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Promoting Social Inclusion and Mitigating Anxiety in Educational Settings through Self-Esteem: A Multi-Group PLS-SEM Analysis of College Students in Indonesia

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ABSTRACT

This comprehensive study explores the predictive role of self-esteem in relation to anxiety, specifically trait anxiety and state anxiety. The research encompasses 229 college students from a university in Medan, Indonesia, who participated in an online survey. Utilizing Multi-Group Analysis PLS-SEM, the collected data underwent thorough analysis. The outcomes obtained from partial least squares structural equation modeling demonstrated that self-esteem has a negative impact on students' anxiety levels, encompassing both trait anxiety and state anxiety. Furthermore, the structural model was assessed across two distinct gender groups (Group 1: Female; Group 2: Male), and the results indicate the model's consistency across these groups. This study contributes novel insights to the existing literature on anxiety mitigation within educational contexts, particularly among Eastern populations. In conclusion, the findings emphasize the crucial role of self-esteem as a predictor of anxiety among college students in Indonesia. The research highlights a negative association between self-esteem and both trait anxiety and state anxiety. Additionally, by demonstrating the robustness of the structural model across gender groups, the study implies the universal implications of its findings. Overall, this research provides valuable insights for educators and practitioners seeking to address anxiety-related concerns and enhance the well-being of students in educational settings.

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1. INTRODUCTION

Mental health issues in the college environment are often underestimated. Mitigating the feeling of excess stress caused by academic activities is very important. Neglecting this matter can lead to serious consequences. Recently, there have been reports of suicides by students due to stress. Although stress may not always lead to suicide, mental health is an essential factor in efforts to promote inclusion in education and also determines the success or failure of students' studies. According to Romppanen,

Korhonen, Salmelin, Puura, & Luoma (2021), mental health can impact academic achievement, work activity, social functioning, and overall quality of life at one point in a person's life. One of the common mental health problems experienced by students is excessive anxiety, also known as anxiety disorder. This term has different definitions. For example, Huang (2012) defines anxiety as an emotion initiated by the judgment of a threat, while Fink (2016) considers anxiety as an unpleasant emotional reaction to danger, whether real or imagined, accompanied by autonomous responses and subjective experiences such as tension, fear, or nervousness. A tendency to imagine negative outcomes can negatively impact symptoms at certain times, for example, when someone is about to face an exam, either during preparation or in the middle of an exam. Previous research indicates that when anxiety occurs while students are facing exams, they may experience learning difficulties and a trend of decreasing grades (Maralani, Lavasani, & Hejazi, 2016). This situation is regrettable, as a student may receive a poor grade not because of their academic incompetence but due to the anxiety they experience.

Many psychologists began to pay attention to anxiety in the 20th century because of the large number of people who suffered from it; this period is often called the "Age of Anxiety" (Charles D. Spielberger, 1983). People often feel anxious when they interpret a situation as dangerous and react negatively emotionally. This construct has not been defined precisely. Both Lazarus (1972) and Beck (1972) agree that anxiety is a negative emotional response to perceived or actual risk, which is characterised by the release of endorphins and the subjective perception of feelings like tension, fear, or uneasiness. In addition, anxiety is defined by Mathison (1977) as a condition accompanied by feelings of powerlessness, core-threatening ambiguity, and challenges to one's identity. Even though there is no universally accepted definition of anxiety, specialists do agree that there are two parts to the disorder: trait anxiety and state anxiety. State anxiety is a transitory emotional condition defined by subjective emotions of tension, fear, uneasiness, and worry that are consciously felt, whereas trait anxiety refers to stable individual differences in anxiety susceptibility (Schwarzer, der Ploeg, & Spielberger, 1982).

