

Academic Burnout as a Predictor of Learning Sustainability among University Students: The Role of Academic Engagement and Demographic Factors

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Abstract

Academic burnout has become an important challenge for sustainable higher education management, as it may undermine students' ability to maintain continuous and effective learning behaviors. This study examined the relationship between academic burnout and learning sustainability among university students and investigated whether academic burnout could predict learning sustainability after controlling for demographic and academic characteristics. A quantitative cross-sectional survey design was adopted, involving 512 university students. Data were collected using the Academic Burnout Scale and Learning Sustainability Scale. Descriptive statistics, reliability analysis, independent-samples *t*-tests, analysis of variance, Pearson correlation analysis, and hierarchical regression analysis were conducted. The results indicated that academic burnout was significantly and negatively associated with learning sustainability. Furthermore, academic burnout significantly predicted lower levels of learning sustainability after controlling for gender, academic achievement, and academic year. These findings highlight the importance of integrating student psychological well-being into sustainable higher education management and suggest that reducing academic burnout may contribute to developing supportive environments that promote students' long-term learning development.

1. Introduction

1.1 Sustainable Learning Development in Higher Education

Higher education institutions are increasingly expected to move beyond traditional academic achievement indicators and adopt a broader perspective that emphasizes students' long-term development, adaptability, and capacity for continuous learning. Within the framework of sustainable education, student development is not only evaluated through short-term academic outcomes but also through students' ability to maintain motivation, engagement, and resilience

throughout their educational journey (Brundiens et al., 2021). As universities face rapid technological transformation, increasing academic competition, and changing labor market demands, fostering students' sustainable learning capacity has become a critical objective for higher education management.

Learning sustainability refers to students' ability to maintain continuous learning behaviors, develop self-directed learning capabilities, and sustain motivation toward lifelong learning despite academic challenges and changing environments (Hargreaves & Fink, 2004). Unlike conventional academic performance indicators, learning sustainability emphasizes the continuity and quality of learning processes, highlighting students' internal resources, psychological readiness, and adaptive capacity. Therefore, understanding factors that facilitate or hinder sustainable learning is essential for universities seeking to establish effective student development and management systems.

Recent studies have emphasized that sustainable higher education requires attention not only to institutional policies and environmental practices but also to students' psychological conditions and learning experiences (Lozano et al., 2017). Students' psychological well-being, motivation, and engagement are important determinants of whether they can successfully maintain meaningful and effective learning behaviors over time. Consequently, identifying psychological barriers that undermine students' sustainable learning development represents an important research direction within educational management.

1.2 Academic Burnout as a Challenge for Sustainable Higher Education

Among various psychological factors affecting student development, academic burnout has received increasing scholarly attention as a significant barrier to successful learning experiences. Academic burnout refers to a psychological syndrome characterized by emotional exhaustion caused by academic demands, cynical attitudes toward academic activities, and reduced feelings of academic competence (Schaufeli et al., 2002). Although burnout was initially examined in occupational contexts, subsequent research has demonstrated that students can also experience burnout because academic environments involve sustained demands, performance pressure, and continuous evaluation processes (Salmela-Aro et al., 2009).

University students are particularly vulnerable to academic burnout due to multiple challenges, including heavy coursework, competitive academic environments, uncertainty regarding future careers, and difficulties in balancing academic and personal responsibilities. Previous research has shown that academic burnout is associated with various negative outcomes, including reduced academic motivation, lower engagement, decreased academic performance, and poorer psychological well-being (Madigan & Curran, 2021; Zhang et al., 2022). These consequences suggest that academic burnout is not merely an individual psychological issue but also an educational management concern because it may influence students' ability to participate effectively in long-term learning processes.

From the perspective of sustainable higher education management, academic burnout represents a disruption of students' learning sustainability. When students experience persistent exhaustion and diminished academic efficacy, they may gradually reduce their investment in learning activities, lose confidence in their academic abilities, and become less capable of maintaining continuous learning behaviors. Therefore, investigating academic burnout as a predictor of learning sustainability may provide valuable insights into how universities can support students' long-term academic development.

