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The Effect of Self-Efficacy, Academic Stress, and Academic Fatigue on Students' Learning Outcomes

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ABSTRACT

This study investigates the influence of self-efficacy, academic stress, and academic fatigue on the learning outcomes of students at the University of Jambi. Using a quantitative survey method, data were collected via an online questionnaire distributed to 200 randomly selected students from various faculties. The results indicate that self-efficacy positively affects learning outcomes, while academic stress and academic fatigue have negative effects. The structural model shows significant relationships between academic burnout and learning outcomes ($\beta = 0.698$, $p < 0.001$), academic stress and learning outcomes ($\beta = 0.167$, $p < 0.001$), and self-efficacy and academic stress ($\beta = 0.300$, $p < 0.001$). These findings suggest that students with higher self-efficacy are more capable of managing their time, seeking assistance, and maintaining a positive approach to their studies—skills that help them cope with academic pressures and reduce stress. The study underscores the importance of developing interventions to enhance self-efficacy and reduce academic stress and fatigue, such as psychological counseling, stress management programs, and academic support services. These efforts are essential for improving student performance and well-being. The findings are expected to inform the development of educational programs and student welfare policies at the University of Jambi through strategic institutional planning and policy refinement.

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1. INTRODUCTION

Transitioning to higher education can be challenging as children transfer from a rigidized school context to increasingly autonomous and demanding academic settings. These challenges can be classified into four domains: intellectual, social, psychological and financial (Mulaudzi, 2023). There is independent study, critical thinking, complex problems all of which are not only challenging but can become can daunting especially for individuals who are used to the rigid structure of high school. They should be able to juggle several courses, assignments, and deadlines without close oversight, and to learn and adjust to various teaching styles. Additionally, assessment methods such as tests, essays, and research projects demand higher-order thinking, which poses difficulty for students previously reliant on rote learning. Additionally, assessment methods such as tests, essays, and research projects demand higher-order thinking, which poses difficulty for students previously reliant on rote learning.

Social issues are also important. Settling into a new environment, meeting new people and establishing support networks can be challenging, especially for students who are living away from home for the first time or from a different culture (Thompson et al., 2021). Academics are also a source of stress, with deadlines and uncertainty casting feelings of inadequacy. A large number of the students also have difficulties with their independence, homesick, and difficulty with decision making in personal and academic issues. Financially, the additional pressures of handling tuition, rental, and everyday expenditures that are frequently unpaid for by someone else, can also be a strain. Many students want part time work, if not handled well it will have an impact on their studies. Also, poor resource allocation can be aggravated by lack of financial knowledge (Leese, 2010).

Assignment at the level of higher education is disproportionately different from the assignments of the earlier level, both qualitatively with respect to the assignment complexity and quantitatively with respect to the format of the assignment. Students frequently participate in collaborative tasks, which involve morphological coordination and independent data collection. The function of teachers changes from that of knowledge

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prescribers to that of enabler, requiring more independence and student initiative (Kljajic et al., 2022). Given that assignments are often due within close proximity or around the same time, the academic requirements of critical reading, reviewing literature and analytical writing can contribute to stress and potentially lead to academic burnout. Failure to cope with these demands leads to reduced cognitive functioning and academic performance (May et al., 2015; Salanova, 2009).

Stressors at the academic level, especially with university students, have been frequently studied and well- documented. Furr et al. (2001) found 53% of university students has experienced academic burnout related to stress, depression and poor learning product, which may be aggravated by economic hardship and isolation in social. In such conditions, self-efficacy, defined as the belief in one's ability to organize and perform actions in order to reach a certain goal (Bandura, 2019), plays a crucial role as a psychological resource. It is a factor in motivation, resistance to stress, coping with time demands, and emotional stability. Students with high self-efficacy are more inclined to perceive academic tasks as challenges as opposed to threats, to use an appropriate learning strategy, to ask for help, and to persist in the face of obstacles (Pajares et al., 2005). By contrast, in students with low self-efficacy, the learners questions their own ability to learn, avoid interaction, and suffer more from stress and disengagement with learning (Bandura, 1994).

Bandura (cited in Widayanto, 2013) defined self-efficacy in education as student's belief in their capabilities to achieve a success in the task to be taken. It impacts both affective (such as anxiety) and performance related responses. Low self-efficacy students may suffer from increased stress and academic burnout, which may negatively influence their performance. In contrast, high self-efficacy students regulate well academically and believe in themselves, resulting in high academic achievement. Wang & Chen (2025) also confirm that self-efficacy has a significant relationship with Student Academic Performance (SAP) together with such influencing components as age, gender, motivation, and test anxiety. While increases in educational quality and access have driven much of the improvement, attention has also turned to non-academic factors such as parental education and income, teacher quality, peer support, and socioeconomic status – factors which shape student achievement. The intricacy and interrelation of these factors imply the need for integrative interventions and mechanistic exploration.

In the modern context of education, academic achievement is largely not only contributed by cognitive abilities but also by psychological and environmental factors. Kasari and Pritchard (1988) proposed that self-efficacy, academic stress, and academic fatigue are among most important factors in students' experience and performance. Academic stress refers to psychological distress as a result of overburdening academic demands that may result in anxiety, distraction and failure (Misra & McKean, 2000). On the other hand, the academic fatigue defines fatigue that occurs after long-term (unsustainable) academic work, causing mental and physical exhaustion that leads to concurrent loss of concentration and motivation, in turn resulting in a decrease in performance.

Learning outcomes are defined as the knowledge, skills, attitudes and confidence that students are expected to gain from a given course of study or an entire programme of study. Although a variety of studies have investigated the isolated effects of self-efficacy, stress, or fatigue, relatively little has been done to explore the interactive or combined effects. Furthermore, studies have been predominantly conducted in Western population, thus it does not accommodate culture and context in other societies, including Indonesian.

This study fills this gap by examining the joint role and single effects of self-efficacy, academic stress and academic fatigue as predictors of learning outcome among Jamb University students. This study is essential for understanding the impact of these psychological factors on academic performance, and for guiding the design of educational intervention to improve students' well-being and success. Because mental health concerns for students are on the rise—especially post-COVID-19 pandemic—this research is timely and important. It examines the predictive power that constructs such as self-efficacy, academic stress and academic fatigue have on the academic achievement of students and attempts to determine which construct(s) most apparently affects student learning. The research question to be answered through the current study is: how does self-efficacy, academic stress and academic fatigue (each alone and combined) influence student learning success?