A meta-analysis study by Sowislo & Orth (2013) revealed that self-esteem is a crucial predictor of anxiety. As is known, self-esteem is a critical component in human life because a person's high or low self-esteem can affect many aspects of life, such as determining the level of happiness (Coffey & Warren, 2020) and their success (Schmitt & Jonason, 2019). Apart from being a predictor, self-esteem is also known as a mediator variable for other behavioral variables. Bajaj, Robins & Pande (2016) researched the role of self-esteem mediation in the relationship between mindfulness, anxiety, and depression. Similarly, Ran, Zhang, & Huang (2018) investigated self-esteem mediation between shyness and social anxiety. Other researchers have also conducted similar studies (Duchesne et al., 2017; Kong, Zhao, & You, 2013; Nima, Rosenberg, Archer, & Garcia, 2013; Rasmussen & Pidgeon, 2011). However, based on the literature review conducted by the author, there has not been a single study investigating how self-esteem influences anxiety when analyzed by gender. Although various behavioral studies suggest that the relationship between different variables can differ based on gender (Alzahrani, Al-Karaghouli, & Weerakkody, 2018; Ghasemy, Mohajer, Cepeda-Carrión, & Roldán, 2020; Kraemer & HJ Gouthier, 2014; Maes, Leroy, & Sels, 2014; Ramírez-Correa, Arenas-Gaitán, & Rondán-Cataluña, 2015; Velayutham, Aldridge, & Fraser, 2012), to our knowledge, no study has investigated the effect of self-esteem on anxiety by gender.

The concept of self-esteem was first introduced by James et al. (1890), who viewed it as a determinant of one's success and aspirations towards important domains in life. (Leary & Baumeister, 2000) define self-esteem as an affective or evaluative component of the self-concept that reflects how individuals feel about themselves. More recent definitions of self-esteem emphasize the importance of differentiating it from other components of the self-concept, such as self-knowledge and self-efficacy. According to (Rosenberg, 2015), a high level of self-esteem is only achieved when an individual feels good enough and valuable, without feeling superior to others. Increasing self-esteem is crucial because it is believed to act as a buffer in reducing negative emotions, anxiety, and improving both mental and physical health (Pepping, O'Donovan, & Davis, 2013).

There is often debate in the literature regarding whether self-esteem should be conceptualized as a single construct (global self-esteem) or as specific domains, such as intellectual ability, physical appearance, or social competence (Swann Jr & Bosson, 2010). However, empirical studies show that global self-esteem measures have more predictive value than specific ones (Trzesniewski et al., 2006). Thus, this research aims to address the following research questions:

1) How does self-esteem influence trait anxiety?
2) How does self-esteem influence state anxiety?
3) Are there gender differences in the relationship between variables?

This study aims to fill the research gap by investigating how self-esteem influences anxiety (state anxiety and trait anxiety), not only for the entire sample but also for gender differences. This research is significant because the education sector, particularly higher education, often neglects to prioritize the mental health of its students. Unfortunately, many higher education institutions prioritize student learning outcomes at the expense of student well-being, leading to a neglect of mental health.

