

Retraction

Retracted: Teaching Practice of College Students' Marketing Course Based on the Background of the Internet Era

International Transactions on Electrical Energy Systems

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] Z. Chi and T. Yang, "Teaching Practice of College Students' Marketing Course Based on the Background of the Internet Era," *International Transactions on Electrical Energy Systems*, vol. 2022, Article ID 3363728, 10 pages, 2022.

Research Article

Teaching Practice of College Students' Marketing Course Based on the Background of the Internet Era

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Marketing teaching is still largely based on theoretical teaching. This kind of teaching mode is difficult to greatly improve the marketing practice teaching, students' practical ability, innovative thinking ability, and so on. At the same time, the teaching arrangement of marketing training is not standardized, which makes it difficult to provide effective guidance for students. This paper attempted to reform the traditional teaching methods of marketing courses in universities, and deeply studied the teaching methods of traditional college students' marketing courses under the background of the network, as well as conducted marketing practice according to two different Internet algorithm marketing strategy models. The experimental data showed that the average teaching quality score of the traditional marketing course teaching mode was only 6.9, while the teaching quality score of the marketing course teaching mode under the Internet background was 8.15; the market share of water heaters under the neural network-based marketing strategy increased by 8.1% within 4 months, while the market share of water heaters under the data mining-based marketing strategy decreased by 4.8%. Therefore, it can be seen that the marketing course teaching mode under the Internet background can improve the teaching quality, and the marketing effect of the neural network-based marketing strategy is better.

1. Introduction

The country has a great demand for marketing talents now. However, due to the relatively low level of theory and technology, it is unable to meet the development needs of the company. Therefore, in this context, various countries pay more and more attention to the quality of university marketing practice teaching. However, there are still many problems in the marketing teaching of many universities, such as the passive status of college students and the backward teaching methods, which makes it difficult to improve students' learning efficiency and teaching quality. Therefore, universities must establish a professional practical teaching system, which can not only combine the theory and practice of marketing, but also allow students to have a complete understanding of the basic principles of the work and operation of marketing, so as to lay a solid foundation for cultivating students' professional skills and systematic

thinking ability. This paper carried out a series of research studies on the teaching of marketing courses under the background of the Internet.

In terms of marketing, the research popularity has always been high, and many scholars have launched a series of research investigations on it. Alalwan et al. systematically reviewed 144 papers and the main topics and trends covered in the relevant literature were outlined and the most common research methods used for social media marketing-related issues were also examined, which explained current review limitations and suggested indications [1]. Key and Czaplowski used a systematic way to formulate a social market strategy for upstream decision makers. On this basis, a conceptual application mode of upstream-oriented social market strategy and a five-stage process was established [2]. Payne and Frow reviewed the development of the relationship market, and put forward the main research directions of the future relationship market, as well as

introduced some common customer-related concepts and their wider applications [3]. Crick explored how to transfer marketing knowledge to non-marketers, so that scholars can let them participate in lectures and guidance. A framework based on empirical data to assist non-marketers in teaching marketing was established [4]. In the past, these marketing studies neglected the course teaching for college students. Therefore, in the context of the Internet era, this paper conducted further research.

Today's society is a rapidly developing network era, and the application of the network has penetrated into all walks of life, as well as related research literature is emerging one after another. Abdou and Matrawy devised Client Presence Verification (CPV) that aimed to verify assertions about the presence of a device within a specified geographic area. Through detailed experiments on Planet Lab, CPV was evaluated, and various factors affecting its efficacy were explored, including the granularity of validation locations and validation time. The experimental results highlighted the potential of CPV for practical applications [5]. Alderson et al. reiterated the main message conveyed in the SIGCOMM'04 paper, which has been largely lost over the past two decades. In the course of the research survey, the fallacy of the popular approach to considering complex systems such as the Internet in terms of disorganized complexity was pointed out, and the "architecture first" perspective was advocated for a renewed effort and a greater focus on advancement [6]. Saarikko et al. introduced the complexity of the Internet of Things, the increasingly complex interconnected environment, and the growing partnership to create innovative solutions. At the same time, he also introduced the basic issues related to business models, cooperation strategies, data ownership, and technology promotion [7]. Stocker et al. launched a service that could quickly publish content on the Internet and bring commercial value to video transmission and the web. He described the current content delivery network ecosystem and the forces driving it outlined different content delivery network architectures, as well as considered their relative strengths and weaknesses. The experiments illustrated the growing complexity of the content delivery network ecosystem [8].