The objectives of this research are two-fold: to empirically validate and analyze the relationship between the stated constructs and to suggest practical implications for university stakeholders. These individuals represent academic advisors, course developers, and administrators who must create a support infrastructure. The results of this study are hoped to add curricula, mental health programs in academic policy as well as

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spectrum therapeutic programs to increase students' resilience and academic performance in the University of Jambi.

2. LITERATURE REVIEW

Self-Efficacy

Bandura (2015) defines "self-efficacy as belief in one's capability to organize and execute the courses of action re-quired to achieve given types of performances," and that "self-efficacy is the belief in one's ability to manage and perform the actions required to manage situations to be confronted". In a person's day-to-day life, self-efficacy is one of the most vital aspects of self-awareness. This is because people's self-efficacy plays a role in shaping the types of actions they decide to take in order to seek out and reach a goal, as well as how they evaluate and interpret the many obstacles they may come across. Self-Efficacy is the belief that we are capable, effective, and capable of managing the lessons of life. Santrock in Novariandhini & Latifah (2012) stated "Self-efficacy is the belief of believe himself in a capabilities in controlling the results of the efforts that have been made". If self-efficacy plays a role in decisions, goals, problem solving and persistence, trying harder can cause different behavior among people with the same capabilities. When learners feel threatened, then they can be able to handle their negative self-thoughts by gradually increasing the positive self-statement, then they, they will steer their thoughts, feelings, and behaviors into a better direction (Ostovar, 2009). Meichenbaum in Kanfer, (1986) If students are successful about gaining control of stress situations through controlling positive thinking, then the deleterious effects of stress can be mitigated.

Academic Stress

According to Branon et al., (2018) stress is a degree of depression in one person, while Selye (1974) explains it as a particular form of the response of the individual to his or her environment (as being or tending to be burdensome or demanding and leading to the creation of distress). According to Beck (1995) stress is an internal impulse which comes from the unconscious that suddenly emerges due to conditions that creates disappointment in a person. According to Lazarus & Folkman (1984) then, stress is said to result from when the individual evaluates his or her ability as being inad-equate to meet the demands of the physical and social environment situation; stressing to be or not to be is determined by the in-dividual's subjective assessment of the source of the stress that comes. If the person feels their capacity is adequate to handle environmental demands, the person does not get stressed. An individual will be depressed if he or she feels weak and feels that the demands of others are stronger than his or her expectations. Beck & Judith (1998) also clarified that negative cognitions would precipitate when people evaluate themselves as incompetent to resist pitfal ls or to refuse pressures. Thoughts can have such a negative force over someone that your mind eventually takes over and you are you can become controlled by doubts and fears. So, human stress is what people makes people feel stress as a result o f the judgments a person makes that a condition or situation or event more dominated or controlled or influenced by negative feeling s or thoughts. It may greatly impact self-efficacy which is considered one's belief in successful performance of specific tasks. This, in turn, affects learning outcomes in at least three ways: negative thoughts cause decreased self-efficacy, low self-efficacy leads to low learning outcomes and disturbing this cycle is a required.

This stress that students experience is known as the academic stress. Carveth in Misra & McKean (2000), who argues that students' perceptions of how much information they have to learn and how little time they have to learn it, are triggers for academic stress. It proposes that academic stress is driven by academic overload, time pressure, and raised self-expectations. Throw these factors into the pot while we expect students to be able to balance school work, turn things in on time, and have personal standards for academic performance that drive even more anxiety. Academic stress is defined as stress that is associated with the student learning process or learning activities in which the student are involved in at school. It is expressed as tension caused by academy variables that lead directly to mental distortion and affect physi- cal, emotional, and behavioural dispositions of the pupils. Kariv & Heiman (2005) also mentioned that ac-ademic stress is stress due to academic stressors that occur in the process of teaching and learning or things related to learning activities such as: pressure to jump up, time to study, anxiety faced when exams, how many tasks must be completed; get test scores bad, complicated bureaucracy, making decisions, time to decide on majors and ca-reer. Academic Stress in College Students Academic stress among college students is defined as the pressures that the individual experiences as a result of the academic expectations placed upon them, their personal stress, or even stress from outside sources that may exacerbate their ability to effectively learn, earn a good grade, and maintain good

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relations with others. This type of stress comes from high expectations, not having enough time, competing, having to take care of your personal needs. It could be due to a number of factors such as an increase in workload, an increase in expectancy, inefficient ability to manage time, as well as social and environmental factors. High academic pressure may have negative effects on academic cognitive, emotional and behavioral aspects, which manifest into academic performance through cognitive dysfunction, emotion and psychology trouble, physical health difficulty, and behavioral problems. But not all academic stress is bad. Some students experience eustress, which increases their motivation, focus and capacity to meet deadlines. Distress (negative stress) occurs when students perceive their emotions to exceed capacity, which results in a reduction in academic performance. There are practical steps that can be taken to further enhance educational achievement and reduce stress in students, such as good time management, healthy living, seeking help, and mindfulness and relaxation techniques. University academic stress is an important predictor of student achievement. While some level of stress can be positive and motivating, too much stress has negative effects on our cognitive, emotional, and physical health. Means to cope with stress are necessary for academic success and for overall health maintenance (Almarzouki, 2024).

Academic Fatigue

Burnout is defined as "a state of emotional, mental, and physical exhaustion in response to chronic job stress associated with a breakdown in the relationship between the work-related demands and the individual's capacity to meet those demands" (Guo, et. al, 2022). Burnout and academic tiredness are closely intertwined, and the feeling of tiredness is often a symptom of emerging burnout. Their effects on children can be overwhelming, affecting children's cognitive, emotional, social and physical well-being. It is critical to address these challenges with tailored and systemic support for academic success and wellness. According to Chen, et. al (2022) Education In the context of education, burnout can be defined as a lack of interest towards learning and the inability to carry out duties. Students always perceive that academic success is the main aim and that is not surprisingly, That it's involves high expectations, that interferes when they are busy to prepare themselves physically and psychologically and that involvement leads to academic Burn out. For example, a study of 1,661 undergraduate students from Spain, China, Portugal and the Netherlands, found that academic burnout was negatively related to students' involvement and success at university, regardless of the country of origin (spoken language, 2018). Academic exhaustion is less frequent in the top achievers with positive attitude toward their discipline that in those without GC4 (Cage & McManemy, 2022). However, there isn't much evidence to suggest that programs studied or program interest is a reliable predictor of academic fatigue.