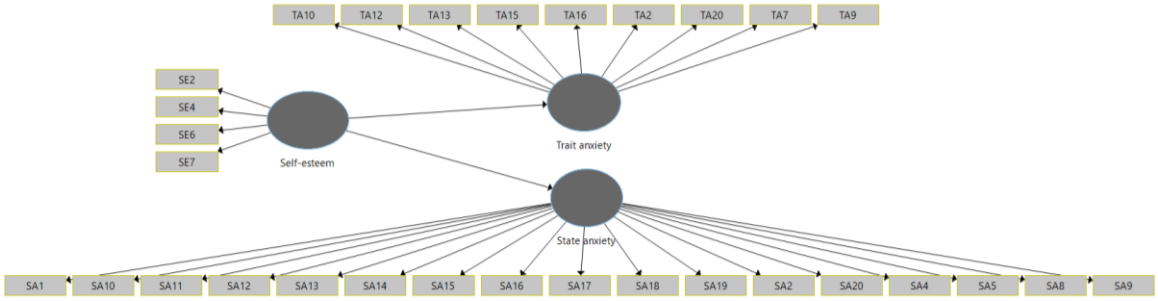

Figure 1. Research Model

2. METHOD

2.1. Data collection and research instrument

The data were collected through an electronic survey administered to students at a university in Medan, Indonesia. The use of electronic questionnaires was intended to reach the sample more efficiently, even though the researcher could not control for certain aspects of the filling out of the questionnaire. However, this data collection method is considered feasible provided that participating respondents are considered eligible to fill out the data (e.g., adults) (Sekaran & Bougie, 2016). The electronic survey was distributed using Microsoft Forms, and a total of 229 students completed the questionnaire, including 91 females and 138 males (Table 1). The total sample size in this study was considered adequate, as the authors initially calculated the minimum sample required using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). According to the G*Power calculation, the minimum sample recommendation was 107, indicating that the sample in this study is more than adequate.

In order to guarantee statistical and theoretical validity and reliability, the researchers utilised equipment that have been established by professionals to measure each variable. An instrument developed by Reeve & Tseng (2011) was used to measure academic engagement, which is based on four aspects: agentic engagement, behavioural engagement, emotional engagement, and cognitive engagement. The Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 2015) was used to measure self-

esteem. Finally, anxiety was measured using the Spielberger's State-Trait Anxiety Inventory (STAI) instrument developed by Charles Donald Spielberger (1970).

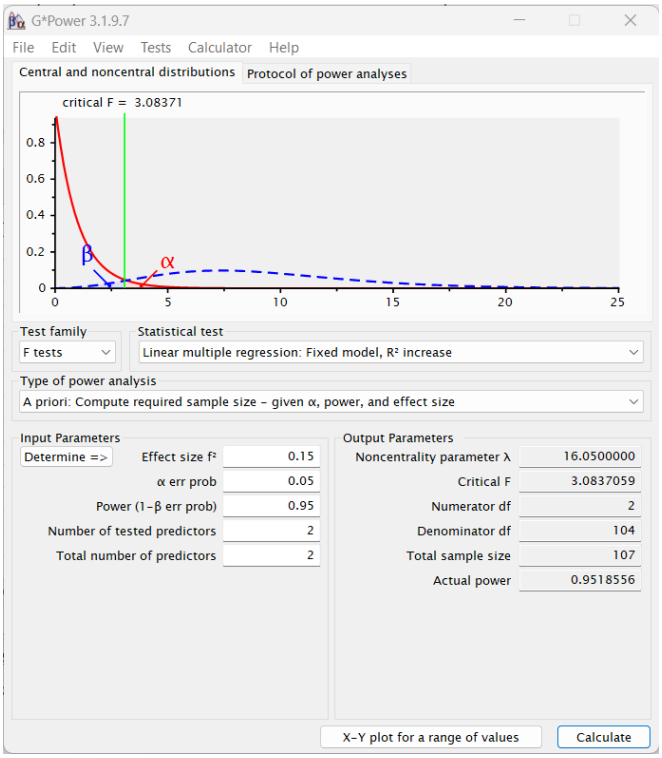

Figure 2. G*Power Calculation

2.2. Data analysis procedure

The data were collected through an electronic survey administered to students at a university in Medan, Indonesia. The electronic survey was spread using Microsoft Forms. A total of 229 students, consisting of 91 females and 138 males, have completed the questionnaire. The amount of total sample in this study was adequate since the authors initially calculated the minimum sample required using G*Power. From the G*Power calculation, the minimum sample recommendation was 107. Hence the sample in this study is more than adequate.

Partial Least Square Structural Equation Modeling (PLS-SEM) is employed to analyze the data in this study. PLS-SEM is used because the authors want to analyze complex interrelationships between observed and latent variables, following two steps: validation of the outer models (measurement), and evaluation of the inner model (structural relations among latent variables). Furthermore, the structural model is also evaluated across groups (gender) through a multi-group analysis (Hair Jr, Hult, Ringle, & Sarstedt, 2016).