In the context of the Internet era, this paper improved some defects of the traditional marketing course teaching mode and designed two marketing strategy models, as well as compared the marketing effects of the two marketing strategy models through marketing practice. The experimental results showed that the average degree of interest in the teaching mode of traditional marketing courses was only 75%, which showed that students were less interested, while the average degree of interest in the teaching of marketing courses under the background of the Internet reached 86%, which showed that the level of interest of students was greatly improved; the total sales amount of products in 4 months under the neural network-based marketing strategy reached 7.7w yuan, and the total product sales amount in 4 months under the data mining-based marketing strategy was 5.5w yuan. In

contrast, it could be seen that the marketing strategy model based on the neural network was more suitable for the marketing law of the market.

2. Teaching Methods of Marketing Courses for College Students

2.1. Marketing Teaching of College Students under the Background of the Internet

2.1.1. Current Status of Teaching of Marketing Courses. Emphasis on theory and light on practice: Marketing practice teaching is still dominated by theoretical teaching to a large extent [9], which would affect the cultivation of marketing practice teaching, practical and creative thinking skills, and social skills [10–12]. In addition, in practical activities, teachers' arrangement of marketing practice activities is relatively loose, which makes it difficult to provide effective training for students.

The passive status of college students: At present, the classroom teaching in many universities is still the traditional teaching method of "teacher leads and teaches, students listen" [13, 14]. Teachers' imparting of knowledge and passive acceptance of students lead to problems such as insufficient subjective ability and low creativity of students. Low personal quality and improper teaching methods would make students lose their interest in learning, which would reduce students' motivation to learn and make a big gap in the direction and level and marketing goals of personal efforts [15, 16].

The teaching methods are backward: In classroom teaching, although a variety of teaching methods such as situational simulation teaching and discussion teaching are used, the teaching methods cannot be changed according to the differences of students and the students' enthusiasm for learning cannot be fully mobilized, so the teaching quality and teaching practice cannot be improved. Common marketing teaching methods are shown in Figure 1.

The teaching evaluation method is old-fashioned: The evaluation method of marketing is relatively simple, and it cannot comprehensively, truly, and fairly evaluate the students' learning status. Marketing is a subject that combines theory with practice, while the current marketing evaluation model is mostly based on closed-book examinations or examinations, which does not pay enough attention to the evaluation of students' learning process and practical ability.

2.1.2. Optimizing Countermeasures for Marketing Teaching

(1) Network Marketing Model. Network marketing refers to the use of online media to conduct interactive sales to achieve work goals [17]. People's work and life are increasingly networked and more and more companies can use the network for marketing and services now. Therefore, when universities implement practical teaching, they should combine the teaching of e-commerce and network marketing, so that students can have a comprehensive understanding of network marketing, which can better improve the personal ability of college students.

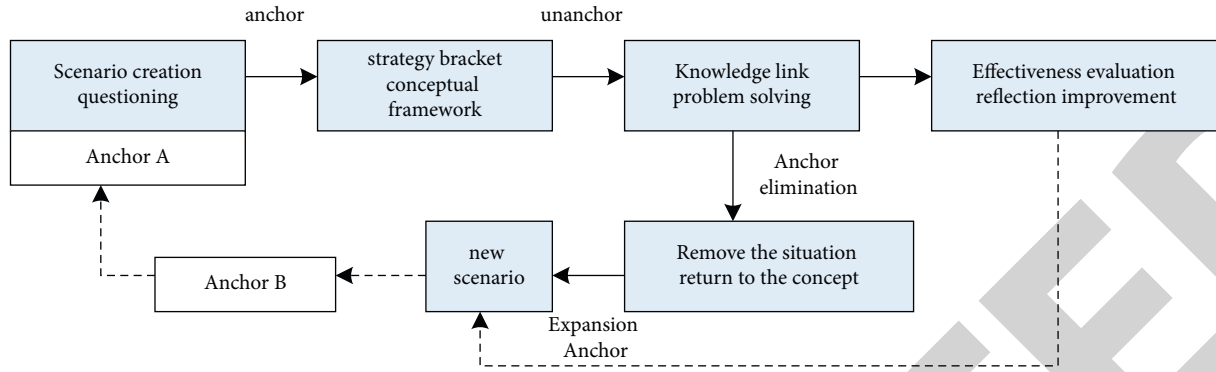


FIGURE 1: Marketing teaching methods.

(2) *Differentiated Marketing Cultivation.* In the process of development, companies adopt different marketing strategies and separate different products and services when they are facing different markets. Therefore, when college students implement marketing training, they must have their own characteristics and carry out differentiated training on this basis, so as to better improve the competitiveness of marketing talents. In addition, when formulating training goals, it is necessary to formulate differentiated talent training methods in combination with local economic development.

