

Evaluation of the Strategies of College English Ecological Classroom Teaching for Sustainable Development

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Abstract: Under the concept of the new English curriculum standard, it is required to fully highlight the dominant position of students in classroom teaching, with the goal of promoting students' comprehensive, balanced and sustainable development. Ecological classroom is a new teaching mode under this background, which provides new ideas for English teaching. At this stage, the promotion of ecological classroom is not mature, and there are many problems in the teaching content and teaching strategies, leading to low teaching efficiency, and students' enthusiasm for learning continues to decline. From the perspective of sustainable development, this paper analyzed the current non ecological situation of college English classroom from the perspectives of restrictive factors, marginal effect (teaching mode), classroom ecological environment and flowerpot effect (English test). Aiming at the emerging problems, this paper put forward the teaching strategies of college English ecological classroom from four aspects: getting rid of the constraints of restrictive factors, determining students' ecological niche, paying attention to classroom physical environment, and downplaying CET-4 and CET-6. The final experimental results showed that the new strategy proposed in this paper has enhanced the students' enthusiasm for learning, improved the teaching efficiency by 7.89%, and provided an important reference value for the sustainable development of English teaching.

1. Introduction

In the new era, traditional English teaching methods can no longer meet students' learning needs. According to the concept of sustainable development, colleges and universities should rethink classroom English education from an ecological perspective, systematically investigate the

ecological environment of the classroom, and then use ecological methods and strategies to carry out teaching activities, create a new model of classroom teaching, and optimize the classroom learning environment, so as to improve the teaching quality and efficiency of English teaching.

With the continuous reform of teaching mode, ecological classroom teaching has gradually entered people's vision. Marzban A discussed the current development of ecological classroom and suggested that English ecological classroom in vocational colleges should be based on education ecology and language ecology [1]. Zhao N discussed the importance of modern educational technology in English teaching, and then used computer technology to build an ecological classroom teaching model of college English [2]. Zhang S, based on the concept of ecological classroom teaching, measured the scope of adaptation and teaching effect of various teaching units such as micro classes, multimedia and network platforms, and finally built a new ecological teaching system [3]. Guo X analyzed the development prospect of ecological classroom teaching in combination with relevant materials, and then conducted classified research and ecological analysis according to the collected data and text information [4]. Zakirova L R analyzed the importance of listening in the ecological foreign language teaching classroom, and then proposed that teachers should give students more time to do classroom activities and homework [5]. Li F summarized the current situation of the imbalance of college English teaching ecosystem, and then constructed a new model of college English teaching in the form of ecological classroom [6]. Spain C applied a multilingual communication method to the ecological classroom teaching of foreign languages, which promotes students to actively use their mother tongue as a connecting tool in language communication [7]. The above research on ecological classroom teaching is relatively complete and has not been applied to the concept of sustainable development.

The concept of sustainable development is the mainstream of the development of the current era, and its application in the field of teaching is more and more mature. Ellison D W discussed the importance of the concept of sustainable development in teaching, and pointed out that the teaching modules and textbooks for engineering students should not only include technical analysis and economic evaluation, but also consider environmental and social factors [8]. Weber J M proposed to use network tools to solve the problem of sustainable development in teaching, and combined with relevant experiments to verify the effectiveness of network tools [9]. Obeng-Odoom F analyzed how to transform the research results of sustainable development into educational practice under the concept of sustainable development education, and finally gave specific strategies in combination with teaching forms [10]. Anastasiadis S investigated the cognition of business school educators on sustainable development. The survey results show that educators believe that sustainability is a complex problem, posing challenges to university teaching activities [11]. Berg A discussed the current situation of the application of the concept of sustainable development in teaching, and finally pointed out that the arrangement of sustainable development teaching strategies should focus on the new teaching system and more perfect teaching mechanism [12]. Kutluca T proposed an experimental teaching mode that combines teaching with research. Practice has proved that this interactive mode can greatly improve students' practical ability and is a sustainable teaching mode [13]. Creel T analyzed the application of the concept of sustainable development in the accounting classroom, and finally pointed out that accounting teachers should not only teach students theoretical knowledge, but also help students establish a concept of sustainable development life [14]. The application research of these sustainable development concepts in teaching is relatively detailed, but it does not involve ecological classroom.

