

A Study on the Relationship between Students' Perception of School Atmosphere and Learning Engagement at Zhengzhou Z University, Henan Province, China

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Abstract: This study aimed to explore the relationship between students' perception of school atmosphere and learning engagement at Zhengzhou Z University in Henan Province, China. The total faculty population of Zhengzhou Z University was 32,075. According to the scale of Krejcie & Morgan (1970), a sample size of 380 was required to be distributed. After excluding invalid questionnaires, 379 valid questionnaires were retrieved, with an effective rate of 99.7%. The specific data analysis methods were descriptive statistics, independent samples t-test, One-way ANOVA analysis and Pearson correlation analysis. The findings showed that the current level of students' perception of school atmosphere and learning engagement at Zhengzhou Z University was moderate. There were significant differences in students' perception of school atmosphere and learning engagement at Zhengzhou Z University in terms of gender, grade, class cadre status, only child status, and major. In terms of perception of school atmosphere, females, freshmen, class cadres, non-only child, and students majoring in Science and Engineering and Economics and Management had higher levels. In terms of learning engagement, females, freshmen, class cadres, only child, and Science and Engineering students had high levels. Students' perception of school atmosphere had a significant positive correlation with learning engagement in Zhengzhou Z University.

Keywords: Zhengzhou Z University, School Atmosphere; Learning Engagement.

1. Introduction

As global higher education shifts from a paradigm of "scale expansion" to "quality improvement", students' learning engagement has become a core metric for measuring educational effectiveness. Learning engagement was not only about students' acquisition of knowledge, but also a comprehensive manifestation of emotional identification, behavioral engagement and cognitive depth. At the same time, the international education community has gradually shifted its research focus from "individual learning behavior" to "environment-individual interaction", among which the school atmosphere, as a core element of the implicit curriculum, has attracted much attention in terms of its influence mechanism on students' learning engagement.

The "Global Higher Education Learning Quality Monitoring Report" released by the OECD (2024) indicated that among the 43 participating countries, 78% of universities have incorporated

"creating a supportive learning environment" into their strategic planning and confirmed through quantitative analysis that for every one standard deviation improvement in students' perception of the school atmosphere, The incidence of deep learning behavior will increase by 19 per cent. Moreover, since the beginning of the 20th century, Koliatic & Kuh (2001)'s survey of students' learning experiences showed that close teacher-student relationships and timely academic support would lead to an average increase of 4.2 hours of self-directed learning per week for students and a 14% increase in course pass rates. It can be seen from this that, on the premise of a positive and good learning environment, supporting resources, providing feedback and recognition can directly affect students' willingness to engage and persistence. The research findings by Chinese scholars Nie et al. (2018), which show significant differences in the perception of school atmosphere among students of different types of universities

illustrate that schools were aware of the importance of creating a school atmosphere in the process of educational management, but face intense competitive pressure. Universities still have the problem of emphasizing form over substance in optimizing the school atmosphere. Some universities simply equate upgrading learning Spaces with improving the atmosphere without establishing a precise and effective student feedback mechanism; Or renovation projects were left idle because they do not meet the actual needs of students (Zhang, 2025). Universities that faced the above problems were eagerly seeking more efficient and long-lasting solutions. Therefore, it was worth noting that Chinese scholars Yuan et al. (2025) emphasized in their research that campus environment design must be dynamically matched with user needs to avoid negative impacts such as resource misallocation and efficiency depletion that were detrimental to the results. It can be said that in this global model of higher education, the process of educational development must always focus on and adhere to the efficient integration of the teaching environment and educational outcomes. Especially in the context of higher education in China, interpersonal relationships, participation experiences, and subjective perceptions of support received in the campus environment all have an impact on the psychology and behavior of college students. The school atmosphere, as an important component of students' learning environment, has a significant impact on students' learning engagement. Learning engagement was the positive mental state and behavioral tendencies that students exhibit during the learning process, and it was an important indicator of students' learning outcomes. The college stage was a critical period for personal growth and development, and learning engagement during this stage directly affects students' academic achievements and future development (Cao & Liu, 2017). However, with the increasing diversity of society's demand for talent and the continuous development and change of higher education models, the factors influencing college students' learning engagement are also increasing. Higher education in China has now entered a stage of rapid development, but college students show a prominent contradiction of "high