(3) *Optimize Course Training Content.* From the perspective of implementation content, it should be organically combined with the teaching of the enterprise [18], which can not only add the learning atmosphere to the course, but also enrich and optimize the content. In addition, while optimizing the training content, online resources, campus supermarkets, and other means can also be used to make the training content more realistic and operable. From the perspective of course practice teaching, the use of Internet technology for micro-course training can not only improve the personal ability of college students studying marketing, but also greatly expand the teaching space of practical training.

(4) *On-Campus Practice Optimization.* In the marketing practice of college students, on-campus internship is a key part. The main contents are: participating in the operation of the company and serving the company. For example, the school's marketing practice activities can be enriched through inter-enterprise cooperation and professional competitions. In addition, students can also participate in various company promotions. On this basis, by promoting their own products to the school or other methods, the school's practical courses are constantly enriched in the best case.

(5) *Off-Campus Practical Training.* When colleges and universities carry out marketing practice, they should provide sufficient employment positions for college students and make a comprehensive summary of the diversification of internship positions and the enrichment of internship content. In addition, various channels such as school-

enterprise cooperation and government coordination can be used as training methods for off-campus marketing training. Colleges and universities should formulate corresponding teaching plans according to the local economic development to improve the level of practice management and the effectiveness and pertinence of internship management.

2.1.3. *Marketing System under the Internet.* Based on marketing theory, the marketing teaching platform under the Internet uses situational simulation technology combined with traditional teaching methods, so that students can simulate marketing through computers in the actual market environment. Through the practical exercise of market analysis, strategic development, and decision-making, and according to its final results, the sustainable development of marketing can be achieved [19]. The whole process of enterprises from market research and market strategy formulation to specific marketing strategy formulation is fully experienced, and a certain understanding of the use of market research and forecasting is needed, which can strengthen the students' marketing strategy, planning and organization, and management skills.

As shown in Figure 2, through the simulation of the above-mentioned businesses, students can integrate and flexibly apply the knowledge they have learned, and master various marketing theories and skills such as market investigation and analysis, product marketing and planning, and market research. The core content of this system is to conduct market analysis and operation on various market parameters and obtain corresponding market effects through simulation.

2.2. *Marketing Strategy Model Based on Neural Network.* An artificial neural network is a network of widely parallel and adaptive neurons [20], whose structure can mimic the human nervous system to interact with real objects and its base model is shown in Figure 3:

The neural network has self-organization and nonlinear approximation performance, so it has become a research hotspot of many scholars [21]. It has many models, but the most mature and widely used is the error back propagation model. In reality, most neural network models adopt the wrong back propagation or its modified network model. The

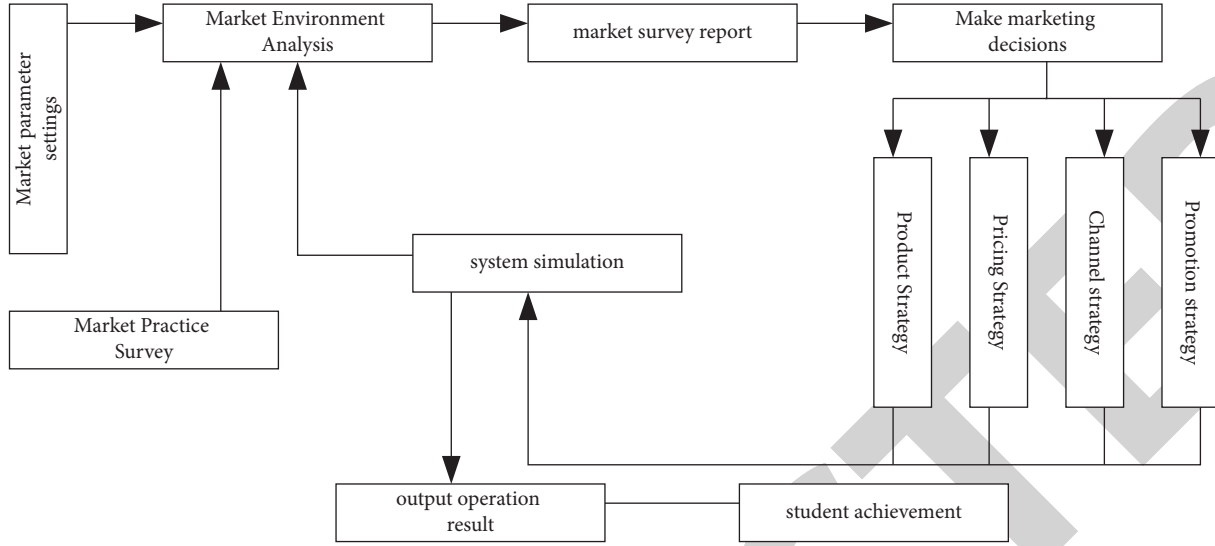


FIGURE 2: Marketing experiment simulation system business process flow diagram.