Learning Achievements

Achievement is a result achieved by a person in the teaching and learning process (Syafi'I et al., 2018). It refers to what people achieve from their hard work, from their schooling, and their skills in a certain area. It is variedly evaluated against set standards of achievement such as academic performance, skill competency, or the ability to meet target. Within the framework of learning, according to Noehi Nasution dalam Syafi'I et al., (2018) "learning" is the teaching aid that causes the appearance of change or attitude changes also in the form of the acquisition of the response formed. Yet the shift or the presence of such attitudes is not the result of temporary shifts triggered by extra factors. Hence learning can be described as an active process leading to changes or an increase in one's knowledge, skill and level of understanding.

3. MATERIAL AND METHOD

Research Design

A study process map in quantitative research illustrates the order of operations for a structured and systematic inquiry into the world of evidence using numerical numbers and objective statistical measurement. It operates as a structure that presents (and organises) the systematic, logical development from the identification of research problems, to the interpretation of findings. The research chart in this study is provided in Figure 1.

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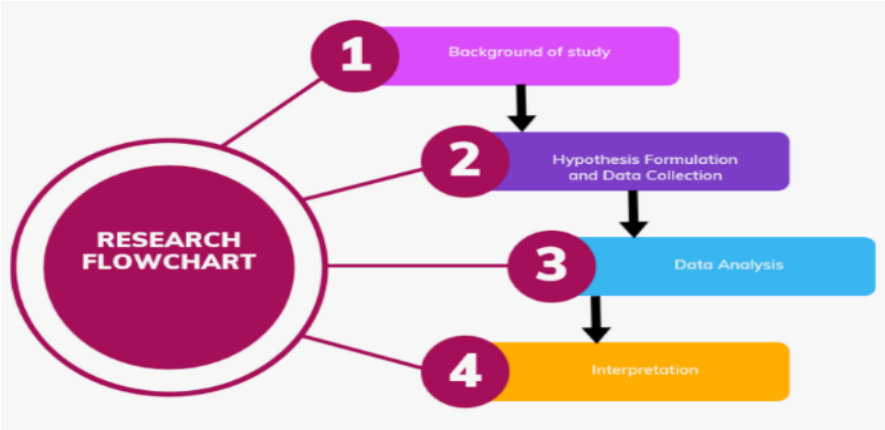

Figure 1. The Research Workflow Diagram

Participants and Data Collections

This study was a quantitative research conducted by the researcher. Creswell (2013) stated that quantitative research is research that investigates the relationship between variables. The terminology of research Sugiyono (2018) states that: Quantitative research is a methodology that employs positivist (empirical) data, in the form of numbers, which is relevant to the research object and is analyzed by statistical means in making conclusions. Due to the researcher's status as a student in University of Jambi. The targeting population is the students' commoner in the university. Random sampling method was employed to choose the respondents that contributed to the efficient and convenient collection of data with a sample size of 200 students.

A questionnaire was the main instrument of data collection. To facilitate responses and reduce collection time, the researcher used Google Forms to administer the questionnaire. A questionnaire is defined by Creswell (2017) is a data collection strategy in which individuals are asked to respond to a set of written questions or statements to identify their perceptions or experiences.

Instruments

The instrument of this study (a questionnaire) was utilized to obtain information on the relationship of self-efficacy, academic stress and academic fatigue with student learning outcomes, based on the findings of previous studies by Qin et al. (2022). Each of self-efficacy, academic stress, academic fatigue, and learning outcomes were operationalized with multiple dimensions to offer a more nuanced picture. Conceptually, self-efficacy involves task-specific self-efficacy, general academic self-efficacy, emotional self-efficacy, and resilience/self-regulation efficacy. Academic stress includes stress due to pressure to perform, workload stress, time management stress, social stress and test anxiety. Physical, cognitive, emotional, and motivational components of academic fatigue. Learning-outcomes are codified in the domains of cognitive, affective, psychomotor and metacognitive.

The development of the questionnaire included two main stages of modifications: the first was the selection of concepts to be measured and the second was the profile of respondents. A five-points Likert scale was used in the questionnaire, because it is a very simple method that can be easily understood by different groups of responders. The Likert scale was chosen because of the ability of the instrument to capture the subtleties of participant responses, its ability to conduct a relatively simple analysis, and the clarity and reliability of the data. Furthermore, expert judgment was incorporated to validate the instrument before it was administered, ensuring that the questionnaire met both content validity and practical applicability standards.

Data Analysis

Data have been analyzed and hypothesis has been developed by employing PLS-SEM by using smart PLS software due to its higher predictive ability (Hair, et al., 2017). Furthermore, it uses convergent validity and discrimination techniques with Smart PLS 3.2.7 to test the data for the adopted variables. to explain the connection between factors influencing students' learning performance. It applies the data analysis technique for some reasons including; complex models, no strict normality assumption, emphasis on prediction and

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invariance to measurement scales. You et al. (2017) build the model to explore the relationship between the variables affecting the outcome student learning with PLS-SEM. For a worthwhile research design applying Smart PLS, a sound instrument is required as it can measure what it is intended to measure (Hair et al., 2017). The validity of the study procedure was tested using convergent and discriminant methods, with Smart PLS 3.2.7. We start by bringing in the raw data in excel CSV format.

4. RESULTS

Measurement model Test

The objective of Measurement Model is to evaluate the quality of latent construct measurements that were used to examine the study proposition. The discriminant validity, convergent validity and reliability of each construct are thus evaluated. This is the Test Model in the Figure 2. This test indicates that the loading of all the items ranges from 0.717 to 0.908. Finally, Cronbach's Alpha for each construct is shown (0.750–0.868).

