Grammar Teaching in College English Green Education from Perspective of Cross-Cultural Learning

Yizhi Cao[1,a,*]

[1]Department of Foreign Language Teaching, Haojing College of Shaanxi University of Science and Technology, Xi'an, 712046, Shaanxi, China
[a]838275428@qq.com
*Corresponding author

Abstract: *Grammar lessons also play an important role in English teaching. Under the influence of the new curriculum reform, the traditional teacher-led grammar teaching model has been unable to adapt to the development of the times, nor can it meet the needs of students' language communication, because the traditional grammar teaching focuses on the cultivation of students' comprehensive application ability, rather than on the narration of the cultural connotation of grammar itself. Therefore, this paper analyzed the current situation of grammar teaching under cross-culture through genetic algorithm, and optimized and reformed the problems in grammar teaching according to green education, so as to promote the development of grammar teaching and improve the quality of grammar teaching. The results showed that both the connection weight value and fitness of grammar teaching grow over time. The mean connection weight value was 1.23, the seventh day was 0.22 higher than the first day, the fitness was 0.91, and the seventh day was 0.14 higher than the first day. The learning efficiency and learning interest of students under the green education grammar teaching were much higher than those of the traditional grammar teaching, and the learning efficiency was 9% higher than the traditional one, and the learning interest was 13% higher than that of the traditional one.*

Keywords: *Grammar Teaching, Cross-Cultural Learning, College English, Green Education*

1. Introduction

With the deepening of education system reform, the concept of green education has received increasing attention. More and more teachers are trying to introduce green education into English grammar classes to improve the vividness of teaching and the comprehensiveness of knowledge. However, some teachers have misunderstandings about green classes, believing that they only focus on listening and speaking, and ignore grammar teaching, which leads to limited accuracy and fluency of students' language expression, and thus affects the development of their comprehensive language abilities such as listening, speaking, reading and writing.

As an important part of language learning, English grammar teaching plays a key role in understanding and expression. Cam L analyzed the application of games in grammar teaching and explored its advantages and disadvantages, emphasizing the important role of games in improving the interactivity of grammar classes [1]. Zhou T found through a questionnaire survey that the communicative teaching method can effectively improve students' grammar mastery and self-confidence [2]. Chen C focused on the application of emotional factors in grammar teaching and proposed that reducing anxiety can help improve learning efficiency [3]. Chen X suggested that grammar teaching should be transformed from descriptive to explanatory from the perspective of language cognition [4]. YU L combined the principles of the communicative method to explore the teaching method of comparative structures of adjectives and adverbs [5]. FA W analyzed the application of flipped classroom in grammar teaching and pointed out that it still faces challenges in stimulating students' interest[6]. Vera W investigated students' cognition and preference for grammar teaching and found that there are certain differences between teachers and students in teaching methods[7]. Although these studies reflect the importance of grammar teaching, they are still insufficient in integrating green education with cross-cultural context.

Cross-cultural concepts help students to deeply understand grammatical rules and language

connotations. QI Y analyzed the impact of cultural factors on grammar learning and emphasized the value of cross-cultural communication awareness in grammar teaching[8]. Xu Y used machine learning methods to construct a cross-cultural oriented grammar evaluation system to promote the intelligentization of grammar teaching[9]. Li Y pointed out that cross-cultural communication ability should be an important goal of language teaching[10]; Chao L also proposed to regard it as a core skill in English learning[11]. Pulverness A demonstrated its potential in improving communication ability through the teaching practice of phrasal verbs[12]. Umar H suggested introducing topics related to source culture and target culture to improve the effectiveness of students' grammar learning[13]. Ayunon C C emphasizes the intrinsic connection between language and culture and advocates the integration of multicultural understanding in teaching [14]. Although many studies have focused on cross-cultural education, its integrated application in English grammar teaching still needs to be deepened.

Therefore, it is of great significance to scientifically understand the application problems and limitations of green education in a cross-cultural context and formulate practical grammar teaching strategies. Teachers should use situational teaching and interactive activities to guide students to understand the language and cultural connotations of grammatical structures, create a real language use environment, and improve their cross-cultural expression and communication skills.

