistira et al., 2021; Beirne, Brown, Mhichíl, & Lochlainn, 2023). Academic stress was measured using an adapted version of the Educational Stress Scale for Adolescents (ESSA), consisting of 16 items (Moustaka et al., 2023). **The ESSA was**



consistently utilized as a measure of academic stress throughout the analysis and reporting. The primary dimensions of this measure include coursework load, relationships with lecturers, and external academic demands (e.g., from family). Peer academic support was measured using the Peer Academic Support (PAS) Questionnaire adapted from Mostafaei and Hosseinneshad (2020), consisting of 25 items. The instrument’s dimensions encompass emotional support from peers, academic information support (e.g., study help, sharing materials), and instrumental support (e.g., practical or technical assistance related to college). Responses were collected using a four-point Likert scale, with the lowest score indicating “strongly disagree” and the highest score indicating “strongly agree.”

Validity and reliability tests were conducted on the measuring instruments, and the results met the established criteria. The validity test used Pearson's test, with items considered valid if they had a p-value ≤ 0.05 , while the reliability test using Cronbach’s α was considered reliable if it had a value ≥ 0.70 (Hidayati, Kusmanto, & Kiswanto, 2023; Kilic, 2016). All items on the self-efficacy scale demonstrated high validity, with a significance value of < 0.001 . The scale exhibited a reliability of 0.843, suggesting both validity and dependability. The Peer Academic Scale displayed high validity across all items, with a significance level of less than 0.001 and a reliability score of 0.852, confirming its validity and trustworthiness. Similarly, the academic stress scale demonstrated high validity for all items, with a significance value below 0.001 and a reliability of 0.826, ensuring its validity and reliability.

Data Analysis

Prior to hypothesis testing, assumption tests for normality and linearity were conducted. Because the data met the assumptions required for parametric analysis, hypothesis testing was performed using simple linear regression and moderation regression analyses. All analyses were conducted using JASP software, version 19.3.0.

Result

Prerequisite Test Analysis

This test is a prerequisite for proceeding to the next test, which employs parametric methods utilizing normality tests.

Table 2. Normality Test

	Total SE	Total PAS	Total AS
Valid	1251	1251	1251
Skewness	0.229	-0.116	0.148
Std. Error of Skewness	0.069	0.069	0.069

The skewness values for self-efficacy (0.229), peer academic support (-0.116), and academic stress (0.148) were within acceptable ranges, suggesting approximately normal distributions suitable for parametric statistical analyses.

Correlation Analysis

At this stage, self-efficacy, academic stress, and peer academic support were examined in relation to the variables. The aim was to determine the initial relationships between these



variables prior to conducting the regression test. The findings of the Pearson correlation test conducted between these variables are described in the following table.

Table 3. Pearson Correlation Analysis between Self-Efficacy, Peer Academic Support, and Academic Stress

Relationship	r (strength of relationship)	p-value	Interpretation
Self-Efficacy (SE) ↔ Academic Stress (AS)	-0.084	0.003	The negative correlation is very weak but significant. This means that the higher the self-efficacy, the academic stress tends to decrease slightly.
Self-Efficacy (SE) ↔ Peer academic support (PAS)	0.308	<.001	The positive correlation is moderate and significant. This means that the higher the self-efficacy, the higher the perception of peer academic support (PAS).
Peer academic support (PAS) ↔ Academic Stress (AS)	0.006	0.831	The correlation is very weak and insignificant. The correlation is weak and insignificant, indicating a lack of a significant direct relationship between peer academic support and stress.

Although peer academic support was not significantly correlated with academic stress, the absence of a direct correlation does not preclude its potential role as a moderator, as moderation effects do not require significant zero-order correlations between the moderator and the dependent variable.

Main Effect Analysis

To analyze the primary effect, a simple linear regression test was used to evaluate the extent to which self-efficacy directly influenced academic stress.

Table 4. Model summary

Model	R	R ²	Adjusted R ²	RMSE
M ₀	0.000	0.000	0.000	6.992
M ₁	0.084	0.007	0.006	6.970

Based on Table 4, a correlation of 0.084 was observed between Self-Efficacy and Academic Stress, indicating a very weak relationship. Specifically, Self-Efficacy accounts for only 0.7% of the variance in Academic Stress. The Root Mean Squared Error (RMSE) of 6.970, used to measure the average prediction error, suggests that the model’s predictions are relatively imprecise; smaller values indicate better predictive accuracy. Self-efficacy only explains a very small part of the variation in Academic Stress, but it is still statistically significant. Although the regression model was statistically significant ($p = 0.003$), the explained variance was very small ($R^2 = 0.007$). This indicates that self-efficacy accounted for less than 1% of the variance in academic stress, suggesting a statistically detectable but practically limited effect. Consequently, Self-Efficacy should be interpreted as a contributory psychological factor rather than a dominant predictor of Academic Stress.