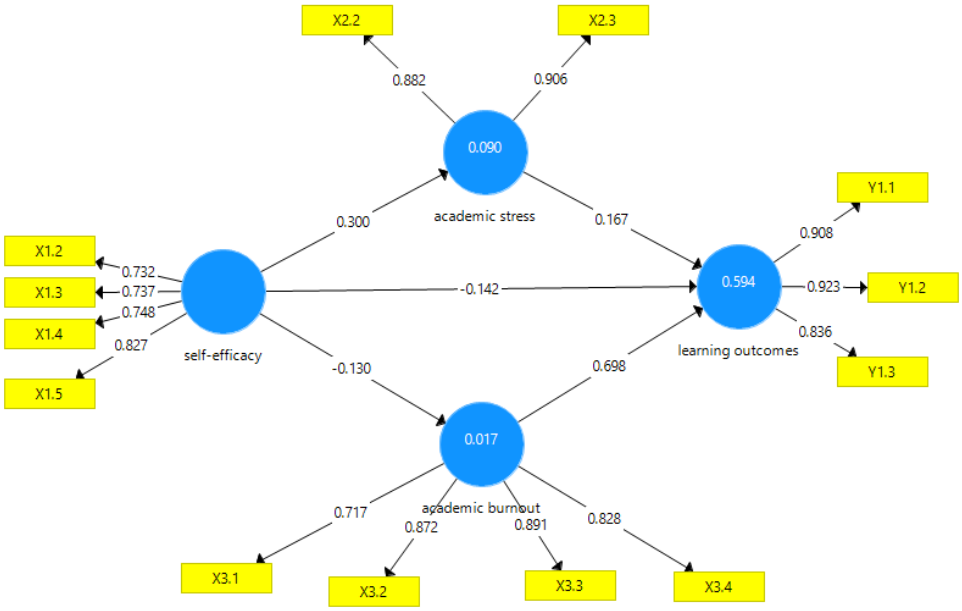

Figure 2. Measurements Model Test

Table 1. Loads, Cronbach's Alpha, composite reliability and AVE

construct	items	Load	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_C)	AVE
self-efficacy (X1)	X1.2	0.732	0.760	0.772	0.847	0.581
	X1.3	0.737				
	X1.4	0.748				
	X1.5	0.827				
Academic stress (X2)	X2.2	0.882	0.849	0.870	0.898	0.689
	X2.3	0.906				
Academic burnout (X3)	X3.1	0.717	0.868	0.877	0.919	0.792
	X3.2	0.872				
	X3.3	0.891				
	X3.4	0.828				
Learning Outcomes (Y1)	Y1.1	0.908	0,750	0.756	0.888	0.799
	Y1.2	0.923				
	Y1.3	0.836				

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Each construct's AVE (Average Variance Extracted) score needs to be higher than 0.50 in order for there to be convergence validity (Fornell and Larcker 1981). After deleting the "X1.1" item from the self-efficacy (SE) construct and the "X2.2" item from the academic stress (AS) construct, Table 1's AVE score for the entire construct is >0.5, indicating significant evidence of convergent validity. This is due to the fact that low factor loading (<0.40) reduces this construction's AVE (Fornell & Larcker 1981; Henseler et al., 2009; Ringle et al. 2014).

Table 2. Discriminated validity test (Fornell-larcker criterion)

	self-efficacy	Academic Burnout	Learning outcomes	Academic stress
self-efficacy	0.762			
Academic Burnout	0.130	0.830		
learning outcomes	0.182	0.751	0.890	
Academic stress	0.300	0.204	0.267	0.894

Table 3. (Heterotrait-monotrait ratio—HTMT)

	self-efficacy	Academic Burnout	learning outcomes	Academic stress
self-efficacy				
Academic Burnout	0.177			
learning outcomes	0.224	0.857		
Academic stress	0.408	0.250	0.317	

Table 4. Colinearity statistics (VIF)—Inner model

	Academic Burnout	Academic stress	learning outcomes	self-efficacy
Academic Burnout			1.089	
Academic stress			1.177	
learning outcomes				
self-efficacy	1.000	1.000	1.147	

According to Hair et al. (2017), for both Cronbach's alpha (α) and composite reliability (CR), the value should be above 0.70 for it to denote internal consistency and reliability. Table 1 also displays that the internal consistency estimates for all of the constructs considered in the study are well above the recommended value of 0.70 for both Cronbach's alpha and CR. Furthermore, a factor loading of 0.70 is the lower limit for each indicator to be considered a reliable measure. Indicators with a loading of.40–.70 can be cut off if the composite reliability increases above the acceptable value of 0.70 (Hair et al., 2017) after reducing the number of indicators. According to the results in Table 1, all constructs of this research satisfy the reliability condition. Discriminant validity was examined on the basis of three approaches including the Fornell-Larcker criterion, cross-loading analysis, & the Heterotrait-Monotrait (HTMT) ratio. Applying the Fornell-Larcker criterion, the average variance extracted (AVE) (Fornell & Larcker, 1981; Hair et al., 2017) of each construct was expected to be higher than the square of its highest correlation with any other construct. This is demonstrated, as can be seem from Table 2. The cross-loadings analysis emphasized that an item loads more strongly on its corresponding construct than on other constructs (Liu et al., 2018). The HTMT ratio is computed as the geometric mean of the average correlations between indicator measures of the same construct (monotrait-heteromethod) divided by the average correlations between indicator measures of different constructs (heterotrait-heteromethod) and reported in Table 3. According to Henseler et al. (2015), the HTMT should be less than 0.90 in order to affirm discriminant validity. The HTMT values in Table 3 are all acceptable. Hence, discriminant validity for all constructs is strong in line with the criteria of Fornell-Larcker, cross-loading analysis, and HTMT value.

Structural Model Test

The subsequent step is to evaluate the output of the structural model and test the proposed hypothesis. Between the structural model quality, the texturing process, and measurements we applied two criteria.

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Based on the R2, R2 and explanatory power value of f2, the initial criteria evaluates the ability of the model to explain. From the perspective of the path coefficient, prediction correlation of Q2 and influential value of Q2, the second indicator can measure the predictive power of the model. R2 represents proportion of variance of the endogenous constructs that can be explained by the exogenous constructs of the model (Hair et al., 2017).

