A study of the influence of architectural space on the climate of English language teaching: an educational psychology analysis based on classroom design

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Abstract In order to improve the atmosphere of English teaching, this paper, from the perspective of educational psychology, through the design of English classroom architectural space, the design content is mainly for the space and seating layout, color and light design, the optimization of the acoustic environment, cultural decorations and interactions, the design of physical comfort, and the intelligent spatial design, as a way to improve the communication between students and teachers, to reduce the anxiety of learning, to isolate the interference of the external noise, and to improve learning concentration and learning motivation. The experimental results show that after the implementation of the proposed teacher space design program, students' satisfaction with several aspects of the classroom, such as the rationality of the layout, color scheme and rationality, is above 85%. After implementing the virtual space speaking practice for 3 months, the students' oral accuracy pass rate increased to 92.17%. Therefore, the proposed method of architectural space design for English classrooms can, not only help to create a favorable teaching atmosphere, but also significantly improve student satisfaction and oral proficiency, and help to improve the effectiveness of English teaching.

Index Terms English teaching atmosphere, educational psychology, seating layout, learning anxiety, learning concentration

I. Introduction

In recent years, the development of the global economy has led to closer and closer ties between the countries of the world, and with the changes of the times, English has become an indispensable language for life from the world's universal language, truly realizing the living of English [1]. Therefore. Proficiency in English has become an inevitable requirement for economic and social development. The English teaching classroom is the main way to learn English, and from the psychological aspect, the design of the English classroom can, to a large extent, improve students' interest in learning English, strengthen students' concentration on learning, and increase the number of speeches made by students in the classroom, which in turn affects the teaching atmosphere of the classroom [2]. In this context, the scientific and reasonable design of English classrooms in combination with educational psychology is a key way to improve the quality of English teaching.

In order to improve the quality of English teaching and the atmosphere of English teaching, this paper aims to scientifically design the architectural space of English classrooms based on the theory of educational psychology. A serious and focused learning atmosphere is constructed through space and seating layout to enhance students' discussion and communication. The light and warm colors in the color and light design can not only reduce students' learning pressure, but also improve creative thinking. In the optimization of the acoustic environment, sound insulation facilities can be added to the walls and windows to isolate the interference of sound sources inside and outside the classroom, cultural decorations and interactions will be posted on the walls to create an atmosphere of English learning with English ornaments, the use of projectors, speakers and other equipment to increase the sense of classroom immersion and interaction, and the degree of physical comfort. Designed to maintain the balance of temperature and humidity in the classroom, the ergonomic chair design ensures students' physical comfort and reduces anxiety, and the intelligent spatial design installs a variety of devices to increase students' interest and motivation in the classroom and optimize the classroom learning atmosphere.

II. Architectural space design for English language classrooms

II. A. Space and seating layout

English teaching cannot be separated from the podium, which should be arranged in the traditional way at the front of the teacher, which is not only convenient for the teacher to manage the classroom order, but also improves the students' concentration on classroom learning. However, the students' desks can be arranged in a circular pattern. The circular layout not only increases the freshness of classroom teaching, but also facilitates the teachers to go down to the podium for further communication with the students. In attracting the attention of students at the same time, break through the spatial boundaries of teachers and students, increasing the sense of equality between teachers and students. This layout not only breaks the inherent concept of good students in the front row and poor students in the back row, but also improves students' participation in the classroom, and strengthens the communication between teachers and students, and students and students [3]. Small wheels can be installed under the desks to improve the flexibility of desk movement, and the desks can be moved freely and flexibly according to classroom needs. Students are divided into groups of six for English scenario simulation to cultivate students' performance ability and creativity, and to enhance the lively and pleasant learning atmosphere in the classroom. The space and seating layout not only enhance the management of classroom order, but also improve the communication between teachers and students.

II. B. Color and Light

The wall color scheme of the English classroom should be mainly in light colors, such as beige, light blue, light green, original wood color, etc., giving a bright and fresh feeling. Not only can create a serious and focused learning atmosphere, but also create a free and relaxed space for students. At the same time, in the soft decoration because of the choice of some light, warm colors, such as light orange, light pink, soft green, etc., through these colors to stimulate the creative thinking of students, improve the vitality of students in the classroom. The warm colors are brighter and more stimulating than light colors, and when students are fatigued from learning, the stimulation of concentration through warm colors will help relieve fatigue. However, care should be taken not to gaze at the stimulating colors for a long time to avoid visual fatigue. Teachers should be set up close to the south side of the teaching building, the sunlight can fully shine into the classroom, to improve the natural light of the classroom, students learning in the classroom full of sunlight can be enhanced, especially in winter, bright warm sunshine can improve the students' sense of well-being [4]. Curtains should be light-colored and not heavy material, which can block the sunlight, but also avoid the heavy material will block all the light out of the visual fatigue caused by insufficient light. Lighting in the classroom should be selected to switch between different colors and brightness of the lamps, for example, in the evening or rainy weather, in order to facilitate the discussion between students, can be switched to warm-colored light, in order to promote harmonious communication between students. When the students are writing, they can switch to a cooler color to improve their concentration on writing.

