

THE INFLUENCE OF STUDENTS' PERCEIVED CLASSROOM TEACHING ENVIRONMENT ON LEARNING QUALITY IN SHANDONG EXPERIMENTAL MIDDLE SCHOOL, CHINA

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Abstract: The classroom teaching environment was not only a place for teachers to answer questions, but also a place for students to carry out daily learning activities, which had an important influence on the psychology and behavior of students. So, to coordinate the relationship between students' perceived classroom teaching environment and learning quality to promote students' learning enthusiasm and learning quality. This study aimed to understand the overall level of students' perceived classroom teaching environment and learning quality, and analyze the differences under different demographic backgrounds, to explore the relationship and influence between students' perceived classroom teaching environment and learning quality. Therefore, a questionnaire survey method was adopted, and SPSS software was used to conduct statistical analysis on the collected 357 valid data. The research results indicated the overall level of students' perceived classroom teaching environment and learning quality was high level. There were differences in students' perceived classroom teaching environment in different grades, whether they were student cadre or not and places of origin. There were differences in learning qualities in terms of gender, grade, whether to serve as student cadre or not and places of origin. There was a significant positive correlation between the students' perceived classroom teaching environment and learning quality. The students' perceived classroom teaching environment had a significant positive influence on learning quality.

Keywords: Senior High School Student, Students' Perceived Classroom Teaching Environment, Learning Quality

Introduction

In the evolution and development of the times, China's education focus and policies have placed greater emphasis on cultivating students' innovative thinking and practical skills, continuously promoting the development of quality education. The basic task of education reform was also gradually

deepening into the teaching process. The classroom teaching environment was the platform and tool for teachers to teach, but it should not only cussingly convey knowledge and curriculum content. If classroom education was only seen as a simple way and tool for transmitting knowledge and skills, then it was not in line with the current state of social progress (Wang, 2015). Guided by the educational concept of focusing on the learning process, the classroom environment was regarded as the core place to perform educational tasks, which played a key role in students' knowledge absorption, the growth of personal and social skills and the progress of academic performance (Liu et al., 2020). Since the late 1960s, scholars have delved into the classroom environment and proposed many viewpoints and conclusions that profoundly influence educational practice. For example, numerous studies have shown that students' understanding of the classroom teaching environment significantly improved their cognitive and social skills, and even the influence of the classroom teaching environment exceeded the influence of students' background characteristics (Fraser, 2001).

In recent years, research on classroom environments has become a highly anticipated focus in international education sociology, educational psychology, and science education. Yu (2006) pointed out that the influence of the classroom teaching environment on classroom teaching behavior was profound, and it was a key factor in determining student growth. Some scholars believed that the teaching environment was an environmental factor that significantly impacted students as a complex system composed of multiple elements (Lin, 2020). The quality of the teaching environment directly determines teachers' teaching effectiveness and impacts students' learning attitudes. Therefore, the classroom environment should be regarded as an important influencing factor that must be considered and not ignored when cultivating learners, especially the teaching environment perceived by students. Otherwise, whether there were problems in the physical or social and psychological environment, it might hinder students' all-round development.

As society backgrounds based on future development, school education prepares students for adapting to the future society, cultivates their lifelong learning ability, improves their complete quality of coping with complex life, and helps them form the ability to adapt to the development of the times (Qin & He, 2021). Therefore, in the growth process of Chinese teenagers, the importance of quality education and all-around development has become increasingly prominent. As the foundation of quality education, students' learning quality has become a key research topic in the field of education in China (Chen, 2014). Learning quality was a comprehensive index that took learners themselves as the core of research. A learning quality scale could be used to evaluate learners' psychological characteristics and behaviors when learning activities. Then, based on the results of self-assessment, it could understand the psychological and behavioral state of learners and deeply explore their psychological and behavioral characteristics in the learning process according to these data (You, 2016). From this, it could be seen that learning quality was the learning literacy and necessary skills reflected by students in the learning

process.

