THE INFLUENCE OF ACADEMIC SELF-EFFICACY ON AUTONOMOUS LEARNING ABILITY OF COLLEGE STUDENTS IN KAIFENG CITY, HENAN PROVINCE, CHINA: A STUDY ON THE MEDIATING ROLE OF ACADEMIC EMOTIONS

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Abstract: This study aims to explore the influence of academic self-efficacy on self-regulated learning ability and the mediating role of academic emotions. The quantitative study was conducted through questionnaire surveys. Descriptive statistics, independent samples t-test, and one-way analysis of variance were applied for analyzing the data from 381 valid questionnaires. The results showed that: 1) The autonomous learning ability, academic self-efficacy and academic mood of college students in Kaifeng City were generally at a relatively high level. 2) There were significant differences in autonomous learning ability and academic self-efficacy among students of different grades and from different places of origin, and the differences in place of origin also significantly affected academic emotions. 3) academic self-efficacy had a significant positive impact on autonomous learning ability ($\beta=0.874$), and academic emotion played a partial mediating role in it (the mediating effect accounts for 45.01%). It is suggested that colleges and universities promote students' academic development through grade-specific guidance, targeted support based on students' place of origin, and emotional management intervention.

Keywords: College Students, Autonomous Learning Ability, Academic Self-Efficacy, Academic Emotions

Introduction

At the higher education stage, the ability to learn independently is a core element for college students to complete their studies effectively. The development of students' autonomous learning ability is directly related to their initiative and sustainability in acquiring professional knowledge and enhancing scientific literacy, and thereby affects the overall quality of talent cultivation and the

potential for scientific and technological innovation in the country. The self-directed learning theory proposed by Zimmerman (2000) deconstructs this ability into four key dimensions: goal setting, strategy selection, process monitoring and effect evaluation, highlighting its direct impact on learning outcomes. At present, on the one hand, there is a widespread problem of insufficient autonomous learning ability among Chinese college students. On the other hand, Chinese college students generally face considerable academic pressure and are prone to negative emotions such as anxiety and burnout, which in turn affect their learning efficiency. Therefore, exploring the mediating role of academic emotions between academic self-efficacy and autonomous learning ability is conducive to a deeper understanding of the regulatory mechanism of emotional factors in students' learning process.

Henan Province, a major province in higher education, faces the challenge of uneven distribution of high-quality educational resources. The current "14th Five-Year Plan" for education development in Henan Province sets the strategic goal of "building characteristic high-level universities", but existing research still lacks systematic exploration of the autonomous learning mechanism of college students in the province, especially the regional characteristics of the relationship among autonomous learning ability, self-efficacy and academic emotion are relatively scarce, and there is an urgent need for in-depth and systematic empirical analysis.

Research Objectives

(1) To understand the current situation of autonomous learning ability, academic self-efficacy and academic emotions of college students in Kaifeng City, Henan Province, China.

(2) To understand the differences in self-directed learning ability, academic self-efficacy and academic emotions among college students in Kaifeng City, Henan Province, China under different background variables (gender, grade, major, place of origin).

(3) To understand the impact of academic self-efficacy on self-directed learning ability among college students in Kaifeng City, Henan Province, China.

(4) To understand the impact of academic emotions on self-directed learning ability among college students in Kaifeng City, Henan Province, China.

(5) To understand the impact of academic self-efficacy on academic emotions among college students in Kaifeng City, Henan Province, China.

(6) To understand the mediating role of academic emotions in the impact of academic self-efficacy on autonomous learning ability among college students in Kaifeng City, Henan Province, China.

Literature Review

Autonomous Learning

Self-directed learning, as a modern learning paradigm, is essentially different from traditional

receptive learning. The learning model has three typical features: autonomy in the learning process, initiative in cognitive activity, and self-regulation in knowledge construction. "Ability," as an important concept in psychology, refers to the stable psychological traits that an individual shows in the process of achieving a specific goal or task, which directly affects the efficiency level of the activity. In terms of theoretical construction, scholars have defined the concept of autonomous learning ability from different perspectives: Holec (1981) regards it as the ability of an individual to be responsible for the entire learning process, covering the complete closed loop from goal setting to effect evaluation; Dickinson (1995) highlights the decision-making and reflective traits of this ability; Arnold (1999) constructed a two-dimensional model that included psycho-social support and technical support.