Table 5. *R Square*

	R Square	R Square Adjusted
Academic Burnout	0.017	0.012
Academic stress	0.090	0.086
Learning outcomes	0.594	0.588

Table 6. *Effect Size (F2)*

	Academic Burnout	**Academic stress**	**learning outcomes**	**self-efficacy**
Academic Burnout			1.103	
Academic stress			0.058	
Learning outcomes				
Self-efficacy	0.017	0.099	0.043	

Table 7. *Q2* Square

	SSO	SSE	Q2 (=1-SSE/SSO)
Academic Burnout	804.000	796.342	0.010
Academic stress	402.000	377.924	0.060
Learning outcomes	603.000	327.218	0.457
Self-efficacy	804.000	804.000	

Table 8. Hypothesis testing results

Hypothesis	**Path**	**Original Sample (O)**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics**	***p* Values**	**Result**
H1 (+)	AB-> LO	0.698	0.699	0.038	18.215	0.000	Supported
H2 (+)	US-> LO	0.167	0.168	0.045	3.742	0.000	Supported
H3 (-)	SE-> AB	-0.130	0.134	0.075	1.743	0.082	Not Supported
H4 (+)	SE-> US	0.300	0.302	0.089	3.391	0.001	Supported
H5 (+)	SE-> LO	-0.142	-0.144	0.044	3.229	0.001	Supported

The Effect size (F2) measures the amount of prediction variance of the model that can be explained by each independent construct and is a significant factor in the explanatory power of the structural model. This is done by a process of iteratively deleting each predictor construct from the model (which is done automatically by SmartPLS) and recalculating the R2 value without this construct. The change in R2 for predictor-inclusion and -exclusion means whether the omitted construct affects the dependent variable in any significant way (Hair et al., 2017). F2 values (Cohen, 1988) are usually regarded in the small ($0.02 \leq F2 < 0.15$), medium ($0.15 \leq F2 < 0.35$), and large ($F2 \geq 0.35$) categories. These values can be useful to understand how strong the impact of each construct within the model is. F2 values of the results obtained in this work are presented in Table 6.

The Q^2 (blindfolding) statistics constitutes the third and last measure of predictive reliability (Geisser 1975). Q^2 has been used to evaluate out-of-sample predictive ability; however, it is not reputed to be as robust as PLS Predict, and this is discussed in the following section. The Q^2 is a measure of predictive relevance, the greater the Q^2, the greater the predictive quality of the model, if the Q^2 is less than 0, the model has no predictive ability. Thresholds corresponding to 0.25 and 0.50 indicate medium and substantial predictive relevance, respectively. Predictive power of the model was further assessed by the redundancy-based Q^2 method. As noted

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by Sarstedt et al. (2017) an explanatory model such as ours is reliable as long as $Q^2>0$, while in our case it is above 0, therefore the model yields predictive accuracy. The results for Q^2 are given in Table 7.

Score Consistency and Correlation Analysis

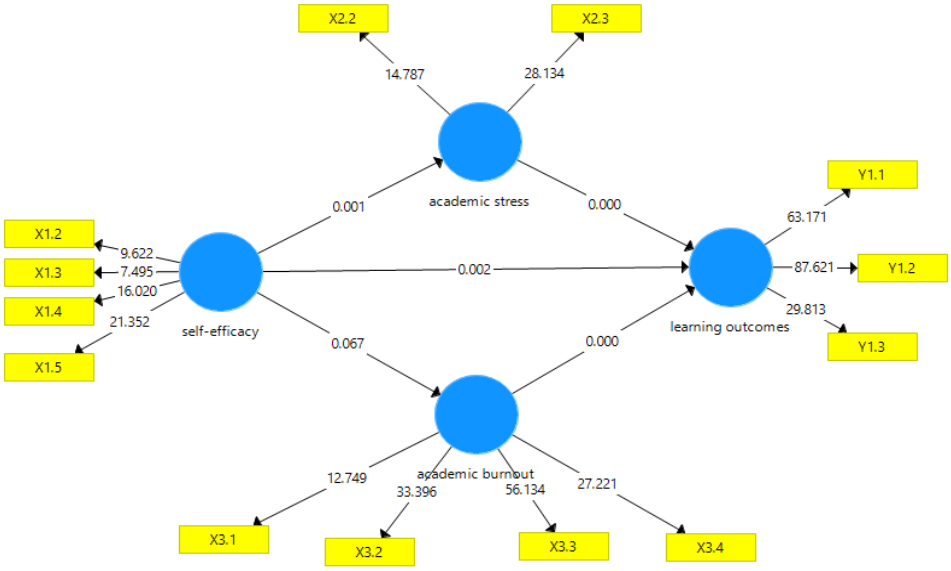

Figure 3. Structural Model Test

According to Figure 3 and Table 8, structural model attests to the positive associations between Academic Burnout (AB) and Learning Outcomes (LO) (β = 0.698, p 0.001) and SE and AB (β = -0.130, p > 0.001), but these findings are insignificant

Hypothesis Tsting Result

The results of research on 200 students at Jambi university, the result showed the first hypothesis (self-efficacy has a negative influence on academic fatigue) is supported. This contention is supported by the evidence that students with a low sense of efficacy procrastinate tasks, refrain from seeking help, and hold pessimistic perceptions about their capabilities, which may cause them to become fatigued. The second hypothesis is that self-efficacy has a positive influence on academic stress. This assumption is also recognized. High self-efficacy students are better at time management, reaching out for help, and have a strong attitude towards their education. It is these behaviors that allow them to better manage academic requirements and lower their stress. The third hypothesis is predicting the negative effect of self-efficacy on learning outcome. This result is not entirely unexpected and suggests that learners low in self-efficacy may have problems believing they are capable of comprehending difficult material. Such questions can discourage students from being motivated and putting in a good effort, and may lead to less desired learning. The fourth hypothesis: academic stress having its positive impact on learning achievement. This is consistent with the results that the pressure to achieve academic targets can drive students to exert more effort and be better disciplined. Academic stress may also encourage persistence and avoid student giving up when faced with learning difficulties if secured at a moderate level.

5. DISCUSSION

Intense efforts and persistence can indeed result in better learning results. This is congruent with the Yerkes-Dodson Law (1908) (commonly referred to as the "inverted U" concept), which posits that to be at their best, people need to have an optimal level of stress, which is moderate (Adler & Fich, 2012).

The fifth hypothesis is that academic fatigue positively affects learning. This would suggest that in some conditions students actually perform better when high in academic fatigue. For example, after completing a

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major academic assignment, a student may feel very tired but more focused and learn more effectively and efficiently for an upcoming exam, and ultimately obtain some of his or her best academic results.