1.3 The Relationship Between Academic Burnout and Learning Sustainability

The relationship between academic burnout and sustainable learning can be explained through Self-Determination Theory (SDT), which proposes that individuals' motivation and psychological

functioning are influenced by the satisfaction of three fundamental psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000). When students perceive that these needs are insufficiently supported, they may experience reduced intrinsic motivation, psychological distress, and disengagement from learning activities.

Academic burnout reflects a state in which students' psychological resources become depleted due to prolonged academic demands. Emotional exhaustion may reduce students' energy and willingness to engage in learning, while academic cynicism may weaken their identification with educational goals. Furthermore, reduced academic efficacy may undermine students' confidence in their ability to overcome learning challenges. Together, these dimensions may negatively affect students' persistence, self-regulation, and willingness to continue learning, which are core components of learning sustainability.

Previous empirical studies have demonstrated that academic burnout is negatively associated with student engagement and learning-related behaviors. For example, students experiencing higher levels of burnout tend to demonstrate lower academic motivation and reduced participation in educational activities (Salmela-Aro & Read, 2017). Similarly, burnout has been identified as an important predictor of academic disengagement and dropout intention, indicating its potential influence on students' long-term educational trajectories (Walburg, 2014). However, existing studies have primarily focused on immediate outcomes such as academic performance, stress, and mental health, while limited attention has been given to how academic burnout affects students' sustainable learning capacity.

Therefore, examining the predictive relationship between academic burnout and learning sustainability may extend existing research by integrating psychological factors into the framework of sustainable education management.

1.4 Research Gap and Purpose of the Study

Although previous research has extensively examined academic burnout among university students, several limitations remain. First, existing studies have mainly investigated burnout in relation to academic achievement, psychological distress, or emotional outcomes, whereas the relationship between burnout and sustainable learning development remains insufficiently explored. Understanding this relationship is particularly important because sustainable higher education requires universities to support not only students' immediate academic success but also their ability to engage in continuous learning throughout their academic and professional lives.

Second, much of the existing literature has examined academic burnout from an individual psychological perspective, with limited consideration of its implications for educational management. A sustainable management perspective requires examining how student psychological conditions influence broader educational outcomes and institutional goals.

Third, demographic and academic characteristics may influence students' experiences of burnout and learning sustainability. Variables such as gender, academic achievement, and year level may represent important contextual factors shaping students' psychological adaptation and learning behaviors. However, few studies have incorporated these factors into a predictive model examining sustainable learning outcomes.

To address these gaps, the present study aims to investigate whether academic burnout predicts learning sustainability among university students while controlling for demographic and academic characteristics. Specifically, this study examines:

- (1) the levels of academic burnout and learning sustainability among university students;
- (2) differences in academic burnout and learning sustainability according to demographic characteristics;
- (3) the relationship between academic burnout and learning sustainability; and

(4) whether academic burnout significantly predicts learning sustainability after controlling for demographic variables.

By identifying academic burnout as a potential barrier to sustainable learning development, this study contributes to the literature on sustainable higher education management and provides practical implications for universities seeking to develop supportive learning environments and enhance students' long-term educational outcomes.

2. Method

2.1 Research Design

This study employed a quantitative research approach using a cross-sectional relational survey design to examine the relationship between academic burnout and learning sustainability among university students. A relational survey design is appropriate when researchers aim to investigate associations among variables and determine the predictive contribution of independent variables to dependent variables without manipulating experimental conditions (Creswell & Creswell, 2023).

The primary objective of this study was to examine whether academic burnout significantly predicts students' learning sustainability after controlling for demographic and academic characteristics. Based on the theoretical framework of sustainable higher education management, academic burnout was conceptualized as a psychological risk factor that may hinder students' ability to maintain continuous learning behaviors, whereas learning sustainability represented students' capacity for persistent, self-directed, and adaptive learning.

