

RESEARCH ARTICLE

The impact of psychological capital on academic burnout among vocational undergraduate college students: The mediating role of positive emotions

Li Wang^{1*}, Congjin Miao², Jun Wang³

¹ Faculty of Education and Music, Hainan Vocational University of Science and Technology, Hainan, 571126, China

² Faculty of Maritime, Hainan Vocational University of Science and Technology, Hainan, 571126, China

³ Automotive engineering Department, Jiangxi Ganzhou Technician College, Jiangxi, 341400, China

* **Corresponding author:** Li Wang, Faculty of Education and Music, Hainan Vocational University of Science and Technology, Hainan, China; wangli.hkedu@foxmail.com; Hainan Vocational University of Science and Technology, No.18 Qiongzhan Avenue, Meilan District, Haikou City, Hainan Province, China

ABSTRACT

In the field of higher education, the phenomenon of academic burnout, such as truancy, absenteeism, and apathy among college students, has become more and more obvious and has attracted the attention of educators and researchers. The causes of burnout are complex, covering individual psychology, social environment and education system. This study focuses on the influence of college students' psychological capital on academic burnout and its internal mechanism, in order to provide new perspectives to alleviate this phenomenon. To this end, a questionnaire survey was conducted on 538 students of a vocational undergraduate university in Hainan Province, and the mediating effect was examined using hierarchical regression analysis, which showed that: (1) college students' psychological capital has a significant negative effect on academic burnout; (2) college students' psychological capital has a significant positive effect on positive emotions; (3) positive emotions play a partial mediating role in the negative effect of college students' psychological capital on academic burnout. effect.

Keywords: Adaptability; Emotional Intelligence; Performance; Team Dynamics; Team Reflexibility

1. Introduction

Human capital theory suggests that individuals add value to their human capital by accumulating productive knowledge, labour skills and managerial competencies, and by improving their physical fitness through participation in formal schooling, adult continuing education programmes, workplace training, personal and family migration for career development, and health maintenance [1]. As the main body of productive activities, educational experience has a long-term positive impact on the performance of individuals and their organisations. As an important productive force for the future development of the country, the effectiveness of college students' schooling is directly related to the growth trajectory of individuals and the smooth development of their careers. However, at present, academic burnout such as

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truancy, skipping classes, and disinterest in learning is common among college students^[2]. The causes of burnout are complex, covering individual psychology, social environment and education system. Academic burnout is an important indicator of negative learning attitudes of college students, which has a significant impact on the quality of learning^[3]. It significantly affects the quality of learning by causing students to lose interest in educational activities. This disengagement stems from a lack of intrinsic motivation, making learning feel like a burdensome obligation. Consequently, students often experience boredom, fatigue, and frustration, which can lead to negative behaviors such as avoiding learning and skipping classes. In order to improve the above negative behaviours of students, colleges and universities and parents are paying more and more attention to the mental health development of college students, and the theory of Psychological Capital Appreciation (PCA) proposed by Luthans is particularly important in this field. Psychological capital refers to the relatively stable and efficiency-enhancing psychological traits formed by individuals in the course of their growth, originating from their early life experiences. It encompasses self-confidence (self-efficacy), hope, optimism, and resilience, and is a positive psychological state that transcends human and social capital to become a core psychological resource for personal growth and performance enhancement. The theory emphasises that the enhancement of psychological capital can effectively promote the growth, development and success of individuals. When college students have a high level of psychological capital, they tend to be able to deal with academic challenges in a more proactive and efficient way, and successfully complete their learning tasks, thus achieving more significant development and improvement in their academic performance^[2]. Therefore, from the perspective of enhancing academic performance, in-depth exploration of the impact of psychological capital on academic burnout and its mechanism is crucial for improving college students' learning quality and strengthening their psychological health. With the deepening of positive psychology research, the key role of positive emotions in individual development has become more and more significant. Positive emotions can not only stimulate individual learning motivation, but also encourage individuals to face difficulties and challenges with a more optimistic and confident attitude, and transform negative emotions into positive emotions. In view of this, it is very likely that emotional variables play a mediating role in the process of psychological capital's influence on individual performance. The present study aims to investigate the effects of psychological capital and positive emotions on academic burnout, and to further reveal the interaction mechanism between these three variables, with a view to providing useful references for improving the academic burnout situation of college students and enhancing their learning quality and mental

1.1. Academic burnout among university students

Clinical psychologist Freudenberger first coined the term "burnout" in a study of careers in helping people^[4]. The term "burnout" was first coined by clinical psychologist Freudenberger in a study of helping people. Learning burnout, or "learning burnout," is derived from "job burnout," and Villwock et al. concluded that academic burnout is a condition in which students, especially medical students, are unable to properly manage stress during the learning process. According to Villwock et al. academic burnout is a state of emotional, attitudinal and behavioural exhaustion in which students, especially medical students, are unable to cope properly with stress during the learning process, and it is a negative way of coping^[5]. According to Pines (1980), academic burnout is a phenomenon in which students experience physical and mental exhaustion, reduced work capacity, lack of achievement, indifference and alienation from classmates, and a gradual loss of enthusiasm for classwork and activities due to the stress and burden of coursework. The phenomenon of students gradually losing enthusiasm for their coursework and activities^[3]. Hu et al (2018). believe that academic burnout is the negative learning psychology of students due to stress or lack of interest in learning, and the formation of negative attitudes and behaviours that are tired of learning^[6]. In this paper,