engagement - low ability" in terms of learning engagement (Guo & Liu, 2023). Also, according to the 2024 annual report on the quality of higher education in China released by the Ministry of Education, the average weekly study time for undergraduate students across the country reached 28.7 hours. However, a careful analysis of the learning content reveals that only 37% of the time was spent on deep learning, such as problem-solving, innovative practice and other activities that can truly enhance abilities, while the remaining 63% was spent on repetitive assignments or exam preparation. Therefore, increasing learning engagement and ensuring its efficiency have become important issues that higher education urgently needs to address. Based on this, this study focused on the correlation between the large students' perception of the school atmosphere and learning engagement, which was a localized practice of the integration of international trends. It was also a key exploration of the contradiction of "hardware upgrade - soft deficiency" in China's private colleges.

Zhengzhou Z University was a local private undergraduate institution in Henan Province. Due to the limited resources of the school, the uneven and limited quality of the teaching staff, and the numerous majors of the school, more attention was paid to the basic educational achievements and the timeliness and accessibility of the school's services. For the students of this private college, it was inevitable that they would care whether the school could provide better educational resources to gain more opportunities to promote their academic engagement and development. This study focused on Zhengzhou Z University, which had distinct characteristics in terms of teaching objectives, training models, teacher-student interaction, and campus culture, with students' subjectivity and emotional experience being particularly prominent. Therefore, this study aimed to explore the current level of students' perception of school atmosphere and learning engagement at Zhengzhou Z University. To explore the correlation between school atmosphere and learning engagement, to draw out existing problems and causes based on the real research results, and to provide a basis for education policymakers to improve the "student-

atmosphere, while junior students pay more attention to the atmosphere of campus recreational activities.

Also, regarding family background, Li et al. (2023) pointed out that students from urban families perceived the abundance of school resources better than those from rural families.

Differences in Students' Learning Engagement under Different Demographic Background Variables

Studies on the demographic backgrounds of college students' learning engagement have started with demographic background variables, but due to differences in major, individual characteristics, and school nature, there were variations in the degree of influence and factor correlation. In terms of the study of different demographic variable factors, Shu (2009) conducted a measurement study on the learning engagement of some college students in Jiangxi Province. The results showed that the overall level of learning engagement of college students was acceptable, but there were significant differences in the performance of grade and major variables. Cai & Wang (2017) argued that there was a significant gender difference in learning engagement among college students. That is, male college students had a significantly higher level of learning activity than female college students. In terms of the overall level of learning engagement, senior students have the highest level of learning engagement. The impact of professional differences on learning engagement was not significant.

The Correlation between Students' Perception of School Atmosphere and Learning Engagement

In the research on the correlation between students' perception of school atmosphere and learning engagement, Wang (2013) held that a positive school atmosphere can meet students' basic psychological needs. And thereby enhance learning engagement. The study found that basic psychological needs played a separate mediating role between the school atmosphere and learning engagement. Sun & Lei (2016) found a significant positive correlation between school atmosphere and learning engagement. A positive school atmosphere can provide students with a safe, supportive and encouraging learning environment,

stimulate their interest and motivation in learning, enhance their confidence and self-efficacy in learning, and thereby promote their active participation in learning activities and improve the level of learning engagement. Liu (2017) argued that a positive school atmosphere can stimulate students' positive emotions such as interest, happiness and pride, indicating that positive emotions further promote learning engagement. The empirical results of the study showed that positive emotions play a separate mediating role between the school atmosphere and learning engagement, and a chain mediating role with basic psychological needs.

Nie et al. (2018) showed that academic self-concept and personal growth initiative play a chain mediating role between perception of school atmosphere and learning engagement. A positive school atmosphere can enhance students' academic self-concept and thereby promote learning engagement. Li (2025) found that school atmosphere was significantly positively correlated with learning engagement and that school atmosphere could positively predict students' levels of learning engagement.

2. Materials and Methods

This study was conducted using convenience sampling with Zhengzhou Z University students as the test survey. The selection of the population sample was based on the convenience sampling criteria of the Morgan table. As of June 2025, the university had 12 teaching units and 32,075 students. Such a relatively large sample size made the university representative. Therefore, this study was determined to be conducted at the university. According to the scale of Krejcie & Morgan (1970), a sample size of 380 was required to be distributed. After excluding invalid questionnaires, 379 valid questionnaires were retrieved, and the effective return rate reached 99.7%.