To sum up, the classroom teaching environment was not only a place for teachers to answer questions, but also a place for students to carry out daily learning activities, which had an important influence on students' psychology and behavior. Therefore, The classroom teaching environment was not only a place for teachers to answer questions, but also a place for students to carry out daily learning activities, which had an important influence on the psychology and behavior of students. So, to coordinate the relationship between students' perceived classroom teaching environment and learning quality to promote students' learning enthusiasm and learning quality. Therefore, this study took senior high school students as the investigation object, investigated the current students' perceived classroom teaching environment and learning quality, deeply discussed the relationship mechanism between them, found out the existing problems, and hoped that the research results could have a positive influence of the teaching work of front-line teachers.

Research Objectives

- (1) To survey the students' perceived classroom teaching environment and learning quality.
- (2) To understand the differences in students' perceived classroom teaching environment and learning quality in different demographic backgrounds.
- (3) To analyze the relationship between the students' perceived classroom teaching environment and learning quality.
- (4) To explore the influence of students' perceived classroom teaching environment and learning quality.

Literature Review

Research on Students' Perceived Classroom Teaching Environment

Classroom teaching environment, as a derivative concept of environment in a specific situation, had gradually become a topic that experts in education, psychology and sociology paid close attention to in recent years. However, due to its rich connotations, it wasn't easy to make a unified definition. In his work, Fraser (1981) defined the classroom teaching environment as a microenvironment that influenced student development, relying on interpersonal relationships and individual feelings and perceptions within the classroom.

In China, some experts held the view that the classroom teaching environment was the key factor that affects teachers' teaching and students' learning psychology. Still, this influence would produce different results due to the difference in individual perception.

The research of Guo & Yang (2019) showed that the influence of students' perceived classroom teaching environment in the process of education should not be underestimated. It was the inner

experience and subjective feeling of teachers and students for the classroom or class from a personal perspective.

Aldridge & Fraser (2000) developed the Classroom Environment Perception Scale (WIHIC) in their research on the classroom environment. This scale consisted of seven parts, namely student cohesion, teacher support, participation, inquiry, task orientation, cooperation, and equality, with a total of 56 questions. After empirical research, the reliability and validity of this questionnaire were quite high. In addition, Wang (2018) created a classroom environment questionnaire that conforms to the Chinese classroom education model based on the translation and modification of Aldridge & Fraser's (2000) "Classroom Environment Perception Questionnaire" (WIHIC). This questionnaire included six main parts: student cohesion, teacher support, classroom participation, inquiry, teaching style, and equality, with a total of 28 questions and good reliability and structural validity.

Many experts have conducted empirical analyses and put forward their insights into exploring demographic factors in their research. For example, Xu (2018) conducted a study on junior-senior high school students' perceptions of their classroom environment. Her research results showed that males were stronger than females in the perception of physics classroom environments because of their differences in logical thinking. In addition, due to the uniqueness of the subject and the development law of students' cognitive ability, the students of lower grades were deficient in the environmental perception of physics classroom compared with the students of other ages.

Some researchers also showed that students who were student cadres were better than other students in understanding and experiencing courses, which mainly depends on their enthusiasm in class and self-confidence in their studies. (Lu, 2016; Ren, 2018).

Research on Learning Quality

The National Education Goals Panel (NEGP) explained the connotation of learning quality in the early 1990s. Learning quality was a part of five fields of early childhood education. As an important comprehensive concept, it had a profound connotation. It mainly covered children's behavior and psychological tendencies during the learning process, as well as their learning attitudes and habits (Kagan, 1998). Chinese scholars have translated the theoretical concepts proposed by the National Education Goals Committee of the United States into learning qualities. Among them, Wang (2014) held that learning quality was a relatively stable psychological state displayed by individuals in the learning process. In this process, individuals would also show some positive psychological characteristics. Obviously, this was defined based on the individual's performance in behavioral activities.