2. Relationship between Green Education and English Grammar Teaching

(1) Green education content

Green education is a concept that integrates environmental education and sustainable development education. It aims to integrate science, humanities and spiritual literacy into teachers' knowledge and behavior, and serve the harmonious development of ecological civilization and society [15]. It emphasizes the harmonious relationship between man and nature, and man and society, and advocates a people-oriented and ability-oriented approach in college teaching, helping students to lay a solid foundation and establish correct values. As shown in Figure 1, green education also encourages teachers to implement its concept in various subjects, especially in grammar teaching, to improve teaching effectiveness by building an ecological and contextualized classroom.
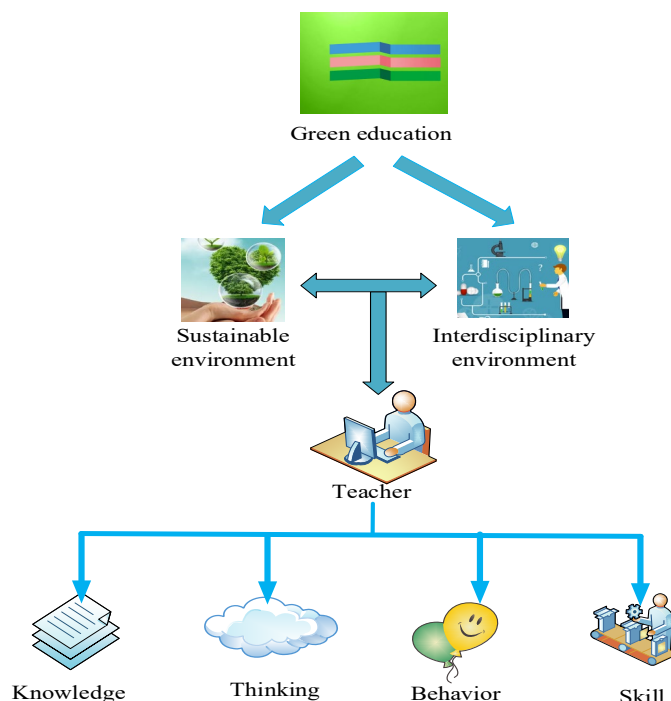

Figure 1: Contents of green education

(2) The link between green education and English teaching

Green education emphasizes the integration of science and humanities, focuses on the cultivation of scientific and humanistic spirits, and aims to be people-oriented, improve students' quality, and promote all-round development. As a new practice in higher education, curriculum construction is its foundation.

As an important part of general education, college English has unique advantages in the cultivation of green talents due to its long cycle, wide coverage, and strong scientificity [16]. Its teaching goal is not only to improve students' comprehensive English ability, especially listening and speaking ability, but also to enhance their self-study ability and cultural literacy, and serve the country's economic development and international exchange needs.

(3) The current situation of English grammar teaching

Traditional grammar classes mainly use the grammar translation method, focusing on the explanation of written teaching materials and language rules, and only imparting abstract language skills[17]. Influenced by this, current English grammar teaching in many regions is still mainly based on structural explanations and reading tests, ignoring the semantic function and actual communicative value of grammar. In fact, language learning should be based on specific situations. Learners should not only master language structures, but also understand the cultural context, pragmatic knowledge and cognitive strategies behind them. Only by understanding the cultural connotations of grammar can we apply and memorize grammatical knowledge more effectively. Therefore, grammar classes should shift from single lectures to contextualized teaching, and enhance the application value of grammar through vocabulary guidance and the integration of multiple forms such as listening, speaking, reading, writing and translation.

3. Optimization of Grammar Teaching in Green Education from Cross-Cultural Perspective

(1) The importance of English grammar

Grammatical skills are an important component of language ability. Grammar lessons play a fundamental role in English teaching. Teachers should pay attention to the effective transfer of grammatical knowledge. If students do not fully understand grammatical points such as sentence structure, modal verbs, non-finite verbs, adjectives and adverbs, it will affect their overall grasp of sentences and their reaction speed[18]. Therefore, in teaching, necessary grammatical knowledge should be imparted in a timely manner to help students improve their listening, speaking, reading and writing abilities in an all-round way. As the word "pearl" symbolizes, grammatical points are like pearls. Only when they are reasonably combined can a complete and beautiful language chain be formed.