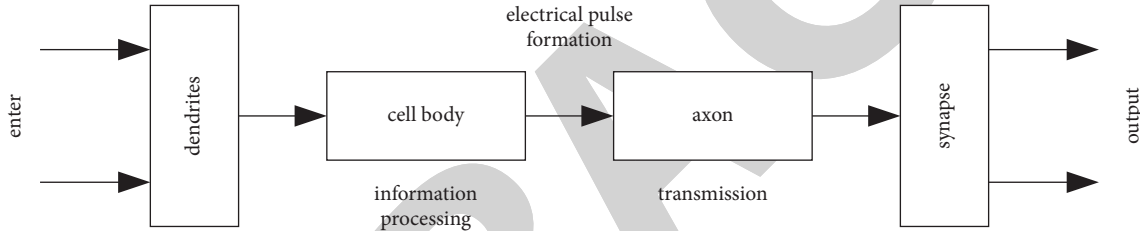


FIGURE 3: Single neuron structure model.

model established in this paper is based on BP neural network. BP neural network is a typical multilayer network, which includes output, hidden, and input layers. Each layer consists of several neurons and each layer is fully connected [22], and the structure is shown in Figure 4.

2.2.1. Model Design. For the same type of product B_n , the market impact factor $B * m$ is determined according to the 4P marketing strategy. By using a simplified multifactor scoring method, purchasing users and consumer users are divided into different groups according to market segmentation, and the B_n of the same quality is scored, which is called the quality score and represented by B_{n1} . When evaluating the price strategy, there is a certain degree of comparability in the prices of similar commodities in the market, so the market price is used as a quantitative indicator, which is represented by B_{n2} . Promotion and distribution channels are important factors that determine whether a product can reach consumers smoothly, so this paper unifies promotion and distribution strategies to achieve better marketing effects, and Table 1 lists the average scores obtained for similar products:

This marketing mix model uses a three-layer feedforward network whose input layer contains 3 neurons. An intermediate hidden layer containing j neurons and an output layer of one neuron is the market share. The BP neural network model used here uses the function program in the

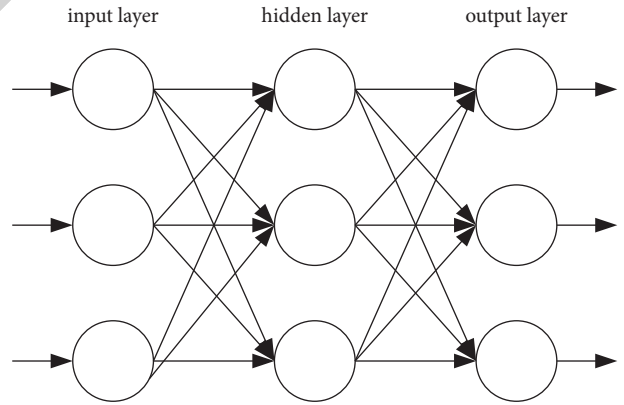


FIGURE 4: BP three-layer neural network structure diagram.

TABLE 1: Scoring table of marketing mix elements for homogeneous products.

Numbering	Product identification	Marketing mix elements		
		Product	Price	Sales system
1	① Company	B_{11}	B_{12}	B_{13}
2	② Company	B_{21}	B_{22}	B_{23}
3	③ Company	B_{31}	B_{32}	B_{33}
...
j	j company	B_{j1}	B_{j2}	B_{j3}

MATLAB toolkit, and the neural network toolkit developed by MATLAB has functions such as initialization and competitive activation, as well as the input and output neurons in the constructed BP network are arbitrary. This paper uses three main evaluation factors as samples and takes market share as the network output. BP network discovers the complex internal correspondence between market share and different market mix strategies through continuous learning and weighting corrections, so that it can evaluate marketing mix strategies comprehensively.

2.2.2. Model Algorithm. For single-layer neurons, the output algorithm is:

$$\alpha(x) = \frac{1}{1 + e^{-\beta x}} \quad (\beta > 0), \quad (1)$$

$$\alpha(x) = \sum_{n=1}^i \gamma_{nm} r_n.$$

In the formula: γ_{nm} is the node weight from the input layer to the hidden layer; i is the number of node input values. In this paper, the input between the hidden layers is $i = 10$.

