

## RESEARCH ARTICLE

# Impact of college students' perceived classroom management on their learning strategies: The mediating effect of academic emotions and the moderating effect of growth mindset

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## ABSTRACT

College students in Jiangxi Province, China, are the research object in this study, the purpose of which is to use the control value theory to explore the impact of perceived classroom management on students' learning strategies, with a focus on the mediating role of academic emotions and the moderating role of a growth mindset. According to the results, the perceived classroom management of college students in Jiangxi Province, China, has a significant and positive impact on their learning strategies, academic emotions play a significant mediating role between these two factors, and a growth mindset plays a significant moderating role between them. It is suggested by the results of this study that colleges and universities should improve teachers' classroom management capabilities, pay close attention to the stimulation and maintenance of college students' positive emotions, and strengthen the cultivation of their growth mindset to effectively promote the optimisation of their learning strategies and improve their learning efficiency.

**Keywords:** college students; classroom management; learning strategies; academic emotions; growth mindset

## 1. Introduction

It is essential for educators to encourage their students to adopt effective learning strategies <sup>[1]</sup>, which can help them to achieve better academic results <sup>[2]</sup>, enhance their learning confidence and reduce incidents of academic - related psychological problems <sup>[3,4]</sup>. If college students can master the use of effective learning strategies, they will remain competitive in their future career <sup>[5]</sup>. Students frequently change their learning strategies during the transition from middle school to college, and this change largely depends on support from the educational environment <sup>[6]</sup>. Hence, it has become essential for college teachers and education administrators to pay close attention to promoting students' use of effective learning strategies in a university environment <sup>[7]</sup>. Therefore, the primary goal of this study is to identify the factors that influence college students' learning strategies.

Classroom management can improve students' engagement with learning and thus influence their choice of learning strategies<sup>[8]</sup>. As research on classroom management continues to deepen, its connotation continues to expand and gradually develop into a systematic reflection of the multidimensional management

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behaviour of teachers taken to improve the quality of their classroom teaching<sup>[9]</sup>. However, many teachers still have a narrow understanding of classroom management as discipline, while ignoring its broad role as a mechanism for regulating the classroom learning environment<sup>[10]</sup>. As the concept of classroom management has continued to expand, academic attention has gradually been drawn to its positive impact on students' learning process<sup>[11]</sup>. Therefore, understanding and analysing the mechanism by which broad classroom management affects students' choice of learning strategies is the second research objective of this study.

Emotion can be defined as a spontaneous reaction to external stimuli<sup>[12]</sup> students as an important external stimulus; hence, it is deemed to be the key antecedent of their academic emotion<sup>[13]</sup>. Emotion affects individuals' behaviour by influencing their thinking style and decision-making propensity<sup>[14]</sup>. With the continued improvement of emotion-related theories, academic emotion has gradually become an important variable to explain students' academic behaviour<sup>[15]</sup>. Various researchers have shown that positive academic emotions help to improve students' learning outcomes, thereby having a positive impact on the output of school education<sup>[16]</sup>. However, as relatively little attention has been paid to emotional factors in the classroom teaching process throughout pedagogy research history<sup>[17]</sup>, the third research goal of this study is to explore the relationship between perceived classroom management, students' academic emotion and learning strategies.

A growth mindset is one possessed by individuals who believe that their abilities are malleable<sup>[18]</sup>. Students with different mindsets have different attitudes when faced with learning tasks<sup>[19]</sup>. Those with a growth mindset are more likely to adjust their strategies to cope with diverse challenges and continuously improve their abilities during the learning process<sup>[20]</sup>. Researchers have found that a growth mindset can be effectively enhanced by brief, precise and generalisable interventions<sup>[21]</sup>, and this feature has further stimulated the continued attention of the academic community to this field<sup>[22]</sup>. Therefore, the fourth research goal of this study is to explore the relationship between perceived classroom management, students' growth mindset and learning strategies.

One contribution of this study is its utilisation of academic emotion as a mediating variable to construct and verify the path mechanism of the effect of perceived classroom management on students' learning strategies, which helps to deepen the understanding of the formation and application of learning strategies from an emotional perspective. At the same time, the factors that affect college students' choice of learning strategies are identified, and the cultivation of their learning strategies is addressed. A second contribution of the study is its incorporation of a growth mindset into the research framework as a moderating variable and its use of college students as research subjects, thereby enriching the empirical research on growth mindsets in the context of higher education.