3. FINDINGS AND DISCUSSION

3.1. Evaluation of measurement models

This research makes use of the reflecting constructions model for its first-order constructs. Three factors must be taken into account when assessing this type of construct: discriminant validity, internal consistency reliability, and convergent validity (Hair Jr et al., 2016). According to Hair Jr et al. (2016), a loading factor and an Average Variance Extracted (AVE) of at least 0.5 is considered fair limits for a measurement or indicator to have convergent validity, which is the degree to which it correlates with other measurements or indicators in the same construct. If you want to know if the items that measure the same concept have similar scores, internal consistency reliability is a good metric to look at. A

composite reliability value and Cronbach's alpha above 0.6 are necessary for this evaluation (Hair Jr et al., 2016). As a last step, this study assesses the measurement model's discriminant validity using the Heterotrait-monotrait ratio (HTMT). In comparison to cross-loading and the Fornell-Larcker criterion, this approach is more accurate (Henseler, Ringle, & Sarstedt, 2015). The optimal value for HTMT as a threshold is 0.85, and it should not be 1. (Henseler et al., 2015).

Data analysis was performed by running the data twice. Table 2 shows the second run after removing the indicators that do not meet the loading factor. Therefore, all the indicators used and shown in Table 2 have met the requirements, including convergent validity, internal consistency reliability, and discriminant validity. For convergent validity, the loading factor for all instruments is sufficient. However, some constructs in Table 2 have AVE values below the recommended limit. Nonetheless, even if the AVE is below the recommended threshold, it does not necessarily mean that the construct is invalid in terms of convergent validity. Referring to Fornell & Larcker (1981), as long as the composite reliability is still above the recommended threshold, the measurement of the construct is still accepted. Table 3 shows that the composite reliability is above 0.6. Concerning discriminant validity, it can be observed in Table 10 that none of the HTMT values have a value of 1. After confirming that the measurement models for first-order constructs are eligible, the next step is to evaluate the structural model.

3.2. Evaluation of structural model (inner model analysis)

The next stage, following the validation and reliability of the outer model, is to assess the inner model to derive hypothetical results between the model-created constructs (Hair, Sarstedt, Ringle, & Mena, 2012; Hair Jr et al., 2016). Note that PLS-SEM and CB-SEM do not use the same metrics to determine goodness-of-fit. The recommendations from Chin et al. (1998), Henseler, Ringle, & Sinkovics (2009), and Hair Jr et al. (2016) are followed for the goodness-of-fit evaluation of the inner model in this work by utilising f2 and Q2 effect sizes. When testing hypotheses, as when evaluating second-order constructs, 5,000 bootstrapping is used to determine significance levels and path coefficients.

To obtain the Q^2 coefficient, the researcher used the SmartPLS blindfolding feature with an omission distance of 7. This value follows the recommendation from Chin et al. (1998) and Henseler, Ringle, & Sarstedt (2012), where the omission distance used should be between 5 and 10. For interpretation, if $Q^2 > 0$, this indicates that the model has predictive relevance, and vice versa (Henseler et al., 2009; Vinzi, Chin, Henseler, Wang, & others, 2010). Regarding f^2, a coefficient of 0.02 to 0.15 indicates a small effect size, 0.15 to 0.35 means a moderate effect size, and above 0.35 indicates a large effect size (Henseler et al., 2012; Vinzi et al., 2010). This classification can also be applied to Q^2 (Henseler et al., 2009).

Regarding the evaluation of the structural model, the analysis will start by examining the relationships between variables based on the entire sample. As shown in Table 4, self-esteem has a significant negative effect on state anxiety ($\beta = -0.54$, $p < 0.001$). Furthermore, based on the obtained samples, self-esteem was also found to have a negative effect on state anxiety ($\beta = -0.57$, $p < 0.001$). This indicates that higher self-esteem leads to a lower potential for the sample to experience anxiety, both in terms of trait anxiety and state anxiety.