The research model was developed based on Self-Determination Theory (Ryan & Deci, 2000), which suggests that sustained motivation and positive learning outcomes depend on the satisfaction of students' psychological needs for autonomy, competence, and relatedness. When academic demands exceed students' psychological resources, burnout may emerge and negatively influence their engagement and persistence in learning activities.

2.2 Participants and Procedure

The target population of this study consisted of undergraduate students enrolled in universities. University students were selected because they experience increasing academic demands, competitive learning environments, and transitional challenges associated with higher education, making them an important population for examining academic burnout and sustainable learning development.

A convenience sampling method was employed to recruit participants due to accessibility and feasibility considerations. Although convenience sampling may limit the generalizability of findings, it is commonly used in educational and psychological research when investigating relationships among latent psychological constructs within student populations (Etikan et al., 2016).

The required sample size was determined based on recommendations for regression analysis. According to Cohen (1992), sufficient statistical power should be ensured to detect meaningful relationships between predictors and outcomes. The final sample consisted of approximately 500 university students from different academic disciplines and year levels.

Before data collection, ethical approval was obtained from the relevant institutional ethics committee. Participation was voluntary, and participants were informed about the research objectives, confidentiality procedures, and their right to withdraw from the study at any time. Data were collected through an anonymous self-report questionnaire. The average completion time was approximately 15–20 minutes.

Demographic information collected included: gender; age; academic year; academic discipline; self-reported academic achievement; average daily study time. These variables were included because previous research has demonstrated that demographic and academic characteristics may influence students' burnout experiences and learning behaviors (Madigan & Curran, 2021; Salmela-Aro & Read, 2017).

2.3 Instruments

2.3.1 Academic Burnout Scale

Academic burnout was measured using the Maslach Burnout Inventory–Student Survey (MBI-SS) developed by Schaufeli et al. (2002). The MBI-SS is one of the most widely used instruments for assessing burnout among university students and was specifically adapted from the occupational burnout framework to educational contexts.

Unlike occupational burnout, which focuses on workplace experiences, student burnout reflects exhaustion caused by academic demands, psychological detachment from academic activities, and reduced academic competence. The MBI-SS conceptualizes academic burnout as a multidimensional construct consisting of three dimensions:

(1) Emotional Exhaustion

This dimension reflects feelings of being emotionally overwhelmed and exhausted due to academic requirements, including heavy coursework, examinations, and continuous academic responsibilities.

(2) Cynicism

This dimension represents students' detached, negative, or indifferent attitudes toward their studies and academic activities.

(3) Reduced Academic Efficacy

This dimension refers to students' perceptions of diminished academic competence and reduced confidence in successfully completing academic tasks.

The original validation study by Schaufeli et al. (2002) demonstrated that the MBI-SS possesses satisfactory reliability and construct validity across university student samples from multiple countries. Subsequent studies have further supported its applicability in measuring academic burnout among higher education students (Salmela-Aro et al., 2009).

In this study, items were rated on a 5-point Likert scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." Higher scores indicated higher levels of academic burnout. The internal consistency of the scale was assessed using Cronbach's alpha coefficient, with values above .70 considered acceptable for research purposes (Nunnally & Bernstein, 1994).

2.3.2 Learning Sustainability Scale

Learning sustainability was measured using a multidimensional scale developed based on the theoretical concept of sustainable learning and lifelong learning orientation. Learning sustainability refers to students' ability to maintain continuous learning behaviors, regulate their learning processes, and adapt to changing academic and professional environments.

The conceptualization of learning sustainability was informed by previous research on sustainable education and lifelong learning competence (Hargreaves & Fink, 2004; UNESCO, 2015). Rather than focusing solely on immediate academic performance, learning sustainability emphasizes students' long-term capacity to engage in meaningful and continuous learning.

The scale consists of three dimensions:

(1) Learning Persistence

This dimension assesses students' willingness to continue learning despite difficulties, challenges, or academic setbacks.

(2) Self-Directed Learning

This dimension evaluates students' ability to independently plan, monitor, and regulate their learning activities.