## **2. Literature review and research hypotheses**

### **2.1. Perception of classroom management and learning strategies**

According to Marder et al.<sup>[23]</sup>, perceived classroom management is students' subjective perception of the various management measures taken by teachers to create a good teaching environment in the classroom. Classroom management includes a wide range of management tasks, such as reducing distractions, increasing monitoring, clarifying rules, and structuring teaching content. Good classroom management should enhance students' learning experience by reducing distractions<sup>[24]</sup>. Increased monitoring refers to teachers' continuous attention to students' learning progress and classroom behaviour<sup>[25]</sup>. Clear classroom rules can effectively reduce students' cognitive load by enabling them to focus on the classroom content<sup>[26]</sup>,

the structure of which will improve their learning outcome by demonstrating how they can learn efficiently and promoting the development of their ability to learn independently <sup>[27]</sup>.

Jiménez et al. <sup>[28]</sup> define a learning strategy as a process by which students actively select, use and adjust learning methods to achieve their learning goal in a specific learning situation. Different types of learning strategies include cognitive strategies, metacognitive strategies, and emotional social support. Cognitive strategies are the basic component of learning strategies. They are mainly manifested as specific ways of dealing with specific learning problems, and their main function is to optimise the efficiency of learning tasks <sup>[29]</sup>. Metacognitive strategies refer to a process by which learners can evaluate task requirements, reflect on the completed learning process, and adjust subsequent learning methods accordingly <sup>[30]</sup>. Social emotional support creates an environment that promotes learning by meeting students' emotional needs <sup>[31]</sup>.

The role of classroom management is not limited to the classroom; it can extend beyond it <sup>[32]</sup>. Teachers' adoption of classroom management strategies will affect their students' behaviour during the learning process <sup>[33]</sup>. Classroom disruption will reduce students' understanding of knowledge, causing them to rely on inefficient learning strategies based on a mechanical memory <sup>[34]</sup>. Low-intensity classroom monitoring causes students to lack learning goals, which, in turn, has a negative impact on their learning motivation <sup>[35]</sup>. If classroom rules are unclear, students are obliged to expend more cognitive resources to understand and adapt to them, which results in insufficient concentration on learning <sup>[36]</sup>. Classroom structuring provides a clear learning path to help students to better master the learning content and organise and review knowledge <sup>[37]</sup>. Hence, the following hypothesis is proposed;

Hypothesis 1: College students' positive perceptions of classroom management have a significant and positive impact on their choice of learning strategies.

## **2.2. Perceived classroom management and academic emotions**

Academic emotions are the various emotional experiences of students in relation to academic activities during teaching or learning <sup>[38]</sup>. Students' academic emotions during classroom teaching can be divided into positive and negative <sup>[39]</sup>. The former mainly include happiness, hope, satisfaction and pride, while the latter consist of fear, anger, shame and boredom <sup>[40]</sup>.

Teachers can improve students' emotional experience by reducing disruption in the classroom based on efficient classroom management <sup>[41]</sup>. When teachers manage the classroom effectively, students' positive emotions, such as joy and concentration, increase significantly, whereas negative emotions like anxiety and anger, are reduced. Disruptive students are happiest when classroom management is ineffective <sup>[42]</sup>. Clear rules in the classroom reduce students' uncertainty, enabling them to participate in classroom discussions and learning tasks more confidently and reducing the generation of negative academic emotions<sup>[43]</sup>. Structured teaching clarifies the learning process, helps students to understand complex learning tasks, effectively reduces students' anxiety, and enhances their positive emotions <sup>[44]</sup>. Due to the structure of the final scale after pilot testing, only positive academic emotions were included in the empirical analysis. Hence, the following hypothesis is proposed;

Hypothesis 2: College students' positive perceptions of classroom management have a significant and positive impact on their academic emotions.

## **2.3. Academic emotions and learning strategies**

Positive academic emotions can stimulate students' intrinsic motivation to adopt more complex learning strategies <sup>[45]</sup>. In a positive emotional state, students are likely to actively use metacognitive strategies and enhance the monitoring and regulation of the learning process <sup>[46]</sup>. Positive academic emotions assist students

to improve their level of processing information and provide support for their use of more effective learning strategies<sup>[47]</sup>; on the other hand, negative academic emotions weaken students' motivation to learn, and their learning behaviour becomes more dependent on external stimuli, such as examination pressure or criticism from teachers<sup>[48]</sup>. Students in this emotional state are likely to utilise simple repetitive mechanical learning strategies, reduce reflection and fail to adjust their learning strategies<sup>[39]</sup>. Negative learning strategies lead to the dispersion of students' cognitive resources and the further weakening of their use of deep learning strategies<sup>[49]</sup>. Hence, the following hypothesis is proposed;

Hypothesis 3: College students' academic emotions have a significant and positive impact on their learning strategies.