we adopt the concept of academic burnout agreed by many scholars in China. This paper adopts the definition of academic burnout agreed by many scholars in China, that "students who have no interest or lack of motivation in learning, but have to learn, will feel bored, tired, frustrated and frustrated, and then there are many inappropriate behaviours to avoid learning, and this state is known as academic burnout", which consists of three dimensions of low mood, inappropriate behaviour, and low achievement^[7]. Foreign studies on school burnout have mainly focused on dropping out, truancy, and refusal to go to school^[8]. The research on anorexia abroad mainly focuses on dropout, truancy and refusal to go to school. The results of a questionnaire survey conducted by Pan Chunsheng on a sample of 788 students from four higher vocational colleges and universities in Hangzhou show that the situation of boredom is more serious among higher vocational students, especially those in the sophomore stage; the situation of academic burnout among higher vocational students has a relatively obvious difference among disciplines, and the situation of boredom among students of arts and sciences is especially obvious^[9]. The situation of academic burnout is more obvious among disciplines, and the anorexia of arts students is especially obvious. Some scholars have conducted correlation tests and regression analyses of personality traits, learning pay-back imbalance and learning burnout, and the results show that the worse the emotional stability, the easier it is to produce learning burnout, learning feedback can effectively reduce learning burnout, the greater the emotional investment in learning, the stronger the motivation for learning, and the smaller the corresponding learning burnout. By improving students' internal drive for learning, emotional regulation ability, improving students' learning input, increasing the sense of learning feedback, and cultivating students' relative extroversion, we can reduce the sense of learning burnout ^[10].

1.2. Psychological capital

Psychological capital, proposed by Luthans, refers to the relatively stable psychological traits that an individual exhibits in the process of growth and development, which can influence the individual to produce efficiency, and it is a psychological tendency that is formed in his or her early life ^[11]. According to Luthans et al. based on the psychological resources theory and the expanded construct theory, psychological capital consists of four main dimensions of self-confidence or self-efficacy, hope, optimism, and resilience, and is characterised by the following features: having the confidence (self-efficacy) to take on and put in the necessary effort to succeed in challenging tasks; making positive attributions for present and future success, and persisting in pursuing the goal; and when necessary Redirecting the path to the goal (hope) in order to succeed; Maintaining and bouncing back, and even surpassing (resilience) when faced with problems and adversity in order to achieve success ^[11]. In this study, this definition of psychological capital theory is used. Some scholars also believe that psychological capital refers to the positive state of an individual's performance in the process of growth, which is an inherent positive resource of an individual with the effect of replenishing energy and motivating the engine^[12]. It has the effect of replenishing energy and stimulating the engine. Some studies have shown that psychological capital plays a mediating role in the relationship between loneliness and depression in older adults^[13].The study shows that psychological capital plays a mediating role in the relationship between loneliness and depression. Wang Jijia et al. conducted a questionnaire survey on breast cancer patients and proved that the mediating effect of psychological capital in the relationship between intuitive stress and the fear of cancer recurrence was 0.101, accounting for 15.51% of the total effect ^[14], which means that psychological capital plays a partial mediating role in the effect of intuitive stress on the fear of cancer recurrence.

1.3. Positive emotions

"Positive emotions, a major branch of positive psychology that has emerged in recent years, involves the identification of virtues, the understanding of human strengths, and the promotion of a sense of well-being to

help people live more meaningful lives^[17]. Positive emotions are positive emotions. Positive emotions, or positive emotions, are emotions accompanied by pleasurable feelings that arise in individuals as a result of external and internal stimuli and events that satisfy their needs^[18]. Positive Emotions It is also the positive and stable psychological tendency of individuals towards themselves and other people or things^[19]. Positive emotions reflect the degree of enthusiasm, activity, and energy that people feel, and are accompanied by high levels of energy, concentration, and pleasure^[20]. It is accompanied by high energy, concentration and pleasure. Psychological experiments have shown that positive emotions can expand one's attention span, making cognition more integrated; make one more decisive in suppressing interference, making cognition more autonomous; and speed up thought transitions, making cognition more flexible^[18]. It is easy to see that positive emotions can expand the scope of human attention and make cognition more integrated. It is easy to see that positive emotions, as a common psychological phenomenon, have an important impact on people's psychological world and social life^[18]. It is not difficult to see that positive emotion as a common psychological phenomenon has an important influence on people's psychological world and social life.

