

## Research Article

# Construction of Credibility Model for Evaluating the Effectiveness of Ecological Civilization Education

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The concept of green development as a rational grasp of the relationship between man and nature is not only an important embodiment of the line of thought of seeking truth from facts and advancing with the times but also a concrete application of Marxist materialistic dialectics combined with the current situation of China's development. Ecological consciousness is a value orientation that reflects the harmonious development of man and nature as a worldview and methodology to explore and reflect on the ecological and environmental problems of the current society. College students are an important force in promoting China's development in the future, and cultivating their good ecological consciousness with the concept of green development as a guide for action is of great significance at both the theoretical level and the practical level. Based on the review of online reviews, this study proposes that the content of positive reviews can be classified into praiseworthy reviews. In order to verify the objectivity of the content dimensions of the three types of positive comments, this study selected 1,800 positive comments as the research sample using stratified random sampling and conducted a content analysis of the comment samples one by one using the NET method. The content analysis results showed that praiseworthy comments appeared in almost all of the samples, constructive comments appeared in 23% of the samples, and prosocial comments appeared in only 14% of the sample. The results of the content analysis show that it is necessary to identify the dimensions of positive online comments because the single-dimensional constructs cannot effectively present the multidimensional information content contained in positive comments. By studying the geometric modeling method in soft tissue modeling technology, we propose covering the surface model on the outer surface of the physical model and using the tetrahedral mesh as the support skeleton of the physical model. Through the purification of the initial items and secondary testing, a scale with good reliability and validity for measuring the three constructs of praiseworthy, constructive, and prosocial comments was finally obtained.

## 1. Introduction

With the continuous progress of production technology, the material production capacity has been enhanced, and at the same time, it has triggered a qualitative change in the relationship between humans and nature, various ecological problems have emerged, and normal human activities have been affected by ecological problems [1]. On the surface, it is caused by human's unreasonable activities and behaviors such as destruction and plundering of nature. In essence, it also reflects the deep-rooted incongruity of the relationship between man and nature. In response to the current ecological environment and the realistic needs of future social development, the Party's Fifth Plenary Session of the 18th

Central Committee put forward the development concept of innovation, coordination, green, openness, and sharing. Such a development concept is a concept that meets the needs of the times and is a concept that needs to be resolutely implemented, and such a concept points the direction for China's economic development and ecological environmental protection in the new era. At the same time, in the face of the current ecological environment problems, human ecological consciousness is being formed and strengthened [2]. As an advanced concept in the transition from industrial civilization to ecological civilization, ecological consciousness is the sum of theory and emotion of the harmonious development of man and nature. Ecological consciousness makes human beings fully aware of the importance of

coordinated development of man and nature and is a theoretical form of understanding the wholeness, foresight, and coordination of the ecosystem [3]. At present, green development has become an important guideline for social development in China and has a wide impact on the production and lifestyle of society, which will cause changes in human consciousness when reflected in the consciousness of people [4]. The concept of green development can change the world by changing people, and education is the main way and means to promote the formation of human consciousness.

College students are the new force of China's future social development and an important driving force of China's green development in the new era [5]. Under the guidance of the green development concept, contemporary college students must establish correct ecological concepts, form scientific ecological consciousness, and cultivate fair and just ecological personality, so as to be able to achieve the ecological practice of protecting the environment and finally realize the situation of continuously promoting the harmonious development of the relationship between human beings and nature [6]. Through the overview of the current general environment and the integration of the connotation of ecological civilization, the concept of ecological civilization literacy is defined, and its deep narrative and extension are carried out. Ecological civilization is a new era civilization form that emerged during the development and progress of human society, an extension and sublimation of material, spiritual and political civilization, and a reflection of industrial civilization. Ecological civilization literacy is the fusion of ecological consciousness, morality, and ethics born in human society for the construction of ecological civilization, which can be internalized into the human will and act as a concept of behavior and habits [7]. As a form of civilization, ecological civilization literacy is full of rich connotations, which not only affects the sustainable development of human society but also has great significance for the harmonious coexistence between humans and nature [8]. Therefore, ecological civilization literacy, as an extension of ecological civilization, has unique characteristics and connotations that distinguish it from other forms. Secondly, through the study of ecological civilization literacy and the comprehensive cultivation characteristics of secondary tourism service and management students, the assessment system of ecological civilization literacy of secondary tourism service and management students is constructed [9]. It complements and improves the research on ecological civilization literacy from another perspective and provides a new reference for the subsequent research on ecological civilization literacy. Finally, in the context of ecological civilization construction in China, an empirical study on ecological civilization literacy of secondary tourism service and management students is conducted in order to understand the current level of ecological civilization literacy of this group [10]. This study takes ecological civilization literacy as the content, takes secondary tourism service and management students as the research object, and proposes strategies to improve ecological civilization literacy of this group based on the analysis of the questionnaire, which is

conducive to the targeted improvement of the overall level of ecological civilization literacy of this group [11]. In addition, moderately rated reviews and online reviews containing both information content were found to be more credible, possibly because they provided a balanced and seemingly credible base of opinion. Some scholars have also focused on the relationship between information quality and the credibility of online reviews.