However, the view of Suo et al. (2016) was that learning quality was a comprehensive psychological trait that could become a huge driving force for children's future academic development and individual growth. At home and abroad, scholars have not only conducted in-depth research on the

connotation of learning quality but also discussed the composition and measurement methods of learning quality and developed some relatively perfect measurement and evaluation tools of learning quality. In Kong's research (2018), taking children as the research object and combining them with relevant examples at home and abroad, learning quality was defined as a series of psychological tendencies that children show when participating in various activities, including learning style, learning attitude and learning habits. It also emphasized that the learning quality of children in large classes was mainly reflected in innovation ability, enthusiasm, reflection and explanation ability, persistence and concentration. Li (2021) designed a self-rating scale for senior high school students' autonomous learning quality, which covered three levels: learning motivation, learning control and learning strategy, while learning motivation covered two dimensions: learning curiosity and learning refinement. Learning control only corresponds to one dimension of concentration and persistence. Learning strategies encompassed three dimensions: cognitive strategy, metacognitive strategy, and resource management strategy. This questionnaire demonstrated good internal consistency and reliability.

Therefore, this study used the questionnaire developed by Li (2021) as a testing tool for the learning quality of students in Shandong Experimental Middle School. At present, education experts and researchers around the world have conducted various in-depth discussions on the current status of learning quality research. Haryono et al. (2018) clearly pointed out in their study that learning quality was formed through the process of learning experience and knowledge mastery. It emphasized the guidance of learning interest and the cultivation of learning habits so as to improve students' learning quality, not just to develop students' intelligence. In the research of Wang (2020), the learning quality of preschool children aged 3-6 years was deeply discussed, and it was found that there were significant differences in the learning quality of preschool children under the influence of various factors such as gender, age and temperament. Family environment was the key factor affecting children's learning quality. Children who were easy to raise had higher learning quality than children who were difficult to raise. In addition, parents' education level and family economic status also had a significant role in promoting children's learning quality. The study also found that learning quality was a key preparation for children before entering school, and external environmental factors significantly influenced its degree.

Research on the Relationship between Students' Perceived Classroom Teaching Environment and Learning Quality

The external environment mainly involves external objective factors that might directly or indirectly affect students, covering multiple levels such as their family, school, and community. In the process of education, the classroom teaching environment played a decisive role, which not only directly affected students' knowledge mastery and technology application but also contributed to their academic progress and the enhancement of individual socialization ability (Zhao, 2019).

In previous studies on the correlation between perceived classroom teaching environment and learning quality, researchers have focused more on analyzing the learning quality of students and the current classroom teaching environment while also gaining a deeper understanding of their relationship with factors such as learning strategies and academic achievement.

Duff (2013) and Gong (2019) empirically explored various factors that affect the learning quality of students. Their research results showed that an excellent students' perceived classroom teaching environment and good learning quality could both promote the improvement of students' academic performance, and these factors have a positive influence on their academic development. In addition, some researchers have shown that both the classroom teaching environment and the learning quality of students could have a significant influence on their learning methods (Lu, 2010; Li, 2021).

Methodology

The research subjects of this study were senior high school students from Shandong Experimental Middle School, China. There were more than 5700 senior high school students in Shandong Experimental Middle School. According to the Morgan Table, 357 students needed to be collected (Krejcie & Morgan, 1970). During the formal testing phase, 357 valid questionnaires were collected. The survey questionnaire on the students' perceived classroom teaching environment among senior high school students in this study was derived from the classroom environment perception questionnaire developed by Wang (2018). Based on the "Classroom Environment Questionnaire" (WIHIC) developed by Aldridge et al. (2000), the questionnaire was revised according to the social environment theory of Moos (MOOS). There were 28 test items, which tested the current students' perceived classroom teaching environment from six dimensions: student cohesion, teacher support, classroom participation, inquiry, teaching method and equality. The questionnaire of senior high school students' learning quality in this study came from the questionnaire of senior high school students' learning quality compiled by Li (2021), which was compiled by interview and referring to the contents of mature scales at home and abroad. There were 22 test items in total, which test the current level of senior high school students' autonomous learning quality from three secondary dimensions, such as learning attitude, learning habits and learning characteristics, and six tertiary dimensions, such as learning curiosity, learning refinement, concentration and persistence, cognitive strategy, metacognitive strategy and resource management strategy.