Academic stress is an often acknowledged major determinant of academic burnout. Academia stress and academic burnout A study reported in Frontiers in Psychology showed that high levels of academic stress are significantly correlated with the level of academic burnout among adolescents, which suggested the detrimental effects of long-term academic stress on students' well-being and academic performance (Gao, 2023). Self-efficacy, the belief that one has the power to produce a specific effect, is also critical in this context. This study also showed that higher academic self-efficacy can mitigate the impact of learning stress on burnout (Gao, 2023).

In addition, follow-up studies reported in the Journal of Psychoeducational Assessment found that intrinsic motivation and learning engagement mediate the relationship between self-efficacy and academic burnout. Kruger, 2007).);Students with higher self-efficacy are likely to demonstrate higher motivation and engagement in their learning, which in turn can reduce the likelihood of burnout (Wang et al., 2024). These correlated factors have a substantial impact on academic achievement. Whereas increased stress and burnout can lead to cognitive impairment and lowered motivation, increased self-efficacy boosts resilience, compensatory resources and a sense of mastery and science letter, and is positively related to academic achievement.

The results of the current study highlight the necessity to promote the academic self-efficacy and intrinsic motivation of students. Educational strategies and interventions that have been used to increase self-efficacy, such as mastery experiences and positive feedback, and provided for in stress coping techniques may assist in preventing burnout and increasing learning. Knowledge of the relationship between self-efficacy, academic stress and academic burnout will be helpful for educators and policy makers targeting at these factors to promote students' wellbeing and their academic performance. The findings of this study have relevance to a diversity of audiences, which are focused on student mental health and academic growth. For higher educational institutions, the findings substantiate the need for implementation of general education or character development classes in academic programmes. In addition, the results have the potential to provide students with a reference point regarding what is deemed a stress-aware and engaging learning experience. For teachers, the research provides a basis to start a dialogue on virtue, and discussions about mental health, ethics, problem solving, and academic integrity.

The Complex Role of Academic Fatigue and Stress

The fact that academic fatigue was positively associated with learning outcomes may seem counterintuitive. Academic school tiredness and stress are routinely assumed to be detrimental to the performance of students. However, empirical evidence in recent years have showed that the linkage is more complex than it was thought to be in the past. Paradoxically, some studies found a positive relation between academic fatigue and learning outcomes. To systematically comprehend this phenomenon, it is necessary to examine its causal theories, following the application of traditional psychological, educational, and physiological theories.

Although academic fatigue and stress generally induce negative consequences, recent research has reported that they can play a positive role in academic performance in some circumstances. The belief behind eustress, or good stress, is that mild stress can improve cognitive function and productivity. In this sense, it could be assumed that mild to moderate levels of academic fatigue will motivate students to engage in better time management, deeper cognitive engagement and increase their commitment to academic goals. This "optimal stress" can result in enhanced focus, increased efficiency, and better school performance. Students who encounter academic tiredness tend to use coping strategies such as goal-setting, self-regulation, and organized study scheduling. And these fatigue-related behaviors are leading to better academic achievement. Research in

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educational psychology (Endler & Parker, 1996) provides evidence in favor of this finding with regard to the use of task-oriented coping during stress situations as compared with emotion-focused coping: learning outcomes are substantially more positive.

The Yerkes-Dodson Law (1908), another theory, dictates that performance rises with physiological or mental arousal, up to a point. Performance decreases beyond that point. In this "optimal zone" of activation, moderate levels of stress and fatigue may result to be beneficial for keeping students in the zone, increasing cognitive performances and motivation. In addition, neuroeducational research indicates that some stress hormone is not always a bad thing when it comes to memory consolidation, since moderate amounts of cortisol may support the transfer of material into long-term memory – especially when both fatigue and activity are involved. The Cognitive Activation Theory of Stress (Ursin & Eriksen, 2004) further argues that stress may lead to positive cognitive activation when it is appraised as a challenge rather than a threat. Chronic exposure (confronted with) academic fatigue and stress, if constructively handled, can give rise to resilience. For these resilient students, fatigue is accepted as an intrinsically part of vigorous study, rather than a barrier, and they keep performance and motivation high.

In conclusion, the paradoxical relationship between academic fatigue and enhanced learning effect indicates the double-edged sword of stress. Too much fatigue is clearly bad, but moderate levels can inspire motivation, improve cognitive focus and build resilience. This reinforces the importance of balanced academic climate where students are challenged but not overwhelmed. On going empirical investigations into how stress management interventions support students with this fine balance are required. Resilience Theory (Masten & Strzelczyk, 2001) also supports this perspective, explaining that exposure to and resolution of adversity is what fosters coping skills, resilience, and, ultimately, academic success.

Self-Efficacy as a Buffer Against Burnout: self-efficacy negatively affects academic burnout

The concept of self-efficacy as defined by psychologist Bandura (1977) involves an individual's perception of their competence to accomplish tasks or to overcome adversities. In the academic domain, academic self-efficacy refers to students' confidence in their ability to participate in learning activities, comprehend course content, and succeed academically. Academic burnout Academic burnout is a psychological syndrome developed in response to chronic academic stress and pressure, which is most often characterized by exhaustion, cynicism and detachment toward academic work, as well as feelings of ineffectiveness and lack of accomplishment with regard to ones' studies. The risk of burnout is significantly higher when the demands are unmanageable, and the school and student counsellors are unable to cope. Self-efficacy is one of the most important buffering factors against academic burnout. Students who are confident that they are able to accomplish a task are typically more resilient in dealing with the stress of school because they are less likely to become emotionally exhausted, disengage, or feel ineffective. Thus, increasing self-efficacy is a potential central strategy for schools wishing to develop resilient, motivated, and mentally healthy students—a result which is consistent with extant research.

Integration of Findings: Psychological Dynamics of Student Performance

Education as journey is more than an intellectual undertaking; it is resoundingly psychological. Recent empirical work underpins a more nuanced picture of the antecedents of student performance in which stress, burnout, self-efficacy, and learning outcomes are interwoven. Bringing evidence from several studies together adds depth to our understanding of these processes. 46,47 The marking students receive, as well as the academic atmo sphere and peer pressure, lead to a certain degree of stress in their studies, but this stress is not entirely detrimental to academic achievement. Positive stress, or eustress, may boost attention, motivation, and energy that support academic achievement. Some stress acts as a motivating force when students view academic challenges as something they can cope with. Harm on the other hand – too much or too frequent stress – that causes coping mechanisms to be overrun can lead to emotional exhaustion, lack of concentration and underachievement in school. Discontent is almost a forerunner to academic burnout.