Through research at home and abroad, we found that the scope and depth of foreign research on environmental literacy are very great compared with those of China, but there is almost no relevant research on secondary tourism majors, such as tourism service and management students, so it is of great theoretical and practical significance to study the current situation of ecological civilization literacy of this group and construct a corresponding ecological civilization literacy assessment system. Most scholars at home and abroad conduct environmental literacy assessment or ecological civilization literacy assessment through the research method of questionnaires, mainly focusing on awareness, attitudes, and behaviors; in addition, foreign studies extend to the evaluation of related skills, and domestic studies extend to values and ethics. In order to test the role of different types of positive review content structures on the credibility of positive reviews, this study uses an experimental method to test the causal hypothesis relationships proposed in this study. The conclusions obtained through the experimental method are more instructive for management practice. The experimental process of this study was designed to fit the real situation in order to map the theoretical reasoning to the objective reality as much as possible so that the obtained conclusions are more meaningful in practice. The research data obtained through the questionnaire analysis method and the experimental method also need to go through a large number of statistical analysis processes in order to obtain useful conclusions. By organizing and analyzing the questionnaire data, mathematical and statistical models were created using statistical software. The specific statistical analysis methods used in this study include descriptive statistical analysis, reliability analysis, exploratory factor analysis, validating factor analysis, correlation analysis, structural equation modeling, and mean difference test including independent sample *t*-test and analysis of variance.

## 2. Related Work

Previous work used the global search advantage of genetic algorithm to build a GABP hybrid prediction model to solve the local minimum problem of the BP neural network algorithm [12]. The other part of the studies aimed to examine other students' perceptions or attitudes toward online reviews, and thus, the classification of online review types and characteristics was often based on other students' perspectives [13]. The vast majority of studies on the antecedents of online reviews treat online reviews as a unidimensional construct. An earlier study of scholars on the antecedents of online reviews used the concept of electronic word of mouth but essentially referred to online

reviews [14]. In that study, electronic word of mouth was defined as any positive or negative review of a product or merchant that is posted by a potential student, current student, or former student via the Internet that can be seen and used by numerous individuals or institutions. Later scholars have built on this foundation by exploring the motivations behind student contributions to online reviews, and because the purpose of these studies has focused on “why reviewers are willing to post online reviews,” online reviews are often defined as “the likelihood that a student will post a review of a relevant product or service” [15].

As research progresses, some scholars no longer limit themselves to the proposition of “why commenters are willing to post online reviews” but begin to focus on “why commenters post different types of online reviews or why students post a certain type of online reviews.” At this point, research on the drivers of online reviews began to purposefully classify categories of reviews according to certain characteristics. Other scholars have divided online reviews according to the platform on which they are posted. For example, online reviews are divided into online reviews on retailer-led online communities and online reviews on third-party organization-led communities. By retailer-led platforms, we mainly refer to online review platforms similar to those provided by Amazon.com, which are online review platforms that accompany sales [16]. Third-party organization-initiated online platforms, on the other hand, refer to online review platforms similar to those provided by Catwalk.com, which are not primarily focused on sales but rather are online review platforms created for the exchange of information about products among students. Regarding the quality of information, the content of online reviews for hotels can be divided into specific and vague content. While specificity refers to the reviewer’s clearer description of the service organization, vagueness is less clear in terms of specific details [17]. Some studies have also suggested that readability is an important attribute of online reviews. Readability focuses on the writing style of online reviews, which represents the extent to which they are easily understood [18].

Other scholars have classified the content of online reviews into attribute-based reviews and experience-based reviews. In general, attribute-based reviews are reviews whose content focuses on reports of product attributes (e.g., CPU parameters and performance of a computer); in contrast, experience-based product reviews focus primarily on the more subjective, emotional, and overall evaluations of the product presented by students (e.g., the fashionability of a piece of clothing). A similar division of online reviews is made in their study, which classifies online reviews into reviews with attribute value and simple recommendatory reviews [19]. The former refers to the rational, objective, and specific comments made by the reviewer on various aspects of the product, while the latter refers to the emotional, subjective, and generalized comments made by the reviewer on the product based on his or her own feelings. Based on the above study, the presentation of review information is further classified into ordered information display reviews and casual information display reviews [20].

Ordered information presentation mainly refers to online reviews whose content includes attribute-based comments followed by experience-based comments or experience-based comments followed by attribute-based comments, while casual information presentation has no specific order, and the reviews contain a mix of experience-based and attribute-based comments [21]. The content attributes of online reviews are classified from other students’ perspectives as strength of tone, the objectivity of presentation, and completeness of message. In turn, it is argued that online reviews can be classified based on whether they are professional and logical. By professionalism, we mean whether the reviewer indicates in the review that it has expertise related to the product while logic examines whether the online review contains both positive and negative information. Some other scholars consider the depth of the review as an important attribute for evaluating the usefulness of online reviews. By review depth, we mean the breadth of information contained in a review [22]. Specifically, some studies have argued that comment depth can be measured by comment length. In terms of objective measures, some studies use the number of words contained in online reviews as a basis for distinguishing the depth of reviews [23].

### 3. Credibility Analysis of Educational Effectiveness Assessment

*3.1. Credibility Assessment.* The one-sidedness of a review refers to whether the information contained in a review is one-sided or two-sided. One-sided information, also called extreme reviews in some studies, refers to reviews that contain only positive or negative comments about a product. A two-sided review, also known as a moderate review, is one that contains both positive and negative information. Online reviews that contain both positive and negative information are generally considered more credible than reviews that contain only one-sided information. Calling five-star positive reviews and one-star negative reviews extreme, he found through his interview study that students perceived such extreme reviews as more manipulative and thus more likely to be presumed by students to be from organizations, competitors, or overly critical students. Information quality refers to the evaluation of the quality of review content from the perspective of information characteristics. Information quality is an important factor that affects the credibility of online reviews. A review that provides an accurate, comprehensive, useful, and detailed evaluation of a product is considered more credible than an online review that appears to be brief, superficial, emotional, and inaccurate. This paper provides an in-depth analysis of the connotation of ecological civilization and discusses the content and structural composition in our national conditions.