The questionnaire used in this study was derived from the Perception of School Atmosphere Scale, revised by Jia et al. (2009) by Yuan et al. (2025). The Perception of School Atmosphere Scale (PSAS) included three dimensions: instructor support, student support, and autonomy

Table 2: Descriptive Statistics of Students' Perception of School Atmosphere

Dimensions	N	M	SD	Interpretation
Instructor Support	379	3.55	0.802	High
Student Support	379	3.32	0.644	Moderate
Autonomy Opportunity	379	2.98	0.855	Moderate
Overall School Atmosphere	379	3.28	0.612	Moderate

(2) There were significant differences in students' perception of school atmosphere at Zhengzhou Z University in terms of gender, grade, class cadre status, only child status, and major.

The overall school atmosphere $t=2.166$ and $p<0.05$, there were significant differences in students' perception of school atmosphere at Zhengzhou Z University of different genders, with females having a higher level of perception of school atmosphere than males.

Table 3: Analysis of Differences in Students' Perception of School Atmosphere by Different Genders

Dimension	Gender	N	M	SD	T	P
Instructor Support	Male	194	3.43	0.764	2.889	.004**
	Female	185	3.67	0.824		
Student Support	Male	194	3.33	0.626	.392	.696
	Female	185	3.30	0.664		
Autonomy Opportunity	Male	194	2.89	0.839	2.251	.025*
	Female	185	3.08	0.861		
Overall School Atmosphere	Male	194	3.22	0.583	2.166	.031*
	Female	185	3.35	0.635		

The overall school atmosphere was $F=4.669$ and $p<0.01$, reaching a significant level, freshmen scored higher than junior and senior students.

Table 4: Analysis of Differences in Students' Perception of School Atmosphere by Different Grades

Dimensions	Grade	N	M	SD	F	P	LSD
Instructor Support	1) Freshman	87	3.65	0.761	1.515	.210	-
	2) Sophomore	99	3.62	0.744			
	3) Junior	105	3.46	0.886			
	4) Senior	88	3.46	0.790			
Student Support	1) Freshman	87	3.45	0.560	4.345	.005**	① > ③ ① > ④ ② > ④
	2) Sophomore	99	3.42	0.682			
	3) Junior	105	3.25	0.682			
	4) Senior	88	3.15	0.594			
Autonomy Opportunity	1) Freshman	87	3.21	0.832	3.885	.009**	① > ③ ① > ④
	2) Sophomore	99	3.04	0.868			
	3) Junior	105	2.86	0.810			
	4) Senior	88	2.83	0.872			
Overall School Atmosphere	1) Freshman	87	3.44	0.548	4.669	.003**	① > ③ ① > ④
	2) Sophomore	99	3.36	0.626			
	3) Junior	105	3.19	0.642			
	4) Senior	88	3.15	0.580			

(3) The overall level of learning engagement was moderate ($M=3.32$), indicating that the current level of students' learning engagement at Zhengzhou Z University was average. The scores of each dimension were distributed in a moderate to high range, ranked from high to low as cognitive engagement ($M=3.55$) > emotional engagement ($M=3.38$) > behavior engagement ($M=3.04$).

Table 5: Descriptive Statistics of Students' Learning Engagement at Zhengzhou Z University

Dimensions	N	M	SD	Interpretation
Behavior Engagement	379	3.04	0.804	Moderate
Cognitive Engagement	379	3.55	0.828	High
Emotional Engagement	379	3.38	0.767	Moderate
Overall Learning Engagement	379	3.32	0.656	Moderate

(4) There were significant differences in students' learning engagement at Zhengzhou Z University in terms of gender, grade, class cadre status, only child status, and major.

The overall learning engagement $t=-2.490$ and $p<0.05$ reached a significant level, indicating significant differences in students' learning engagement at Zhengzhou Z University of different genders. Female students have a higher level of learning engagement than male students.