II. C. Acoustic environment

In order to increase the sound insulation effect of the classroom and avoid the noises from other classrooms or corridors from entering the English classroom and disturbing the students' attention, soundproof panels can be installed on the walls around the classroom, which can block the interference of external sound sources and improve the students' attention to learning. As the thinnest position in the English teaching space, the window is most likely to leak indoor sound or introduce outdoor sound, so it is necessary to replace the original ordinary window glass with insulating glass with an overall thickness of 2.5cm, thus realizing a completely closed space for English teaching, preventing sound leakage and interference, and reducing the psychological burden of the students who are afraid of leaking the sound of answering questions in class [5]. Sound-absorbing panels can also be installed on the ceiling of the classroom to reduce the echo inside the classroom and prevent the sound from leaking through the ceiling from the room or the classroom upstairs. This environment not only improves the clarity of the teacher's and students' voices, but also helps the teaching of English listening, creates a quiet learning environment for students, strengthens students' concentration and improves the quality of English learning.

II. D. Cultural decoration and interaction

It is indispensable to set up some English-related decorations in the English classroom, such as maps of European countries, pictures of representative buildings in European countries, pictures explaining the customs of European countries, cartoons of foreign celebrities and so on, through which an English immersion learning environment can be created. At the same time, we can also set up a wall of posters to put some excellent English works written by students on the wall for all students to visit, which can not only improve students' enthusiasm for English learning, but also promote students to learn more from some excellent works to improve their own English level. After the

students' works are displayed, it can enhance the students' sense of belonging and sense of achievement, and improve the students' learning concentration [6]. Setting up projectors, speakers and other equipment in the classroom, relevant derivative videos can be played for the content of students' learning in the classroom. For example, if the students mainly study American racial discrimination in the classroom, the teacher can play the origin of racial discrimination in the earliest period of the United States, as well as some of the feudal hierarchy in the United States through multimedia equipment, which promotes students' in-depth understanding of the classroom content and strengthens the students' sense of immersion. This approach helps to increase students' interest in the content of the course and improve their motivation to learn English.

II. E. Physical comfort design
In order to ensure that students are not disturbed by other hard conditions in the English classroom, it is necessary to regulate the indoor temperature of the classroom to promote the indoor temperature has been maintained in the classroom temperature is maintained between 22-24 ℃, which is the most comfortable temperature for the human body surface. Too low a temperature inside the classroom will affect students' concentration on learning, and too high a temperature will raise students' anxiety and stress in learning, leading to distraction and affecting learning efficiency. Several vents can be installed in the classroom to enhance indoor ventilation, reduce students' sense of sleepiness and maintain a positive classroom state. Ergonomic chairs should be chosen to adapt to the sitting postures of students of different heights under the scientific design of the seats to reduce back fatigue and improve students' comfort, so that students will not be unable to concentrate on their studies due to the seating problem. A reading corner can also be set up in the English classroom, in which soft cushions are laid down for students to read, creating a relaxing informal learning space and relieving students' anxiety through the reading corner.

II. F. Intelligent Space Design
With the development of network technology, the National Bureau of Education has called on colleges and universities to innovate the education model, change the traditional education model through big data technology, cloud computing technology and artificial intelligence technology, etc., to improve the effect of English teaching and learning while sending samples of high and new technology talents [7], [8]. Therefore, many colleges and universities have begun to bring a variety of multimedia devices such as networks, computers, cameras, induction lighting systems, temperature and humidity sensing systems, projectors, speakers and other multimedia devices into English teaching, through a variety of devices to access information in real time, to participate in online interactions, to create a sense of science and technology classroom. Speech recognition equipment can also be installed in the classroom, through which students' pronunciation accuracy can be evaluated to help them understand the pronunciation problems of individual phrases, and the intelligent recognition function can improve students' motivation in oral practice and interest in learning. And the intelligent virtual technology can be used to create a high fidelity virtual space for students, which can simulate the real scenes in English-speaking countries, and build a high fidelity of virtual characters, virtual objects, and virtual environments in the scenes, to improve the immersive learning of the students, to strengthen the sense of the atmosphere of the oral practice of the students, and to reduce the anxiety psychology in the real situation [9].

III. Impact of architectural space on the climate for English language teaching and learning

III. A. Study design
In order to respond to the national call and improve the effect of English teaching, a college installed soundproof boards in its English classrooms, the classroom windows became double-layer soundproof glass, the placement of students' desks in the classroom, the color scheme of the interior and the ornaments related to the English language were designed, and many kinds of multimedia equipment were installed to assist the teachers in teaching, and the process of the design of the English classroom architectural space was completed in October, 2024. In order to verify that the design of English classroom architectural space in this paper helps to improve the atmosphere of English teaching, 175 students in the second year of a university are taken as the object of investigation, and the questionnaire survey method is used to investigate 175 students. The questionnaire research mainly focuses on analyzing students' satisfaction before and after the architectural space design of the English classroom, and the questionnaires were filled out through the method of students staying after class. Finally, 175 questionnaires were distributed and 175 were retrieved, and all of them were valid questionnaires, the effective recovery rate was 100%, and SPSS 20.0 software was adopted to process the data.

