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ORIGINAL RESEARCH

The Effect of Academic Adaptability on Learning Burnout Among College Students: The Mediating Effect of Self-Esteem and the Moderating Effect of Self-Efficacy

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Background: With the popularization of higher education, the problems of academic adaptability and learning burnout among college students have become increasingly prominent. The purpose of this study was to investigate the relationship between academic adaptability, learning burnout, self-esteem and self-efficacy of college students and their underlying mechanisms.

Methods: The study was conducted on 2110 college students using the College Student Learning Adjustment Scale, the Learning Burnout Undergraduates Scale, the Self-Esteem Scale, and the Self-Efficacy Scale to establish a mediating model of adjustment. SPSS 26.0 was used for descriptive statistics and Pearson correlation analysis. Model 4 and Model 14 in the process plug-in prepared by Hayes (2017) were used for mediating effects analysis and moderating mediator analysis respectively, and the significance of the mediating effects was tested using the bias-corrected percentile Bootstrap method.

Results: (1) academic adaptability significantly and positively predicted self-esteem; (2) self-esteem significantly and negatively predicted learning burnout; (3) academic adaptability significantly and negatively predicted learning burnout; (4) self-esteem partially mediated the effect of academic adaptability on learning burnout; and (5) self-efficacy moderated the latter half of the mediation process of academic adaptability-self-esteem-learning burnout.

Conclusion: These findings are useful for college educators and related researchers to better understand the mechanisms underlying the relationship between academic adaptability and learning burnout, thus providing practical and effective operational suggestions on the prevention and intervention of learning burnout in college students.

Keywords: academic adaptability, learning burnout, self-esteem, self-efficacy, moderated mediation model

Introduction

Adaptation is a psychological process in which individuals actively develop and adjust themselves to cope with changes in the objective environment, and then harmonize and balance with the external environment.[1] According to Feng et al,[2] academic adaptability is a psychological and behavioral process in which subjects strive to adapt himself or herself to the needs of the environment and learning in order to achieve a balance with the learning environment. As early as 2006, the "Public Image Survey of College Students" conducted by the Youth Development Research Institute of China Youth University for Politics Science found that 38.8% of college students had an "average and perfunctory attitude" toward learning, while only 8.5% had a "very good attitude" toward learning.[3] According to the Central People's Government of the People's Republic of China, the total number of students enrolled in higher education in China reached 44.3 million by 2021 and the gross enrollment rate of higher education increased from 30% in 2012 to 57.8% in 2021. Chinese higher education has entered the stage of universal development.[4] With the expansion of higher education, some problems of

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college students' learning have been highlighted. For example, the phenomenon of college students skipping classes is serious.[5] In addition, according to the systematic assessment of 1373 normal university students and 227 publicly funded normal university students, the proportion of students with poor academic adaptation during college is as high as 23.6% and 33.4%, respectively.[6] The problem of academic adaptability among college students has attracted widespread attention. Studies have confirmed that academic adaptability has a significant negative predictive effect on learning burnout.[7,8] Learning burnout is a burnout phenomenon in which students lose interest in their studies and their sense of academic achievement due to emotional exhaustion caused by excessive long-term academic stress.[9] Students' learning burnout is manifested by lack of interest in learning, inability to continuously participate in the course, and non-participation in classroom activities, etc.[10] Some students even suspend or withdraw from school and quit campus early because they cannot adapt to the college study.[11] Izadpanah[12] explores the mediating role of academic enthusiasm in the relationship between academic self-regulation, goal orientation, and learning burnout among college English foreign language students. Students with high levels of academic adaptability have strong self-regulatory abilities. They adapt to university culture with full enthusiasm and build good teacher-student relationships, reducing the fatigue and burnout generated by their studies. For this reason, hypothesis H0 is proposed. H0: There is a moderated mediating effect between academic adaptability and learning burnout. The purpose of this study is to explore the influence of academic adaptability on learning burnout and its mechanism among college students.

The Relationship Between Academic Adaptability and Learning Burnout

Academic adaptability is related to the way individuals cope with stress. Stress from specific academic tasks has a significant positive predictive effect on learning burnout.[13] The inability to cope effectively with academic stress is one of the most important factors contributing to learning burnout.[14] College students can suffer from learning burnout due to difficulties in adapting to stress.[15] If adolescent students are unable to apply appropriate stress relief methods, this can contribute to a large extent to their weak academic adaptability.[16] This is likely to develop into a learning psychiatric disorder in students, which in turn induces symptoms of learning burnout. It has been established that academic adaptability is negatively related to learning burnout.[8,15,17] Hou and Liang[18] hold a similar view. They also argue that learning burnout is the result of individuals' inability to cope with learning difficulties. In summary, hypothesis H3 is proposed.