Measurement of Autonomous Learning Ability

The measurement of autonomous learning ability is an important topic in educational psychology research. Researchers have developed various tools to assess students' autonomous learning levels. According to different theoretical frameworks, the measurement methods mainly include self-reporting scales, behavioral observation, learning logs and computer tracking techniques, etc. (Zimmerman, 2000).

The Connotation of Academic Self-efficacy

Self-efficacy is regarded as one of the core concepts in the social cognitive theory framework proposed by Bandera (1983). On the basis of the social cognitive theory framework, an increasing number of scholars have supplemented and deepened the concept of self-efficacy: Ashton (1986) defines it as the psychological response tendency that an individual has in a specific situation; Schultz (1990) believes that this is the perception of competence that an individual has when dealing with specific tasks; Midgley (1997) suggests that it is a situation-dependent belief system about the impact of one's own behavior on achievement. Domestic scholars have also made significant contributions. Zhou Guotao (1988) et al. defined it as an individual's cognitive assessment of their ability to perform a particular activity.

Measurement of Academic Self-efficacy

The basis of the measurement tools for academic self-efficacy is Bandura's (1997) theory of self-efficacy, which particularly emphasizes an individual's belief in their ability to complete specific academic tasks. At present, the self-reporting method is widely used in the academic community. The most representative one is the Academic Self-Efficacy Scale (Chemers et al., 2001). In the context of Chinese culture, Liang Yusong and Zhou Zongkui (2000) revised the "College Students' Academic Self-Efficacy Questionnaire", dividing academic self-efficacy into two dimensions: learning ability efficacy and learning behavior efficacy.

Academic Emotions

The concept of academic emotions was first introduced in 2002 by scholars such as Pekrun to describe the various emotional experiences related to academic activities that students experience

during the learning process. The concept includes both immediate emotional responses during the learning process, such as the pleasure of learning in the classroom, and emotional manifestations related to academic achievement, such as test anxiety or pride after success. In terms of concept definition, Wang Zhenggang (2010) particularly emphasized the significant role of academic emotion as a non-intellectual factor, arguing that it interacts with psychological factors such as cognitive processes and learning motivation, and has a significant impact on students' academic development and personality growth.

Measurement of Academic Emotions

The academic mood assessment tool was developed by the research team of German psychologist Pekrun based on the control-value theory, using a two-dimensional classification model of mood valence (pleasure/unhappiness) and activation level (high/low). The assessment system divides emotional experiences during the learning process into four typical categories: highly activated positive emotions (such as enthusiasm for learning), low activated positive emotions (such as learning achievement), highly activated negative emotions (such as exam anxiety), and low activated negative emotions (such as academic fatigue).

The Relationship between Autonomous Learning Ability, academic self-efficacy and academic Emotion

Based on previous research results, there is a clear positive correlation between academic self-efficacy and autonomous learning ability. In Bandura's (1997) theory of social cognition, it is mentioned that self-efficacy is an individual's belief in their own abilities, which affects their goal setting, effort level, and persistence.

Existing research indicates that there is a significant dynamic interaction between autonomous learning ability and academic emotion. According to Pekrun's (2006) control-value theory, when students have strong autonomous learning abilities, their sense of control over the learning process increases, making them more likely to generate positive academic emotions (such as pleasure and achievement), while reducing the experience of negative emotions (such as anxiety and boredom).

Research shows that there is a systematic association pattern between self-efficacy and academic emotions. According to the findings of Brown and Dutton (1995), differences in self-efficacy levels can lead to significant differentiation in emotional experiences among individuals.

Methodology

This study uses convenience sampling to conduct a sample survey among the students of the three undergraduate institutions in Kaifeng City, Henan Province. The schools selected in this study cover both public and private ones, each with its own educational characteristics and professional directions. Therefore, the three undergraduate institutions selected in this study are representative of the sample

The questionnaire used in this study was in the form of an electronic survey, targeting more than 50,000 undergraduate students in the spring semester of 2025 at three undergraduate institutions in Henan Province, China. According to the Krejcie and Morgan Table, it is expected that 381 questionnaires will be distributed. Among them, 181 people were expected to be sampled from School A, 100 from Study B, and 100 from School C.