Folkman and Lazarus (1984) contribute the Transactional Model of Stress and Coping, which suggests

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that, ultimately, the individual's perception of the stressor and types of coping utilized—not the stressor itself—dictate outcomes. Self-efficacy appears as a major protective factor in this regard. In other words, pupils who believe in their own capability to achieve learn to be more adaptable, emotionally managed and motivated. Thus, school success is influenced by both intellectual capacity and psychological robustness. Academic institutions must understand that these efforts are interconnected: They manage academic stress with wellness programs, prevent burnout by reducing workload and provide emotional support, and increase self-efficacy through mentorship, feedback, and skills. A mentally-friendly classroom is an necessary component for longterm student success.

6. CONCLUSION

Academic stress, working as pressure to achieve academic goals, might serve as incentive to put more efforts and show more diligence toward studies. Mild to moderate stress could also facilitate discipline and persistence in pursuit of goals, not allowing the learners to easily give in to difficulties. Academic fatigue is higher for students with low self-efficacy. Those with low self-efficacy procrastinate, avoid asking for help, and also have negative self-expectation, driving academic fatigue. In fact, high self-efficacy alleviates academic stress. High self-efficacy students are more capable at time management, help-seeking, and positive thinking in their studies, leading to their preparation for academic demands and avoidance of stress.

The association between self-efficacy and achievement is not straightforward. Self-efficacy is lower when the students doubt their possibility to learn, which leads to a low learning outcome. Nevertheless, even if there is a point of view of high self-efficacy, such does not necessarily mean good learning outcomes achieved. It indicates that self-efficacy is positively related to intelligent learning, which senses that intelligent learning may be the result of the process that students believe that they own unchallengeable ability, but not only this, according to the previous research conclusion. Hence, whilst some level of self-efficacy is helpful, it needs to be instilled with a sense of effort and self-learning in order to achieve optimum performance. Optimal academic stress enhances academic performance. The pressure from academic goals stimulates students to work harder, watch their learning more carefully, enhance their self-discipline, awareness, persistence, and make it difficult to give up their goals when faced with setbacks. In some situations, academic fatigue can be beneficial for learning. As fatigue increases, learning performance reduces as it is limited by availability of attentional resources. It's important to manage fatigue with the appropriate amount of rest, taking breaks at the right moments, and living a healthy lifestyle to get the most out of learning. It's a good idea to let your student rest on their laurels, and thus encourage them to rest after completing a large project—providing them an object lesson, energizing them to study in a more focused and energized way for the next test, and then breaking their focus so they get better performance.

Ultimately, this research sheds light on the multifaceted and intertwined interrelationships of self-efficacy, academic stress, and academic fatigue in predicting learning achievement among Jambi University students. Additional work is required to understand the interactions in these relationships and what appropriate responses by educators will promote student health and learning. This study contributes to several stakeholders engaged in students' mental growth, particularly in terms of self-efficacy, academic stress, and academic fatigue affecting learning achievements, such as university's curriculum integration for the general education course or character development course. This work can be used as material by students in an effort to become comfortable with learning free of pressure (epistemic validity), as well as improve their engagement and identity with the educational environment. For teachers, it can enable thoughtful conversations around mental health, ethics, problem solving, and academic honesty. There are some issues for consideration with this study—the sampling and its variables, which are leaning outcomes. However, with respect to such further work, they could be encouraged to investigate more with respect to the cultural and conceptual aspects, the variability in the learning outcomes, and the temporal variations in stress and fatigue.

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7. REFERENCES

Adler, R. F., & Benbunan-Fich, R. (2012). Juggling on a high wire: Multitasking effects on performance. *International Journal of Human-Computer Studies*, *70*(2), 156-168. https://doi.org/10.1016/j.ijhcs.2011.10.003

Almarzouki, A. F. (2024). Stress, working memory, and academic performance: a neuroscience perspective. *Stress, 27*(1). https://doi.org/10.1080/10253890.2024.2364333

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215. https://doi.org/10.1037//0033-295x.84.2.191

Beck, R. (1995). *Cognitive-Behavior Therapy: Basic and Beyond (2nd ed).* New York: The Guilford Press. https://doi.org/10.1017/s135246581200094x

Beck, R., & Judith S. (1998). *Cognitive Behavioral Therapy in the Treatment Inc.* 95 Church Street, White Plains, N.Y. 106001. https://doi.org/10.1037/e533342012-001

Branon, L., Updegraff, J. A., & Feist, J. (2018). *Health psychology: An introduction to behavior and health*. Cengage Learning. https://doi.org/10.1002/food.19900340332

Cage, E.; & McManemy, E. (2022). Burnt Out and Dropping Out: A Comparison of the Experiences of Autistic and Non-autistic Students During the COVID-19 Pandemic. *Front. Psychol, 12*, 792945. https://doi.org/10.3389/fpsyg.2021.792945

Cohen, Jacob. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. Hillsdale: Erlbaum. https://doi.org/10.2307/2290095

Creswell, J. W. (2013). Steps in conducting a scholarly mixed methods study. https://doi.org/10.4135/9781529624915

Endler, N. S., & Parker, J. D. A. (1990). Multidimensional Coping Inventory [dataset]. In PsycTESTS Dataset. American Psychological Association (APA). https://doi.org/10.1037/t02377-000

Folkman, S., & Lazarus, R. S. (1985). Stress Questionnaire [dataset]. In PsycTESTS Dataset. American Psychological Association (APA). https://doi.org/10.1037/t06129-000

Fornell, Claes, and David F. Larcker. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research* 18: 39–50. https://doi.org/10.1177/002224378101800104

Furr, S. R., McConnell, G. N., Westefeld, J. S., & Jenkins, J. M. (2001). Suicide and depression among college students: A decade later. *Professional Psychology: Research and Practice*, *32*(1). https://doi.org/10.1037/0735-7028.32.1.97