#### **2.4. Academic emotions, perceived classroom management, and learning strategies**

As mentioned earlier, emotion is defined as individuals' spontaneous response to external or internal stimuli, which has a significant effect on their cognitive behaviour and performance<sup>[50]</sup>. In an educational context, academic emotions are an important reflection of students' subjective experience of the learning environment, which affects their motivation to learn, as well as determining the kind of learning behaviour they adopt to a certain extent<sup>[46]</sup>. In the field of educational research, academic emotions have been widely regarded in recent years as a key mediating variable that connects the external teaching environment to students' learning outcomes<sup>[16]</sup>. Proponents of the control value theory suggest that academic emotions can play a mediating role between environmental, evaluation and performance variables<sup>[51]</sup>. A learning strategy is essentially the external manifestation of a learning behaviour, and its specific form is that learners take the initiative to optimise the learning process<sup>[52]</sup>. The core component of the learning environment is the classroom, which is also the main place for students to generate their academic emotions<sup>[53]</sup>. Hence, the following hypothesis is proposed;

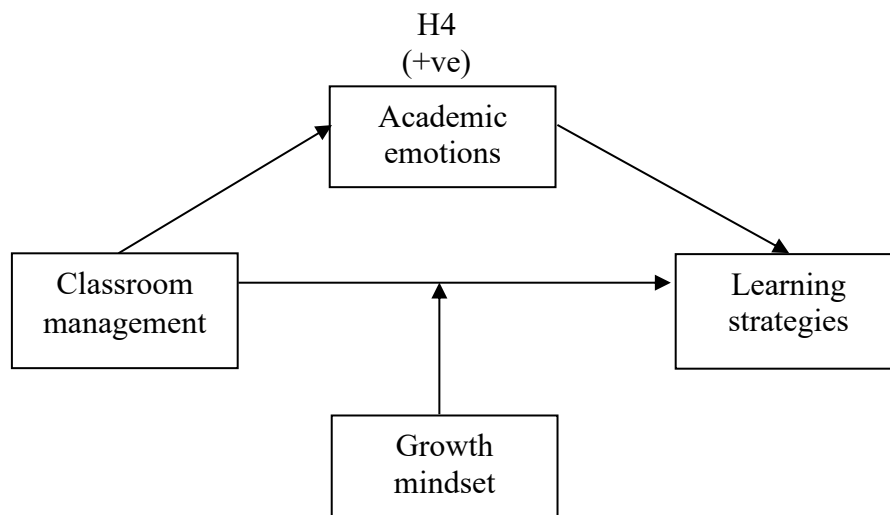
Hypothesis 4: College students' academic emotions mediate the effect of their positive perceptions of classroom management on learning strategies.

#### **2.5. Growth mindset, perceived classroom management and learning strategies**

A growth mindset is the belief that individuals can improve their intelligence by making a continuous effort<sup>[54]</sup>; in contrast, individuals with a fixed mindset believe that it is difficult to raise their level of intelligence, no matter how much effort is made<sup>[18]</sup>. Students with a growth mindset pay more attention to the learning process than the learning results, because they believe that hard work will lead to progress<sup>[20]</sup>. When they encounter failure, students with a growth mindset usually attribute the cause to insufficient effort, while those with a fixed mindset are more likely to attribute failure to their lack of ability<sup>[55]</sup>. When faced with difficulties, students with a growth mindset are inclined to redouble their efforts to seek a breakthrough, while those with a fixed mindset may engage in avoidance behaviour due to doubting their ability<sup>[56]</sup>. It is evident that different thinking styles determine students' cognitive evaluation and behavioural choices in specific situations. For example, in classroom learning situations, students with a stronger growth mindset are more likely to perceive classroom management as a part of learning support rather than suppression or control. This encourages them to use a variety of learning strategies with a more positive attitude<sup>[57]</sup>. Hence, the following hypothesis is proposed;

Hypothesis 5: College students' growth mindset has a moderating effect on their positive perceptions of classroom management and learning strategies.