With the continuous reform of the teaching system, English teaching must face sustainable development and take the ecological classroom teaching path. This paper first expounds the necessity of sustainable development in English teaching, then introduces the specific requirements of ecological classroom in combination with the concept of sustainable development, and then

analyzes the current non ecological situation of college English classroom, and gives specific solutions. The study found that combining ecological classroom with sustainable development of English teaching can improve teaching efficiency to a certain extent.

2. Necessity of Sustainable Development in English Teaching

The so-called sustainable development not only represents meeting the current needs, but also represents the possibility of integration with the original development model. The characteristic of sustainable development is that it can not only meet the development needs, but also deal with various contradictions in the development process [15]. Many students think that learning English means memorizing words and passing exams. They are completely passive learners and do not understand the real purpose of learning English. As shown in Figure 1, students memorize words and grammar every day and are busy preparing for the exam. If the students have good grades, they are considered to have reached a certain level of English learning. If the test results are not good, they often lose confidence in learning English and gradually lose interest in learning English. For some English teachers, they often ask students to take more notes, practice more and memorize more words in class, ignoring both listening and speaking, and turning the whole classroom into a vicious circle of exam oriented education. The new curriculum reform requires the idea of quality education to be integrated into classroom teaching, and the core of this idea is sustainable development. In this context, the sustainable development of English teaching can be said to be crucial. First of all, it can better summarize the advantages and disadvantages of English language courses and provide better guidance for the promotion of English language teaching. Secondly, according to the new educational concept, it can fully adapt to the future trend of English education. Finally, the sustainable development of English teaching can enable teachers to pay more attention to teaching methods, fully improve the teaching level, and then promote the overall quality of classroom teaching to a higher level.

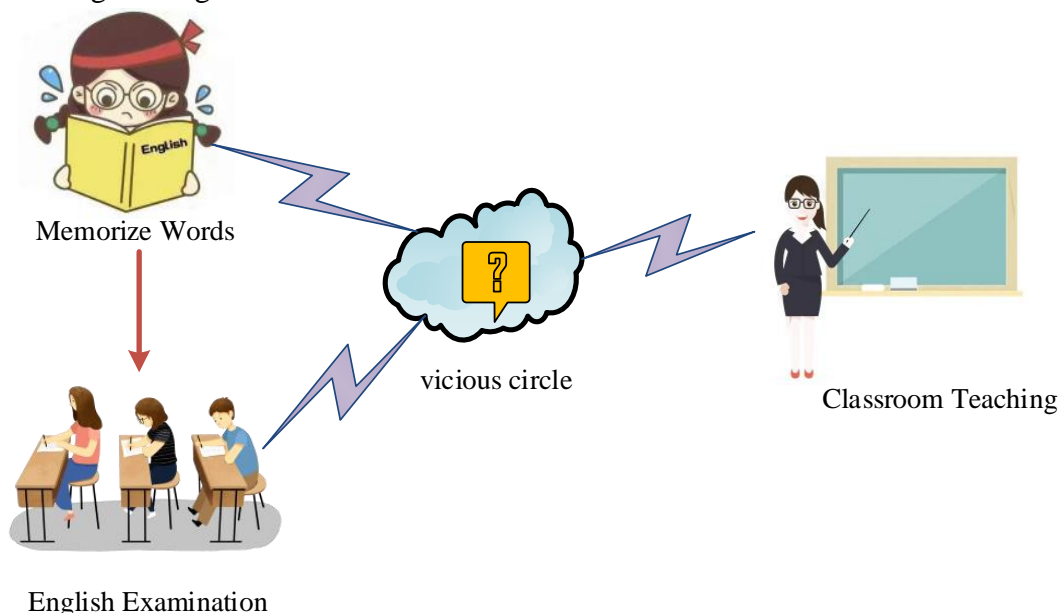


Figure 1. The current situation of traditional classroom teaching

3. Ecological Classroom under the Concept of Sustainable Development

As shown in Figure 2, ecological classroom refers to a dynamic, balanced, open and orderly

microecosystem composed of four elements: teachers, students, classroom natural environment and classroom humanistic environment. It conducts classroom teaching in a sustainable and ecological way. From a micro perspective, the ecological classroom should abide by the laws of education and cognitive development, and focus on students' physical and mental development and meet their individual needs. The construction of ecological classroom needs to abandon the traditional education concept, establish a "life centered" outlook on life, create a dynamic classroom full of humanistic care between teachers and students, and achieve the overall linkage between teachers and students, teaching and learning, and people and the environment.