The quality of arguments is an important variable that affects the credibility of online reviews. Argument quality refers to the subjective perception of the recipient of the information as to whether the arguments to persuade the message are convincing or specious. Their study shows that argument quality has a positive effect on the credibility of

online reviews, as shown in Figure 1. Classifying the content attributes of online reviews as objective and subjective information, their study found that students perceived higher credibility of reviews when the content presented in online reviews was objective information. Student reviews that contain information involving product details (such as product descriptions or information related to some specific details about the reviewer's experience) are perceived to be more persuasive than reviews that are broad. Research on traditional word of mouth also confirms that word of mouth containing detailed information is more credible because students presume that reviewers who can provide detailed information do have a better understanding of the product. Students with high trust levels tend to be more distrustful of online reviews that contain typographical errors, but students with low trust levels show less sensitivity to typographical errors in online reviews. Trust propensity refers to the tendency of individuals to show trust in their treatment of others. Individuals with high levels of trust are perceived to be more trusting but also more sensitive to trust-related cues. Thus, students with high trust levels will be more sensitive to typographical errors and attribute them to carelessness, which usually implies untrustworthiness.

For example, students may judge similarity with a commenter by inferring the values and preferences of the individual who posted this comment from the information contained in an online comment, and higher perceptions of similarity trigger higher online comment credibility, as shown in Figure 2. It is proposed that information relevance contains two dimensions: personal similarity and usage similarity. Personal similarity refers to the extent to which students' assessments of the reviewer's characteristics, background, and expectations are similar to their own. In other words, from the students' perspective, a key question is whether the reviewer is like them in certain characteristics and backgrounds. Relevant research generally accepts that even in offline settings, attractive, well-liked, or similar sources have a stronger effect on information recipients than less attractive or less similar sources. Essentially, people like other people who are like them, and they find the ideas and opinions held by similar individuals to be more applicable to them. In the online context, information receivers can only speculate about similarities between online reviewers and themselves through very limited cognitive cues. For example, many participants hypothesized that commenters who wrote longer comments had higher levels of similarity because they were motivated to help others, especially for students who posted comments to help others. For college students, they perceived comments that contained misspellings or grammatical errors as a sign that the reviewer was not well educated and thus had little in common with the reviewer.

**3.2. Mechanism of Forming Trust in Educational Effects.** Similarity mainly refers to the similarity between an individual and another person in terms of preferences, tastes, and lifestyles. In an online context, although students and commenters are usually strangers, students use a variety of

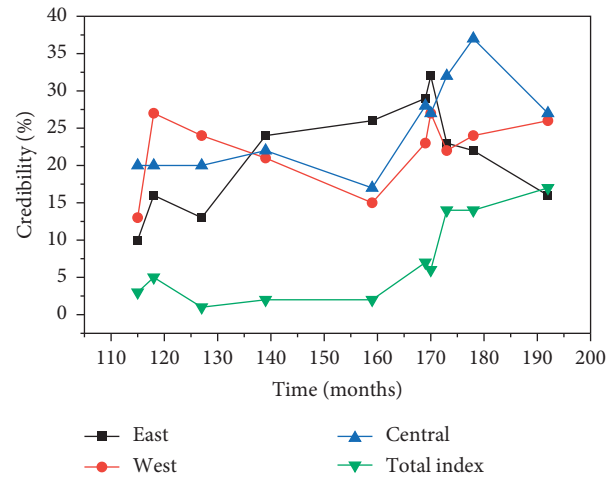


FIGURE 1: Credibility of the review effect.

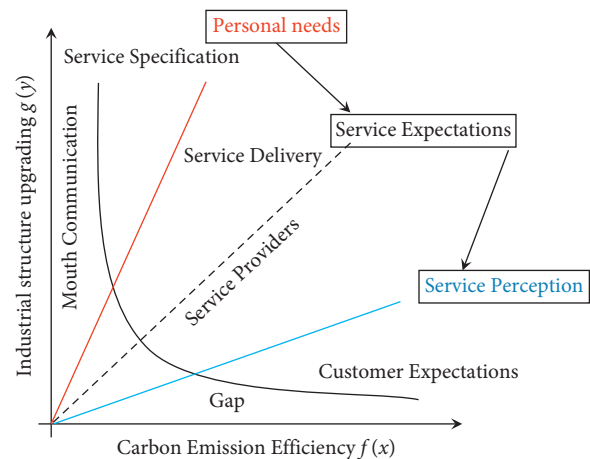


FIGURE 2: Eco-efficient coupling mechanism.

potentially illuminating cues to determine similarities with commenters. Regarding the process of trust formation, theory identifies five different processes of trust formation. *The Calculation Process.* This process is essentially a calculation by an individual or organization of the costs and benefits gained by the other party in deceiving or maintaining the relationship. To what extent the benefits gained from deception will not exceed the costs of being arrested. One party may infer that the deception is contrary to the other party's best interests, which makes the other party likely to be trusted. For example, the organization may spend the best price to make a purchase to ensure a higher level of quality, and the organization raises the cost of deception because the supplier loses the benefit of future sales if it is found to be untrustworthy. *The Expectation Process.* The expectation process of building trust relies heavily on one party's ability to predict the other party. Because trust is an assessment of one party's trustworthiness and integrity, the individual or organization making the assessment must have information about the other party's past behavior and commitments. Repeated interactions allow one party to better assess the outcomes of the other party and therefore

provide the basis for trust assessment. *The Competence Process*. The competency process encompasses the ability of one party to meet its responsibilities.