The correction of γ_{nm} : In theory, the initial value of γ_{nm} can be any number in $[-1, 1]$. However, when the weight does not satisfy the condition, it must be corrected. The modified calculation expression of the output back to the middle layer is:

$$\gamma_{nm}(r+1) = \gamma_{nm}(r) + \delta \alpha_n M_n + \theta [\gamma_{nm}(r) - \gamma_{nm}(r-1)]. \quad (2)$$

In the formula: $\gamma_{nm}(r)$ is the connection weight from neuron m to the previous layer of neurons at time r ; M_n is the actual output of neuron m at time r ; δ is the step adjustment factor and the value range is between 0 and 1; θ is the smoothing factor and the value range is between 0 and 1; α is the error weight adjustment factor.

The output layer node is:

$$\alpha_n = x_m(1 - x_m)(r_m - x_m). \quad (3)$$

In the formula: r_i is the output target value.

The hidden layer node is:

$$\alpha_n = x_m(1 - x_m). \quad (4)$$

The error function is:

$$W_k = \frac{M_{k0} - M_k}{M_{k0}}. \quad (5)$$

In the formula: W_k is the network relative error function; M_{k0} is the actual value; M_k is the output value predicted by the network.

In general, if the error of W_k does not exceed the fault tolerance value of the network, it can be considered that the calculation of this mode is error-free [23]. If the error of W_k

exceeds the network fault tolerance value, it should be rewinded to the network for a second correction before it can be carried out. The final network output value also needs to be de-normalized and transformed, and its calculation expression is:

$$x = x'(x_{max} - x_{min}) + x_{min}. \quad (6)$$

In the formula: x_{max} is the maximum value of the output data; x_{min} is the minimum value of the output data; x' is the calculated output value.

A dynamic parameter is selected, and its value is 0.001, as well as the parameter γ_{nm} is adjusted each time and repeated until the dynamic parameter is lower than the specified target, which achieves successful network training. By selecting appropriate network parameters and performing multiple iterations of the network, the deviation between the obtained results and the simulation results can be controlled within an acceptable range.

2.3. Marketing Strategy Model Based on Data Mining. The precision of data and marketing has two sides [24]. In order to make the marketing of the market more accurate, it must start from the slow accumulation of the most basic data together with the unique advantages of the media. On the network, every detail can be seen clearly and the amount of data collected is huge and real, which allows users to meet every nuanced requirement.

When applying data mining technology to formulate marketing strategies, the most important business approach is how to accurately identify customer categories, how to select appropriate customers, how to communicate with customers, how to find relationships with customers [25], and the relationship with the customers is analyzed. These steps are more difficult for marketers to operate alone, so data mining technology can be used to find out these data information faster and more accurately.

The steps of the data mining marketing model algorithm are as follows:

In order to construct the marketing strategy model of data mining and calculate the correlation coefficient, it is necessary to select a and m self-parameters B_{m-1}, \dots, B_0 from the sample data, which are sorted and analyzed, resulting in the following formula:

$$a = \alpha_0 b_0 + \alpha_1 b_1 + \dots + \alpha_{m-1} b_{m-1} + \alpha_m. \quad (7)$$

The above parameters are introduced into the system, and linear analysis is performed. Among them, $\alpha_0, \alpha_1, \dots, \alpha_{m-1}$, and α_m are all fixed system values, so the minimum value of o needs to be obtained, as follows:

$$o = \sum_{j=0}^{n-1} [a_j - (\alpha_0 b_0 + \alpha_1 b_1 + \dots + \alpha_{m-1} b_{m-1} + \alpha_m)]^2. \quad (8)$$

Each of the α values has a corresponding numerical correspondence [26, 27], which can be expressed as:

$$(ZZ^R) \begin{pmatrix} \alpha_0 \\ \alpha_1 \\ \alpha_2 \\ \vdots \\ \alpha_{m-1} \\ \alpha_m \end{pmatrix} = \begin{pmatrix} a_0 \\ a_1 \\ a_2 \\ \vdots \\ a_{m-1} \\ a_m \end{pmatrix} = Z, \quad (9)$$

$$Z = \begin{bmatrix} a_{00} & a_{01} & \cdots & a_{0,n-1} \\ a_{10} & a_{11} & \cdots & a_{1,n-1} \\ \vdots & \vdots & \vdots & \vdots \\ a_{m-1,0} & a_{m-1,1} & \cdots & a_{m-1,n-1} \\ 1 & 1 & 1 & 1 \end{bmatrix}.$$

In $XB = D$, X must be a real symmetric array so that it can be written as:

$$X = T^R T. \quad (10)$$

Each factor of the T matrix can be expressed by a formula 20, and its expression are:

$$T_{00} = \sqrt{\alpha_{00}},$$

$$T_{jj} = \left(\alpha_{jj} - \sum_{i=0}^{j-1} r_j^2 \right)^{1/2}, \quad j = 1, 2, \dots, n-1, \quad (11)$$

$$T_{jp} = \left(\frac{\alpha_{jp} - \sum_{i=0}^{j-1} t_{ij} t_{ij}}{t_{jp}} \right), \quad p > j.$$