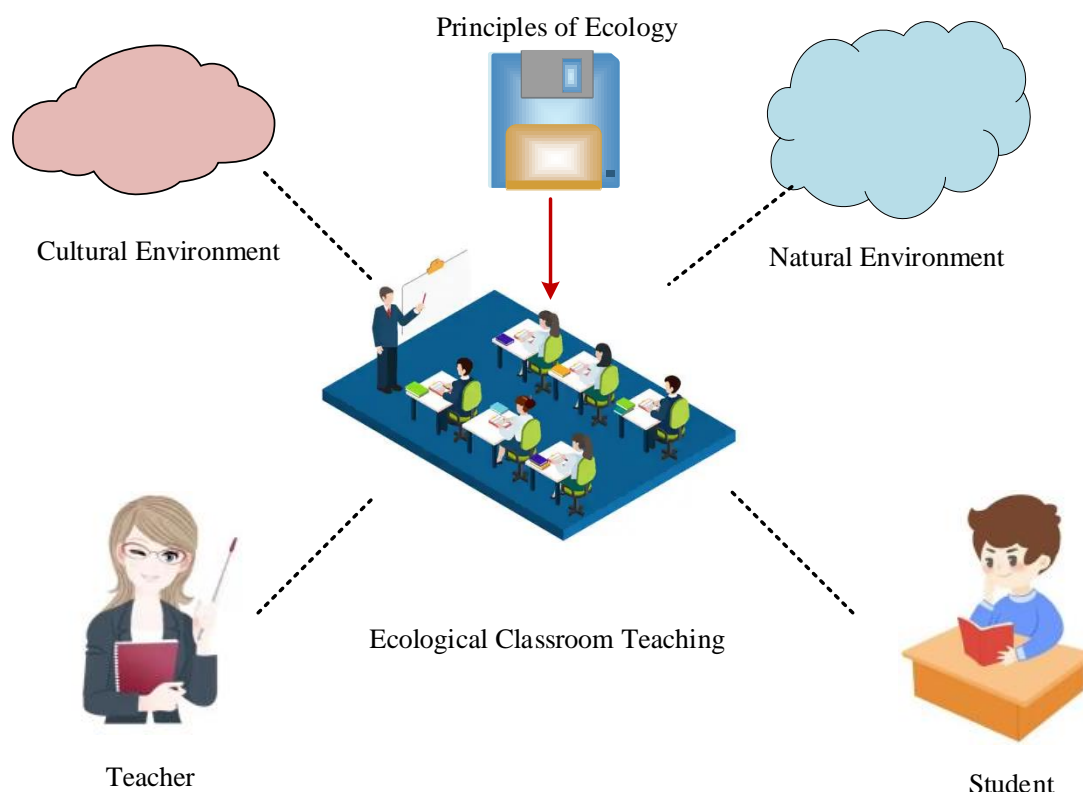


Figure 2. Eco-classroom combining the concept of sustainable development

4. Non Ecological Status Quo of College English Classroom

In terms of educational ecological practice of college English classroom teaching, there are many disharmonious non ecological situations that violate the ecological laws of the classroom, mainly in the following aspects:

(1) The restrictive factors of traditional teaching mode

The study found that, in the ecological environment, the lack of some ecological factors would hinder the development of organisms, that is, play a limiting role [16].

In English classroom teaching, year-round exam oriented education, relatively closed learning environment and relatively single communication environment are the main factors that limit students' English proficiency. If the adaptation mechanism of the natural ecosystem to the limiting factors is a passive instinctive response, then teachers and students can show their subjective initiative in English classes. However, this is not the case. In the English classroom, teachers who dominate English teaching and have the right to speak and control use the indoctrination teaching method to improve students' language skills. Students are like a container to receive knowledge, and

the whole learning process is a purely static giving and receiving, lacking vitality and motivation. According to the principle of limiting factors in educational ecology, teachers who teach too much and talk too much limit students' subjective initiative, which also exceeds students' tolerance of ecological learning environment, and ultimately become a limiting factor affecting students' all-round development.