The questionnaire for this study mainly adopted the content from Li Tianjiao (2010) in "Research on Autonomous Learning Ability of College Students in Western Regions", Liang Yusong (2000) in "Research on Achievement Goals, Attribution Patterns and Academic Self-Efficacy of College Students", and Xu Xiancai & Gong Shaoying (2011) in "Compilation of General Academic Emotion Questionnaire for College Students". The questionnaire section of this article mainly consists of three parts: The first part is personal basic information; the second part is a questionnaire about college students' self-directed learning ability. The third part is a questionnaire on academic self-efficacy of college students.

Results

Basic Information of the Respondents

Among the valid samples, there were 247 male students, and 231 female students. The number of male students was slightly higher than that of female students. In terms of grade composition, there were 144 freshmen; There are 164 sophomores; There were 131 junior students; The number of senior students is 39. As for the major category, science students are the most numerous, with 279 students; There are 91 liberal arts students; There are 57 engineering students; There are 30 art and sports students; There are 21 students from other majors. In terms of place of origin, 329 students were from cities; There were 149 students from rural areas.

Descriptive statistical analysis

According to the descriptive statistics results, the overall average self-study ability of college students in Kaifeng City, Henan Province, China is at a relatively high level overall. From this, the group has shown a good level of overall performance in self-directed learning ability and in each dimension. The academic self-efficacy level and the overall academic mood of college students in Kaifeng, Henan Province, China is high overall and in all dimensions.

Statistical analysis of quantitative Questionnaire Data

According to the difference's statistics, there are no significant gender differences in students' autonomous learning ability, academic self-efficacy, overall academic emotion, and each dimension. There were significant differences in self-regulated learning ability and academic self-efficacy among students of different grades, but no significant grade-level differences in academic mood. However, there were were no significant professional differences in students' autonomous learning ability, academic self-efficacy, overall academic emotion, and each dimension. In terms of student origin, there

were significant differences in students' autonomous learning ability, academic self-efficacy, and academic emotion in terms of student origin.

Correlation Statistical Analysis

It can be seen from Table 1 that the VIF values of each independent variable were within a reasonable range when the model was constructed, indicating that the study model had no multicollinearity problem, and the standardized coefficient of academic self-efficacy was 0.874, with a p value less than 0.001, meaning that academic self-efficacy of college students has a significant positive impact on autonomous learning ability.

Table 1: Regression analysis of academic self-efficacy on self-directed learning ability1

Model	Unstandardized coefficients		Standardized coefficient	t	Significance	Collinearity statistics	
	B	Standard error	Beta			Tolerance	VIF
1 (Constant)	.522	.119		4.384	.000		
Academic self-efficacy	.886	.023	.874	39.249	.000	.995	1.006

a. Dependent variable: Autonomous learning ability

As shown in Table 2, the VIF values of each independent variable at the time of model construction were all within a reasonable range, indicating that there was no problem of multicollinearity in the study model. The standardized coefficients of academic self-efficacy were 0.837, with p values <0.001, indicating the positive impact of academic self-efficacy on academic mood among college students

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Table 2: Regression analysis of academic self-efficacy on academic emotions

Model	Unstandardized coefficients		Standardized coefficient	t	Significance	Collinearity statistics	
	B	Standard error	Beta			Tolerance	VIF
1 (Constant)	1.884	.087		21.696	.000		
Academic self-efficacy	.549	.016	.837	33.353	.000	.993	1.007

a. Dependent variable: Academic mood

As shown in Table 3, the VIF values of each independent variable at the time of model construction were all within a reasonable range, indicating that there was no problem of

multicollinearity in the study model. The standardized coefficients of academic emotions were 0.872, with p values <0.001, indicating that academic emotions have a significant positive impact on autonomous learning ability among college students.

Table 3: 2Regression Analysis of Academic Emotions on Autonomous Learning Ability

Model	Unstandardized coefficients		Standardized coefficient	t	Significance	Collinearity statistics	
	B	Standard error	Beta			Tolerance	VIF
1 (Constant)	-1.452	.161		-9.005	.000		
Academic emotions	1.350	.035	.872	38.908	.000	.993	1.007

a. Dependent variable: Autonomous learning ability

Mediation analysis

In this study, the Bootstrap method was used to test the mediating effect of academic emotion between academic self-efficacy and autonomous learning ability. When controlling for variables such as gender, grade, major, and place of origin, a mediating model was constructed with autonomous learning ability as the dependent variable and academic self-efficacy as the independent variable. The results showed that academic self-efficacy had a significant positive predictive effect on autonomous learning ability (β=0.874, p<0.01), and academic emotion also had a significant positive impact on autonomous learning ability.