The theory proposes that the process of trust formation is a cognitive process, as shown in Figure 3, and proposes two types of processes. The first type is the categorization process, in which people will be divided into different groups and then form their trust in the delegate based on their perception of each group. The categorization process includes the following. *The Unit Grouping Process*. Principals categorize principals into the same type as they are. Intraunit groups can quickly lead to high levels of trust. *The Reputation Categorization Process*. Principals categorize principals based on their secondary information. If a given principal has a good reputation, the principal will quickly build trust in the principal, even without first-hand knowledge. *The Stereotype Process*. The principal's trust in the principal is judged by the category to which the principal belongs, for example, bias from gender or occupation. In particular, in the initial interaction with the principal, the principal may form stereotypes based on the principal's accent or physical appearance. Through the process of positive stereotyping, the principal can quickly form a positive impression of the principal. Conversely, negative stereotypes can lead to mistrust.

Judging the professionalism of commenters in the online environment is difficult. The anonymous nature of the Internet makes it difficult to understand the credentials of the reviewer in question, and the research that has been conducted has found that the cues that can be used to infer reviewer expertise include identifying information related to the reviewer and the content characteristics of the review. Regarding the identity of reviewers, it was found that reviewers on professional third-party review sites had more experience reviewing products, and therefore, students inferred that reviewers on these sites were more professional.

**3.3. Values and the Decision Relationship.** It is mainly used to analyze and study the correlation between values and obtain the decision relationship between output and input values. The key of the plain Bayesian algorithm is to find the joint distribution  $K(X, Y)$  of  $Y$  and  $X$  values, and the probability of the final class to which they belong is derived. It is known that in the context of knowledge of probability theory, the conditional probability can be expressed by the following formula:

$$K(x, y) = \sum_{i=1}^n \frac{q(x)}{y} [x, y]. \quad (1)$$

$Q(X, Y)$  denotes that the probability that events  $X$  and  $Y$  occur simultaneously is equal to the probability of occurrence given the occurrence or the probability of occurrence of  $X$  given the occurrence. Bayes' theorem is that after the probability of occurrence of a certain condition is known, the probability of other associated events after interchange can be obtained; for example,  $P(Y|X)$  can be obtained, which has been known, so  $P(Y)$  is called the prior probability

and  $P(Y|X)$  is called the posterior probability of  $Y$ , which can indicate that the probability of occurrence of  $Y$  can be judged after known. In daily life and work,  $P(X|Y)$  can be obtained directly or indirectly, but the acquisition of  $P(Y|X)$  is a more difficult process, so  $P(X|Y)$  can be used as an intermediate step, i.e., a bridge to obtain  $P(Y|X)$ . Bayes' theorem can be expressed by

$$Q(x) = \frac{P(X, Y)/q(X)}{k + P(Y)}. \quad (2)$$

The plain Bayesian approach ultimately gives results in the form of probabilities, so the classification of the test set samples into different types is done with reference to the magnitude of the probabilities obtained by the samples. Suppose that  $X$  is a probability space consisting of several mutually independent events, denoted by  $X = \{a_1, a_2, a_3, \dots, a_n\}$ , a finite set representing different classes, and the objective function  $f(x)$  takes values in the set  $V$ . Then, the plain Bayesian model predicts the maximum probability category of the new sample attribute values  $\{a_1, a_2, a_3, \dots, a_n\}$  after the available category data, denoted as VMAP, which is calculated as shown in

$$X\{a_1, a_2, \dots, a_n\} = \frac{\{a_1, a_2, a_3, \dots, a_n\}}{\max P(X, Y)}. \quad (3)$$

Based on Bayes' theorem, it can be deformed to

$$Q(x) = P(X, Y | v_j) p(v_j). \quad (4)$$

According to the above formula, the frequency of occurrence of the data to be classified in the sample can be obtained. However, because the features in the probability space are independent of each other when the target value is known, estimating  $P(a_1, a_2, a_3, \dots, a_n)$  is not feasible.

$$P(a_1, a_2, \dots, a_n) = \sum_{i=1}^n \frac{a_i}{y} \max(Q). \quad (5)$$

Through this research report, we can see that, on the whole, people with high education are obviously more concerned about ecological and environmental information. At the same time, there are differences among different groups of people in terms of their concern for ecological and environmental information, which are shown as follows. "First, among the respondents, those with higher education are more concerned about the current situation of ecological environment in their daily life. At the same time, more than half of the respondents with bachelor's degrees are able to pay attention to ecological and environmental information "often" or "always" Second, among those who are concerned about "the impact of personal life and consumption behavior on the environment," respondents with bachelor's degree and students account for a higher percentage, 59.2% and 60.8%, respectively, indicating that respondents with higher education and the younger generation are more concerned about the impact of personal behavior on the environment. Third, for those who are concerned about "information related to scientific proof of environmental decision-making," respondents with bachelor's degrees or above and the