H3: There is a significant effect of academic adaptability on learning burnout.

The Relationship Between Academic Adaptability and Self-Esteem

Whether college students can adapt to learning has an important impact on their healthy physical and mental development and the successful completion of their studies. It has been found that students with low levels of academic adaptability have been found to have lower levels of self-esteem.[19] Self-esteem is an important construct in positive psychology and an important psychological resource. It consists of self-competence and self-liking, and it's the individual's overall evaluation of himself or herself.[20] People with high self-esteem are usually confident and happy, while those with low self-esteem are prone to anxiety and lack of self-confidence. Students with high academic adaptability have increased their self-confidence and self-satisfaction due to positive learning feedback (eg, praise and motivation from teachers and parents) as a result of good learning adjustment adaptation strategies.[21] Academic adaptability has a positive effect on self-esteem levels.[22] There is a correlation between learning adaptation and self-esteem. In summary, hypothesis H1 is proposed.

H1:There is a significant effect of learning adaptation on self-esteem.

The Relationship Between Self-Esteem and Learning Burnout

Burnout is often viewed as physical and emotional fatigue, which includes the development of negative attitudes and poor self-concept.[23] Melamed et al[24] consider burnout as a combined experience of physical fatigue, emotional exhaustion, and cognitive boredom. Learning burnout is a phenomenon that occurs in college students and has an important impact on their successful completion of study tasks and good grades. Students' learning burnout is a phenomenon that they hold a negative attitude towards studies. It results from long-term academic pressure or academic

load and energy consumption, and students are less motivated to complete school work and activities, apathetic and alienated, thus making the results not as good as expected.[8] Salmela-Aro and Upadyaya[25] take a similar view and they consider learning burnout as a psychological syndrome that arises due to the prolonged exposure of students to related stress. Adolescents with impaired self-esteem are more likely to have academic adjustment problems.[26] Various of studies have confirmed that self-esteem is significantly and negatively related to learning burnout in college students.[27–29] That is, the higher the level of self-esteem of college students, the lower their level of learning burnout. In summary, hypothesis H2 is proposed.

H2: There is a significant effect of self-esteem on learning burnout.

Mediating Effects of Self-Esteem

Positive psychological factors can influence an individual's assessment of the environment and thus mediate individual stress response relationships.[30,31] Self-esteem is an important positive psychological factor and a protective factor for mental health.[32] According to Maslow's[33] pyramid of needs, self-esteem is a bridge between the real self and the ideal self and is a kind of emotional regulation resource. Enhancing individuals' self-esteem by increasing their level of academic adaptability can have a protective effect on students' academic and behavioral development, thereby improving their overall physical and mental health and a sense of happiness.[34] Students with high academic adaptability show adequate enthusiasm for learning and pride in learning. The higher level of students' academic adaptability, the higher their self-esteem level will be.[35] There is a correlation between academic adaptability and self-esteem. In addition, students with low self-esteem levels always refer to themselves in a negative way, placing themselves in a disadvantaged "weak mentality". They tend to experience academic exhaustion and learning burnout.[36] Self-esteem is negatively associated with learning burnout.[37] There is a correlation between self-esteem and learning burnout. In summary, hypothesis H4 is proposed.

H4: Self-esteem mediates between academic adaptability and learning burnout.

Moderating Effects of Self-Efficacy

Self-efficacy is an individual's beliefs and expectations about his or her ability to accomplish various tasks or behaviors.[38] Bandura[39] further states that such beliefs provide individuals with confidence and motivation to complete tasks. Individuals with high self-esteem are better at building and maintaining a higher sense of self-efficacy than individuals with low self-esteem.[40] Reasonably accurate judgments of individual values by individuals with high self-esteem can motivate students' self-efficacy.[41] There may be a correlation between self-efficacy and self-esteem. In addition, previous studies have found that self-efficacy effectively predicts learning burnout.[42–45] Mostert and Pienaar[46] hold a similar view. They conclude that poor self-state, such as strong negative emotions and lack of self-efficacy, is one of the important factors causing learning burnout. Students with low self-efficacy are more likely to suffer from learning burnout.[47] There may also be a correlation between self-efficacy and learning burnout. In summary, hypothesis H5 is proposed.

H5: Self-efficacy moderates the latter half of the mediated pathway of academic adaptability-self-esteem-learning burnout.

In summary, this study proposed a moderated mediation model (Figure 1) with two main purposes: (1) to investigate the mediating role of college students' self-esteem in the relationship between academic adaptability and learning burnout. (2) to explore whether college students' self-efficacy moderates the relationship between their self-esteem and learning burnout.