Table 4: Regression Analysis of The Relationship between Academic Self-Efficacy and Academic Emotion and Autonomous Learning Ability3

Variables	self-directed learning ability		Academic emotions		self-directed learning ability	
	Beta	t	Beta	t	Beta	t
Academic self-efficacy	0.874	39.249 ***	0.837	33.353 ***	0.480	13.873 ***
Academic emotions					0.470	13.553 ***
R2	0.767		0.704		0.833	
F	311.415 ***		224.645 ***		390.573 ***	

Table 5: Analysis of The Mediating Effect of Academic Self-Efficacy between Academic Emotions and Autonomous Learning Ability

Effect types	Effect values	BootSE	Bootstrap95%CI		Relative effect share
			Lower limit	Upper limit	
Total effect	0.874	0.030	0.489	0.608	100.00
Direct effects	0.480	0.035	0.168	0.306	54.99
Indirect effects	0.394	0.021	0.145	0.145	45.01

Discussion

Analysis of Autonomous learning ability, academic self-efficacy and academic emotional status of college students in Kaifeng City, Henan Province

The results of this study show that the overall and various dimensions of the autonomous learning ability of college students in Kaifeng City, Henan Province, China, are at a relatively high level. The overall and various dimensions of academic self-efficacy of college students in Kaifeng are quite high, indicating that they have a strong confidence in completing their academic tasks and achieving good grades. The overall level of academic emotions and their dimensions is relatively high. Positive academic emotions such as pleasure and pride are dominant, while negative academic emotions such as anxiety and depression are relatively few.

Analysis of Differences in autonomous learning ability, academic self-efficacy, and academic mood among college students with different demographic background variables

This study found that there were no significant gender differences in students' autonomous learning ability, academic self-efficacy, and academic emotions as a whole or in each dimension. Zhou Yanguen & Sang Qingsong (2007) pointed out that schools pay more attention to individual differences and all-round development of students in educational and teaching management rather than simply treating them differently based on gender, providing equal learning opportunities and development space for male and female students.

Research data analysis indicated significant grade differences ($p<0.05$) in both dimensions of learning ability self-efficacy and learning behavior self-efficacy in terms of academic self-efficacy. This finding suggests that students show distinct stage-specific changes in their assessment of their learning ability and confidence in their learning behavior as they change grades.

There are significant differences in students' autonomous learning ability, academic self-efficacy, and academic mood from their place of origin.

Regression analysis of autonomous learning ability, academic self-efficacy and academic emotion among college students

The autonomous learning ability of college students is significantly positively influenced by academic self-efficacy. The results of this study show that the academic self-efficacy of college students has a significant promoting effect on their autonomous learning ability. In the dimension of academic emotions, studies have found that academic self-efficacy also plays a key role. Students with a positive perception of self-efficacy tend to have greater learning confidence and motivation (Tang Li & Zhang Sha, 2009).

Analysis of the mediating role of academic emotions in the impact of academic self-efficacy on autonomous learning ability

College students' autonomous learning ability is influenced by academic self-efficacy, and academic emotions play a mediating role in this process, which means that academic self-efficacy has

both direct and indirect effects on autonomous learning ability, and the indirect effects are achieved through academic emotions.

Conclusion

This study reached the following conclusions:

(1)   Students in Kaifeng City, Henan Province, China, have high levels of self-directed learning ability, academic self-efficacy, and academic emotions in general and in various dimensions.

(2)   There are significant grade and place of origin differences in self-study ability among college students in Kaifeng City, Henan Province, China; But there are no significant gender or major differences. There are significant differences in students' academic sentiments based on their place of origin, but there are no significant differences in gender, grade, or major.

(3)   College students' academic self-efficacy has a significant positive impact on autonomous learning ability; College students' academic self-efficacy has a significant positive impact on academic mood; College students' academic emotions have a significant positive impact on their autonomous learning ability.

(4)   College students' academic emotions play a mediating role in the impact of academic self-efficacy on autonomous learning ability.

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