1.4. The relationship between psychological capital and academic burnout

Xiong Yingying and Qi Ning conducted a questionnaire survey of 689 college students on positive psychological capital and academic burnout, and the results showed that positive psychological capital can better predict academic burnout^[15]. In other words, academic burnout is influenced by psychological capital to a certain extent. An Rong conducted a questionnaire survey on 544 college students in three colleges and universities in Tianjin to explore the moderating role of life satisfaction in the relationship between college students' psychological capital and academic burnout, and the results showed that self-efficacy, optimism, and hope of psychological capital were negatively correlated with academic burnout, and resilience was positively correlated with academic burnout^[16]. The results showed that self-efficacy, optimism and hope in psychological capital were negatively related to academic burnout, and resilience was positively related to academic burnout. Hu Hengde et al. explored the impact of academic burnout on the subjective well-being of military medical college students and the mediating role of psychological capital, and the results showed that psychological capital was negatively correlated with academic burnout^[6]. The results show that psychological capital is negatively correlated with academic burnout. That is to say, the higher the level of psychological capital, the higher the self-confidence of students, with indomitable tenacity, willing to work hard to face and complete challenging tasks, and find ways to improve learning efficiency and achieve greater academic success^[6]. The higher the level of psychological capital, the greater the self-confidence of the students. Therefore, enhancing psychological capital can reduce students' academic burnout. Summarising the above discussion, Hypothesis 1: College students' psychological capital negatively affects academic burnout.

1.5. The relationship between positive emotions and psychological capital

Research has shown that there is a strong link between positive emotions and psychological capital, academic burnout, learning engagement, sense of meaning in life, and motivation to learn. Based on the individual-centered perspective, Wu Min studied the heterogeneity of psychological capital, positive and negative emotions, and pro-social behaviours of boarding students in rural primary schools. The results showed that boarding students with high psychological capital had higher levels of gratitude, autonomy, joyfulness, resilience, hopefulness, and optimism, and possessed sufficient psychological resources to cope with the risks of unfavourable situations and develop positively, as well as positive emotions, behaviours, and excellent academic performance^[22]. In other words, the higher the psychological capital scores of boarding students, the more positive their emotions are, and there is a close relationship between psychological capital and positive emotions. Yeh An-Fa in a simulation study on strategies to improve

academic performance of college students. Using the retrospective method to define the four sub-dimensions of students' psychological capital, form the relationship equation between psychological capital, positive emotions and academic performance, give the positive and negative correlation between psychological capital and students' performance, form the quantitative equation of the effect of changes in psychological capital on college students' performance, and use the results of the experimental simulation method to analogise the results of the traditional method. The dependent and independent variables of the influence of psychological capital on college students' grades are calculated, and the analysis of the strategy of improving college students' grades by psychological capital is completed. The simulation results show that the proposed method of impact analysis is highly accurate and can provide a strong basis for the development of scientific teaching strategies. The experimental results support the hypothesis that positive emotions have a mediating effect on college students' psychological capital and academic burnout^[23]. The experimental results support the hypothesis that positive emotions have a mediating effect on college students' psychological capital and academic burnout. Combined, positive emotions and psychological capital are closely related, and psychological capital can predict positive emotions. Hypothesis 2: College students' psychological capital negatively affects positive emotions.

1.6. Relationship between positive emotions, psychological capital and academic burnout

According to resource conservation theory, positive emotions as an emotional personal psychological resource that can help employees alleviate burnout caused by insufficient personal work resources^[24-25]. This is because, firstly, positive emotions are conducive to the formation of positive perceptions of work, reducing negative emotions about work and thus reducing burnout; secondly, positive emotions can awaken one's own motivation and initiative at work, increasing the degree of commitment to work and thus reducing burnout; thirdly, positive emotions embody the sense of significance and satisfaction of employees' work, enhancing the sense of achievement of the individual at work and thus helping to reduce burnout^[26]. Thirdly, positive emotions reflect employees' sense of meaning and satisfaction at work, enhance their sense of achievement at work, and thus help them alleviate burnout. Therefore, positive emotions can be used as an emotional resource that directly and negatively affects burnout. On the other hand, positive emotions are also conducive to broadening the individual thinking field and help employees to further construct and expand their cognitive^[27], psychological and social resources in order to help individuals obtain more support from work resources^[28]. According to the theory of resource conservation, the increase of existing resources can form a positive spiral of resource gain, which makes individuals have more and more resources^[29]. The positive emotion as an affective resource can be a positive spiral of resource gain. Therefore, positive emotions, as an emotional resource, can further increase employees' resources under the effect of the resource gain spiral to help them cope with the demands and challenges at work, thus releasing the pressure of resource constraints faced by employees^[30]. This in turn releases the pressure of resource tension faced by employees, and ultimately alleviates burnout^[31]. The positive emotions, for example, can help employees cope with the demands and challenges of their jobs. For example, positive emotions can help employees establish good interpersonal relationships in the organisation, which in turn can obtain interpersonal resource support in the organisation, further increase individual resources, and ultimately reduce the level of burnout. Therefore, positive emotions can further expand the resources possessed by employees, which in turn negatively affects burnout. In summary, Hypothesis 3 is proposed: Positive emotions play a mediating effect in the negative influence of college students' psychological capital on academic burnout.health.

1.7. Research questions and research hypotheses

The purpose of this study is to investigate the effects of psychological capital and positive emotions on academic burnout and to further reveal the interaction mechanism between these three.