Table 5. ANOVA table

Model		Sum of Squares	df	Mean Square	F	p
M ₁	Regression	428.676	1	428.676	8.825	0.003
	Residual	60673.225	1249	48.577		
	Total	61101.901	1250			

Based on Table 5, the F-test statistic (8.825) suggests an immediate correlation between self-efficacy and academic stress. The p-value was 0.003, indicating a significant result ($p < 0.05$), which suggests that the regression model incorporating self-efficacy as a predictor was superior to the model without predictors. Within the regression model, self-efficacy demonstrated a statistically linear relationship with academic stress, although its impact was minimal, as evidenced by the low F value.

Table 6. Regression Coefficients for the Effect of Self-Efficacy on Academic Stress

Model		Unstandardized	Standard Error	Standardized	T	p
M ₀	(Intercept)	42.407	0.198		214.532	< .001
M ₁	(Intercept)	47.032	1.569		29.970	< .001
	Total_SE	-0.147	0.050	-0.084	-2.971	0.003

Table 6 shows that the B value is negative (-0.147), which means that every 1 point increase in self-efficacy reduces Academic Stress by 0.147 points. Self-efficacy significantly and negatively affected Academic Stress. However, the strength of this effect was very small ($R^2 = 0.007$). This could mean that self-efficacy plays a role, but many other factors have a greater influence on Academic Stress.

Moderation Analysis

Following a direct analysis test examining the relationship between self-efficacy and academic stress, a moderation analysis was conducted to assess the role of peer academic support.

Table 7. Moderation test summary model

Model	R	R ²	Adjusted R ²	RMSE
M ₀	0.000	0.000	0.000	6.992
M ₁	0.101	0.010	0.008	6.964

Note. M₁ includes Total_SE, Total_PAS, Total_SE:Total_PAS

The model summary indicates that the collective impact of self-efficacy, peer academic support (PAS), and their interaction with academic stress is minimal. As shown in the model summary in Table 7, the R² coefficient (0.010) indicates that the model explains only 1% of the variance in academic stress. In conclusion, the model accounts for a small variation in academic stress.

Table 8. Moderation ANOVA

Model		Sum of Squares	df	Mean Square	F	P
M ₁	Regression	624.257	3	208.086	4.291	0.005
	Residual	60477.644	1247	48.499		
	Total	61101.901	1250			

Note. M₁ includes Total_SE, Total_PAS, Total_SE:Total_PAS

Based on Table 8, in the ANOVA test, the F value (4.291) and p-value is 0.005, meaning that the regression model containing the variables self-efficacy, Peer academic support (PAS), and their interaction are overall significant. This model contributes marginally to predicting academic stress.

Table 9. Moderation Regression Coefficients for the Interaction between Self-Efficacy and Peer Academic Support

Model		Unstandardized	Standard Error	Standardized	t	p
M ₀	(Intercept)	42.407	0.198		214.532	< .001
M ₁	(Intercept)	26.115	12.178		2.144	0.032
	Total_SE	0.438	0.377	0.250	1.164	0.245
	Total_PAS	0.292	0.165	0.370	1.772	0.077
	Total_SE * Total_PAS	-0.008	0.005	-0.551	-1.620	0.105

Table 9 shows the extent of the moderating effect of academic stress. Because the interaction coefficient (SE × PAS) only has a value of -0.008 with a negative direction, the moderating effect reduces self-efficacy's effect on academic stress if peer academic support is high. In addition, the p-value was 0.105 > 0.05, indicating that it lacked significance, suggesting that there was no statistically significant moderating effect. Peer academic support neither significantly enhanced nor diminished the effect of self-efficacy on academic stress. The moderation analysis examined whether peer academic support altered the relationship between self-efficacy and academic stress. Although the overall regression model was statistically significant (p = 0.005), the interaction term between self-efficacy and peer academic support was not statistically significant (p = 0.105).. This indicates that peer academic support did not significantly moderate the relationship between self-efficacy and academic stress in this sample. While the interaction coefficient showed a negative direction, the effect was small and statistically unreliable. An interaction plot could illustrate this trend. An interaction plot could illustrate the trend, however, given the non-significant interaction effect and minimal explained variance (R² = 0.010), the slopes of self-efficacy on academic stress are interpreted as relatively stable across levels of peer academic support.