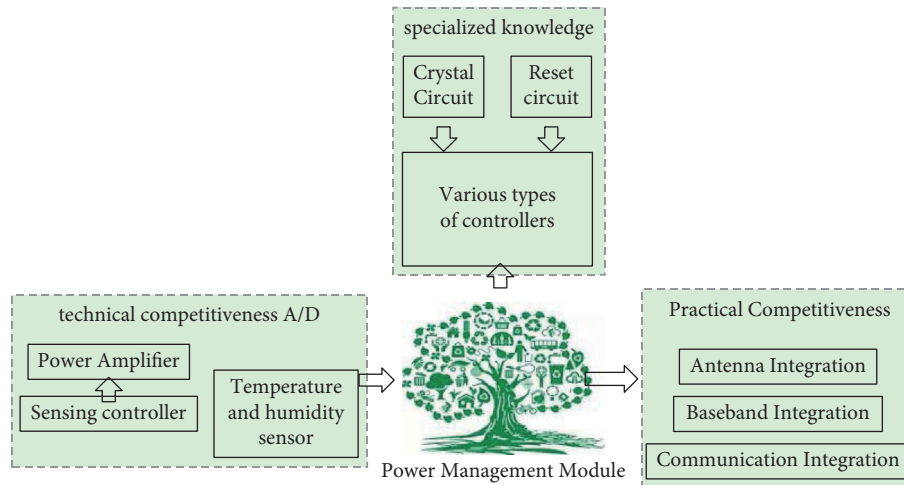


FIGURE 3: Expertise of source credibility.

student group are more concerned about such information, with 29.6% and 34.6% of the respondents, respectively.”

**3.4. Ecological Civilization Awareness Enhancement.** As shown in Figure 4, based on the above research data, it can be seen that the proportion of respondents who are concerned about the current state of the ecological environment and the proportion of ecological awareness level are significantly and positively correlated with their education level. Among the respondents, the group with education level above bachelor’s degree has the most comprehensive and accurate ecological knowledge. In the process of paying attention to the current state of the ecological environment, college students not only pay attention to ecological environment knowledge but also care about the impact of their personal activities on the ecological environment and have a certain degree of understanding of different levels of ecological environment knowledge. This indicates that the more educated the respondents are, the more they are concerned about the ecological environment in terms of awareness and the relationship between human production and life and the ecological environment.

We can find that this measure of soft decoupling calculated from the perspective of eco-efficiency can be improved. For example, the eco-efficiency of economically developed regions such as Beijing, Tianjin, and Shanghai is calculated by multiple DEA analyses with a maximum value of 1 for many years, so it is difficult to reflect the progress of eco-efficiency changes, which leads to a long year of  $\epsilon$  value of 0. It is more difficult to accurately reflect the decoupling effect in provinces where eco-efficiency is already high and has a maximum value by this method. The results of the analysis of soft decoupling show that a number of provinces are already in a state of relative decoupling, but absolute decoupling is very rare. In addition, among the provinces that have not yet decoupled, Shanxi, Inner Mongolia, Liaoning, Anhui, Jiangxi, Guangxi, Shaanxi, Gansu, Qinghai, and other provinces still need to persevere in their efforts, and Guangdong, Hainan, Chongqing, Sichuan, and

Yunnan need to identify the reasons to rise to the challenge. The above-mentioned provinces have not been decoupled. The former category belongs to the economic underdevelopment, backward industrial structure, where pollution or energy consumption per unit of output is relatively large, and the need to urgently implement the transformation of industrial structure as well as clean energy development, such as Inner Mongolia, Gansu, and Qinghai which should vigorously develop solar energy and wind energy. The latter category belongs to the economic work in recent years, and ecological and environmental protection has slackened, to abandon as soon as possible the tendency to focus on the pursuit of economic speed and grasp the ecological and economic development in harmony. The analysis of the above data reveals that although there is no strict  $\sigma$  convergence in eco-efficiency each year, except for individual years, there is a trend of narrowing eco-efficiency differences between the east, middle, and west for the rest of the period 2005–2019. According to the  $\sigma$  analysis, the national, eastern, and western parts of China basically showed a convergence trend from 2005 to 2019, and only the central region did not show a convergence trend during this period.

## 4. Optimization and Upgrading of Industrial Structure

**4.1. Socioeconomic Development.** The optimization and upgrading of industrial structure happen not only in China but also in different countries with different levels of socioeconomic development. We study the impact of industrial structure optimization and upgrading on the ecological economy, in order to promote better development of the ecological economy. We need to learn from foreign experiences, and we need to do our best to prevent and avoid the lessons learned from foreign experiences. Therefore, the study of the impact of industrial structure optimization and upgrading on the ecological economy in foreign countries has important theoretical and practical significance for the sustainable development of China’s economy. At the

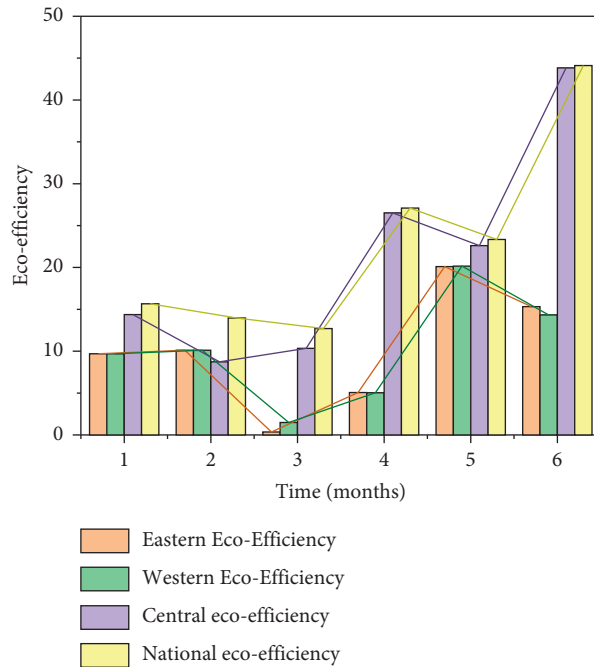


FIGURE 4: Changes in eco-efficiency values.