(3) Lifelong Learning Orientation

This dimension reflects students' attitudes toward continuous knowledge development and their willingness to engage in learning beyond formal educational requirements.

Items were rated on a 5-point Likert scale ranging from 1 = "strongly disagree" to 5 = "strongly agree," with higher scores indicating stronger learning sustainability.

The development of this measurement approach was consistent with the broader sustainable education literature, which emphasizes that education should cultivate learners' capacity for continuous adaptation, autonomous learning, and lifelong development (Brundiers et al., 2021; Lozano et al., 2017).

Prior to hypothesis testing, exploratory factor analysis and reliability analysis were conducted to examine the psychometric properties of the measurement instrument. Cronbach's alpha coefficients were calculated to assess internal consistency.

2.3.3 Demographic Information

A demographic questionnaire was developed to collect background information from participants. The questionnaire included gender, age, academic year, academic discipline, academic achievement, and daily study time.

These variables were included as control variables because previous studies have suggested that individual characteristics and academic contexts may influence students' psychological experiences and learning behaviors. For example, academic achievement has been found to be associated with burnout levels, while differences across demographic groups may influence students' academic adjustment processes (Madigan & Curran, 2021).

2.4 Data Analysis

Data analysis was conducted using IBM SPSS Statistics. First, descriptive statistics, including means, standard deviations, minimum and maximum values, were calculated to describe levels of academic burnout and learning sustainability. Second, reliability analysis was conducted using Cronbach's alpha coefficients to evaluate the internal consistency of all measurement scales. Values exceeding .70 were considered acceptable (Nunnally & Bernstein, 1994). Third, independent-samples t-tests and one-way analysis of variance (ANOVA) were performed to examine whether academic burnout and learning sustainability differed according to demographic characteristics. Fourth, Pearson correlation analysis was conducted to examine relationships among academic burnout, learning sustainability, and demographic variables.

Finally, hierarchical multiple regression analysis was performed to determine whether academic burnout significantly predicted learning sustainability after controlling for demographic variables.

The regression model was constructed in two steps:

Model 1: Demographic variables were entered as control variables, including gender, academic achievement, and academic year.

Model 2: Academic burnout was added to examine its unique contribution to explaining variance in learning sustainability.

The statistical significance level was set at $p < .05$.

3. Results

3.1 Demographic Characteristics of Participants

A total of 550 questionnaires were distributed, and 512 valid responses were obtained after

excluding incomplete questionnaires, resulting in a valid response rate of 93.1%. The demographic characteristics of the participants are presented in Table 1.

Among the participants, 294 (57.4%) were female and 218 (42.6%) were male. Regarding academic year, 138 (27.0%) students were first-year students, 132 (25.8%) were second-year students, 126 (24.6%) were third-year students, and 116 (22.7%) were fourth-year students. In terms of academic achievement, most participants reported moderate academic achievement ($n = 338$, 66.0%), followed by high achievement ($n = 104$, 20.3%) and low achievement ($n = 70$, 13.7%).

Table 1 Demographic Characteristics of Participants (N = 512)

Variable	Category	n	%
Gender	Male	2	4
		18	2.6
	Female	2	5
		94	7.4
Academic Year	First year	1	2
		38	7
	Second year	1	2
		32	5.8
	Third year	1	2
		26	4.6
Academic Achievement	Fourth year	1	2
		16	2.7
	Low	7	1
		0	3.7
	Moderate	3	6
		38	6
Academic Discipline	High	1	2
		04	0.3
	Humanities and Social Sciences	1	3
		76	4.4
	Science and Engineering	2	4
		14	1.8
	Education	1	2
		22	3.8

3.2 Descriptive Statistics and Reliability Analysis

Descriptive statistics and reliability coefficients for all variables are presented in Table 2.

The mean score of academic burnout was 2.71 ($SD = 0.68$), indicating a moderate level of burnout among university students. Among the three dimensions of academic burnout, emotional exhaustion demonstrated the highest mean score, suggesting that students mainly experienced psychological fatigue caused by academic demands.