(2) The system of English grammar teaching across cultures

Under the cross-cultural communication, the teaching system of college English mainly has the following three aspects, as shown in Figure 2.
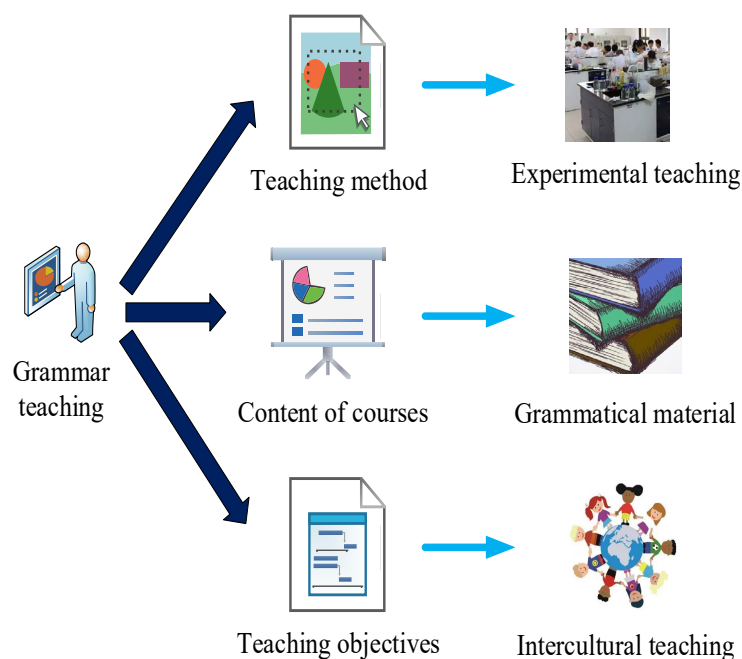

Figure 2: The system of English grammar teaching in cross-cultural context

In college English teaching, we should focus on the integration of language skills and basic

grammar knowledge, create a cross-cultural learning atmosphere, stimulate students' interest in grammar learning, and ultimately improve their language communication ability in a multicultural context [19]. The teaching content should not only cover the core elements of the language, but also integrate the social and cultural background, reasonably introduce cultural themes related to grammar, and achieve the simultaneous improvement of language knowledge and cultural literacy. Textbooks should take into account the diversity, authenticity and practicality of grammatical materials, combine different language tasks with cultural contexts, and enhance students' grammatical understanding and application motivation. In terms of teaching methods, language teaching should be combined with cultural teaching. Through vocabulary classes, students should be guided to understand the deep meaning of vocabulary and its contextual connection. In reading classes, texts with cultural depth, especially literary works, should be selected to help students understand the relationship between grammatical structure and cultural connotation. Literary works not only carry rich grammatical skills, but are also an important carrier for understanding national culture. Teachers should guide students to participate deeply in reading, writing and classroom activities, and apply grammatical knowledge to real communication through role-playing, cultural discussions and other forms, so as to improve their comprehensive language application ability and cross-cultural awareness [20].

(3) Optimization of grammar teaching in green education under cross-cultural learning

There are three main grammatical strategies for green education from a cross-cultural perspective, as shown in Figure 3.
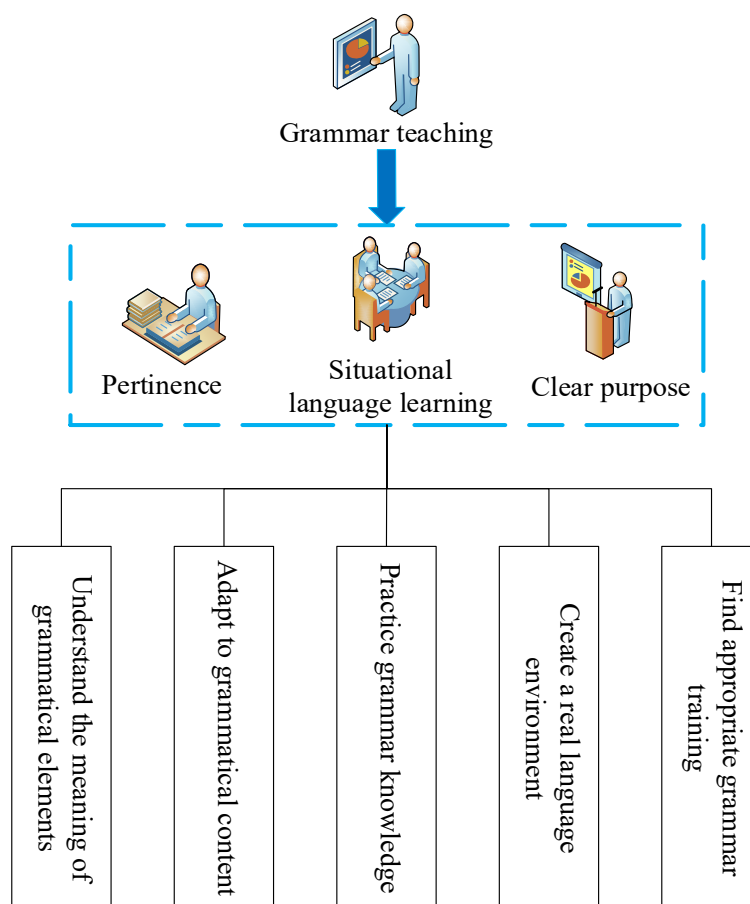