The research framework of this study is summarised in Figure 1 below.



**Figure 1.** Research framework

**Note:** (+ve) indicates a positive correlation, (-ve) indicates a negative correlation.

### 3. Samples and procedures

The classroom context in this study is limited to a specific basic course in relation to the major students are taking in order to control the interference caused by differences in course types and bring it more in line with the strong demand for efficient learning strategies in this type of course. A convenient sampling method was used to distribute the questionnaires, and the main research subjects were college students in Jiangxi Province. Firstly, the names of the basic courses involved in the study were determined based on the schools and majors sampled. Before distributing the questionnaires, a statement was provided to inform the participants of the relevant matters and to assure them of the strict confidentiality of the information they provided. They completed the questionnaire on a voluntary basis and were prompted to fill in the course information involved in order to further clarify the classroom context. 600 formal questionnaires were distributed in this study, 526 of which were identified as being valid, meeting the minimum sample size requirement of 500 set for this study <sup>[58]</sup>. As shown in Table 1, the valid questionnaires were completed by 208 male students (39.5%) and 318 female students (60.5%). 356 of them, accounting for 67.7% of the total number, were enrolled in undergraduate universities, while 170 students, accounting for 32.3% of the total, were enrolled in junior colleges,

**Table 1.** Demographic information of participants

Statistical Variable	Category	Quantity	Percentage (%)	Cumulative Percentage (%)
Gender	Male	208	39.5	39.5
	Female	318	60.5	100
University Type	Undergraduate	356	67.7	67.7
	Specialist	170	32.3	100

### 4. Measuring tools

The scales used in this study were all derived from existing studies. A reliability analysis and a confirmatory factor analysis were conducted to ensure that these scales were applicable for use in this

particular study. All the measurements were based on a 5-point Likert scale, with a rating ranging from 1 ("strongly disagree") to 5 ("strongly agree").

#### **4.1. Perceived classroom management**

Marder et al. <sup>[23]</sup> developed a 19-item classroom management scale containing four dimensions, namely, Disturbances, Monitoring, Rule Clarity, and Structure. The reliability of the perceived classroom management scale was 0.911, and the reliabilities of the four dimensions were 0.901, 0.861, 0.850, and 0.874, respectively. The results of the confirmatory factor analysis indicated that:  $\chi^2 / df = 1.342$ , GFI = 0.963, AGFI = 0.951, NFI = 0.963, TLI = 0.989, CFI = 0.990, RFI = 0.957, IFI = 0.990, RMR = 0.049, SRMR = 0.032, PNFI = 0.882, PGFI = 0.740, with a good model fit<sup>[59,60]</sup>.

#### **4.2. Learning strategies**

Jiménez et al. <sup>[28]</sup> developed a 17-item learning strategy scale containing three dimensions, namely, Microstrategies, Keys for memory and metacognition, and Emotional-social support. The reliability of the learning strategy scale was 0.901, and the reliability of the three dimensions were 0.870, 0.885, and 0.901, respectively. The results of the confirmatory factor analysis showed that :  $\chi^2 / df = 1.252$  , GFI=0.969 , AGFI=0.958 , NFI=0.969 , TLI=0.992 , CFI=0.994 , RFI=0.964 , IFI=0.994, RMR=0.039 , SRMR=0.026, PNFI= 0.827 , PGFI= 0.734 , with a good model fit <sup>[59,60]</sup>.

#### **4.3. Academic emotions**

Chen and Lu<sup>[16]</sup> developed an academic emotion scale containing 9 items. After a pilot test, two items were deleted, resulting in a final 7-item scale. two reverse-coded items measuring negative emotions were deleted, resulting in a final 7-item scale measuring only positive academic emotions. The overall reliability of the adjusted scale was 0.921, and the results of the confirmatory factor analysis illustrated that:  $\chi^2 / df = 1.153$  , GFI=0.991 , AGFI=0.983 , NFI=0.993 , TLI=0.998 , CFI =0.989 , RFI= 0.981 , IFI=0.989, RMR=0.018 , SRMR=0.012, PNFI=0.662 , PGFI=0.513, with a good model fit<sup>[59,60]</sup>.