Based on the above literature exploration, the following three research hypotheses are proposed

Hypothesis 1: College students' psychological capital negatively affects academic burnout.

Hypothesis 2: College students' psychological capital negatively affects positive emotions

Hypothesis 3: Positive emotions play a mediating effect in the negative influence of college students' psychological capital on academic burnout.

2. Materials and methods

2.1. Research framework

Using psychological capital as the independent variable, academic burnout as the dependent variable, and positive emotions as the mediating variable, we explore the effect of psychological capital on academic burnout and whether positive emotions play a mediating role in the effect of psychological capital on academic burnout. The following research framework is proposed, as illustrated in **Figure 1**

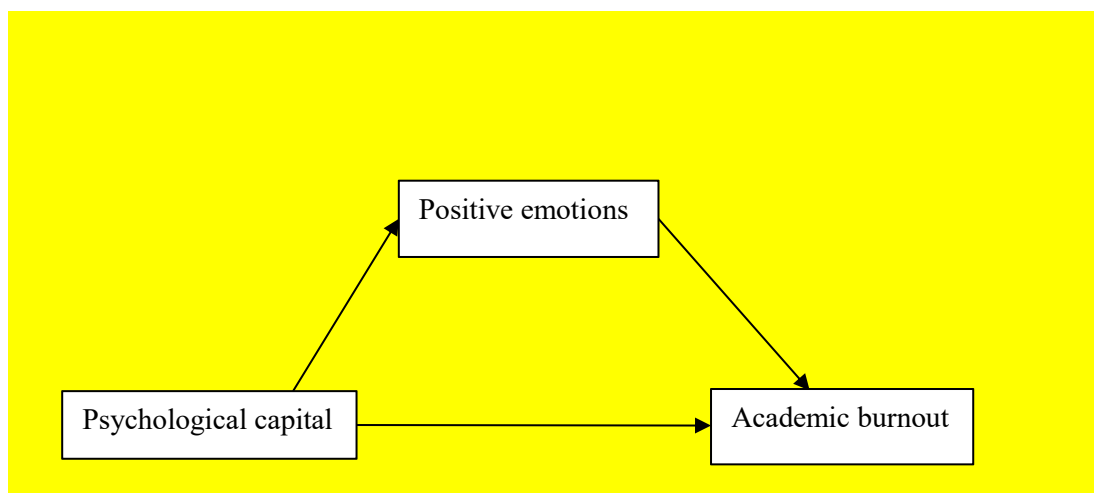


Figure 1. Research framework.

2.2. Subjects of the study

This study was administered to the students of a college in Hainan Province, using convenience sampling, a college in Hainan is one of the first batch of vocational universities in China, the school is ranked second in the comprehensive competitiveness of 22 undergraduate-level vocational universities and first in private institutions in the China Science and Education Evaluation Network (CSEEN), and at the same time, it has gained the first place in the ranking of Chinese vocational and technical universities in the evaluation of the AiRuiShen alumni network in 2021, which is a typical representative of vocational undergraduate colleges and universities in the country. It is a typical representative of vocational undergraduate colleges in China, so the students of this university were chosen as the research object.

The test was administered in groups of classes, with a counsellor as the main test taker for each class. Before the administration of the test, a special unified training was given to the test masters, which included the questionnaire guidelines, the questionnaire content, and the notes for the college subjects. The training covered questionnaire instructions, content, and precautions specifically for college students. The test was administered online, with students completing the questionnaire on their mobile phones. Completion time was within 10-15 minutes, and the data were imported directly into SPSS by the assessment system after the administration. Statistical analyses were conducted using SPSS 26.0 with Amos21 software package.

The first preliminary test was distributed to 120 students, and 118 valid questionnaires were obtained from university students, aged between 18 and 24 years old, including 86 males and 32 females. The data for the exploratory factor analysis came from this group of subjects.

For the second official administration, questionnaires were distributed to 550 students, obtaining 538 valid questionnaires with a validity rate of 97.8 per cent. Among them, 341 (63.38%) were male and 197 (36.62%) were female; 80 (14.87%) were in the first year, 272 (50.56%) in the second year, 154 (28.62%) in the third year, and 32 (5.95%) in the fourth year; 270 (50.19%) were specialists and 268 (49.81%) were undergraduates; 79 (14.685%) were only children and 459 (85.32%) were non-only children; 131 class cadres (24.35%), 407 non-class cadres (85.32%); 51 (9.485) in arts, 405 (75.28%) in sciences, 82 (15.24%) in others; the source of the students is out-of-province towns and cities 87 (16.17%), out-of-province rural areas 187 (34.76%), 79 (14.68 %)

2.3. Research tools

2.3.1. Psychological capital scale for university students

In this study, we used the Psychological Capital Scale for College Students (PCQ-16), which was revised by Song Hongfeng and Mao Tianwei (2012) and is divided into four dimensions: self-confidence, hope, optimism, and resilience, and each dimension consists of four items, with a total of 16 items. It is scored on a 5-point scale, with 1 being “strongly disagree” and 5 being “strongly agree”, and questions 1.3.6.8.11.13.15.18 are reverse scored^[2].