When solving a real number matrix, the Jacobian algorithm is generally used to solve it. First, X is assumed to be a symmetric array, and then the largest data in the other direction is selected for correlation transformation to obtain a new matrix. The relationship with the original matrix can be expressed as:

$$X_1 = W_0(m, n, \gamma)^R Y W(m, n, \gamma). \quad (12)$$

After matrix X transformation, the sum of squares of cells outside the main line is reduced by $2x^2_{mn}$. However, the number of main lines is increased by the same size, so the final result does not change. It can be seen from these data that after conversion, the sum of the non-main line is very close to 0, and the calculation of 0 can be completed after a few conversions, as well as the transformation of the X matrix is completed slowly. In this matrix, the main line becomes the required eigenvalues and the eigenvectors are obtained.

3. College Students' Marketing Practice Experiment and Data Evaluation

In the experiment part of this paper, 100 college students from a university are selected as the experimental objects, and they are divided into groups to carry out the teaching of marketing courses in the traditional market and the teaching

of marketing courses in the market after the improvement of the Internet background. Taking the water heater market as an example of marketing analysis, different groups of students use different marketing strategy models for marketing practice.

First, by using the Delphi method and combining the survey data and related materials, the sales data of different brands in the current water heater market are given as shown in Table 2.

Table 2 shows the current water heater marketing factor evaluation score and market share survey data. According to the data in the observation table, the quality scores of five water heater brands are relatively close, and the quality scores of other brands except Vantage are 8 points; the water heater brand with the highest price score is Shuaikang, whose price is divided into 9 points; the water heater brand with the highest sales system score is Shuaikang and Robam, both of which have a sales system score of 8.5; and the water heater brand with the highest market share is Shuaikang, and the market share score reached 9.23 points.

Figure 5 shows the teaching effect of different marketing course teaching modes. Figure 5(a) shows the degree of interest of selected college students in marketing teaching courses. It can be seen from this figure that students in the traditional marketing course teaching mode are less interested, with an average interest rate of only 75%. This is because the traditional teaching mode of marketing courses is boring and is explained by teachers, and students are always in a passive position; in the teaching of marketing courses under the background of the Internet, the students' interest degree has been greatly improved, and the average interest degree has reached 86%, which is an increase of 11%. It can be seen that the teaching mode of marketing courses under the background of the Internet can attract students' interest and make them more focused on the learning of the course. Figure 5(b) shows the practice of students under different teaching modes. On the whole, the practice rate of students in the marketing course teaching mode under the Internet background is higher than that of the traditional marketing course teaching mode, with an average practice degree of 8.5, while the average practice degree of students in the traditional teaching mode is only 7.1. In contrast, it can be seen that the students in the marketing course teaching mode under the Internet background can get more practical opportunities, which makes their marketing experience richer.

Figure 6 shows the comparison of the teaching quality and efficiency of the two marketing teaching modes. Figure 6(a) shows the comparison of the teaching quality of the courses. It can be seen from the figure that the teaching quality of the marketing course teaching under the background of the Internet is relatively stable. The teaching quality score is maintained at around 8.0 and its average teaching quality score is 8.15; the average teaching quality score under the traditional teaching mode of marketing courses is only 6.9, so the teaching mode of marketing courses under the Internet background can bring higher teaching quality of marketing courses to college students. Figure 6(b) shows a comparison of course teaching

TABLE 2: Scores and market share of marketing factors.

Numbering	Product identification	Marketing mix elements			Market share
		Quality	Price	Sales system	
1	Shuaikang	8	8.5	8.5	9.23
2	Boss	8	7.5	8.5	8.59
3	Fang Tai	8	8	8	7.80
4	Vantage	7.5	7.5	7.5	6.70
5	Haier	8	7.5	7.5	5.69