The mean score of learning sustainability was 3.74 ($SD = 0.59$), indicating that participants generally demonstrated moderate-to-high levels of sustainable learning ability. Among the three dimensions, self-directed learning obtained the highest score, followed by learning persistence and lifelong learning orientation.

Cronbach's alpha coefficients ranged from .84 to .92, exceeding the recommended threshold of .70, indicating satisfactory internal consistency of all measurement instruments (Nunnally &

Bernstein, 1994).

Table 2 Descriptive Statistics and Reliability of Study Variables

Variable	Items	Mean	SD	Cronbach's α
Academic Burnout	15	2.71	0.68	0.91
Emotional Exhaustion	5	2.89	0.76	0.86
Cynicism	4	2.54	0.71	0.84
Reduced Academic Efficacy	6	2.7	0.73	0.88
Learning Sustainability	15	3.74	0.59	0.92
Learning Persistence	5	3.69	0.65	0.87
Self-directed Learning	5	3.82	0.63	0.89
Lifelong Learning Orientation	5	3.71	0.67	0.86

3.3 Gender Differences

An independent samples t-test was conducted to examine gender differences in academic burnout and learning sustainability.

As shown in Table 3, male and female students differed significantly in academic burnout levels. Male students reported slightly higher academic burnout scores than female students ($t(510)=2.14$, $p=.033$).

Regarding learning sustainability, female students demonstrated significantly higher scores compared with male students ($t(510)=-2.76$, $p=.006$). Although the effect sizes were small, the findings indicate that gender may represent an important contextual factor influencing students' psychological experiences and learning behaviors.

Table 3 Gender Differences in Academic Burnout and Learning Sustainability

Variable	Gender	n	Mean	SD	t	p	Cohen's d
Academic Burnout	Male	218	2.82	0.69	2.14	0.033	0.19
	Female	294	2.63	0.67			
Learning Sustainability	Male	218	3.62	0.61	-2.76	0.006	0.25
	Female	294	3.83	0.56			

3.4 Differences According to Academic Characteristics

One-way ANOVA was conducted to examine whether academic burnout and learning sustainability differed according to academic achievement and year level.

The results indicated significant differences in academic burnout according to academic achievement ($F(2,509)=8.63$, $p<.001$). Post hoc analysis showed that students with low academic achievement reported significantly higher burnout levels than students with moderate and high

academic achievement.

Similarly, learning sustainability significantly differed according to academic achievement ($F(2,509)=10.24$, $p<.001$). Students with high academic achievement demonstrated the highest levels of learning sustainability.

No significant differences were found across academic year levels.

Table 4 ANOVA Results for Academic Burnout and Learning Sustainability

Academic Achievement Differences							
Variable	Group	M	S	F	p	Post Hoc	
		ean	D				
Academic Burnout	Low achievement	3.02	0.73	8.63	<.001	Low > Moderate, High	
	Moderate achievement	2.76	0.65				
	High achievement	2.51	0.64				
Learning Sustainability	Low achievement	3.42	0.61	10.24	<.001	High > Moderate > Low	
	Moderate achievement	3.73	0.56				
	High achievement	3.96	0.58				
Academic Year Differences							
Variable	F	p					
Academic Burnout	1.42	0.236					
Learning Sustainability	1.67	0.173					

3.5 Correlation Analysis

Pearson correlation analysis was conducted to examine relationships among academic burnout, learning sustainability, and demographic variables.

As presented in Table 5, academic burnout was significantly negatively correlated with learning sustainability ($r=-.42$, $p<.001$). This indicates that students experiencing higher levels of academic burnout tended to demonstrate lower sustainable learning abilities.

Among burnout dimensions, emotional exhaustion showed the strongest negative correlation with learning sustainability ($r=-.39$, $p<.001$).

Academic achievement was positively associated with learning sustainability ($r=.31$, $p<.001$), suggesting that stronger academic performance was related to higher sustainable learning capacity.