Method

Data Sources and Sample Characteristics

A total of 2145 full-time college students from Chinese universities, including Xiamen University, Jimei University and Xiamen Institute of Technology et al, were selected as the subjects of the study using the convenience sampling method. After eliminating invalid questionnaires, 2110 valid questionnaires were obtained, with a valid return rate of 98.36%. The

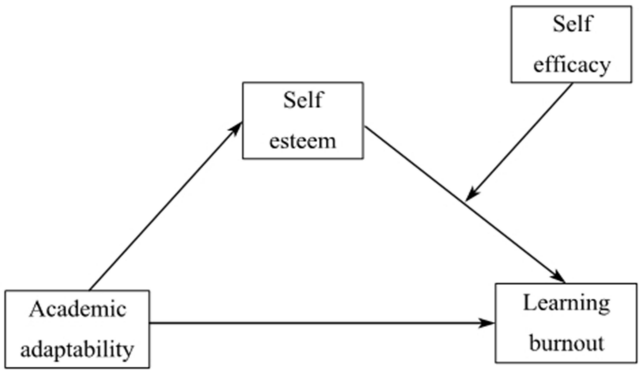

Figure 1 Theoretical model.

sample was relatively well distributed in terms of demographic variables (Table 1), which was representative and could better meet the needs of this study. Among them, 1080 (51.18%) were male and 1030 (48.82%) were female; 677 (32.09%) were only children and 1433 (67.91%) were non-only children; 1255 (58.06%) were urban and 885 (41.94%) were rural. Informed consent was obtained from the subjects before this survey was conducted.

Research Tools

Self-Esteem Scale

The Self- Esteem Questionnaire of Undergraduates prepared by Zhang et al[48] was used and adapted to the actual situation of college students. The scale consists of 18 questions. Questions such as "I am well liked and people are willing to make friends with me". "When I encounter difficulties in my study or life, I always believe that I can handle them properly". "I feel that I have a lot to be proud of". All were rated on a 5-point Likert scale, with higher scores representing higher agreement with the question. The KMO value of the scale was 0.920, which means the study data were well suited for extracting information. The Cronbach alpha coefficient of the scale was 0.888, and the scale had good consistency and validity of the measurement results. After reversing the scores of the questions, the 18 items were summed and averaged to obtain the variable of self-esteem, which was used to indicate the level of self-esteem. Higher scores indicate a higher level of self-esteem.

Table 1 The Description of the Sample

Name	Option	Frequency	Percentage(%)
Gender	Male	1080	51.18
	Female	1030	48.82
Only child or not	Yes	677	32.09
	No	1433	67.91
Place of origin	Town	1255	58.06
	Rural	885	41.94
Major	Science	769	36.4
	Engineering	738	35.0
	Arts	486	23.0
	Other	117	5.5

Learning Adjustment Scale

The Learning Adjustment Scale for college students developed by Feng et al[2] was used and adapted to the actual situation of college students. The scale consists of 44 questions. Questions such as "Facing the fierce competition in college, I always try to improve myself". "I feel uncomfortable with the disconnection between university studies and secondary school". "If it were not for the credits and diploma, I would have stopped studying long ago". All were rated on a 5-point Likert scale, with higher scores representing higher agreement with the question. The KMO value of the scale was 0.943, which means the study data were well suited for extracting information. The Cronbach alpha coefficient of the scale was 0.869, and the scale had good consistency and validity of the measurement results. After reversing the scores of the reverse questions, the 44 question items were summed and averaged to obtain the variable of learning adaptation, which was used to indicate the degree of academic adaptability. Higher scores indicate a higher degree of academic adaptability.

Learning Burnout Scale

The Learning Burnout Undergraduates Scales (LBS) developed by Lian et al[48] was used and adapted to the actual situation of college students. The scale consists of 20 questions. Questions such as "So far, my university studies have enabled me to demonstrate my abilities to the fullest". "It is difficult for me to stay enthusiastic about studying for a long time". "I want to study but I feel that it is boring". All were rated on a 5-point Likert scale, with higher scores representing higher levels of agreement with the question. The KMO value of the scale was 0.906, which means the study data were well suited for extracting information. The Cronbach alpha coefficient of the scale was 0.824, and the scale had good consistency and validity of the measurement. After reversing the scores of the reverse questions, the 20 items were summed and averaged to obtain the variable of learning burnout, which was used to indicate the degree of learning burnout. Higher scores indicate higher levels of learning burnout.