Summary of Findings

The findings revealed that self-efficacy significantly and negatively affected Academic Stress. However, the strength of this effect was very small (R² = 0.007). This could mean that self-efficacy has a role, but many other factors have a greater influence on Academic Stress. Subsequent moderated regression analysis indicated that self-efficacy, peer academic support, and their interaction explained only 1% of the variance in academic stress (R² = 0.010). Although the overall model is significant (p = 0.005), the interaction coefficient between Self-Efficacy and Peer Academic Support lacks significance (p = 0.105), and the



relationship between self-efficacy moderated by peer academic support results in no statistical evidence that is strong enough to show its influence on academic stress. The hypothesis test results are presented in the table below.

Table 10. Hypothesis test results

Test	Hypothesis	Results	Interpretation
Main Effect Analysis	H1	Accepted	Self-efficacy is negatively associated with academic stress among college students of the millennial generation.
Moderation Analysis	H2	Rejected	Peer academic support does not moderate the relationship between self-efficacy and academic stress among strawberry generation college students; therefore, high levels of peer academic support do not strengthen the negative relationship.

Overall, the findings indicate a statistically significant, yet small, association between self-efficacy and academic stress, and that peer academic support does not significantly moderate this relationship. These results suggest that academic stress among strawberry-generation students is likely influenced by a broader set of psychological, contextual, and structural factors beyond individual self-efficacy and peer-based academic support alone.

Discussion

This study examined the role of self-efficacy in academic stress among strawberry-generation undergraduate students and investigated whether peer academic support moderated this relationship. The findings indicate that self-efficacy is negatively associated with academic stress. However, the magnitude of this relationship was very small, suggesting a limited practical impact. These results suggest that statistical significance does not necessarily imply substantive explanatory power, and that self-efficacy may function as a minor contributory factor rather than a central determinant of academic stress among undergraduate students.

Previous research has established a strong negative correlation between self-efficacy and academic stress; therefore, the results of this study contradict several prior investigations. For example, Kristensen, Larsen, Urke, and Danielsen (2023) and Hitches, Woodcock, and Ehrich (2022) research indicates that people with strong self-efficacy often experience less academic stress because they believe they can effectively handle academic challenges. The weak effect of self-efficacy observed in this study contrasts with prior research that reported stronger associations (e.g. Kristensen et al., 2023). In such contexts, self-efficacy may not be sufficient to mitigate academic stress if structural demands, emotional regulation difficulties, or systemic academic pressures remain unaddressed. In such contexts, self-efficacy alone may not be sufficient to mitigate academic stress if structural demands, emotional regulation difficulties, or systemic academic pressure remain unaddressed. However, findings from other contexts also explain this. For example, Rohmani & Andriani (2021) found that nursing students with moderate levels of self-efficacy were more likely to experience severe fatigue during distance learning. This is contrary to the expectations of the hypothesis which states that low stress levels will be present when a person has higher self-efficacy. Lai et al., (2021) also found that individuals experiencing depressive symptoms tend to report lower self-efficacy and reduced self-management skills. This suggests that psychological factors, such as depression, can negatively impact self-efficacy, potentially leading to increased stress. Within the Indonesian higher education context, these generational characteristics may interact with

rapid digitalization, competitive academic environments, and institutional expectations, thereby shaping how self-efficacy operates in relation to academic stress (Apriyansyah et al, 2023; Ayuni, 2019).

The generation referred to as the strawberry generation, which refers to individuals from Generation Z, is often described as having delicate characteristics, being easily hurt, and being less resistant to pressure (Apriyansyah, Sukatmi, & Mustafa, 2023). In this context, even a high level of self-efficacy may be insufficient to alleviate academic stress if it is not complemented by effective emotion regulation skills or structural support. This may account for the lack of a significant direct effect of self-efficacy in the present study.

Furthermore, based on the findings of this study, peer academic support was not found to significantly influence self-efficacy or academic stress, which indicates the participants' lack of awareness regarding the effectiveness of peer social support in alleviating academic pressure. This suggests that participants may lack awareness of the potential benefits of peer social support in mitigating academic pressure. In this study, it is possible that respondents perceived that peer academic support (PAS) was not directly relevant to the academic burden they experienced. This is because other contexts can also reduce the academic burden. Generation Z is referred to as the strawberry generation, which tends to be more independent and understanding of technology (Ayuni, 2019). Generation Z students tend to be more independent and dependent on technology or digital resources; therefore, direct social interaction is not always the main source of support they rely on (Widodo et al., 2020). Consequently, PAS may be viewed as supplementary rather than essential, thereby limiting its ability to buffer academic stress through interactions with individual psychological resources, such as self-efficacy.