Figure 3: Optimization of grammar teaching in green education under cross-cultural learning

The core of grammar teaching should be to help students master and use language flexibly, rather than simply instilling grammatical knowledge. For beginners, the most basic and commonly used grammatical elements should be taught based on actual learning needs, such as plural nouns, subject pronouns, basic changes in verbs, preposition usage and simple sentence structure, rather than emphasizing the rigor of the grammatical system. Isolated grammar explanations are often boring and difficult to arouse learning interest. Therefore, the teaching process should clarify the goals and stimulate students' enthusiasm for participation through situational creation. Teachers can guide students to naturally master tense changes in describing daily activities or preferences based on topics

of interest to students. They can also introduce new grammatical knowledge subtly through situational dialogues, music appreciation and other forms, so that students can understand and use grammar in actual communication. In teaching, attention should be paid to the actual situation of students, materials and methods should be flexibly selected, and what has been learned should be consolidated through various exercises. At the same time, teachers should encourage students to actively discover grammatical rules in real contexts, summarize learning methods, and improve their independent learning and transfer abilities, so as to truly realize the transformation of grammatical knowledge into language skills.

4. Application of Genetic Algorithm in English Grammar Teaching

In order to study English grammar teaching under green education, this paper evaluates the quality of grammar teaching through genetic algorithms. Genetic algorithms can obtain better optimization results faster than traditional algorithms when solving complex optimization problems. First, calculate the input and output nodes of the middle layer of teaching quality evaluation:

$$M_j = \sum_{i=1}^{n} \alpha_{ij} a_i \tag{1}$$

$$N_j = \left\| \left[\left(\sum_{i=1}^{n-1} \alpha_{ij} a_i \right)^{-1} - 1 \right]^2 \right\|^{-1} = \left[1 + \left(M_j^{-1} - 1 \right)^2 \right] \tag{2}$$

Among them, formulas (1) and (2) are the input and output nodes of the middle layer respectively, α_{ij} is the input weight value of the middle point, and then the nodes to calculate the output layer are:

$$b = \left\| \left[\left(\sum_{i=1}^{n-1} \alpha_{ij} N_i \right)^{-1} - 1 \right]^2 \right\| \tag{3}$$

b is the actual output value of the evaluation sample, and then the mean of the actual sum of squared errors of the sample is calculated by the genetic algorithm:

$$A = \left(\frac{1}{c} \right) \sum_{c=1}^{c} \left[\overline{b} - b \right]^2 = \left(\frac{1}{c} \right) \sum_{c=1}^{c} A_j \tag{4}$$

c is the total logarithm of the training samples. Adjust the connection weight according to the error value to obtain the optimized connection weight value:

$$\min(A) = f(\alpha_1, \alpha_2, \cdots, \alpha_n) \tag{5}$$

The connection weight values are used to evaluate the relationship between the input and output layers. Among them, A is the total error of grammar training, and finally the fitness of grammar learning can be obtained as:

$$f_1 = R - A \tag{6}$$

R is the training objective function.

5. Experimental Analysis of Grammar Teaching in Green Education from Cross-Cultural Perspective

In order to understand the effect of grammar teaching under green education from a cross-cultural perspective, this paper optimizes grammar teaching through genetic algorithm. First, we surveyed 200 teachers and students in a school on the satisfaction effect of grammar teaching under green education, which was divided into three levels: satisfied and dissatisfied. The results are shown in Table 1.