Self-Efficacy Scale

The self-efficacy scale developed by Schwarzer et al[49] was used and adapted to the actual situation of college students. The scale consists of 10 questions. Questions such as "I can always solve problems if I do my best". "I can face difficulties calmly because I trust my ability to deal with them". "When there is trouble, I can usually think of some way to cope". All were rated on a 5-point Likert scale, with higher scores representing higher levels of agreement with the question. The KMO value of the scale was 0.935, which means the study data were well suited for extracting information. The Cronbach alpha coefficient of the scale was 0.914, and the scale had good consistency and validity of the measurement results. After reversing the scores of the reverse questions, the 10 items were summed and averaged to obtain the variable of self-efficacy. Higher scores indicate higher levels of self-efficacy.

Data Processing

SPSS 26.0 was used for descriptive statistics and Pearson correlation analysis. Model 4 and Model 14 in the process plug-in prepared by Hayes (2017)[50] were used for mediating effects analysis and moderating mediator analysis respectively. Model 4 is an analysis model of process for the operation and result interpretation of simple mediations. If the bootstrap 95% confidence interval does not contain 0, it indicates a partial mediation effect; if it contains 0, it indicates a full mediation effect. Model 14 is a moderated mediation effect model in which the second half of the mediation effect is moderated. When the size of the regulating variable changes, the relationship between the mediating variable and the dependent variable will also change, thus affecting the mediating effect. In addition, the significance of the mediating effects was tested using the bias-corrected percentile Bootstrap method. Statistical significance was considered if the 99% confidence interval did not contain a value of 0. In addition, all variables were standardized beforehand to avoid bias in the moderating effect.

Research Results

Common Method Bias Test

The problem of common method bias may arise when data are collected using the self-report method. The common method bias test was conducted using the Harman single-factor test. The results showed that there were four factors with a characteristic root greater than one, and the total variance explained by the first common factor was 34.61%, which was less than the critical value of 40%. Therefore, there is no common method bias in the data of this study.

Descriptive Statistics and Correlation Analysis of Each Variable

Four variables such as learning burnout, academic adaptability, self-esteem and self-efficacy were analyzed for correlation, and Pearson correlation coefficient test was used considering that the main variables were continuous variables. The results showed that the four variables of learning burnout, learning adaptation, self-esteem and self-efficacy showed significant correlations with each other. The results were shown in Table 2.

Testing the Mediating Effect

Model 4 (Model 4 is a simple mediation model) in the SPSS macro developed by Hayes (2017)[50] was used to test the mediating effect of self-esteem in the relationship between academic adaptability and learning burnout. The results were shown in Table 3 and Table 4. The positive predictive effect of academic adaptability on self-esteem was significant (B= 0.382, t = 13.142, p < 0. 001), and hypothesis H1 was verified; the negative predictive effect of self-esteem on learning burnout was significant (B= −0.080, t = −5.521, p < 0. 001), and hypothesis H2 was verified; the negative predictive effect of academic adaptability on learning burnout was significant (B = −0.795, t = −41.023, p < 0. 001), and hypothesis H3 was verified; when mediating variables were put in, the negative predictive effect of academic adaptability on learning burnout was still significant, but the effect value was reduced (B = −0.765, t = −38.195, p < 0. 001). In addition, the upper and lower

Table 2 Correlation Analysis Between Variables

	Mean	Standard Deviation	Self-Esteem	Learning Burnout	Academic Adaptability	Self-Efficacy
Self-esteem	3.182	0.582	1			
Learning burnout	2.856	0.501	−0.269**	1		
Academic adaptability	3.411	0.419	0.275**	−0.666**	1	
Self-efficacy	3.292	0.645	0.650**	−0.318**	0.372**	1

Note: ** indicates p<0.01.

Table 3 Mediated Model Test for Self-Esteem

Regression Equation (N=1061)		Fitted Indicators			Coefficient Significance	
Outcome Variables	Predictor Variables	R^2	Adjustment R^2	*F* value	β	*t*
Learning burnout	Constant	0.444	0.444	1682.924***	5.569***	83.586
	Academic adaptability				−0.795***	−41.023
Self-esteem	Constant	0.076	0.076	172.722***	1.879***	18.823
	Academic adaptability				0.382***	13.142
Learning burnout	Constant	0.452	0.451	868.466***	5.718***	79.972
	Academic adaptability				−0.765***	−38.195
	Self-esteem				−0.080***	−5.521

Note: ***Indicates p<0.001.

Table 4 Decomposition of Total, Mediated and Direct Effects

	Effect Value	95% BootCI Upper and Lower	Bound Effect Share
Total effect	−0.795	−0.833~-0.757	
Mediated effect	−0.030	−0.041~-0.726	3.8%
Direct effect	−0.765	−0.804~-0.726	96.2%

limits of the bootstrap 95% confidence interval for the mediating effect of self-esteem did not contain 0 (see Table 4), indicating that the mediating effect existed and was partially mediated, and hypothesis H4 was verified.