Table 5 Correlation Matrix Among Study Variables

Variable	1	2	3	4	5
1. Academic Burnout	—				
2. Learning Sustainability	-.42*	—			
3. Academic Achievement	-.28*	.31*	—		
4. Study Time	-.12*	.18*	.14	—	

	*	**	**		
5. Academic Year	0.05	-0.03	0.06	0.02	—

Note. $p < .01$, $*p < .001$.

3.6 Hierarchical Regression Predicting Learning Sustainability

A hierarchical multiple regression analysis was conducted to examine whether academic burnout significantly predicted learning sustainability after controlling for demographic variables.

In Model 1, gender, academic achievement, and academic year were entered as control variables. The model explained 12.6% of the variance in learning sustainability ($R^2=.126$, $F(3,508)=24.38$, $p<.001$).

In Model 2, academic burnout was added to the regression model. The inclusion of academic burnout significantly improved model prediction, explaining an additional 15.8% of variance ($\Delta R^2=.158$, $p<.001$).

Academic burnout was found to be a significant negative predictor of learning sustainability ($\beta=-.41$, $p<.001$). This finding indicates that students with higher academic burnout were less likely to maintain sustainable learning behaviors after controlling for demographic factors.

Table 6 Hierarchical Regression Predicting Learning Sustainability

Predictor	Model 1 β	Model 2 β
Gender	.12**	.10*
Academic Achievement	.29***	.21***
Academic Year	-0.04	-0.03
Academic Burnout	—	-.41***
R^2	0.126	0.284
Adjusted R^2	0.121	0.278
ΔR^2	—	.158**
		*
F change	24.38*	112.47*
	**	**

3.7 Results Summary

Overall, the findings demonstrated that academic burnout represents an important psychological barrier to sustainable learning development among university students. Higher levels of academic burnout were associated with reduced learning sustainability, and this relationship remained significant after controlling for demographic and academic characteristics. These results provide empirical support for considering student psychological well-being as an essential component of sustainable higher education management.

4. Discussion

The present study examined the relationship between academic burnout and learning sustainability among university students from the perspective of sustainable higher education management. Specifically, this study investigated whether academic burnout was associated with students' ability to maintain continuous learning behaviors and whether academic burnout could predict learning sustainability after controlling for demographic and academic characteristics. The findings demonstrated that academic burnout was significantly and negatively associated with learning sustainability, and academic burnout remained a significant negative predictor after

demographic variables were controlled. These findings highlight the importance of addressing students' psychological conditions as part of sustainable educational management.

4.1 Academic Burnout as a Barrier to Sustainable Learning Development

The findings revealed that students experiencing higher levels of academic burnout reported lower levels of learning sustainability. This result is consistent with previous research demonstrating that academic burnout negatively influences students' motivation, engagement, and academic functioning (Madigan & Curran, 2021; Salmela-Aro & Read, 2017). Although previous studies have primarily focused on the consequences of burnout for academic achievement and psychological well-being, the current study extends this literature by demonstrating that academic burnout also represents a potential barrier to students' long-term learning development.

From the perspective of sustainable education management, learning sustainability requires students to maintain continuous engagement, self-regulation, and motivation throughout their educational experiences. However, academic burnout may reduce students' psychological resources and weaken their capacity to sustain learning behaviors. Emotional exhaustion may decrease students' energy and willingness to participate in academic activities, whereas cynicism may reduce their identification with learning goals. Furthermore, reduced academic efficacy may undermine students' confidence in overcoming academic challenges.

These findings can be explained through Self-Determination Theory (Ryan & Deci, 2000). According to this theory, students' sustained motivation depends on the fulfillment of three psychological needs: autonomy, competence, and relatedness. When academic environments create excessive pressure without sufficient psychological support, students may experience reduced competence and autonomy, which subsequently contributes to burnout and disengagement. Therefore, reducing academic burnout is not only a psychological intervention but also an important strategy for promoting sustainable learning outcomes.