Results

Demographic Analysis of the Respondents

In this study, senior high school students in Shandong Experimental Middle School were investigated. A total of 357 valid questionnaires were collected in the formal investigation stage, and

the distribution of demographic backgrounds of the respondents in the questionnaires was counted. Among the demographic backgrounds in the questionnaire, there were 181 males, accounting for 50.7%, and 176 females, accounting for 49.3%. The number of males and females participating in the test was similar, and the gender distribution ratio was relatively balanced. In terms of grades, there were 109 students in grade one, accounting for 30.5%, 123 students in grade two, accounting for 34.5%, and 125 students in grade three, accounting for 35.0%. The number of students participating in the test was similar, and the grade distribution ratio was relatively balanced. In terms of whether to serve as student cadre or not, 127 people served as student cadre, accounting for 35.6%, while 230 people did not serve as student cadre, accounting for 64.4%. The number of people who did not serve as student cadres was relatively large, and the distribution proportion of whether to serve as student cadres or not was in line with the actual situation. In terms of whether to serve as student cadre or not, there were 171 only children, accounting for 47.9%, and 186 non-only child, accounting for 52.1%. The distribution ratio of whether to serve as a student cadre or not was relatively balanced. In terms of students' places of origin, there were 227 students in urban areas, accounting for 63.6%, and 130 students in rural areas, accounting for 36.4%. Among the students who participated in the test, there were more students from urban and rural areas, which was consistent with the actual situation of the school.

Descriptive Statistics on the Students' Perceived Classroom Teaching Environment and Learning Quality

1) The current students' perceived classroom teaching environment

As shown in Table 1, the overall students' perceived classroom teaching environment was at a high level (M=3.61). From high to low, the cohesion was highest (M=3.83), followed by equality (M=3.62), teacher support (M=3.61), teaching method (M=3.58), and classroom participation (M=3.57). The lowest was inquiry (M=3.46), which was at a moderate level. Therefore, the overall level of students' perceived classroom teaching environment was relatively high.

Table 1: Descriptive Statistics on the Students' Perceived Classroom Teaching Environment (N=357)

Dimension	Mean	SD
Teacher Support	3.61	0.881
Student Cohesion	3.83	0.926
Classroom Participation	3.57	0.835
Inquiry	3.46	0.913
Teaching Method	3.58	0.837
Equality	3.62	0.760
Classroom teaching environment perception	3.61	0.635

2) Current learning quality of senior high school students

As shown in Table 2, the overall learning quality of senior high school students was at a high level (M=3.51). From high to low, resource management strategy was the highest (M=3.84), followed

by metacognitive strategy (M=3. 62), cognitive strategy (M=3. 49), learning curiosity (M=3. 47) and learning refinement (M=3. 32), and the lowest was concentration and persistence (M=3. 29), which was at a moderate level. Therefore, the overall level of learning quality among senior high school students was relatively high.

Table 2: Descriptive Statistics on Learning Quality of Senior High School Students (N=357)

Dimension	Mean	SD
Learning Curiosity	3.47	1.001
Learning Refinement	3.32	1.059
Concentration and Persistence	3.29	0.825
Cognitive Strategy	3.49	1.006
Metacognitive Strategy	3.62	0.905
Resource Management Strategy	3.84	0.804
Learning quality	3.51	0.669

Analysis of Differences in Classroom Teaching Environment Perception and Learning Quality among Senior High School Students

Through independent sample T-test and One-way ANOVA analysis test, this study analyzed the differences in different demographic backgrounds, and understood the differences in students' perceived classroom teaching environment and learning quality in different genders, grades, whether they were student cadre, whether they were only children and places of origin. There were differences in the students' perceived classroom teaching environment in different grades, whether they were student cadres or not and places of origin. There were differences in the learning quality of senior high school students in terms of gender, grade, whether to serve as student cadres or not and places of origin.