#### **4.4. Growth mindset**

Dweck et al.<sup>[18]</sup> developed a three-item growth mindset scale with a reliable Cronbach's  $\alpha$  coefficient of 0.819. A tau-equivalent model was utilised to process the confirmatory factor analysis of the growth mindset scale <sup>[61]</sup>, and the results showed that:  $\chi^2 / df = 0.286$  , GFI = 0.999 , AGFI = 0.998, NFI = 0.999, TLI = 0.999 , CFI = 0.997 , RFI = 0.998 , IFI = 0.997 , RMR = 0.021 , SRMR = 0.005 , PNFI = 0.666 , PGFI = 0.513, with a good model fit<sup>[59,60]</sup>.

### **5. Measurement results**

Gender and university type were both controlled for in this study because they are both substantially associated with learning strategies <sup>[62,63]</sup>. SPSS and AMOS software were used for the data analysis process, combined with PROCESS macro and the Bootstrap method, and key measurement conclusions were verified using multiple technical paths to enhance the reliability of the results.

#### **5.1. Common method bias**

As convenience sampling was used to collect the data in this study, there may have been common method bias; hence, two commonly-used methods were used to examine its potential impact, namely Harman's single-factor test using SPSS <sup>[64]</sup> and a comparison of model fit between single- and multi-factor models using AMOS<sup>[65]</sup>.

In the first method, all items were subjected to an unrotated principal component analysis, and a total of 9 factors were extracted under the condition of unrotated principal components; the cumulative explained variance was 67.991%, of which the explained variance of the first factor was 29.846%, which did not exceed 50%. Hence, it was preliminarily judged that the data did not have any serious common method bias [64]. As for the second method, as shown in Table 2, the goodness-of-fit index of the single-factor model was significantly worse than that of the multifactor model, further indicating that common method bias had no substantial impact on the results [65].

**Table 2.** Comparison of AMOS model fit between single and multi-factor structures

Model	$\chi^2$	df	$\chi^2 / df$	$\Delta \chi^2$	$\Delta df$	p
Single Factor Model	7700.521	989	7.786	2565.997	2.563	<.001
Multi Factor Model	5134.524	983	5.223			

## 5.2. Descriptive statistics and correlation analysis

Each variable in this study was subjected to descriptive statistics and a Pearson's correlation analysis, and the results are shown in Table 3. The correlation coefficients between the variables included in the research framework ranged from 0.31 to 0.61, and there was no high correlation or collinearity problem [66].

**Table 3.** Means, standard deviations and correlations across studies

		Average Value	Standard Deviation	1	2	3	4	5	6
1	Gender	1.60	0.49	1					
2	University Type	1.32	0.47	-0.07	1				
3	Perceived Classroom Management	3.12	0.77	.48**	-0.08*	1			
4	Learning Strategies	3.09	0.76	.44**	-0.05	.61**	1		
5	Academic Emotions	3.11	1.01	.33**	-0.09*	.52**	.49**	1	
6	Growth Mindset	3.18	1.06	.31**	.01	.47**	.32**	.31**	1

Note: \*\*  $p < .01$ , \*  $p < .05$

## 5.3. Hypothesis testing

The PROCESS macro of SPSS was used in this study in order to test the proposed hypotheses. Model 4 was used to test the mediating effect of academic emotions, and the results are shown in Table 4. Based on Model 1, perceived classroom management has a significant and positive impact on students' choice of learning strategies ( $B = .516$ ,  $p < .001$ ), thereby supporting Hypothesis 1. According to Model 2, perceived classroom management has a significant and positive impact on academic emotions ( $B = .616$ ,  $p < .001$ ), which supports Hypothesis 2. As shown in Model 3, after introducing academic emotions as a mediating variable, students' perceived classroom management still has a significant and positive impact on learning strategies ( $B = .413$ ,  $p < .001$ ), and academic emotions also have a significant and positive impact on learning strategies ( $B = .167$ ,  $p < .001$ ), thereby supporting Hypothesis 3. However, compared to Model 1, the regression coefficient of perceived classroom management on learning strategies decreased from .516 to .413, indicating that academic emotions have a partial mediating effect between perceived classroom management and learning strategies, supporting Hypothesis 4.