The results of calculating the f2 effect size in Table 4 show that the self-esteem variable has a large effect size in influencing the state anxiety and trait anxiety variables (0.38 and 0.49, respectively). In addition to the f2 effect size, it is also necessary to analyze the Q2 effect size to determine the predictive relevance of variables that act as exogenous variables. Table 4 shows that self-esteem, which acts as an exogenous variable in the research model, has relatively small predictive relevance.

3.3. Multi-group analysis

The multi-group permutation test was employed to validate the structural model across two distinct gender groups, using the methodology outlined by Hair Jr et al., (2016). While Table 4 displayed minor variations in important path estimates among the groups, the multi-group permutation tests

indicated that none of the paths exhibited significant changes between the two groups. Hence, the outcome implies that gender does not serve as a distinguishing element.

Table 1. Sample demographic background

	Frequency	Percent	Valid Percent
Male	91	39.7	39.7
Female	138	60.3	60.3

Table 2. Convergent validity and internal consistency reliability measures

Latent Variable	Indicators	Loadings	AVE	Composite Reliability	Cronbach's Alpha	Discriminant Validity
		>0.50	>0.50	0.60-0.90	0.60-0.90	HTMT confidence interval does not include 1
Self-Esteem	SE2	0.559	0.45	0.76	0.77	Yes
	SE4	0.593				
	SE6	0.691				
	SE7	0.819				
Trait anxiety	TA10	0.674	0.40	0.86	0.86	Yes
	TA12	0.697				
	TA13	0.607				
	TA15	0.688				
	TA16	0.651				
	TA2	0.618				
	TA20	0.537				
	TA7	0.673				
	TA9	0.55				
State anxiety	SA1	0.609	0.44	0.93	0.93	Yes
	SA10	0.742				
	SA11	0.854				
	SA12	0.499				
	SA13	0.603				
	SA14	0.608				
	SA15	0.534				
	SA16	0.571				
	SA17	0.617				
	SA18	0.518				
	SA19	0.716				
	SA2	0.606				
	SA20	0.715				
	SA4	0.798				
	SA5	0.747				
	SA8	0.754				
	SA9	0.595				

Table 3. HTMT values for discriminant validity

	Self-esteem	State anxiety	Trait anxiety
Self-esteem			
State anxiety	0.603		
Trait anxiety	0.684	0.913	

Table 4. Results summary for structural model evaluation

		Path Coefficient		Effect size f2		Effect size Q2	
		Self-esteem -> State anxiety	Self-esteem -> Trait anxiety	Self-esteem -> State anxiety	Self-esteem -> Trait anxiety	State anxiety	Trait anxiety
Female	Coefficient	-0.52	-0.60	0.38	0.57	0.12	0.16
	Mean	-0.53	-0.61	0.43	0.63		
	Standard Deviation	0.07	0.06	0.15	0.18		
	T Values	7.60	11.05	2.43	3.24		
	P Values	0.00	0.00	0.02	0.00		
Male	Coefficient	-0.57	-0.55	0.47	0.42	0.11	0.12
	Mean	-0.59	-0.56	0.57	0.50		
	Standard Deviation	0.07	0.07	0.21	0.20		
	T Values	8.54	7.40	2.23	2.14		
	P Values	0.00	0.00	0.03	0.03		
Pooled	Coefficient	-0.53	-0.57	0.38	0.48	0.12	0.15
	Mean	-0.54	-0.58	0.42	0.51		
	Standard Deviation	0.05	0.05	0.12	0.13		
	T Values	9.79	11.91	3.25	3.70		
	P Values	0.00	0.00	0.00	0.00		
Grp 1 vs Grp 2	Path Coefficients-diff (Female - Male)	0.04	-0.06				
	p-value	0.65	0.53				

3.4. Self-esteem towards trait-anxiety and state-anxiety

Anxiety is a prevalent psychiatric illness that affects individuals across various age groups, including students. There is a growing incidence of worry among students, which can adversely affect their academic achievements and overall state of health. Hence, comprehending the elements that contribute to anxiety is crucial in order to formulate efficacious interventions and therapies.