Low data variation can also result in insignificant moderation test results. When most respondents exhibit moderate or high levels of peer academic support (PAS) or self-efficacy, the variation between individuals is limited, making it difficult to detect the interaction effect statistically. Furthermore, given that the main effect of self-efficacy on academic stress is already weak ($\beta = -0.084$ in the initial analysis), peer academic support does not appear as a significant moderating effect. The absence of a significant moderating effect suggests that peer academic support may not function as a stress-buffering resource in the expected manner for Generation Z students. Considering their tendency toward independence and reliance on digital resources, students may perceive academic challenges as individual responsibilities rather than shared experiences, thereby reducing the functional impact of peer academic support. This contrasts with previous findings suggesting that certain moderating variables can play a significant role in reducing academic stress. For example, Gao (2023) determined that the negative impact of stress experienced by adolescents can decrease when they have high self-efficacy, with self-efficacy as an amplifier of the variables of academic stress and academic burnout. Similarly, Choi et al. (2023) found that among adolescents, the relationship between academic stress and school adjustment is influenced by the level of resilience, where adolescents with higher resilience tend to experience a less negative impact of stress on their academic and social adaptation. Various variables can moderate this relationship. Therefore, it is also possible that in this study, academic stress can be influenced and moderated by other variables. This suggests that the absence of a significant moderating effect should be interpreted cautiously and understood within the broader complexity of academic stress, rather than as evidence against the relevance of social or psychological resources altogether.

This study has certain limitations. As a cross-sectional design, it cannot establish cause-and-



effect relationships with depth. In addition, all data were collected through self-report, which is prone to perceptual bias. Based on these results and limitations, it is advised that upcoming studies employ a longitudinal approach to track the changes in self-efficacy and academic stress throughout the years over time, as well as explore more specific types of peer academic support (PAS). Future studies should also consider incorporating objective indicators of academic demand and longitudinal designs to better capture the changes in stress and self-efficacy over time. Moreover, researchers should examine other variables that may significantly influence the relationship, such as coping strategies, perceptions of task load, and support from lecturers and family. Consequently, the findings should be interpreted as context-specific and exploratory, reflecting patterns observed within the sampled population rather than definitive conclusions applicable to broader student populations. Although the moderation hypothesis was not statistically proven, the results of this study still make an important contribution to expanding the understanding of the psychological dynamics of strawberry generation students, particularly in relation to academic challenges. From a practical standpoint, universities should not solely rely on enhancing self-efficacy through motivational programs. Instead, integrated interventions that combine academic skill development, emotional regulation training, and institutional support are needed. Academic advisors, counselors, and faculty members may play a critical role by providing structured guidance, stress management programs, and accessible academic support services tailored to Generation Z students.

Conclusion

This study explores how self-efficacy influences academic stress among strawberry-generation undergraduate students, while also examining the impact of peer academic support as a moderating factor. The findings indicated that self-efficacy had a statistically significant but very weak negative association with academic stress ($R^2 = 0.007$). However, peer academic support did not significantly moderate this relationship. The very low explanatory power of the model suggests that academic stress among respondents is likely influenced by multiple factors beyond individual self-efficacy and peer academic support. This finding differs from much of the earlier research, which has generally reported a negative association between self-efficacy and academic stress. This difference in findings could be due to various contextual factors, including the unique characteristics of the strawberry generation, who tend to be more sensitive, independent, and technology-reliant. Moreover, students might not perceive peer academic support (PAS) as sufficiently effective in influencing the impact of self-efficacy on their academic stress.

Low data variation is also a factor that may have influenced the insignificance of the moderation results, where the majority of respondents had moderate to high levels of self-efficacy or peer academic support (PAS). This limited variability may have reduced the statistical power to detect interaction effects. Therefore, it is highly advisable that future studies employ a longitudinal approach and investigate more specific forms of peer academic support (PAS), **as well as consider other variables such as coping strategies, perceived academic load, and support from family and educational institutions.**

Although the hypothesis of moderation was not proven, this study significantly enhances understanding of the psychological dynamics among students of the strawberry generation, particularly in relation to academic challenges. The findings emphasize the importance of a more comprehensive and contextualized intervention approach aligned with the characteristics of contemporary young people. In practical terms, higher education institutions

should complement self-efficacy-focused programs with structured interventions targeting emotional regulation, academic skill development, stress management services, and accessible institutional support systems, rather than relying solely on peer-based or individual psychological resources.

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Informed Consent: *All participants in this study provided informed consent to participate after receiving clear information about the purpose and procedures of the study.*

Data availability: *The data used in this study are available upon reasonable request from the author and will be provided while maintaining the confidentiality of the respondent's identity.*

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