The data results indicated that academic adaptability significantly and positively predicted self-esteem; self-esteem significantly and negatively predicted learning burnout, and self-esteem was able to predict learning burnout through the mediating effect of academic adaptability. The mediation model was shown in Figure 2.

Testing for Moderating Effects

Again, model 14 in the SPSS plug-in macro PROCESS prepared by Hayes (2017)[50] was used (model 14 assumes that the latter half of the indirect effects in the mediated model are moderated, as expected by our hypothesis). The results were shown in Table 5 and Table 6. The moderated mediating effect analysis was performed using model 14. For the mediating variable of self-esteem, its boot 95% CI at low levels includes the number 0, implying no mediating effect at this level; its boot 95% CI at the mean level does not include the number 0, implying a mediating effect at this level and an Effect value of −0.021; its boot 95% CI at high levels does not include the number 0, implying a mediating effect at this level and an Effect value of −0.034. In summary, the analysis showed that the mediating profile was inconsistent at different levels, indicating a moderating mediating effect. In addition, the interaction term between self-esteem and self-efficacy showed significance (β= −0.275, t=−7.746, p=0.000<0.05). These implied that when the effect of academic adaptability on learning burnout arose, the moderating variable (self-efficacy) was at different levels, the magnitude of the effect was significantly different. What's more, this moderation was negative.

Finally, in order to interpret the moderating role of self-efficacy in the relationship between self-esteem and learning burnout more graphically, this study depicted the relationship between self-esteem on learning burnout in the cases of high and low self-efficacy by using the mean of the moderating variable (self-efficacy) plus or minus one standard deviation as the grouping criterion and making a simple slope test to obtain Figure 3. The results showed that self-esteem negatively contributed to college students' learning burnout at different levels of self-efficacy (all slopes were less than 0). Overall, college students with high levels of self-efficacy had lower learning burnout than those with low levels of self-efficacy at all stages of self-esteem levels. As self-esteem rose, learning burnout decreased more rapidly in college students with high levels of self-efficacy, suggesting that the self-esteem of college students with high levels of self-efficacy had a stronger inhibitory effect on their learning burnout.

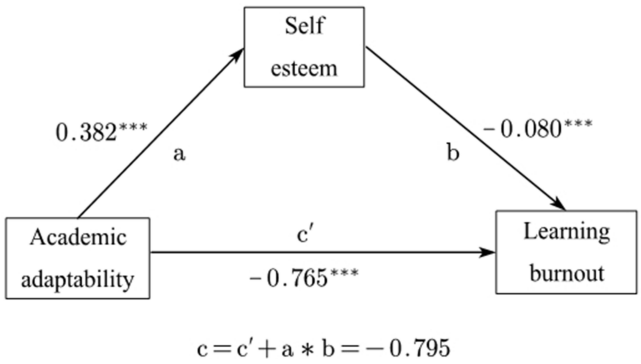

Figure 2 Intermediary model: effect values.
Notes: c' is direct value, a*b is indirect value, c is total value; *** indicates p<0.001.

Table 5 Test of Moderating Mediating Effect

Regression Equation (N=1061)		Fitted Indicator			Coefficient Significance	
Outcome Variables	**Predictor Variables**	**R^2**	**Adjustment R^2**	***F* value**	**β**	***t***
Self-esteem	Constant	0.076	0.075	172.722***	1.879***	18.823
	Academic adaptability				0.382***	13.142
Learning burnout	Constant	0.457	0.455	442.412***	5.129***	31.224
	Academic adaptability				−0.748***	−36.059
	Self-efficacy				0.142***	3.096
	Self-esteem				0.125***	2.506
	Self-esteem*Self-efficacy				−0.054***	−4.005

Notes: * indicates the adjustment variable cross terms, ***indicates p<0.001.

Table 6 Conditional Indirect Effect Results

Moderating Variable	Level	Level value	Effect	BootSE	BootLLCI	BootULCI
Self-esteem	Low level (−1SD)	2.647	−0.007	0.009	−0.021	0.009
	Mean	3.292	−0.021	0.008	−0.033	−0.005
	High level (−1SD)	3.937	−0.034	0.011	−0.054	−0.018

Notes: BootLLCI refers to the lower limit of the 95% interval of Bootstrap sampling, BootULCI refers to the upper limit of the 95% interval of Bootstrap sampling.