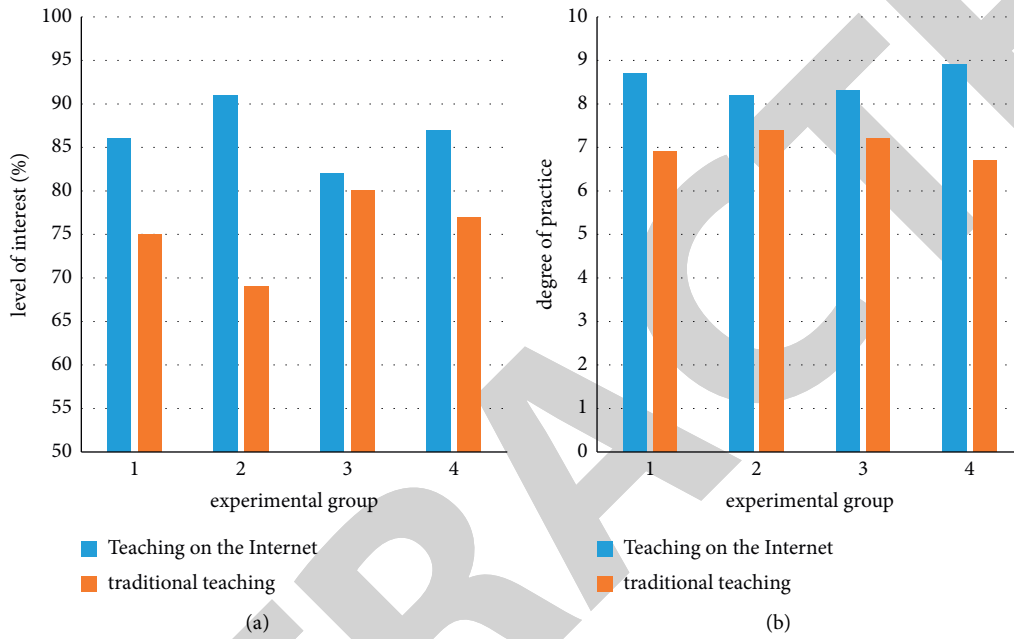


FIGURE 5: Teaching effect of different teaching modes. (a) Experimental group. (b) Experimental group.

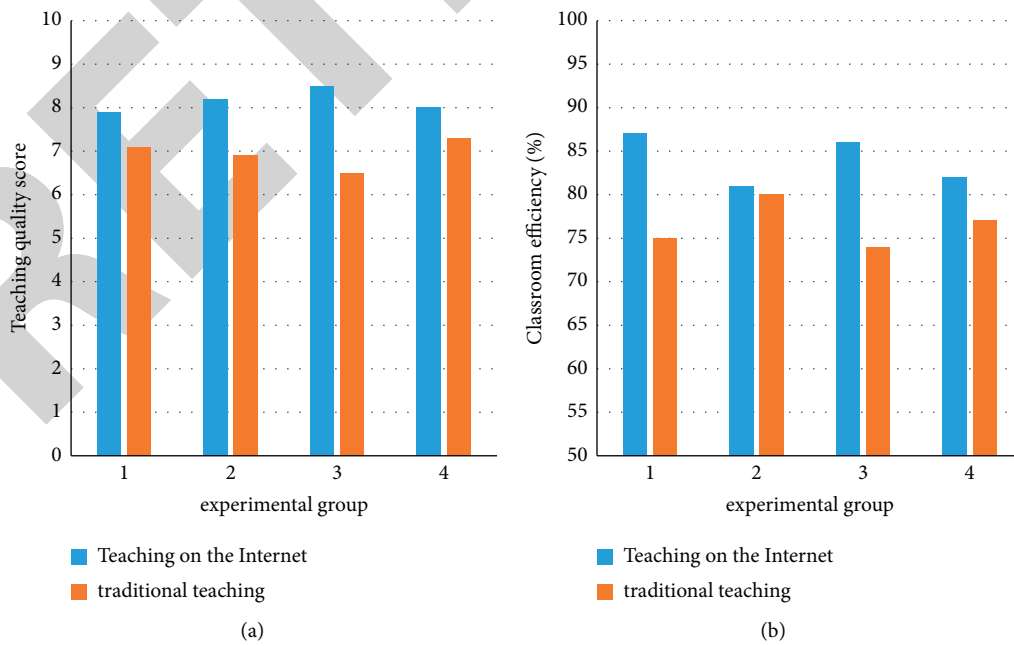


FIGURE 6: Comparison of teaching quality and efficiency of courses. (a) Experimental group. (b) Experimental group.