**Table 4.** Mediating effects of academic emotions

Variable	Model 1			Model 2			Model 3		
	LS			AE			LS		
	B	SE	t	B	SE	t	B	SE	t
Constant	1.606	.138	11.605***	1.192	.201	5.922***	1.407	.139	10.135***
Gender	-.294	.060	-4.887***	-.201	.088	-2.295*	-.261	.059	-4.436***
University Type	-.014	.055	-.258	.104	.080	1.296	-.032	.054	-.589
CM	.516	.038	13.495***	.616	.056	11.072***	.413	.041	10.013***
AE							.167	.029	5.723***
R <sup>2</sup>		.403			.281			.438	
F		117.320			68.158			101.530	

**Note 1:** CM is perceived classroom management, LS is learning strategy, AE is academic emotion. B is the unstandardised regression coefficient, SE is the standard error.

**Note 2:** Females are the control group; vocational college students are the comparison group.

**Note 3:**  $p^{***} < .001$ .

At the same time, the Bootstrap method was used in this study to re-examine the mediating effect of academic emotions. This method has been demonstrated to have high statistical power in estimating the mediating effect [67]. The results are shown in Table 5. The total effect of perceived classroom management on learning strategies was 0.516, and the 95% confidence interval was [0.441, 0.591], which did not include 0, indicating that the overall effect was significant; after controlling for academic emotions, its direct effect was 0.413, and the 95% confidence interval was [0.332, 0.494], which is still significant; the indirect effect was 0.103, and the 95% confidence interval was [0.064, 0.147], which also did not include 0. This again proved that academic emotions play a significant and partial mediating role in the relationship between these two factors.

**Table 5.** Bootstrap mediation effect and confidence interval

Path	Effect	SE	95% LLCI	95% ULCI
Total Effect	.516	.038	.441	.591
Direct Effect	.413	.041	.332	.494
Indirect effects	.103	.021	.064	.147

**Note 1:** 95%LLCI=95% lower limit of confidence interval; 95%ULCI=95% upper limit of confidence interval.

**Note 2:** Indirect path = medical college students' perceived classroom management-academic emotions-learning strategies.

Model 1 was used in the PROCESS macro in this study to test the moderating effect of a growth mindset, and an interaction variable was constructed through the centered product term of perceived classroom management and growth mindset. The results are shown in Table 6, from which it can be seen that a growth mindset has a significant and positive moderating effect on the relationship between perceived classroom management and learning strategies ( $B = 0.140$ ,  $SE = 0.043$ ,  $p = .001$ ,  $95\%CI = [0.056, 0.224]$ ), which supports hypothesis 5. It was found from a further analysis that the positive impact of perceived classroom management on learning strategies was more significant when college students had a higher level of growth mindset.



**Table 6.** Moderating effect of a growth mindset

Variable	LS				
	<i>B</i>	<i>SE</i>	<i>t</i>	LLCI	ULCI
Constant	3.170	.054	59.117***	3.065	3.276
Gender	-.310	.006	-5.142***	-.429	-.192
Education	-.013	.055	-.242	-.121	.095
CM	.465	.043	10.752***	.380	.550
GM	.028	.028	1.007	-.027	.083
CM*GM	.140	.043	3.279**	.056	.224
<i>R</i> <sup>2</sup>			.415		
<i>F</i>			73.783		

**Note 1:** CM is perceived classroom management, LS is learning strategy, GM is growth mindset; *B* is the unstandardized regression coefficient, *SE* is the standard error.

**Note 2:** Females = the control group; vocational college students = the comparison group.

**Note 3:** \*\*\*  $p < .001$ , \*\*  $p < .01$ .

## 6. Discussion

### 6.1. The influence of university students' positive perception of classroom management on their learning strategy choices

According to the findings of this study, university students in Jiangxi Province who hold a positive perception of classroom management tend to adopt more effective learning strategies, thus supporting Hypothesis H1. This result is consistent with previous research<sup>[43,68]</sup>. Classroom management practices employed during teaching promote student engagement<sup>[69]</sup>, and higher levels of engagement increase students' susceptibility to the influence of perceived classroom management behaviours, thereby shaping their learning behaviours.

### 6.2. The influence of positive perception of classroom management on students' positive academic emotions

This study found that university students in Jiangxi Province who positively perceive classroom management are more likely to experience positive academic emotions, supporting Hypothesis H2. This result aligns with prior studies<sup>[70,71]</sup>. Research has shown that Chinese students tend to exhibit a relatively high tolerance for teachers' classroom management behaviours<sup>[16]</sup>. When students perceive that teachers implement management practices to create a favourable learning environment, they are more likely to experience positive academic emotions due to the smoother progression of the learning process.