Discussion

The Effect of Academic Adaptability on Learning Burnout

The results of this study showed that academic adaptability negatively predicted learning burnout, ie, the higher the academic adaptability level of college students, the lower the level of learning burnout, and vice versa. This is consistent with the conclusion of previous studies. Academic adaptability plays an important role in promoting positive outcomes.[51] Students' persistence, planning, and task management are in part due to their adaptability.[52] Therefore, students with high level of academic adaptability tend to be able to create action plans and stick to them. They are better able to adapt to the stresses of the academic side of school. These stresses include attending classes and preparing for exams, group discussions, etc.[17] In addition, students with great academic adaptability are able to cope with stress by taking control of their lives and are able to reflect and take stock of their personal behavior after setbacks,[16] and internalize negative emotions into certain positive cues,[53] thus reducing the appearance of learning burnout. Students who have less academic

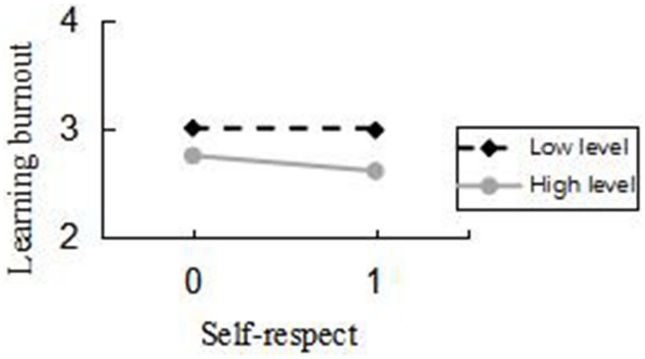

Figure 3 Moderating effects of mean, high and low levels of self-efficacy.

adaptability perceived stress significantly higher than students who have stronger academic adaptability. This sensitive perception leads to persistent energy expenditure and their inability to focus on academic tasks, inadvertently making students feel exhausted. When this exhaustion accumulates to a certain peak, this group of students may develop symptoms of learning burnout such as low mood, truancy, or even dropping out of school.[13] In addition, students with poor academic adaptability are easily tempted by other things, resulting in their inability to ensure sufficient energy and enthusiasm in the learning process. At the same time, there is often a gap between these students' practical level and the expected level, which in turn induces the emergence of learning burnout.[54] The more adaptive college students are in their studies, the better they can concentrate on coping with the stress of their studies, and thus the lower their level of learning burnout.

The Effect of Academic Adaptability on Self-Esteem

The results of this study showed that academic adaptability positively predicted self-esteem, ie, college students with higher academic adaptability would have higher self-esteem. Conversely, college students with low academic adaptability would have lower self-esteem, which was consistent with the conclusions of existing studies. Aİ Koçkar[55] points out that students with low levels of adaptability are used to using negative attributions to explain and cope with negative events. They are more inclined to the problems of their weak abilities and skill shortages than the role of external factors. This segment of students tends to believe that their failures are beyond their control (eg, attributed to their lack of ability). As a result, they are prone to give up when faced with difficult tasks and have a lower opinion of themselves. Such negative attribution pattern may cause individuals to feel helpless and even develop learned helplessness, which greatly contributes to the decrease in self-esteem levels of students with low academic adaptability. In the context of higher education promotion, some individuals actively or passively make unrealistic comparisons with their peers. They may struggle repeatedly to act on what they cannot have on their own, but feel disappointed and helpless because it does not fit with their reality, and feel that it is beyond their level of competence. For this reason, they may develop low levels of self-esteem.[56] Students with weak academic adaptability are prone to psychological stress due to the large gap that exists between their own abilities and social expectations. They are unable to find a balance point to reasonably regulate the psychological gap, and the weaker their confidence in conquering difficulties, the less affirmative evaluation they receive, thus lowering their self-esteem level.[57] College students with maladaptive learning are more likely to develop low self-esteem and doubt their abilities, which in turn lowers their self-esteem levels.

The Effect of Self-Esteem on Learning Burnout

The results of this study showed that self-esteem negatively predicted learning burnout, ie, the higher the self-esteem of the college student group, the lower the level of learning burnout. Conversely, college students with low self-esteem had higher levels of learning burnout, which was consistent with the findings of most studies. Students with high self-esteem are less likely to be affected by stress and have adequate psychological buffers even when they are stressed. They have a sense of control over their environment and confidence in their ability to face challenges, and are able to learn with motivation and planning. Individuals with low self-esteem tend to deny and belittle themselves when under stress. They are accustomed to avoidance, sluggish learning strategies.[58] These students, when experiencing consistently high levels of pressure from school demands, tend to burn out over time and are reluctant to invest time in their academic lives, which leads them to reduce their participation or simply drop out of school activities, contributing to the emergence of academic burnout.[37] Students may avoid academic activities and show less positive attitudes in school when they feel unappreciated by their peers and their self-esteem is threatened. This group of students may also seek the company of other disgruntled students which induces group burnout. Individuals with healthy levels of self-esteem are better able to accept and be happy with themselves.[59,60] When faced with difficulties and setbacks, these individuals are able to objectively and rationally assess the situation and adopt positive coping strategies to achieve their goals.[19,61] They are able to gain a sense of accomplishment and self-confidence from it, and are more motivated to follow through with their studies. The higher the level of self-esteem of college students, the better they are able to understand themselves more