III. B. Satisfaction with English classroom design

After the questionnaire statistics are summarized, the satisfaction of English classroom architectural space design is shown in Figure 1. Before the architectural space design, students' satisfaction with many aspects of the classroom, such as rationality of layout, color and rationality, sound insulation, indoor temperature, seat comfort, intelligent equipment, etc., is below 60%, while after the architectural space design in this paper, the satisfaction of many aspects is increased to more than 85%, especially the satisfaction of sound insulation, teaching innovation, learning atmosphere and learning motivation, all of which are above 93%. The satisfaction level of sound insulation, teaching innovation, learning atmosphere and learning motivation are all above 93%. Thus, the architectural space design of English classrooms in this paper can effectively improve the learning environment, learning atmosphere and motivation in English teaching.
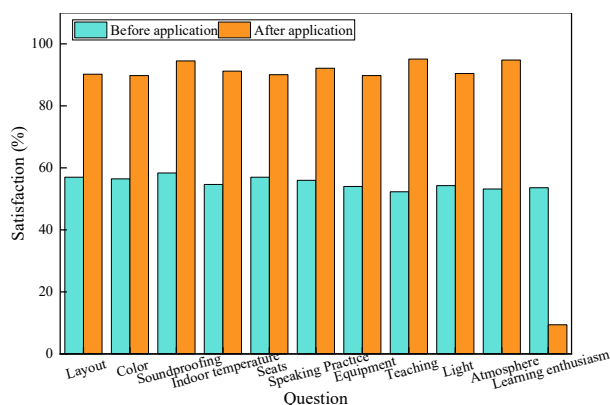

Figure 1: Satisfaction with architectural space design of English classrooms

III. C. Analysis of English Learning Effectiveness

In order to verify the effectiveness of the English classroom architectural space design in this paper, 175 students in the second year of the university were tested on the pre-test of the English classroom architectural space design, and then after three months of oral practice in the virtual space, the students completed the post-side of the English classroom architectural space design once again, and the oral test sentences totaled 18 sentences, all of which are the common phrases of the spoken English, as shown below:

(1) It will be in the place where we always put it.
(2) The clothes are lying on the fridge.
(3) She will hand it in on Wednesday.
(4)Tonight I could tell him.
(5) The black sheet of paper is up there beside the piece of timber.
(6) In seven hours the team leader will come.
(7) What are the bags standing there under the table?
(8) They have just carried it upstairs and now they are coming down again.
(9) At the weekends I always go home and see Agnes.
(10) I just want to take this away and then go for a drink with Karl.
(11) Could you recommend a good place to study on campus when it's noisy in the dormitory?
(12) What's your favorite part about participating in student clubs, and how has it influenced your college life?
(13) Describe a time when you had to work in a group for a project. What challenges did you face, and how did you solve them?
(14) Do you think social media has more positive or negative effects on young people's mental health? Why?
(15) Should universities require students to take physical education courses throughout their studies? Explain your opinion.
(16) In your view, what's the most important quality for a leader? Give an example to support your answer.
(17) Tell me about a traditional festival in your country that holds special meaning for you.
(18) If you could travel to any country for a month, which one would you choose, and what would you hope to experience there?

The passing rates of students' pitch, speech rate, rhythm and intonation in the front and back side speech tests were compared by the installed speech recognition equipment, and the results of the comparison of the passing rates of the speech indicators are shown in Table 1. The results show that before the design of the English

classroom building space, the pass rates of pitch, speech rate, rhythm, and intonation of English spoken by 175 second-year students in this university were 62.45%, 61.79%, 67.17%, and 64.69%. And after 3 months of virtual space speaking practice after the English classroom architectural space design, the students' speaking pitch, speed, rhythm, and intonation improved significantly, and the passing rates of pitch, speed, rhythm, and intonation increased to 92.17%, 92.33%, 90.53%, and 93.52%, which shows that the English classroom architectural space design based on the psychology of education can effectively improve the students' English speaking level.

Table 1: Comparison results of speech index pass rate

Evaluation indicators	Voice index pass rate/%			
	Pitch	Speech rate	Rhythm	Intonation
Before application	62.45	61.79	67.17	64.69
After application	92.17	92.33	90.53	93.52

IV. Conclusion

In order to strengthen the classroom atmosphere in English teaching and improve students' learning concentration and teaching effectiveness, this paper optimizes classroom architectural space design based on educational psychology. Through space and seating layout, color and light design, physical comfort, acoustic environment, cultural decoration and interaction, and smart space design to enhance students' immersion and improve English learning effect. The results show that after the architectural space design in this paper, the overall satisfaction of the students all increased to more than 85%, especially the satisfaction of sound insulation, teaching innovation, learning atmosphere, and learning motivation were more than 93%. In addition, after 3 months of virtual space speaking practice, the pass rates of pitch, speed, rhythm, and intonation were all significantly improved. It is further shown that the architectural space design can effectively alleviate students' anxiety, which not only improves the effect of English teaching, but also plays a positive role in the development of students' psychological health, which is of great significance for improving the quality of teaching.

Funding

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