Correlation Analysis between Students' Perceived Classroom Teaching Environment and Learning Quality

Through Pearson correlation analysis, this study explored the correlation between students' perceived classroom teaching environment and the learning quality of senior high school students. As shown in Table 3, the $r=0.741$, $p < 0.05$, between the overall students' perceived classroom teaching environment and the overall learning quality of senior high school students, reached the significant standard; that was, there was a significant positive correlation between the two variables.

Table 3: Correlation Analysis between Students' Perceived Classroom Teaching Environment and Learning Quality

	Correlation	Learning quality
Classroom teaching environment perception	Correlation Coefficient	0.741**
	<i>P value</i>	0.000

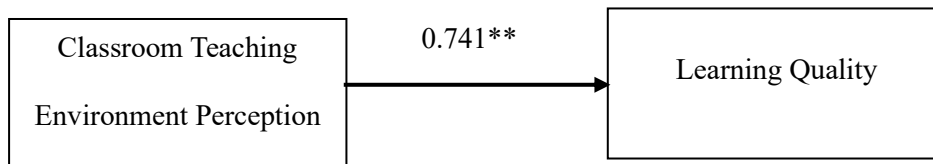
Regression Analysis of Students’ Perceived Classroom Teaching Environment and Learning Quality

Through regression analysis, explored the influence of the students’ perceived classroom teaching environment and learning quality.

As shown in Table 4, the regression model was established with students’ perceived classroom teaching environment as the independent variable and learning quality as the dependent variable, $F=432.432$, $p < 0.05$, which showed that the regression model had a significant effect.

Table 4: Regression Analysis of the overall Students’ Perceived Classroom Teaching Environment on Learning Quality of Senior High School Students

	Learning Quality				
	<i>B</i>	Standard error	<i>t</i>	<i>p</i>	β
Constant	0.685**	0.138	4.976	0.000	-
Classroom teaching environment perception	0.781**	0.038	20.795	0.000	0.741
<i>R</i> ²	0.549				
Adjust <i>R</i> ²	0.548				
<i>F</i> value	$F=432.432$, $p=0.000$				
Dependent variable: Learning Quality					
Note* $p < 0.05$ ** $p < 0.01$					



Picture 1: Research Regression Diagram

Discussion

Curren Students’ Perceived Classroom Teaching Environment and Learning Quality

According to descriptive statistics, the overall level of students’ perceived classroom teaching environment and learning quality was relatively high. The specific survey results showed that the overall and all dimensions of senior high school students’ perceived classroom teaching environment scores were higher than the moderate standard, and only the inquiry dimension scores were the lowest, just reaching the moderate standard. It showed that the students had a good perception of the current classroom teaching environment. The reason was that Shandong Experimental Middle School was the first batch of experimental schools in the province, which not only had a long history, but also had perfect infrastructure and first-class teachers, which laid a good foundation for the classroom teaching environment.

The overall level of senior high school student learning quality might be due to, on the one

hand, Shandong Experimental Middle School always insisting on promoting higher quality education and devoting itself to cultivating all-round development talents with a scientific and innovative spirit. Hence, the school attached great importance to the cultivation of students' learning quality. On the other hand, as far as the students who have been admitted to Shandong Experimental Middle School over the years were concerned, where there were a large number of candidates, their rankings were relatively high. In other words, most students had excellent learning ability.

Demographic Backgrounds Differences in the Classroom Teaching Environment Perception and Learning Quality among Senior High School Students

According to the difference analysis of gender variables, there were significant differences in the learning quality of senior high school students. Still, the overall gender difference in students' perceived classroom teaching environment was not significant. This research result was basically consistent with the research findings of Chen (2018), and Allen et al. (2011). The specific investigation results showed that the gender differences in learning quality were mainly reflected in learning curiosity, learning refinement, cognitive strategy and metacognitive strategy. The reason might be that the content of the learning quality investigation was mainly the non-intelligence factors in students' learning activities, which were closely related to the development of students' thinking mode, emotional state and personality traits.