(2) The marginal effect of teaching mode

When two or more different biota collide, more creatures would be produced, which is called edge effect. In English teaching, with the implementation of various enrollment policies, the enrollment scale of colleges and universities has become larger and larger, which would lead to the emergence of large or mixed English classes. This class has an average of more than 60 people per class, with a maximum of 100 people. As the main form of college English teaching, the larger the class size, the more people in the class, and the smaller the space for students. The crowded classroom increases the physical and mental pressure in the classroom, and students would become restless when answering questions. The depressed state of mind would make students have a negative attitude and shrink back and even choose to avoid questions in the classroom. In addition, it is difficult for teachers to pay attention to all students, and they cannot fully communicate with each student. A small number of students with excellent English ability would get the right to communicate, while most students with poor English ability would not improve their English ability because of poor communication, which has gradually formed the marginal effect of the large class English teaching model in colleges and universities.

(3) Unsuitable classroom ecological space environment

The inappropriate classroom ecology of tolerance is reflected in the classroom, that is, large class teaching. It is very common for desks and chairs to be arranged in rows in English classrooms. Teachers would strictly control classroom activities, resulting in students' rebellious psychology and sense of resistance. Due to the distance between students and teachers in the classroom, a relatively cold teacher-student relationship has been formed between teachers and students. This traditional arrangement of tables and chairs inevitably creates a teacher centered closed space, restricts the communication between teachers and students, and hinders the linkage between teaching and learning.

(4) The flowerpot effect implied by CET-4 and CET-6

Flower pot effect is also called local habitat effect in educational ecology [17]. The ecological environment space of the flower pot is very limited, and needs manual help. The same is true of English classroom teaching. In order to prepare for the CET-4/CET-6 exam, students learn from one book to another in class and immerse themselves in the sea of questions every day. The monotonous textbooks show boring language knowledge, and separate students from real life, forming a rigid learning space. In the classroom, the English skills to cope with the examination are far from the language environment in the real society. Although students have passed the CET-4/CET-6, they are often in an awkward situation when they can only express themselves in writing. The "flower plate effect" implied by the CET-4 and CET-6 makes English teaching solidified and closed, destroys the practical significance of classroom English teaching, and hinders the survival and development of students in the educational ecological environment.

5. Specific Strategies for Developing College English Ecological Classroom under the Concept of Sustainability

(1) Getting rid of the shackles of restrictive factors and enhancing the vitality of classroom teaching

In the educational ecological environment, almost all environmental factors can become limiting

factors. Therefore, in order to improve the effectiveness of English teaching, it is necessary to analyze various restrictive factors, and then find out and eliminate the dominant restrictive factors that hinder the development of teaching from among the numerous restrictive factors. Classroom is an ecological environment for teacher-student activities, classroom teaching is a process of teacher-student interaction and common growth, and classroom teaching ecology is a dynamic and open system. In the teaching ecology, students are the most basic and active variables. Without students, there is no classroom teaching ecology. Combining sustainable development and ecological classroom teaching mode to promote humanization and autonomy is to transform teachers' teaching behavior from simple preaching to humanistic care and expectation. It requires teachers to look forward to the independent development of students with enthusiasm, so that learning is full of humanistic care, all students can enjoy the sunshine of humanistic education, and the ecological classroom shows its charm. In addition, in a lively learning situation, teachers, knowledge and students should interact in a diversified, multi-directional, multi-level classroom ecosystem, eliminate the limitations of traditional classrooms, create a new ecological classroom teaching model, and improve the overall efficiency of classroom learning.

(2) Reasonably determining the ecological niche of students and realizing teaching equality

In educational ecology, niche mainly includes educational ecosystem, ecological group and ecological individual. Each student has his or her own niche in the English teaching ecosystem, which is related to students' ability, personality and interpersonal relationship. If the ecological environment of classroom teaching is compared to a circle, each student's position in the circle is different. There are few people at the center and edge of the circle, and most people are in the middle of the circle. The center of the circle represents excellent students, while on the edge of the circle are students who often have learning difficulties. These niche differences determine that individual students in the same class are unequal in the ecological environment, especially those in the center and edge of the circle. This inequality mainly focuses on the uneven distribution of resources. Due to the characteristics of English teaching (usually using languages other than the mother tongue for communication), differences in foreign language ability and personality would continue to increase the inequality of resource distribution. For example, students with good foreign language proficiency and outgoing personality tend to be asked more questions by the teacher, and they can speak without being asked, which takes up more classroom time than other students. The fair distribution of learning resources can not be ignored. Facing all students is the ultimate goal of ecological classroom teaching under the concept of sustainable development. Therefore, college English teachers must consciously pay attention to the fair distribution of time, space and other educational resources, pay attention to marginalized people as much as possible, and avoid marginalization.