An exploratory factor analysis was conducted on the Psychological Capital Scale for College Students with a KMO Sphericity Test value of 0.942 and a Bartlett's Test of $P < .000$. Principal component analysis was chosen and rotated using the maximum variance method, extracting an eigenroot of greater than one, and four factors were extracted, with factor loadings on each of the question items ranging from 0.691- 0.769, resulting in a cumulative total explained variance of 74.192%. The Cronbach's alpha values for the four dimensions of self-efficacy, hope, optimism, and resilience were 0.878, 0.894, 0.871, 0.876 respectively, and the overall Cronbach's alpha of the scale was 0.946. This indicates that the Psychological Capital Scale for College Students has good reliability and validity.

2.3.2. Academic burnout scale for college students

The Academic Burnout Scale for College Students developed by Lian Rong and Yang Lixian (2005), which has been widely used by scholars, consists of 20 question items divided into 3 dimensions. There are 8 items in the low mood dimension, 6 items in the misbehaviour dimension, and 6 items in the low achievement dimension. The scale is scored on a 5-point scale, with 1 representing "very inconsistent" and 5 representing "very consistent", and questions 1.3.6.8.11.13.15.18 are reverse scored^[7].

Through exploratory factor analysis, after deleting the 2nd, 12th, 14th, and 15th question items, a KMO sphericity test value of 0.900 was obtained, and $P < .000$ in Bartlett's Test. principal component analysis was chosen, and using the maximum variance method for rotation, the extracted eigenroot was greater than 1. 3 factors were extracted, and the factor loadings for each question item ranged from 0.604-0.801, and the Cronbach's alpha values for the three dimensions of low mood, misbehaviour, and low achievement were 0.785, 0.882, 0.879, respectively, and the overall Cronbach's alpha of the scale was 0.879, which indicated that the scale had feasible reliability and validity in this study.

2.3.3. Positive emotions scale

The positive emotions subscale of the Job Affect Scale (JAS) developed by Brief et al. (1988), consisting of six questions with high activity levels, was used, which still has good reliability and validity in

domestic studies in oriental cultures and Chinese contexts. The scale is scored on a 5-point scale, with 1 representing "very poor" and 5 representing "very good". The Cronbach's alpha coefficient in this study was 0.95, indicating that the scale has good reliability.

This study plans to implement a questionnaire survey using the three scales mentioned above to collect data from the study participants. Subsequently, the survey results will be statistically analyzed using SPSS 26.0 and Amos21 software, with methods covering descriptive statistics of variables, analysis of variance (including t-test and ANOVA analysis), correlation analysis, multiple regression analysis, and mediation analysis.

3. Results

3.1. Descriptive statistics of variables

3.1.1. Descriptive statistics results

The results of descriptive statistics (**Table 1**) show that the mean and standard deviation of college students' psychological capital, academic burnout, and positive emotions are 3.467 ± 0.698 , 2.827 ± 0.572 , and 3.459 ± 0.852 , respectively, which shows that the psychological capital scores of college students of a university in Hainan investigated are higher than the mean value of 3, which is at the middle to upper level. The score of academic burnout is lower than the average value of 3 at a medium-low level. The score of positive emotions is higher than the average value of 3, indicating that the students' positive emotions are moderately high and at a high level. This indicates that the students have strong psychological capital and positive emotions and show some degree of academic burnout.

3.1.2. Differential analysis of psychological capital, positive emotions, and academic burnout among college students

The independent samples t-test was used to compare the differences in psychological capital, positive emotions, and academic burnout among college students by gender, level, sole student or not, and class officer or not. The results showed that: there were significant differences in psychological capital and positive emotions among students of different genders, with male students having higher scores than female students; there were significant differences in positive emotions between sole and non-sole students, with sole students scoring higher than non-sole students; there were significant differences between class officers and non-class officers in psychological capital, positive emotions, and academic burnout, with class officers scoring higher than non-class officers in psychological capital and positive emotions, and class officers scoring higher than non-class officers in academic burnout. There are significant differences in psychological capital, positive emotions, and academic burnout between class officers and non-class officers, with class officers having higher psychological capital and positive emotions scores than non-class officers, and class officers having lower academic burnout scores than non-class officers;

Table 1. Analysis of t-tests for three variables.

variant	male	female	t	specialist	undergraduates	t	only children	non-only children	t	class cadres	non-class cadres	t
	M	M		M	M		M	M		M	M	
psychological capital (independent variable)	3.520	3.374	2.347*	3.479	3.454	.413	3.608	3.442	1.951	3.647	3.409	3.428***
positive emotions (independent variable)	3.520	3.355	2.161*	3.467	3.452	.215	3.652	3.427	2.182*	3.676	3.390	3.371***
academic burnout (dependent variable)	2.816	2.845	-.563	2.835	2.818	.351	2.768	2.837	-.981	2.698	2.868	-2.734**

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$.