Self-esteem is a factor that has been thoroughly examined in the literature. Self-esteem pertains to an individual's subjective assessment of their own significance and merit. Research has indicated that those with low self-esteem are more susceptible to developing a range of mental health conditions, such as anxiety. Individuals exhibiting poor self-esteem often harbour pessimistic thoughts and convictions about their own worth, which can contribute to the development of anxiety. The objective of this study was to examine the correlation between self-esteem and anxiety in students, primarily focusing on trait anxiety and state anxiety. Trait anxiety is the inclination to feel anxiety in different circumstances, whereas state anxiety is a transient anxiety triggered by a particular scenario or event.

The findings of our study indicate an inverse relationship between self-esteem and both trait anxiety and state anxiety among students. The aforementioned discovery aligns with prior studies that have established a robust correlation between diminished self-esteem and elevated levels of anxiety (Nguyen, Wright, Dedding, Pham, & Bunders, 2019). Moreover, our study revealed that the correlation

between self-esteem and anxiety remained constant for both male and female students (Mo, Chan, Wang, & Lau, 2020). This discovery is significant, as it indicates that the influence of self-esteem on anxiety is not limited to a certain gender. Both male and female students with diminished self-confidence exhibited elevated levels of both trait anxiety and state anxiety.

These results highlight the importance of promoting positive self-esteem among students to prevent and manage anxiety. Faculty members and mental health professionals can work together to develop interventions and strategies to improve self-esteem among students. This may include promoting positive self-talk, encouraging social support, and providing peer-counselling (Crisp, Rickwood, Martin, & Byrom, 2020).

Our study provides compelling evidence regarding the relationship between self-esteem and anxiety among university students. The findings consistently demonstrate that higher levels of self-esteem are associated with lower levels of both trait anxiety and state anxiety, regardless of gender. These results underscore the significance of fostering positive self-esteem as a preventive and management measure for anxiety in student populations. Collaboration between faculty members and mental health professionals is crucial in implementing interventions that promote positive self-talk, encourage social support, and offer peer counseling. By prioritizing the cultivation of self-esteem, we can effectively address anxiety-related concerns and enhance the overall well-being of students in educational settings. Further research is warranted to explore additional factors that may influence the relationship between self-esteem and anxiety, thereby providing a more comprehensive understanding of this important area of study.

4. CONCLUSION

In conclusion, this study highlights the crucial role of self-esteem in the mental health and well-being of students in an educational setting. By demonstrating the negative relationship between self-esteem and both trait and state anxiety, this study emphasizes the need for interventions aimed at enhancing self-esteem to reduce the likelihood of students experiencing anxiety. As such, educators, counselors, and mental health professionals working with students should consider strategies to enhance self-esteem, such as providing positive feedback, promoting self-reflection, and encouraging students to set achievable goals. The findings of this study also have broader implications for the development of mental health policies in educational institutions. By identifying the causal relationship between self-esteem and anxiety in the Indonesian context, this study provides evidence for the importance of promoting self-esteem as a preventive measure against anxiety. These results may have relevance for other countries and regions, particularly those with similar cultural backgrounds and educational systems. While this study contributes to the growing body of literature on self-esteem and anxiety, there are some limitations to consider. The use of self-reported measures for both self-esteem and anxiety may have introduced measurement errors or biases, and a more diverse sample that includes various sample characteristics would increase the generalizability of the findings. Future research could also explore other factors that may moderate the relationship between self-esteem and anxiety, such as social support and coping strategies. Overall, this study highlights the importance of addressing self-esteem as a key factor in the prevention and management of anxiety in educational settings. By enhancing self-esteem, students may experience better mental health and well-being, leading to improved academic performance and greater success in their personal and professional lives

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Conflicts of Interest: The authors declare no conflict of interest.

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