(3) Paying attention to the classroom physical environment and optimizing the teaching ecological space

Classroom ecology refers to the relationship between people and the environment in the classroom. Classroom environment factors include human factors, material factors and psychological factors. The three are interdependent and restrict each other, showing a pluralistic and interactive relationship. Physical factors are environmental factors outside the classroom subject, which represent the natural environment of the classroom, such as facilities, time, space, etc. Among them, facilities refer to desks, chairs, desks, blackboards and other furnishings in the classroom. The layout of these materials affects the spatial elements of the classroom. Therefore, to improve the classroom ecological environment, people must fully mobilize the material elements of the ecological level. In the classroom, the closed and single classroom layout should be changed according to the characteristics of students and the actual teaching situation of the class. As shown in Figure 3, desks and chairs can be arranged in circular, fan-shaped, U-shaped and other open

forms, which reflects the teaching concept of ecological classroom. The teacher walked from the distant platform to the students, realizing equal dialogue with students. Although it is only a simple transformation of the classroom layout, it actually promotes the student-student relationship and teacher-student relationship in the classroom, and also forms a communication mechanism. This transformation of classroom physical environment and teaching ecological space has a subtle impact on students' mentality, enabling them to learn with a positive attitude and creating an atmosphere for participating in the classroom. In the classroom, the enthusiasm of teachers and students is high, the degree of tacit understanding is improved, and a good learning environment is bound to improve the effectiveness of English teaching.

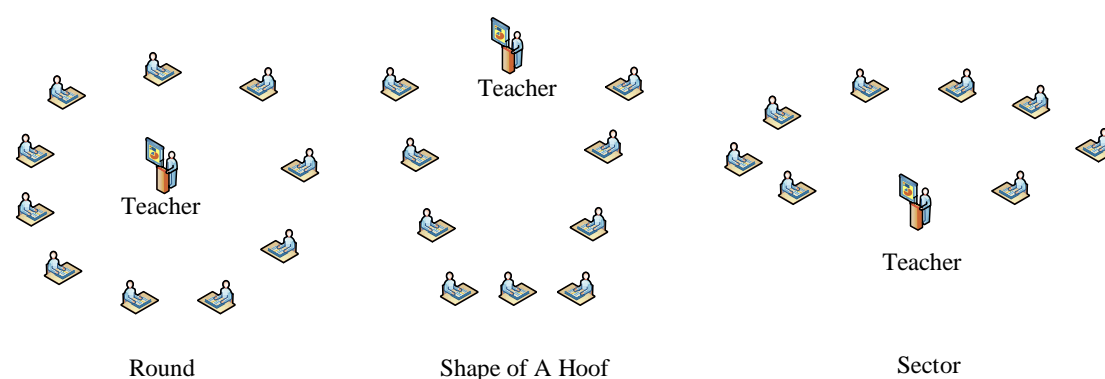


Figure 3. The new arrangement of desks and chairs in the ecological classroom

(4) Desalination of CET-4 and CET-6

The CET-4 and CET-6, which are produced by exam oriented education, are the embodiment of the traditional English teaching model. In this environment, a variety of skills to cope with examinations are gradually increasing, resulting in a large number of graduates showing a phenomenon of high scores but low abilities. The ecological environment of English classroom under this model is not conducive to the development of ecological teaching activities to a certain extent, and cannot provide students with the real language environment and living situation necessary for the formation of language ability. In order to break this vicious circle, college English teaching should follow the principle of openness, downplay the importance of CET-4 and CET-6, and break the test oriented education chain. With the help of ecological classroom teaching, people can enrich the content of English extracurricular activities and social practice, and provide all students with English learning opportunities. In addition, people should create an open ecological environment for English learning and application, extend guidance and learning to a wider social life, bring students from small classes into large social classes, strengthen the connection between classroom learning and extracurricular applications, and place students' foreign language learning in an open ecosystem.