A one-way analysis of variance (ANOVA) was used to examine the differences in psychological capital, positive emotions, and academic burnout among college students across different origins, grades, professional attributes, and faculties. The results show that there is a significant difference in psychological capital between students from different origins ($F=4.849, P<0.01$), and further post hoc comparison using the Schaefer method shows that students from out-of-province towns and out-of-town rural areas have greater psychological capital scores than those from in-province rural areas, which means that students from out-of-province Hainan Province have higher psychological capital than those from in-province rural areas, and they are more self-confident, optimistic, hopeful, and resilient. They are more confident, optimistic, hopeful and resilient. There is also a significant difference in positive emotions among students from different places of origin ($F=4.144, P<0.01$), with students from cities and towns outside Hainan Province scoring higher than students from rural areas inside Hainan Province, which means that students from cities and towns outside Hainan Province are more positive than students from rural areas in Hainan Province.

3.2. Analysis of psychological capital, positive emotions, and correlation with academic burnout among college students.

Pearson correlation analysis was used to examine the correlation between psychological capital, academic burnout, and positive emotions among college students. As the results in **Table 2** show, psychological capital has a significant negative correlation with academic burnout ($r=-0.584, p<0.001$); psychological capital shows a significant positive correlation with positive emotions ($r=.742, p<0.001$); and positive emotions have a significant negative correlation with academic burnout ($r=-.536, p<0.001$).

Table 2. Descriptive statistics and correlation analysis.

variant	M	SD	psychological capital	academic burnout	positive emotions
psychological capital	3.467	.698	.1		
academic burnout	2.827	.572	-.584***	1	
positive emotions	3.459	.852	.742***	-.536***	1

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$.

3.3. The mediating effect of positive emotions in the influence of college students' psychological capital on academic burnout

Based on the above correlation analyses, the mediating role of positive emotions between psychological capital and academic burnout was further examined. We conducted the analysis by the ENTER method, with psychological capital as the dependent variable, and gender ("female" as the benchmark), grade, education level ("specialist" as the benchmark), class officer or not ("being a class officer" as the benchmark) as the control variables. The control variables are: grade, education level (based on "specialist"), and whether the student is a class officer (based on "being a class officer"). Using the mediation effect test process proposed by Wen Zhonglin and Ye Baojuan (2014), the model was built step by step and the results are shown in **Table 3**.

Model 1, we predicted academic burnout with college students' psychological capital ($\beta=-.573, p<0.001$) controlling for gender, grade, academic level, and class stem variables, with an R^2 of 35.4%, and the results indicate that college students' psychological capital significantly and negatively affects academic burnout, and Hypothesis 1 was verified.

Model 2: We used psychological capital to predict positive emotions ($\beta=.733, p<0.001$) with an R^2 of 56.4%, controlling for gender, grade, educational level, and class stem variables, and the results showed that psychological capital significantly and positively affects positive emotions, and Hypothesis 2 was verified.

Model 3: We predicted academic burnout with psychological capital ($\beta=-.401, p<0.001$), and positive emotions ($\beta=-.233, p<0.001$), controlling for variables, and the results showed that both psychological capital and positive emotions significantly and negatively affect academic burnout, with R^2 of 37.7%. ΔR^2 is 2.2%, which has an enhanced explanatory rate. Therefore, it indicates that positive emotions play a partial mediating effect in the effect of psychological capital on academic burnout, and Hypothesis 3 is tested.

Total effect of psychological capital on academic burnout is $-.572$; Indirect effect of psychological capital on academic burnout through positive emotions are $-.171$; Indirect effects as a proportion of total effects is 29.9 percent. Thus, positive emotions play an important role in mediating the negative effects of self-efficacy, hope, and optimism on academic burnout.

Table 3. Mediating effects of positive emotions between psychological capital, academic burnout examined.

control variable	Model 1 academic burnout Beta	Model 2 positive emotions Beta	Mode 3 academic burnout Beta
distinguishing between the sexes	-.025	-.019	-.029
first-year university student	-.095	.119*	-.067
second-year university student	-.027	.117	.000
third-year university student	.048	.207**	.096
branch (of medicine)	-.054	-.068	-.070
class monitor	-.045	.036	-.036
variable			
psychological capital	-.573***	.733***	-.401***
positive emotions			-.233***
F-value	41.41***	97.796***	
ΔR^2	-	-	.023
R2	.354	.564	.377

Notes: * $p<.05$ ** $p<.01$ *** $p<.001$.