Table 6: Analysis of Differences in Students' Learning Engagement by Different Genders

Dimensions	Gender	N	M	SD	T	P
Behavior Engagement	Male	194	3.02	0.817	-.307	.759
	Female	185	3.05	0.793		
Cognitive Engagement	Male	194	3.41	0.850	-3.359	.001**
	Female	185	3.70	0.780		
Emotional Engagement	Male	194	3.29	0.764	-2.468	.014*
	Female	185	3.48	0.760		
Overall Learning Engagement	Male	194	3.24	0.668	-2.490	.013*
	Female	185	3.41	0.635		

The overall F for learning engagement was 5.725 and $p<0.01$, reaching a significant level. By LSD multiple comparisons, it can be known that freshmen score higher than sophomores, juniors, and seniors. This indicated that there were significant differences in students' learning engagement at Zhengzhou Z University of different grades, with first-year students having a higher level of learning engagement than other grades. Among the dimensions of learning

engagement, behavior engagement ($F=4.457$, $p=0.004$) and cognitive engagement ($F=5.529$). There were significant grade-level differences in both emotional engagement ($F=3.082$, $p=0.027$).

Table 7: Analysis of Differences in Students' Learning Engagement by Different Grades

Dimensions	Grade	N	M	SD	F	P	LSD
Behavior Engagement	1) Freshman	87	3.26	0.850	4.457	.004**	① > ③ ① > ④
	2) Sophomore	99	3.09	0.805			
	3) Junior	105	2.94	0.732			
	4) Senior	88	2.86	0.791			
Cognitive Engagement	1) Freshman	87	3.81	0.802	5.529	.001**	① > ③ ① > ④ ② > ③
	2) Sophomore	99	3.61	0.867			
	3) Junior	105	3.35	0.778			
	4) Senior	88	3.47	0.803			
Emotional Engagement	1) Freshman	87	3.58	0.737	3.082	.027*	① > ② ① > ③
	2) Sophomore	99	3.32	0.793			
	3) Junior	105	3.26	0.781			
	4) Senior	88	3.40	0.721			
Overall Learning Engagement	1) Freshman	87	3.55	0.670	5.725	.001**	① > ② ① > ③ ① > ④
	2) Sophomore	99	3.34	0.675			
	3) Junior	105	3.18	0.608			
	4) Senior	88	3.25	0.625			

(5) The correlation coefficient between the overall school atmosphere and learning engagement was $r=0.434$, and $p<0.01$, reaching a significant level. This indicated a significant positive correlation between students' perception of school atmosphere and learning engagement at Zhengzhou Z University.

Table 8: Correlation Analysis Matrix of Students' Perception of School Atmosphere and Learning Engagement at Zhengzhou Z University

Dimensions	1	2	3	4	5	6	7	8
1. Instructor Support	1							
2. Student Support	.493**	1						
3. Autonomy Opportunity	.406**	.468**	1					
4. Overall School Atmosphere	.799**	.784**	.807**	1				
5. Behavior Engagement	.278**	.258**	.259**	.332**	1			
6. Cognitive Engagement	.333**	.273**	.252**	.358**	.495**	1		
7. Emotional Engagement	.332**	.263**	.307**	.380**	.476**	.561**	1	
8. Overall Learning Engagement	.382**	.322**	.331**	.434**	.802**	.841**	.820**	1

4. Discussion

(1) The findings showed that Students' perception of school atmosphere at Zhengzhou Z University was generally at a moderate level. The scores of each dimension were ranked from high to low as instructor support, student support, and autonomy opportunity. The results suggested that the students' perception of school atmosphere was generally average, with a relatively high instructor support dimension and a relatively low autonomy opportunity dimension. Mainly due to multiple factors, schools attach great importance to the construction of teacher-student relationships. Teachers can provide students with certain emotional care and academic guidance, and students perceive a more positive experience of instructor support, consistent with the view emphasized in Zhang's (2025) study that a good teacher-student relationship can make students feel warm and respected.

(2) Females have a higher level of perception of school atmosphere than males. This result was consistent with the findings of Lin et al. (2020) that females generally perceive a supportive atmosphere at school more than males. It may be related to society's expectations of gender roles and the way schools provide support. Females were usually better at expressing their emotional needs, more proactive in seeking emotional care from teachers, and more inclined to build close peer relationships, so they were more sensitive to the supportive elements in the school atmosphere. The findings showed that Students' perception of school atmosphere at Zhengzhou Z University varies significantly by grade. Freshmen have a higher level of perception of school atmosphere than juniors and seniors. This result was similar to the findings of Li et al. (2020), where lower-year students were more concerned about the atmosphere of campus activities, while upper-year students may have a harsher perception of the school atmosphere due to the pressure of further education or employment. The findings showed that students' perception of school atmosphere at Zhengzhou Z University varies significantly in terms of majors. Students in Science and Engineering and Economics and Management have higher levels of perception of

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