### 6.3. The influence of positive academic emotions on learning strategy choices

Based on the survey results, the positive academic emotions of university students in Jiangxi Province significantly and positively influence their choice of learning strategies, supporting Hypothesis H3. This finding is consistent with previous studies<sup>[45,62]</sup>. Positive academic emotions motivate students to set higher learning goals and adopt more complex and deep-level learning strategies to improve learning efficiency.

### 6.4. The mediating role of positive academic emotions

The results of this study indicate that positive academic emotions serve as a mediating variable between perceived classroom management and learning strategies among university students in Jiangxi, supporting Hypothesis H4. This conclusion is in line with existing research<sup>[32,39]</sup>. The classroom is a crucial part of the learning environment<sup>[53]</sup>, while learning strategies represent the concrete manifestation of student learning

behaviours. According to the Control-Value Theory, academic emotions can mediate the relationship between environmental variables and performance variables.

### **6.5. The moderating role of students' growth mindset traits**

The findings also reveal that the growth mindset of university students in Jiangxi moderates the relationship between perceived classroom management and learning strategy choice. Specifically, when students possess a higher level of growth mindset, the effect of perceived classroom management on learning strategies becomes more significant. This conclusion is supported by prior studies<sup>[57,72]</sup>. Students with a stronger growth mindset are more likely to believe that effort leads to academic improvement, which in turn enhances their perceived value of learning tasks<sup>[73]</sup>. Within the framework of the Control-Value Theory, the accessibility of value appraisals helps reinforce the influence of external environmental variables (e.g., classroom management) on learning behaviours (e.g., strategy use).

## **7. Conclusion**

The perceived classroom management of college students in Jiangxi Province has a positive and significant impact on their learning strategies. Academic emotions play a significant mediating role between perceived classroom management and learning strategies, and a growth mindset plays a significant moderating role between perceived classroom management and learning strategies. Therefore, the influencing mechanism model of perceived classroom management and learning strategies constructed in this study has been confirmed, and the relationship between the variables on the path has been verified. When college students feel that classroom management is standardised, orderly and supportive, they are more likely to have positive academic emotions, which stimulate them to use more effective learning strategies that can improve their learning outcomes; at the same time, students with a strong growth mindset are more highly sensitive to this process, and the impact of classroom management on their learning strategies is more positive and significant.

The above findings not only deepen the understanding of the relationship between college students' learning environment, emotions and behaviour, but they also provide a theoretical reference for improving universities' teaching quality and hence, learning outcomes.

## **8. Research Recommendations**

Based on the findings of this study, the following recommendations are proposed:

(1) Institutions of higher education should strengthen training programs aimed at improving teachers' classroom management competencies, including time management, student behavior guidance, instructional pacing, and the establishment of clear classroom rules, in order to foster a structured and well-organized learning environment.

(2) Teachers should attend to students' emotional responses during classroom instruction, and enhance their positive academic emotions—such as enjoyment, pride, and a sense of accomplishment—through strategies that stimulate interest, utilize encouraging language, and cultivate a supportive learning atmosphere.

(3) Teachers and educational institutions should systematically guide students to develop a belief in the malleability of their abilities, encouraging sustained effort in the face of difficulties rather than avoidance or withdrawal.

(4) Emotional regulation techniques and growth mindset training—such as emotion journaling, mindfulness practices, and peer discussions of failure experiences—should be incorporated into curriculum design to assist students in maintaining positive emotions and sustained motivation under pressure.

## 9. Limitations and directions for future research

Firstly, the research was only conducted using university students in Jiangxi Province, China. As Jiangxi is a less developed region economically, the quality of higher education there is likely to be influenced by regional economic conditions <sup>[74]</sup>. Hence, the generalisability and representativeness of the findings may be limited.

Secondly, the data was solely collected using questionnaire surveys and, while this method enabled an efficient quantitative analysis, it may not have fully captured the students' subjective perception of classroom management and academic emotions. Future studies could be based on the incorporation of qualitative data collection approaches, such as interviews or focus groups, for deeper insights.

Finally, the research was based on a cross-sectional design, whereby the data was collected at a single point in time. This limited the ability to examine dynamic changes in growth mindset and academic emotions throughout the learning process. Future researchers are recommended to adopt a longitudinal or experimental design in order to explore the temporal development of these variables and their practical implications for education.

## Conflict of Interest

The authors declare no conflict of interest.

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