According to the difference analysis results of whether to serve as a student cadre or not, there were significant differences in students' perceived classroom teaching environment and learning quality. The level of students' perceived classroom teaching environment and learning quality of students who serve as class cadres was relatively higher. This conclusion was consistent with previous research results (Xu, 2018; Li, 2021). On the one hand, students who served as student cadres and assistants of teachers in managing classes and organizing class activities had more opportunities to contact teachers and felt more teacher support.

According to the difference analysis results of the variables of origin, there were significant differences in students' perceived classroom teaching environment and learning quality. The level of students' perceived classroom teaching environment and learning quality of urban students was relatively higher. The reasons might be as follows: First of all, the students in Shandong Experimental Middle School were mainly in the form of day students, and the number of urban students was the majority. Therefore, compared with rural students, urban students could get familiar with the school environment, teachers' teaching method and classroom interactive atmosphere faster and better control.

Relationship between Students' Perceived Classroom Teaching Environment and Learning Quality

According to the results of the correlation analysis, there was a significant positive correlation between students' perceived classroom teaching environment and the learning quality of senior high

school students, which was basically consistent with the research conclusion of Yang (2011). The higher the students' perceived classroom teaching environment, the better their level of learning quality. It also indicated that as the main place for students to engage in learning activities, the classroom teaching environment was closely related to students' learning psychology, behavior, and habits in all aspects.

According to the regression analysis results, the students' perceived classroom teaching environment had a significant positive influence on learning quality. Student cohesion, classroom participation, inquiry, teaching style, and equality could all positively affect the learning quality of students. As Lin (2020) pointed out, a relaxed, harmonious, positive, united, and friendly classroom teaching environment was the key to mobilizing students' learning autonomy and enthusiasm, and it was also the key factor that could affect students' learning attitude, learning behavior and will. Firstly, a student's learning attitude determined their learning motivation and goals, which was the individual's comprehensive internal cognition of learning-related activities. This cognition came from many aspects, such as the learning environment atmosphere, interpersonal relationships, learning content, and teaching style.

The perception of the classroom teaching environment by students was a comprehensive reflection of these aspects. Therefore, the perception of the classroom teaching environment by students has an important influence on the formation of their positive learning attitude. Secondly, the level of active participation of students in the classroom reflected their focus on classroom learning content and careful consideration of issues. When students perceived that they could actively participate in the classroom, it showed that they were interested in learning and willing to explore problems actively. At the same time, this perception could stimulate students' learning autonomy and provide an inexhaustible motive force for the cultivation of learning quality. Finally, the positive perception of the teaching method among students indicated a high level of recognition and acceptance towards the teaching method adopted by teachers, which could enable students to more effectively master learning methods and strategies, thereby improving their learning quality and grades.

Conclusions

Conclusion 1: The overall students' perceived classroom teaching environment and learning quality was high level.

Conclusion 2: There were differences in the students' perceived classroom teaching environment in different grades, whether they were student cadres or not and places of origin.

In terms of grades, the students' perceived classroom teaching environment of senior two students were greater than that of senior one students. In terms of whether to serve as student cadres, students who served as student cadres had a higher students' perceived classroom teaching environment. In terms of origin, urban students' perceived classroom teaching environment was higher than that of

rural students.

There were differences in the learning quality of senior high school students in terms of gender, grade, whether to serve as student cadres or not and places of origin.

In terms of gender, females' learning quality level was significantly higher than males'. In terms of grades, the learning quality level of senior two and senior three was higher than that of senior one. In terms of whether to serve as student cadres, students who served as student cadres had higher learning quality. In terms of origin, the learning quality of urban students was higher than that of rural students.

Conclusion 3: There was a significant positive correlation between the students' perceived classroom teaching environment and learning quality.

Conclusion 4: The students' perceived classroom teaching environment had a significant positive influence on learning quality.

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