beginning of this paper, we discuss the issue of industrial structure and analyze and deepen the problem of industrial structure optimization and upgrading. The study of industrial structure optimization and upgrading will always involve industrial structure rationalization and industrial structure advanced and will also discuss some other measures to optimize the industrial structure. On the other hand, the degree of industrial structure optimization and upgrading is both a vertical historical concept and a horizontal comparative result. The optimization and upgrading of industrial structures can be measured by a variety of quantitative indicators. The general principles of industrial structure adjustment are as follows. First, industrial policy should pay attention to the dynamic nature; industrial policy should be diversified and meet the needs of macroeconomic development. Second, industrial policy must be highly targeted, and in general, industrial policy should be in line with the laws of industrial evolution. Third, the negative effects of industrial policy should not be ignored. It is inevitable that there are differences in industrial policies between countries, firstly, because of different national conditions, secondly, because of the differences in industrial economic theories or concepts pursued by each country, and thirdly, because of the values and theoretical and practical levels of policymakers. Eco-efficiency and eco-welfare performance are increasingly becoming issues of concern to various countries and regions and even to the whole world. Eco-efficiency and eco-welfare performance are issues related to sustainable development, and the results of theoretical research and the extent to which they are put into practice determine the extent to which sustainable development is promoted in each country.

Clean energy generation has a certain degree of territoriality, especially when the percentage of clean energy

generation is relatively small, it is likely to be directly consumed by the region or province, and it is difficult to have an impact on other regions or provinces. And when the proportion of clean energy generation reaches a certain level, clean energy generation may be exported to other provinces. In addition, there are differences in resource endowment and energy consumption in each province, so the critical point for clean energy generation to be exported outward will be different. Based on the above analysis, this paper speculates that there is a threshold effect when clean energy generation plays the role of indirect impact mechanism, and perhaps, there is more than one threshold. The results of the threshold effect may also differ depending on the scope of the examination. The way of the role of industrial structure optimization and upgrading on clean energy generation has been argued in the previous part of this chapter. And the result of the argument is that there is not only a significant basic effect of industrial structure optimization and upgrading on clean energy generation but also a significant spatial effect, as shown in Figure 5. Therefore, this section focuses on the demonstration of the threshold effect of clean energy generation affecting eco-efficiency and the threshold effect of clean energy generation affecting the structure of energy consumption and thus eco-efficiency.

*4.2. Credibility Assessment.* This result also shows that the college students in China have a certain degree of awareness of the important role of the ecological environment and also shows the effectiveness of environmental education in China and the achievement of ecological awareness cultivation among college students under the guidance of green development concept. The above once again shows that it is indeed necessary to look at the ecological economy from

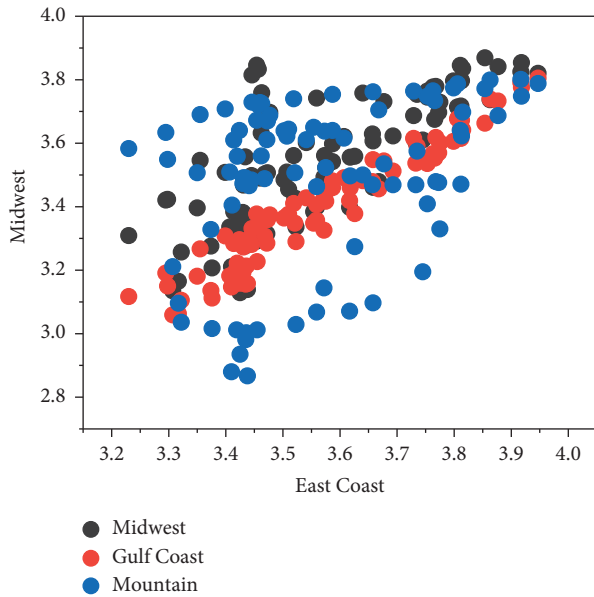


FIGURE 5: Industry structure rationalization.

different perspectives so that the reality of the ecological economy can be reflected as comprehensively as possible. In the process of measuring two indicators of the ecological economy, eco-efficiency and eco-welfare performance, this chapter finds that they may differ to some extent. Both of them can reflect the reality of the ecological economy, but the perspectives and problems reflected by them do differ to some extent, so it is necessary to take the strengths and weaknesses and examine them together. The measurement of eco-efficiency reveals its four characteristics: wholeness, variability, hierarchy, and dynamism. The subsystems of eco-economy interact with each other and with each other, thus constituting a complex and powerful overall system. Changes in any one subsystem can cause changes in other subsystems or even in the whole system, which is the holistic nature of the eco-economic system. Since there are differences in resource endowment, economic development level, etc., there are also ecological differences between different regions, and the operation of each subsystem will be different. A large system is composed of many subsystems, and subsystems are composed of smaller systems, so there is a hierarchy between different systems, and their roles may vary. Ecological and economic systems are composed of many factors, including material, people, information, and energy. There is also an exchange of material and energy with the outside world, so ecological and economic systems are also constantly changing dynamically.