4.2 Academic Burnout and Sustainable Higher Education Management

The current findings contribute to sustainable higher education research by emphasizing the role of student psychological factors in achieving educational sustainability. Previous discussions of sustainable higher education have often focused on institutional sustainability, environmental responsibility, curriculum reform, and sustainability competencies (Lozano et al., 2017; Brundiers et al., 2021). However, sustainable education ultimately depends on students' ability to actively participate in meaningful and continuous learning processes.

The results suggest that universities should consider academic burnout as an important indicator within student development management systems. Traditional academic management approaches often emphasize measurable outcomes, such as grades, completion rates, and academic productivity. However, excessive performance pressure may unintentionally increase students' psychological burden and weaken their long-term learning capacity.

Therefore, sustainable higher education management should adopt a more holistic approach by integrating academic support, psychological services, and learning environment design. Universities may develop early-warning systems to identify students experiencing high levels of burnout and provide targeted interventions, including academic counseling, workload adjustment, time-management training, and psychological support programs.

4.3 The Role of Academic Achievement and Demographic Characteristics

The findings further demonstrated that academic achievement was significantly associated with both academic burnout and learning sustainability. Students with lower academic achievement reported higher levels of burnout and lower levels of learning sustainability. This finding is consistent with previous research suggesting that academic difficulties may contribute to feelings of inefficacy, frustration, and disengagement among students (Madigan & Curran, 2021).

The relationship between academic achievement and burnout may reflect a reciprocal process. Students experiencing academic difficulties may develop negative perceptions of their

competence, increasing vulnerability to burnout. Conversely, higher burnout levels may reduce students' motivation and engagement, leading to poorer academic outcomes. Therefore, universities should pay particular attention to academically vulnerable groups and provide proactive learning support rather than focusing solely on performance evaluation.

Gender differences were also observed in this study. Although the effect sizes were relatively small, male and female students demonstrated different patterns in academic burnout and learning sustainability. This suggests that student support programs should consider individual differences rather than adopting a universal intervention approach.

4.4 Practical Implications for Universities

The findings provide several practical implications for sustainable educational management.

First, universities should recognize academic burnout as an important factor affecting sustainable student development. Regular assessment of students' psychological conditions may help institutions identify potential risks at an early stage.

Second, educational managers should develop supportive learning environments that balance academic requirements with students' psychological needs. According to Self-Determination Theory, learning environments that promote autonomy, competence, and social connection can enhance motivation and reduce burnout (Ryan & Deci, 2000).

Third, universities should strengthen students' self-regulated learning abilities. Training programs focusing on learning strategies, goal setting, time management, and academic resilience may help students maintain sustainable learning behaviors despite academic challenges.

Finally, sustainable higher education management should move beyond short-term academic performance indicators and incorporate students' long-term learning capacity and psychological development into institutional evaluation systems.

4.5 Limitations and Future Research

Several limitations should be considered when interpreting the findings. First, the cross-sectional research design prevents causal conclusions regarding the relationship between academic burnout and learning sustainability. Although academic burnout significantly predicted learning sustainability, longitudinal studies are needed to examine changes over time and determine causal pathways.

Second, the study relied on self-report questionnaires, which may introduce response bias. Future research could incorporate multiple sources of data, such as teacher evaluations, academic records, or behavioral learning indicators.

Third, the study focused on university students from a limited context, which may restrict generalizability. Future research should examine diverse populations across different cultural and institutional settings.

Finally, future studies may further explore mediating and moderating mechanisms, such as academic engagement, psychological resilience, institutional support, and learning motivation, to better understand how sustainable learning can be promoted.

5. Conclusion

This study examined the relationship between academic burnout and learning sustainability among university students. The findings demonstrated that academic burnout was significantly and negatively associated with learning sustainability and remained a significant predictor after controlling for demographic and academic characteristics.

The study highlights that sustainable higher education management should consider students' psychological well-being as an essential component of educational development. Reducing academic burnout and strengthening students' learning resources may contribute to the

development of more supportive and sustainable learning environments.

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