Gao, X. Academic stress and academic burnout in adolescents: a moderated mediating model. *Frontiers in Psychology, 14*. https://doi.org/10.3389/fpsyg.2023.1133706

Geisser, S. (1975). The predictive sample reuse method with applications. *Journal of the American Statistical Association*. 70, 350, 320-328. https://doi.org/10.1080/01621459.1975.10479865

Guo, J., Liu, Y., Chen, Y., Chai, G., & Zhao, X. (2022). Psychological support for public-funded normal students engaged in teaching profession. *Front. Psychol*, *13*, 940431. https://doi.org/10.3389/fpsyg.2022.940431

Hair, Joseph F., G. Tomas M. Hult, Christian Ringle, and Marko Sarstedt. 2017. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 2nd ed. Los Angeles: SAGE. https://doi.org/10.1080/10705511.2022.2108813

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, *43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8

Henseler, Jörg, Christian M. Ringle, and Rudolf R. Sinkovics. 2009. The Use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing* 20: 277–319. https://doi.org/10.1108/s1474-7979(2009)0000020014

Kanfer, F. H. (1986). Implications of a self-regulation model of therapy for treatment of addictive behaviors. In *Treating addictive behaviors: Processes of change* (pp. 29-47). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4613-2191-0_2

Kariv, D., & Heiman, T. (2005). Task-oriented versus emotion-oriented coping strategies: The case of college students. *College Student Journal*, *39*(1). https://doi.org/10.58809/iqud5542

p-ISSN: 2597-7792 / e-ISSN: 2549-8525
DOI: https://doi.org/10.20961/ijpte.v9i1.94522

Kljajic, K., Schellenberg, B. J. I., & Gaudreau, P. (2022). Why do students procrastinate more in some courses than in others and what happens next? Expanding the multilevel perspective on procrastination. *Frontiers in Psychology,* 12. https://doi.org/10.3389/fpsyg.2021.786249

Lazarus, R.S & Folkman, S., (1984). *Stress, appraisal, and coping*. New York: Springer. https://doi.org/10.1037/t06129-000

Leese, M. (2010). Bridging the gap: Supporting student transitions into higher education. *Journal of Further and Higher Education, 34*(2), 239-251. http://dx.doi.org/10.1080/03098771003695494

Liu, Sen, Felix T. S. Chanb, Junai Yang, and Ben Niu (2018). Understanding the effect of cloud computing on organizational agility: An empirical examination. *International Journal of Information Management* 43: 98–111. https://doi.org/10.1016/j.ijinfomgt.2018.07.010

Masten, J., & Strzelczyk, J. (2001). Journal of Cardiovascular Risk, 81(6), 678–682. https://doi.org/10.1097/00043798-200112000-00018

May, R. W., Bauer, K. N., & Fincham, F. D. (2015). School burnout: Diminished academic and cognitive performance. *Learning and Individual Differences*, *42*. https://doi.org/10.1016/j.lindif.2015.07.015

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, *16*(1). https://doi.org/10.1037/1072-5245.11.2.132

Mulaudzi, C. I. (2023). Challenges faced by first-year university students: navigating the transition to higher education. *Journal of Education and Human Development, 12*(2), 79- 87. https://doi.org/10.15640/jehd.v12n2a8

Novariandhini, D. A., & Latifah, M. (2012). Self-Esteem, Self-Efficacy, Learning Motivation, and Academic Achievement of High School Students in Various Learning Models. In *Journal of Family and Consumer Sciences* (Vol. 5, Issue 2, pp. 138–146). https://doi.org/10.24156/jikk.2012.5.2.138

Qin, L., Lu, J., Zhou, Y., Wijaya, T. T., Huang, Y., & Fauziddin, M. (2022). Reduction of Academic Burnout in Preservice Teachers: PLS-SEM Approach. *Sustainability*, *14*(20), 13416. https://doi.org/10.3390/su142013416.

Ringle, Christian M., Dirceu Da Silva, and Diógenes De Souza Bido. 2014. Modelagem de equações estruturais com utilização do smartpls. *Revista Brasileira de Marketing* 13: 56–73.

Salanova, M. (2009). Organizaciones saludables, organizaciones resilentes. *Gestión Practica de Riesgos Laborales*, *58*. https://doi.org/10.1158/0008-5472.SABCS12-S5-3

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Treating unobserved heterogeneity in PLS-SEM: A multi-method approach. *Partial least squares path modeling: Basic concepts, methodological issues and applications*, 197-217**.** https://doi.org/10.1007/978-3-319-64069-3_9

Selye, H. (1974). Stress without distress. In *Psychopathology of human adaptation* (pp. 137-146). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4684-2238-2_9

Sugiyono. 2018. *Quantitative Research Methods.* Bandung: Alfabeta. https://doi.org/10.5040/9781350188884.0009

Suharsono, Y., & Anwar, Z. (2020). Stress analysis and self-adjustment in students**.** *Online Journal of Psychology***,** *8*(1), 1–12.

Syafi'i, A., Marfiyanto, T., & Rodiyah, S. K. (2018). The study of student learning achievement in various aspects and influencing factors. *Journal of Educational Communication*, *2*(2), 115-123. https://doi.org/10.32585/jkp.v2i2.114.

Thompson, M., Pawson, C., & Evans, B. (2021). Navigating entry into higher education: the transition to independent learning and living. *Journal of Further and Higher Education, 45*(10), 1398–1410. https://doi.org/10.1080/0309877X.2021.1933400

Ursin, H., & Eriksen, H. R. (2004). The cognitive activation theory of stress. *Psychoneuroendocrinology, 29*(5), 567–592. https://doi.org/10.1016/s0306-4530(03)00091-x

Wang, L. & Chen, C.J. (2025). Factors affecting student academic performance: A systematic review. *International Journal on Studies in Education (IJonSE), 7*(1), 1-47. https://doi.org/10.46328/ijonse.276

Wang, X.-C., Zhang, M., & Wang, J.-X. (2024). The Effect of University Students' Academic Self-Efficacy on Academic Burnout: The Chain Mediating Role of Intrinsic Motivation and Learning Engagement. *Journal of Psychoeducational Assessment, 42*(7), 798-812. https://doi.org/10.1177/07342829241252863

Yerkes-Dodson Law. (n.d.). SpringerReference. https://doi.org/10.1007/springerreference_184066

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