Table 1: Teachers and students' satisfaction with grammar teaching under green education

	Satisfied	Commonly	Dissatisfied
Teacher	162	20	18
Student	180	12	8
Total	342	32	26

According to the data in Table 1, teachers and students are highly satisfied with reading and green education, with a satisfaction rate of 85.5%, general 8%, and dissatisfaction of 6.5%. Satisfied students believe that this strategy has promoted the classroom atmosphere and improved students' cognition and interest in English grammar; dissatisfied students reflect that both teachers and students need to invest a lot of time, and that there are difficulties in memorizing and understanding grammar and cultural connotations.

(1) Grammar mastery and grammatical accuracy in grammar teaching in green education

In order to study the specific effect of grammar teaching in green education, this paper evaluated the quality of grammar teaching by analyzing students' grammar mastery and grammar accuracy under green teaching. The specific analysis results are shown in Figure 4.
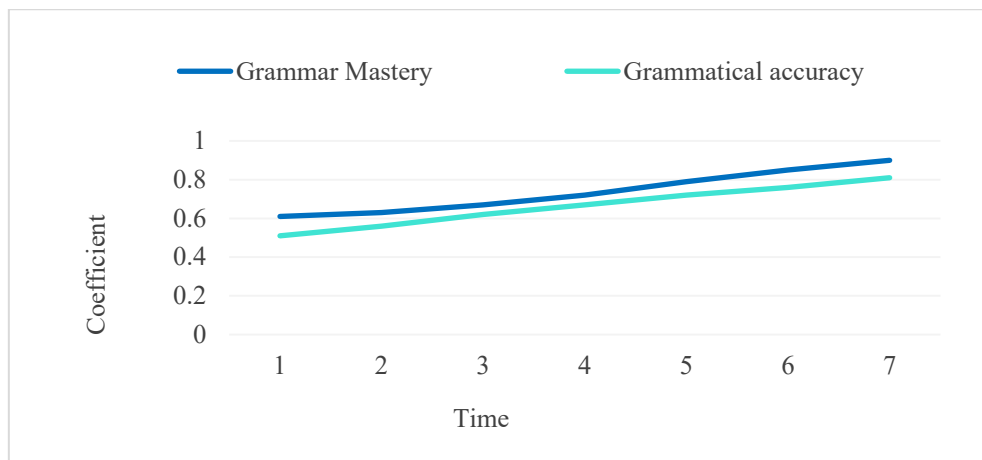

Figure 4: Grammar Mastery and Grammar Accuracy of Grammar Teaching in Green Education

According to Figure 4, it can be seen that with the increase of time, the students' grammar mastery and grammar accuracy are gradually increasing. The mean grammar mastery was 0.74, and the seventh day was 0.29 higher than the first, and the mean grammar accuracy was 0.66, and the seventh day was 0.30 higher than the first. The rise of both shows that the effect of grammar teaching under green education was very effective. Under this kind of education, students had a better understanding of the meaning of grammar and the cultural meaning behind it, and they can also communicate and interact with their classmates quickly and accurately using grammar. Students can master grammar knowledge more quickly from a cross-cultural perspective.

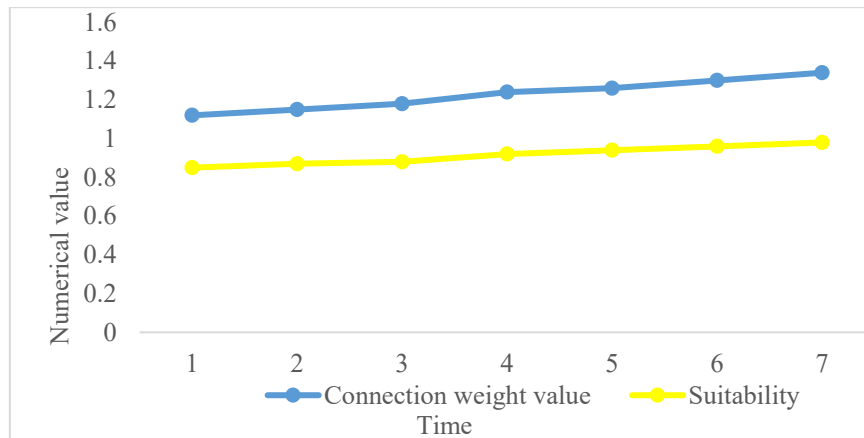(2) Experimental analysis of genetic algorithm in grammar teaching

Figure 5: Experimental Analysis of Genetic Algorithm Neural Network in Grammar Teaching

In order to understand the specific effect of grammar teaching under cross-cultural green education, this paper analyzed the connection weight value and fitness of grammar teaching through genetic algorithm. The specific analysis results are shown in Figure 5.