objectively and solve the problems they encounter in their studies with a positive attitude, and thus the lower the degree of their learning burnout.

The Mediating Effect of Self-Esteem

The results of this study showed that self-esteem partially mediated the relationship between academic adaptability and learning burnout. That was, the higher the level of academic adaptability of college students, the higher their self-esteem and thus the lower their level of learning burnout would be. Students with low academic adaptability tend to have low levels of self-esteem. By adapting well to the learning environment, tasks and challenges, students are able to gain a greater accumulation of positive emotions such as happiness, pride, accomplishment and good evaluations from others. This group of students also has a more stable emotional state when facing unexpected situations and has more confidence to start the next level of learning, improving their self-esteem in a gradual process.[35] Students with poor academic adaptability tend to experience more stress and depression in their daily academic life, lacking positive affirmative evaluations and proper emotional relief, which in the long run tends to lead to a decline in both their academic performance and self-esteem levels.[62] Students with low self-esteem are more at risk for social and emotional difficulties, which prevents them from being fully engaged in their studies, resulting in poor academic performance. This causes students to lose enthusiasm and reduces their motivation to learn, leading to symptoms of learning burnout such as low morale.[56,63] High levels of self-esteem help students to adapt to challenging situations and overcome risks. Their higher levels of emotional repair and self-management reduce the risk of learning burnout.[26] Self-esteem is a positive psychological resource and a form of emotional resilience.[61] It can activate adaptive coping mechanisms to help individuals overcome frustration and difficulties and thus achieve their goals. For example, a problem-oriented adaptive coping approach helps students recover from academic and emotional fatigue as quickly as possible to avoid learning burnout. High self-esteem levels further drive students' enthusiasm for learning, and the accumulation of positive affective experiences increases students' self-efficacy. This group of students is less likely to feel powerless and depressed about their studies, which greatly reduces the occurrence of burnout.[64] In addition, people with high self-esteem are more effective and motivated in meeting the demands of their environment. This group of students has a more stable self-mindedness and good academic adaptability, and is better able to complete all academic tasks and requirements, resulting in higher academic achievement and self-efficacy. Therefore, college students with high self-esteem are less prone to learning burnout.[29]

Moderating Effect of Self-Efficacy

The present study found that self-efficacy moderated the latter half of the mediating effect of academic adaptability-self-esteem-learning burnout, specifically, this mediating effect was significant when self-efficacy was high and insignificant when self-efficacy was low. In addition, with the enhancement of self-efficacy, the level of negative prediction of self-esteem on learning burnout would be higher, ie, college students with high self-efficacy would have a stronger inhibitory effect of self-esteem on their learning burnout when compare to the group of college students with low self-efficacy. This suggested that in order to effectively reduce learning burnout, increasing the self-efficacy of college students at the same level of self-esteem might be an effective measure. Research by Usán Supervía and Salavera Bordá[65] supports this idea. College students with lower levels of academic adaptability may choose to avoid studying in order to avoid failure because they lack some self-efficacy support. This group of students has a higher level of learning burnout. When college students have comparable levels of self-esteem, those with low self-efficacy tend to experience severe emotional internal conflict and academic anxiety when they are unable to resolve academic stress and reach their academic goals, and thus abandon their academic tasks. They experience higher levels of learning burnout.[66] A high sense of self-efficacy can serve to mitigate the effects of stress. When individuals have a more positive self-perception, the negative effects of stressors are reduced.[67] Students with higher self-efficacy are more efficient in managing their emotions and have a stronger buffering and regulating effect on stress. This means that such students have the ability to export negative emotions into positive emotional feedback and are less likely to become angry at the task at hand due to external stimuli, effectively reducing the emergence of learning burnout.[68] According to Bandura's[38] self-efficacy theory, an individual's self-efficacy affects his or her behavioral choices in the face of difficulties and influences the persistence of his or her

behavior. Students with high self-efficacy tend to choose in-depth approaches to learning and problem-centered learning strategies, which predicts better performance and reduces their likelihood of learning burnout.[69] A good sense of self-efficacy can help students gradually develop a controlled and stable sense of self-worth and better meet challenges as they adjust to college life.[70] College students gain a sense of recognition by completing their study tasks and study plans, which enhances their self-efficacy. They are able to adjust their mindset to face difficulties and challenges in a more proactive manner, thus reducing the risk of learning burnout.[71]