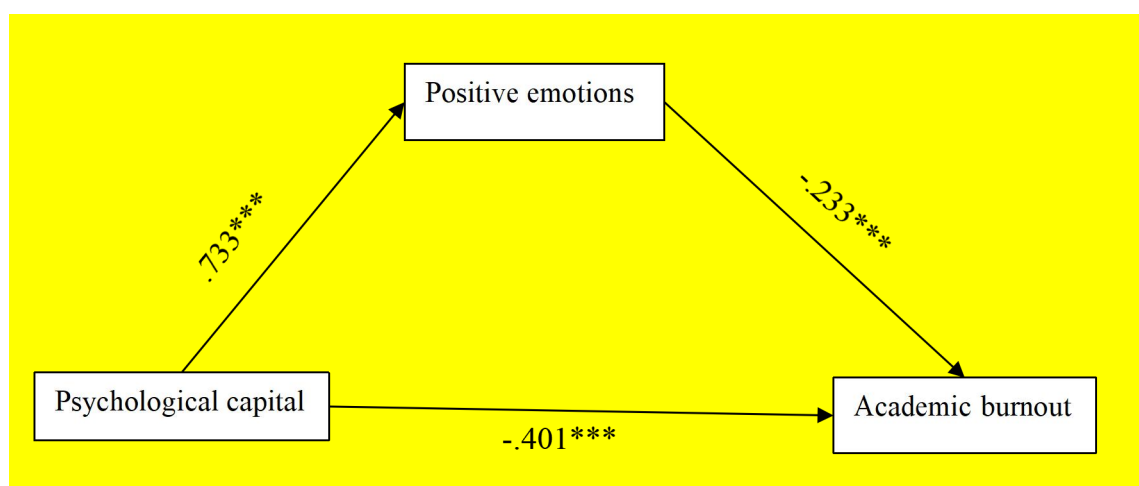


Figure 2. Pathway map of research results.

To further verify the mediating effect of positive emotions, the unstandardised regression coefficients of psychological capital on positive emotions ($a=-1.255$), standard error ($Sa=0.448$) in the mediation model; and the unstandardised regression coefficients of positive emotions on academic burnout ($b=-.157$), standard error ($Sb=0.034$) in the mediator model were input into the Sobeltest detection model, and the p-value of 0.0166175, which is less than 0.5, showing a significant mediating effect.

4. Discussion

1. college students' psychological capital negatively affects academic burnout and positive emotions.

Based on the research framework of "psychological capital-positive emotion-academic burnout", this study explores the relationship between psychological capital and academic burnout of college students and its mechanism of action. The results show that college students' psychological capital negatively predicts academic burnout, which means that the higher the psychological capital of college students, the lower the academic burnout, which is similar to the research of domestic scholars. Xiong and Qi (2020) showed that there is a significant negative correlation between positive psychological capital and academic burnout factor, which also indicates that the higher the students' positive psychological capital score, the lower the level of academic burnout^[15]. The empirical study of Hu (2018) showed that academic burnout was negatively correlated with psychological capital ($r = -0.721$, $P < 0.01$), which is consistent with the findings of this paper^[6]. During the COVID-19 pandemic, a survey study of online learning among nursing students at the University of Traditional Chinese Medicine (UTCM) showed that 39.29% had some degree of academic burnout and that psychological capital was negatively correlated with academic burnout, which is consistent with the results of this study (Wang et al., 2021)^[34]. Song (2014) study showed that psychological capital is negatively related to the three dimensions of academic burnout, namely emotional loss, misbehavior, and low achievement, and can effectively reduce these burnout symptoms. Its findings are consistent with this study's conclusion that college students' psychological capital negatively affects academic burnout, emphasizing the validity of psychological capital as an important predictor^[3]. A questionnaire survey of Chinese corporate employees found that psychological capital was negatively related to burnout. This finding not only holds true in enterprises, but also provides indirect support for studying the effect of psychological capital on academic burnout among college students^[35]. The results of a questionnaire survey on 916 psychiatric nurses in Shandong Province showed that psychological capital ($r = -0.35$, $p < 0.01$) was negatively related to burnout. This result also strongly suggests that psychological capital negatively influences burnout^[37].

2. positive emotions play a mediating effect in the negative influence of college students' psychological capital on academic burnout.

By testing the mediating effect of positive emotions between psychological capital and academic burnout, this study concludes that positive emotions play a partial mediating role in the effect of psychological capital on academic burnout, which is consistent with the conclusion of Song (2014) who proposed that positive emotions play a partial mediating role in the effect of psychological capital on low mood and low sense of achievement, indicating that by improving psychological capital not only can we directly reduce college students' academic burnout, but also by indirectly increasing the level of positive emotions, thus reducing academic burnout^[3]. The findings are consistent with the findings of Jiang (2021) conducted the first intervention study using integrated positive emotion therapy in nursing staff with moderate to severe burnout; it proved that this therapy can effectively alleviate burnout and anxiety in nursing staff, in other words, positive emotions can effectively attenuate burnout^[32]. This conclusion has similarities with the text proposed that psychological capital through positive emotions significantly negatively affects academic burnout. Yeh (2017) mentioned in a simulation study on college students' academic performance improvement strategies that positive emotions play a mediating role in the influence of psychological capital on students' academic burnout, and the negative correlation between psychological capital and students' performance is similar to that of the text that suggested that psychological capital through positive emotions significantly negatively affects academic burnout^[23]. It has been shown that higher education institutions can effectively reduce academic stress through the development of human and psychological capital, a process that not only reduces the incidence of academic burnout, but also enhances the level of positive emotions in students, thereby laying a solid foundation for their academic success and future development^[36]. Research has shown that academic enthusiasm positively enhances students' academic performance from a positive psychology perspective. Zhao et al. (2019) noted that students with academic enthusiasm understand the value of learning better and thus are more motivated and focused in their studies. Therefore, the greater the academic enthusiasm, the higher the level of engagement, which proves that positive emotions reduce academic burnout^[38]. Research has shown that a harmonious and enthusiastic emotional climate significantly enhances positive affect, which is positively associated with life satisfaction, meaning in life, and personal vitality, and negatively associated with anxiety, depression, and academic burnout. Thus, individuals with high levels of positive affect have a relatively low risk and degree of academic burnout, suggesting that positive affect has a negative effect on academic burnout^[39].