6. Evaluation of the Experimental Results of the New Strategies of English Ecological Classroom Teaching under the Concept of Sustainable Development

The emergence of any new thing would have a process from understanding to adapting. As a new teaching form, the ecological classroom must allow teachers and students to have a full understanding, so as to better use the actual teaching activities. In order to analyze whether the ecological classroom can play an effective role in the actual teaching activities, first of all, 300 teachers and students (150 teachers and 150 students each) of A University were investigated for their understanding of the ecological classroom. The understanding was divided into no

understanding, heard of, understanding and very understanding. The investigation results are shown in Table 1.

Table 1. Understanding of college teachers and students on ecological classroom

Degree of understanding	Teacher		Student	
	Number of people	Proportion	Number of people	Proportion
Don't understand	3	1%	5	1.7%
Heard about it	22	7.3%	19	6.3%
Understand	53	17.7%	49	16.3%
Know very well	72	24%	77	25.7%

According to the number distribution and specific proportion in Table 1, it is easy to draw a conclusion that the number of people who do not know about the ecological classroom is very small, while the number of people who have only heard about it is relatively large. Teachers and students account for 13.6% of the total number, while the number of people who know and know very well accounts for the majority. The number of teachers and students exceeds 80% of the total number, which also shows that the development of ecological classroom is relatively successful in recent years.

Learning enthusiasm is the premise to ensure the smooth development of ecological classroom, and the level of enthusiasm can also reflect the success of teaching strategies. In order to verify whether the new teaching strategy combined with the concept of sustainable development can have an impact on the learning enthusiasm, a survey was conducted on the learning enthusiasm of Class B of College A for a week (Monday to Friday) under the traditional strategy and the new strategy. The learning enthusiasm was scored by a scoring system, with the maximum score of 100 points. The survey results are shown in Figure 4.

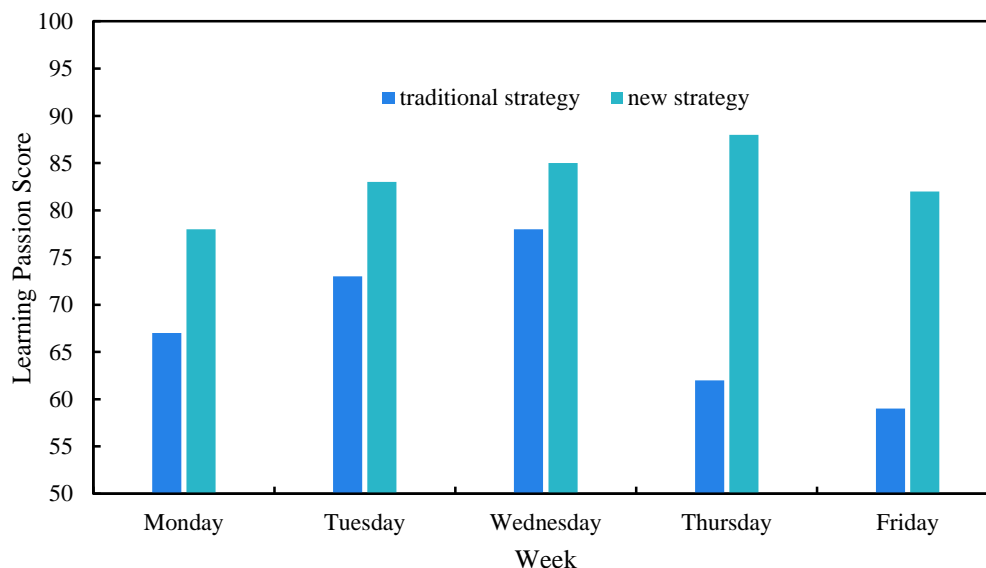


Figure 4. The scores of learning enthusiasm for the traditional strategy and the new strategy from Monday to Friday

It can be clearly seen from the histogram in Figure 4 that under the traditional strategy, students' enthusiasm for learning continued to rise from Monday to Wednesday, with a maximum of 75 points on Wednesday, but on Thursday and Friday, their enthusiasm for learning declined sharply.

On the other hand, the enthusiasm for learning under the new strategy exceeded 75 points on Monday, and then it was in a state of high enthusiasm until Thursday. On Thursday, the enthusiasm for learning was the highest, reaching nearly 90 points. On the whole, the learning enthusiasm under the new strategy from Monday to Friday is much higher than that under the traditional strategy. Although there is a slight decline on Friday, it does not affect the overall learning enthusiasm.