Research Value

Contributions

This study revealed the mediating process of academic adaptability affecting learning burnout from the perspective of self-esteem and verified the moderating role of self-efficacy in it, which has some reference value for the theoretical construction of the mechanism of the occurrence of learning burnout among college students. Self-esteem and self-efficacy as two positive psychological resources play a protective role in the influence of academic adaptability on learning burnout among college students. In addition, the results of the study can provide practical and effective operational suggestions for college educators to prevent and intervene college students' learning burnout. For example, improve college students' academic adaptability and enhance their self-efficacy, thus reducing the risk of college students' learning burnout.

Enlightenment

Improve College Students' Academic Adaptability

Whether students can adapt to college study is of great significance to their physical and mental health and career development. Many college students encounter problems of adapting to their studies after entering college. Universities are supposed to provide students with guidance on study methods, study plans and career development through lectures and so on. At the same time, universities should also guide students to build harmonious interpersonal relationships and provide them with various platforms and opportunities for academic exchanges. In addition, teachers' expectations and support can positively influence students' academic adaptability.[72] College students who receive positive attention and expectations are able to achieve better academic success.[73] Teachers need to give more attention and support to students to develop their self-directed learning and promote their personal and academic development. These initiatives are conducive to helping students adapt to university studies and life, thus preventing and alleviating learning burnout.

Enhance College Students' Self-Esteem Level

The level of self-esteem is related to how college students perceive and evaluate themselves. Self-esteem comes from the support and acceptance signals from significant others, success related to academic work and its internal attributions and conditions that promote success.[53] College students are eager to get the recognition and support from others. On the one hand, colleges are supposed to guide college students to correctly understand their own strengths and weaknesses, learn to objectively evaluate themselves, and guide them to face academic pressure with a positive attitude. On the other hand, colleges should help students grow by building relevant platforms to help them gain successful experiences. Meanwhile, teachers in colleges should give positive feedback to college students' learning, recognize and encourage the progress they make. In addition, college teachers need to also guide students to learn proper attribution, that good academic achievement comes mainly from students' efforts and dedication, and make them realize that they can achieve their learning goals through their own efforts. When the level of self-esteem of college students increases, they can get more pleasure and pride from learning, and their level of learning burnout decreases.

Improve College Students' Self-Efficacy

Self-efficacy is an important influencing factor on whether students can rise to the occasion and persevere in the face of academic pressure. If a student believes that he or she is not capable of adapting to college studies, is a failure in learning, and cannot achieve good academic results, then he or she is likely to lose interest and motivation in learning. Colleges

and universities should provide more resources and opportunities for learning to students, improve their sense of competence in the process of practical participation, and help them build self-confidence. Higher education teachers should create a supportive learning environment to promote their motivation for self-regulated learning. Teachers engage students by creating valuable activities and in the process practice students' self-regulated learning strategies to improve their academic adaptability, leading to students' satisfactory academic performance.[74] The increased self-efficacy of college students will in turn further stimulate their interest in learning, thus reducing their risk of learning burnout.

Limitations and Prospects

This study, which was conducted on 2110 college students from different Chinese universities, explored the influence of college students' learning adaptation on burnout in a more systematic way. Of course, it still has some limitations. Firstly, cross-sectional studies were difficult to reveal the ongoing development of the mechanisms of academic adaptability influence on learning burnout and were still insufficient in confirming the causality inference of the variables. Follow-up studies can conduct longitudinal studies by collecting data several times at the same time interval (eg, 1 month, even more longer) to explore the relationship between these variables. Secondly, this study explores the influence mechanism of four-year college students' academic adaptability on learning burnout, but does not make a comparative analysis of students from different university types and grades. Future studies can complement comparative studies in these areas. Thirdly, the present study focused only on the mediating and moderating roles of two psychological resources, self-esteem and self-efficacy, in the relationship between academic adaptability and learning burnout. In fact, psychological resources such as resilience and optimism may also be related to the level of academic adaptability and learning burnout among college students, which can be further explored in subsequent studies. Resilience and optimism will be regarded as new variables and their mechanisms in the influence of academic adaptation on learning burnout will be explored, so as to enrich the existing relevant studies.

Data Sharing Statement

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Ethics Statement

The present research was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of Xiamen Institute of Technology. The participants provided their written informed consent to participate in this study.

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Disclosure

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