The threshold values obtained by these two tests are indicated if there is no threshold effect, and it can be seen that there are differences in the threshold values obtained by using the official Stata command. The overall effect of these two tests shows that in terms of the impact of industrial structure optimization and upgrading on clean energy generation, the threshold effect of industrial structure advanced is weaker, and the possibility of the threshold effect of industrial structure rationalization in the whole country and

western region is higher. According to the coefficients of the test results, it can be found that once the key indicators exceed a certain threshold, then its effect will be stronger. Next, we do the verification of the second half of the two paths of the indirect impact mechanism of clean energy generation on eco-efficiency, still using the official order, and the key variable is clean energy generation. The second half of the impact pathway one of clean energy generation is validated first, and the results are shown in Figure 6.

*4.3. Threshold Effect.* According to the results shown in Figure 7, we can know that the threshold effect is most obvious in the central region under the impact mechanism of the indirect impact mechanism of clean energy path one. The threshold effect of the indirect impact mechanism of clean energy is also present in the second half of pathway one in the eastern region at 1% and in the western region at 0.01% for this segment. Such estimation results show that the impact of clean energy generation on eco-efficiency, i.e., the indirect impact mechanism of clean energy generation pathway 1, has strong geographical characteristics, and there are significant differences in the significance of the pathway between the eastern, central, and western regions, and the threshold value is also different; once the threshold value is crossed, the effect becomes more prominent. Next, the threshold effects of the second and third segments of the indirect impact path of clean energy generation are verified. The threshold effect of clean energy generation on energy consumption structure is verified first.

There is a threshold effect on the impact of clean energy on eco-efficiency, and there is also a threshold effect on the impact of energy consumption structure on eco-efficiency. Therefore, the multiplicative difference method can be used to estimate the second segment of the indirect impact of clean energy on path 1, the third segment of the impact on path 2, and the first segment of the indirect impact of clean energy on path 1 and path 2 in the eastern region. The reason why the first segment of the indirect impact path of clean energy generation in the eastern region can be analyzed by the multiplicative difference method is that clean energy generation in the region is affected by the rationalization of the industrial structure and the advanced industrial structure, and there is an obvious threshold effect. The multiplicative difference estimation method divides the study population into a control group and a treatment group. Corresponding to the second segment of the indirect impact of clean energy path I and the third segment of the indirect impact path II, dummy variables  $b$  representing whether the impact of clean energy generation on eco-efficiency exceeds the threshold effect and dummy variables  $b$  representing whether the impact of energy consumption on eco-efficiency exceeds the threshold effect are set here. In the case of the eastern region and the western region with the multiplicative difference method to verify the first segment of indirect impact path I and indirect impact path II of clean energy power generation, the dummy variable representing whether the impact of rationalization of industrial structure on clean energy power generation exceeds the threshold value can be



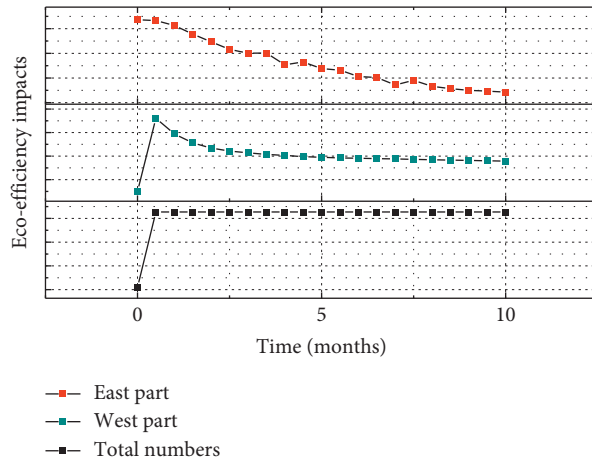


FIGURE 6: Threshold effects of direct eco-efficiency impacts.