Positive emotions have a positive impact on students' attitudes and behaviours, often accompanied by pleasant subjective experiences and increasing individual motivation and activity. Students negatively influence academic burnout by increasing their psychological capital, i.e., increasing confidence, hope, optimism, and resilience, while also increasing the production of positive emotions, which indirectly reduces academic burnout through positive emotions. Students remain more positive, optimistic, and confident, and are more able to explore and meet the challenges of solving learning difficulties.

5. Conclusion

The results of this study indicate that there is a significant correlation between college students' psychological capital, positive emotions and academic burnout; psychological capital and positive emotions are effective in negatively predicting academic burnout; and positive emotions play a partially mediating role in the effect of psychological capital on academic burnout. In order to improve students' learning quality, academic achievement, and reduce and attenuate academic burnout, the following suggestions are made.

1. Psychological capital and positive emotions: negative predictors of academic burnout

Psychological capital and positive emotions play a crucial role in the college student population, and there is a significant negative correlation between them and academic burnout. Specifically, students with strong psychological capital tend to have higher self-efficacy, optimism, hope, and resilience, which work together to reduce the occurrence of academic burnout. Meanwhile, positive emotions, as part of psychological capital, further contribute to the improvement of learning quality and the alleviation of academic burnout by enhancing students' emotional state. Positive emotions not only have a direct negative effect on academic burnout, but also play a partial mediating role in the effect of psychological capital on academic burnout, which suggests that enhancing students' positive emotions is an effective way to reduce academic burnout.

2. Enhancement of psychological capital: building a healthy mind and motivation for learning

In order to enhance students' learning quality and academic achievements, schools should focus on strengthening students' psychological capital. This includes strengthening students' psychological health and helping them to develop a correct self-perception and a positive and optimistic attitude towards learning through mental health education and psychological counselling. At the same time, schools should also provide positive guidance to encourage students to maintain self-confidence and resilience in learning and life, so as to effectively reduce academic burnout. Through the organisation of mental health seminars, psychological development training and other activities, schools can provide students with more opportunities and platforms to enhance their psychological capital.

3. Stimulating Positive Emotions: Creating a Pleasant Atmosphere and Promoting Engagement in Learning

Positive emotions play a vital role in the learning process of students. In order to stimulate positive emotions in students, schools should endeavour to create a pleasant and comfortable learning environment. This includes providing adequate psychological and teaching resource support, constructing a sound assessment system, and carrying out positive activities. In the classroom, teachers should focus on maintaining a pleasant and relaxed atmosphere, maintaining good teacher-student relationships, and providing timely and positive feedback on students' learning outcomes. In addition, schools should also focus on developing students' emotional management skills so that they can maintain a positive emotional state or recover quickly from negative emotions to form a stable positive state of mind. These measures will help maintain students' better learning attitudes and enhance their commitment to learning, thereby reducing academic burnout.

4. Geographical differences and psychological capital: optimising the structure of the student body and improving the overall level of performance

According to the results of ANOVA, students from outside Hainan Province have higher psychological capital than students from rural areas in Hainan Province, and students from towns outside the province also score higher on positive emotions than students from rural areas in the province. This indicates that geographical differences have a significant effect on students' psychological capital and positive emotions. In order to improve the overall level of psychological capital and positive emotions, the school can appropriately increase the proportion of students admitted from outside Hainan Province through various ways, and absorb more outstanding students from different geographical areas. This will help enrich the structure of the school's student population and enhance the levels of students' psychological capital and positive emotions, which in turn will promote the improvement of students' learning quality and the reduction of academic burnout.

5. Research limitations and future directions

This study delved into the relationship between college students' psychological capital, positive emotions, and academic burnout, confirmed the mediating role of positive emotions in psychological capital to alleviate academic burnout, added new perspectives to theoretical research in related fields, and provided practical guidance for educators and mental health experts. However, the sample of this study was limited to students at a vocational university in Hainan Province, China, which may not fully reflect the characteristics of a broad student population, limiting the generalizability and applicability of the findings. To overcome this limitation, future studies need to include more diverse samples, such as students from different geographic regions, cultural backgrounds, and types of institutions, in order to fully understand the interactions of these psychological variables. In terms of sampling method, this study used convenience sampling, which may introduce sample bias and affect the accuracy and reliability of the results. Therefore, it is recommended that future studies adopt more scientific sampling methods such as stratified or random sampling to ensure a representative and broad sample. Future studies should be devoted to this in order to promote the in-depth development of research in related fields

Author contributions

Conceptualization, LW; methodology, LW; software, LW and JW; investigation, LW, JW and CM ; resources, LW, JW and CM ; data curation, LW, JW and CM .; writing—original draft preparation, LW; writing—review and editing, LW. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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