English achievements directly reflect the students' learning effect, and can also fully demonstrate the quality of teaching strategies. In order to better understand the practical effect of the new ecological classroom teaching strategy combined with sustainable development in English teaching, the students' English achievements under the traditional strategy and the new strategy within 5 weeks were investigated. The sample of students is College A English majors, with a total number of 200 students, including excellent and qualified grades. The survey results are shown in Figure 5 and Figure 6.

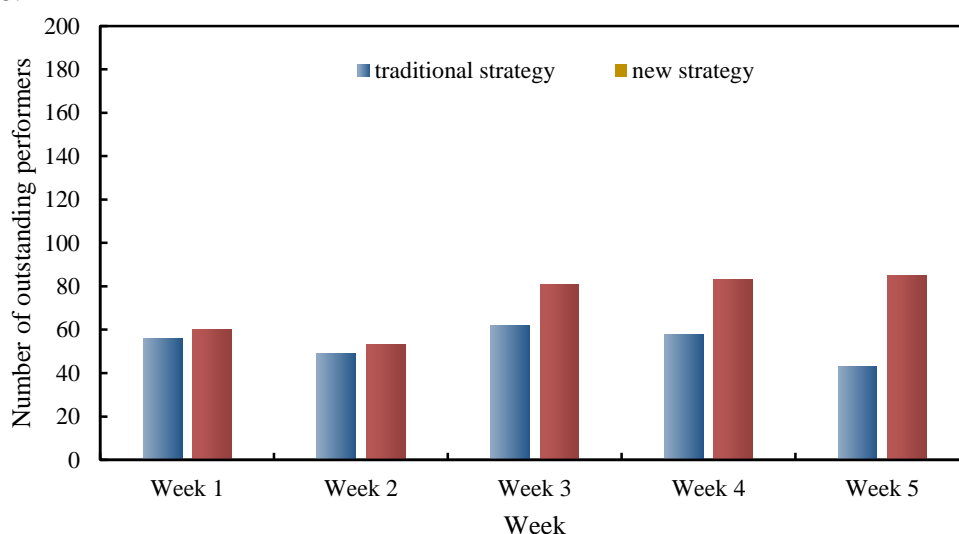


Figure 5. Changes in the number of outstanding performers under the two strategies

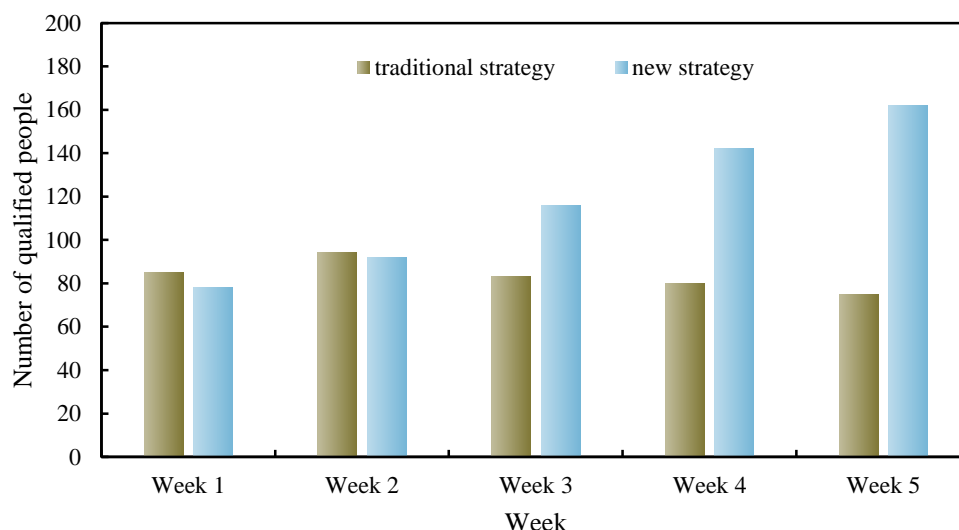


Figure 6. Changes in the number of qualified grades under the two strategies

In the above, Figure 5 shows the results of excellent English performance, and Figure 6 shows the results of qualified English performance. It can be seen that in the first two weeks, there was

little difference between the number of excellent English learners and the number of qualified English learners under the two teaching strategies. Neither the number of excellent English learners nor the number of qualified English learners exceeded 100 in the first two weeks. As time goes by, the number of excellent and qualified students under the new strategy is increasing from the third week, while the number of excellent and qualified students under the traditional strategy is decreasing. By comparing the growth of the number of students under the two types of achievement, it can be concluded that the implementation of the new strategy has led to the continuous improvement of students' English performance, while under the traditional strategy, students' English performance is unstable and has the possibility of continuous decline.