According to the data in Figure 5, the connection weight value and fitness of grammar teaching both increased with time. The mean connection weight value was 1.23, the seventh day was 0.22 higher than the first day, the fitness was 0.91, and the seventh day was 0.14 higher than the first day. The increase of the connection weight value showed that the grammar teaching under green education pays more attention to the importance of cross-cultural learning, and the grammar content was adjusted according to the students' learning status. The increase in suitability shows that grammar teaching was gradually being integrated into the cross-cultural learning atmosphere. By gradually adding the concept of green education to grammar learning, it can improve students' interest in grammar learning.

(3) Analysis of learning efficiency of grammar teaching in green education

In order to study the actual use effect of grammar teaching, this paper compared and analyzed students' learning efficiency and learning interest under traditional grammar teaching. The specific analysis results are shown in Figure 6.
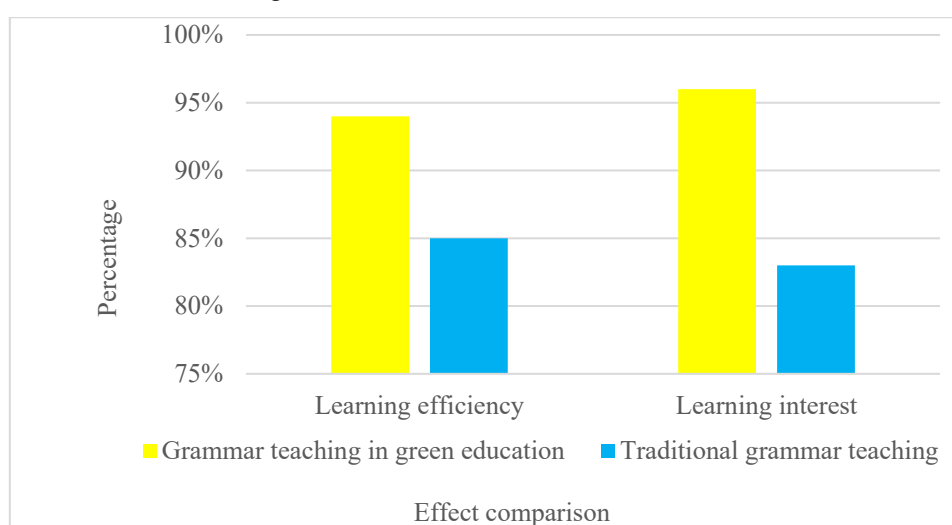

Figure 6: Analysis of learning efficiency of grammar teaching in green education

According to the figure 6, the learning efficiency and learning interest of students under the green education grammar teaching were much higher than that of the traditional grammar teaching. The learning efficiency was 9% higher than the traditional one, and the learning interest was 13% higher than the traditional one. This showed that under green education, English grammar can have more teaching space, students can be trained by establishing scenarios, and green education can be used to promote students' understanding and mastery of cross-cultural grammar knowledge. In addition, the grammar of green education can also improve students' enthusiasm and interest in grammar exercise, allowing students to understand the grammatical background and meaning through the concept of green education across cultures, so that they can master English grammar more quickly.

6. Conclusion

Modern classrooms should take multicultural education as the goal, change mentality, improve teaching methods, properly play the role of teachers, and create a good learning environment for students. A variety of teaching methods can be used to actively stimulate students' interest in learning and achieve good classroom results. In the practice of English teaching, language and culture education should be combined with each other, and flexible teaching methods should be adopted in grammar class to improve students' interest in grammar. In addition, grammar lessons should be linked to language use and grammar lessons and reinforce language use, so as to promote students to master the specific usage of grammar and grammar usage skills. Only by constantly updating the teaching process, improving the teaching methods in green education, and continuously improving students' interest in learning English, can the quality of grammar lessons be improved and higher teaching effects be achieved.

Acknowledgements

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