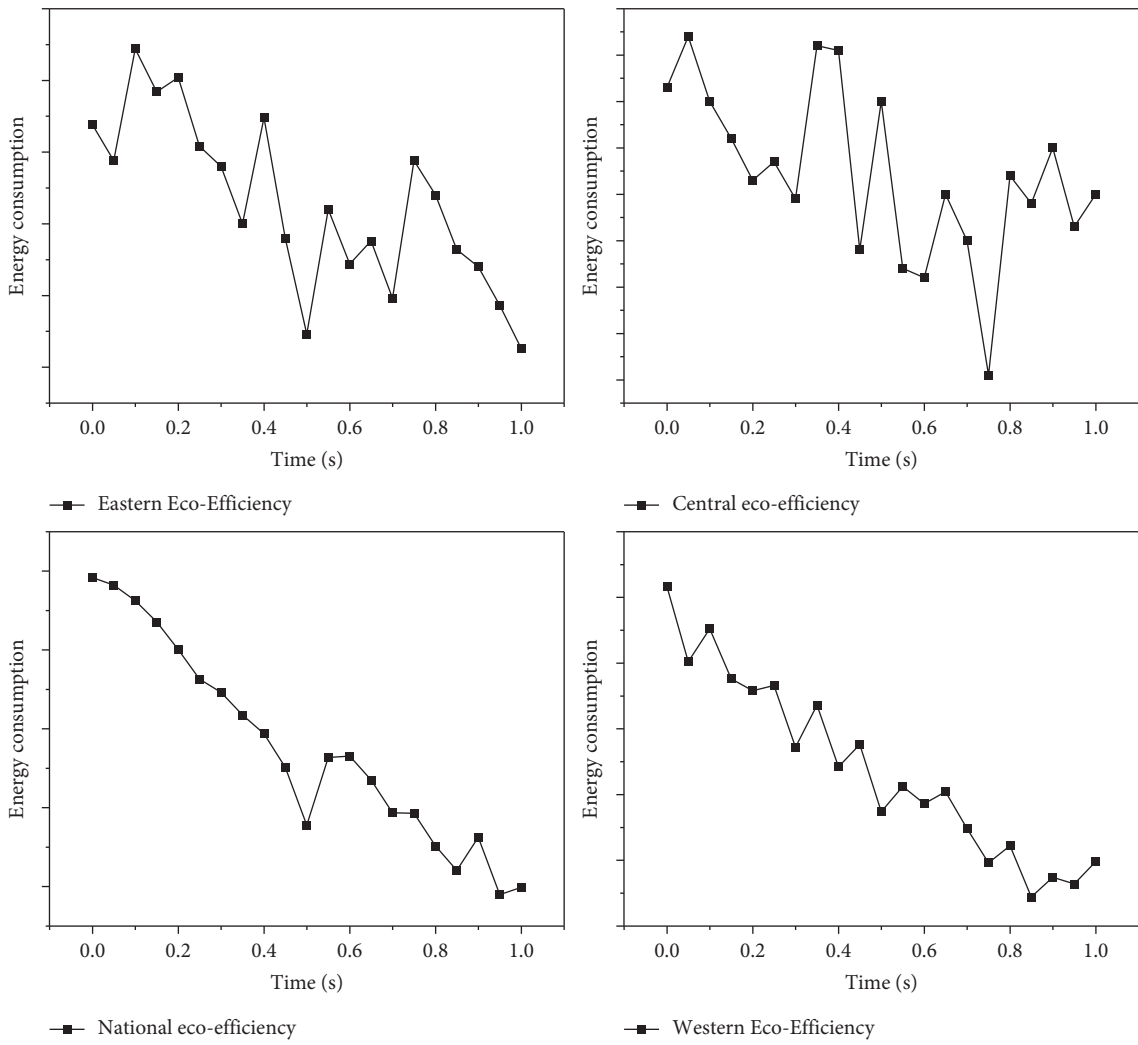


FIGURE 7: Plausibility check of the impact of energy consumption structure.

set as  $b$ , and the dummy variable representing whether the impact of advanced industrial structure on clean energy power generation exceeds the threshold value can be set as  $a$ .

The basic issues of cultivating ecological consciousness of college students under the guidance of the green development concept, a profound analysis of the current problems of ecological consciousness of college students and targeted countermeasures are proposed on the basis of this. As an important part of the new development concept, the green development concept emphasizes the issue of sustainability and direction of development and plays an important role in guiding the development of economic society and environmental protection. As a profound understanding of the laws of nature-society-economy, the green development concept has a content system that points to many fields such as economy, politics, culture, and society. Under the guidance of the green development concept, the cultivation of ecological consciousness among college students is very important. The green development concept inherently requires college students to establish a scientific ecological consciousness, form a green lifestyle, and transform from theoretical form to realistic action. Only in this way can the concept of green development be truly put into practice and play its important value. The final point of cultivating ecological consciousness of college students under the concept of green development lies in the reconciliation of man and nature and man and man, and in this process, it is necessary to integrate the content system of the concept of green development into the whole field and process of college students' life and study and cultivate the ecological consciousness of college students from different dimensions such as developing a green economy, implementing green administration, and promoting culture and building green society, in order to fully promote the process of cultivating ecological consciousness of college students. The cultivation of ecological consciousness among college students is not only a response to the current ecological crisis but also an important aspect to realize the sustainable development of the Chinese nation, and the cultivation of ecological consciousness among college students under the guidance of the green development concept is not only a long-term work but also a challenging work.

## 5. Conclusion

Virtual surgery is noninvasive, repeatable, and not limited by time and space and can help train new doctors, plan surgical paths, and locate surgically. It is significant in improving the success rate of surgery and reducing medical costs. In view of the significance of virtual surgery research, more and more researchers have started to study the technology related to virtual surgery simulation systems, and many research results have emerged, but how to ensure both the real-time system and the accuracy of soft tissue model deformation is still a pressing problem to be solved. In order to establish a soft tissue model that conforms to the biomechanical properties, the viscoelastic theory is used as the theoretical basis for modeling by summarizing and analyzing the mechanical properties of soft tissues. By studying the

physical modeling methods, the advantages and disadvantages of various physical modeling methods are summarized to pave the way for building a more realistic soft tissue model. The soft tissue model of the liver, for example, not only has "body" characteristics but also shows good viscoelastic properties. In order to verify the deformation effect of the model, a virtual simulation platform was built, and the simulation experiments proved that the model has a good deformation effect and high deformation accuracy. Simulation experiments of viscoelastic properties were carried out to prove that the soft tissue has good stress relaxation and creep properties. The results of the content analysis show that it is necessary to identify the dimensions of positive online comments because the single-dimensional constructs cannot effectively present the multidimensional information content contained in positive comments.

## Data Availability

The data used to support the findings of this study are available from the author upon request.

## Conflicts of Interest

The author declares no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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