The goal of integrating the concept of sustainability and ecological classroom into English teaching strategies is not only to improve students' academic performance, but also to improve teachers' teaching efficiency. In order to verify whether the new strategy can improve the teaching efficiency of teachers, the teaching efficiency under the new strategy in 12 semesters was analyzed and compared with that under the traditional strategy. The comparison results are shown in Figure 7.

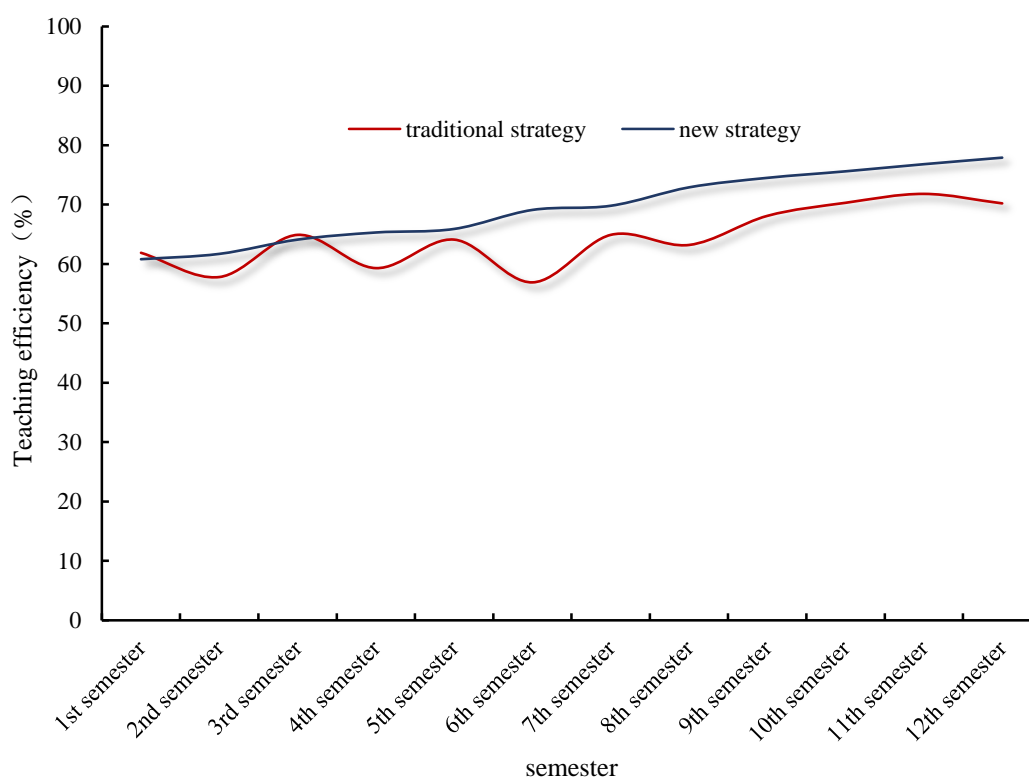


Figure 7. Changes in teaching efficiency in 12 semesters under the two strategies

It can be seen from the curve in Figure 7 that there is still a large gap in teaching efficiency under the two teaching strategies in 12 semesters. Obviously, in the adaptation stage of the first semester, the teaching efficiency under the new strategy is lower than that under the traditional strategy. However, since the second semester, the teaching efficiency under the new strategy has risen slowly, and has not declined until the 12th semester. In contrast to the teaching efficiency under the traditional strategy, although there is an upward trend in the middle few semesters, the overall fluctuation is too obvious. By contrast, it can be calculated that the teaching efficiency under the new strategy is 7.89% higher than that under the traditional strategy in 12 semesters.

7. Conclusion

With the proposition of the concept of all-round development in the teaching field, colleges and universities attach more and more importance to English teaching. The traditional mode of English teaching mainly focuses on memorizing words and responding to examinations, which limits the development of students and creates a bad teaching environment. In recent years, the emergence of ecological classroom and the concept of sustainable development has given English teaching a new opportunity. The reasonable integration of the two into English teaching plays an important role in optimizing the teaching environment, mobilizing students' enthusiasm and improving teaching efficiency.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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