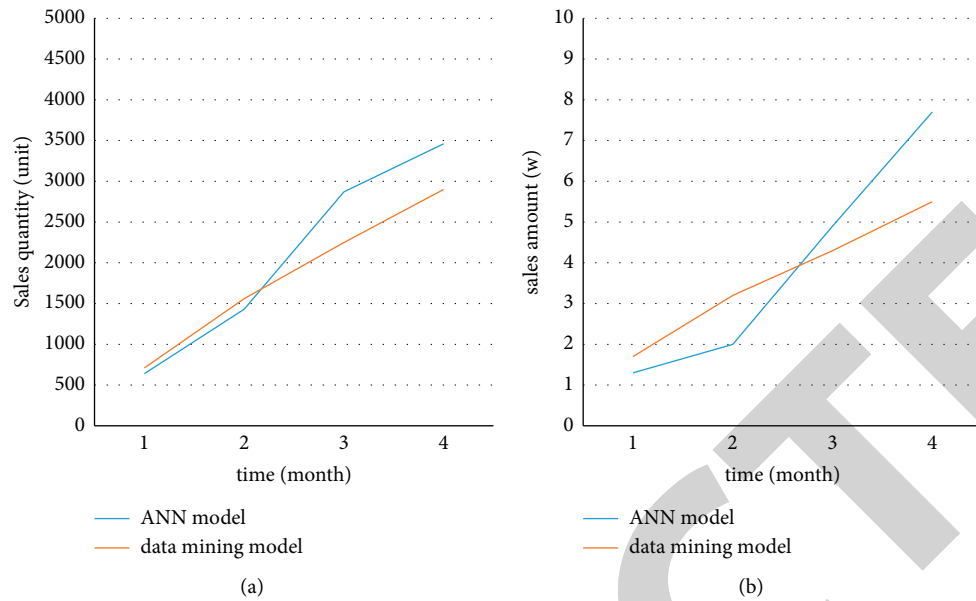


FIGURE 7: Water heater sales under different marketing strategies. (a) Time/month. (b) Time/month.

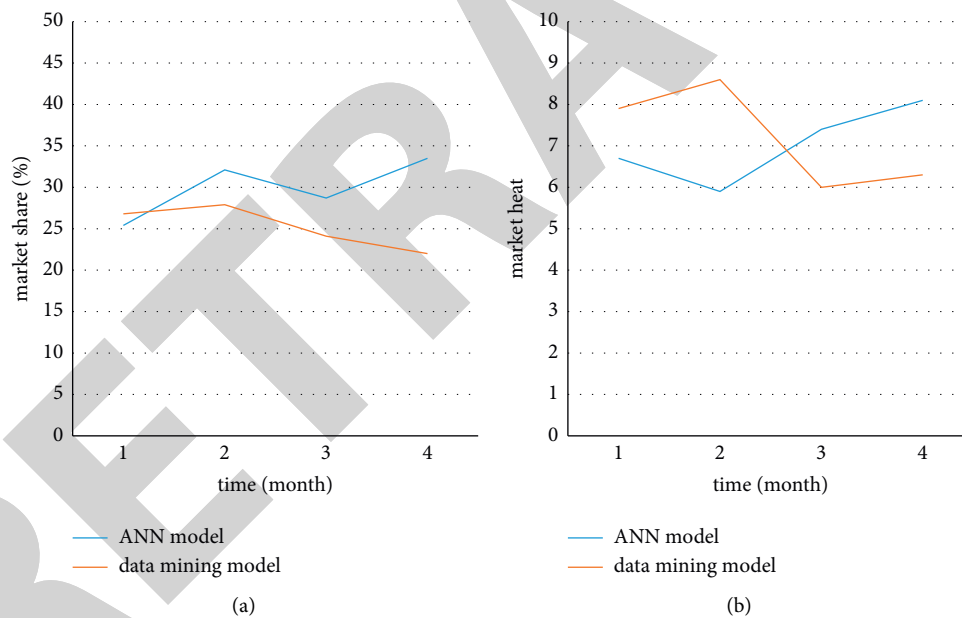


FIGURE 8: Water heater market share and changes in market heat. (a) Time/month. (b) Time/month.

efficiency, in which the traditional marketing course teaching model has low course teaching efficiency, and the average course teaching efficiency is only 76.5%; the marketing course teaching mode under the background of the Internet has greatly improved the course teaching efficiency. The average course teaching efficiency has reached 83.5%, and the teaching efficiency is improved by about 7% on the basis of the traditional teaching model, which has made a great improvement for college students to study marketing courses.

Figure 7 shows the sales of water heaters under different marketing strategy models. Figure 7(a) shows a graph

showing the change in the number of sales of water heaters in four months. It can be seen from the figure that the sales volume of water heaters under the marketing strategies formulated by the two marketing strategy models in the early stage is similar, and the sales numbers in the first two months are 1560 units and 1430 units, respectively. After the second month, the sales volume of water heaters under the neural network-based marketing strategy increased rapidly, which far exceeded the sales volume of water heaters under the data mining-based marketing strategy. The total sales volume in 4 months is 3460 units and 2900 units, respectively, with an additional 560 units sold. Figure 7(b) shows

the sales amount data of the water heater in four months. From the data point of view, in the first two months, the sales amount of water heaters under the marketing strategy based on data mining is higher than the marketing strategy based on neural networks. However, in the next two months, the sales volume of water heaters increased rapidly under the marketing strategy based on neural networks. Its sales amount also increases rapidly, and the total sales amount in 4 months reaches 7.7w yuan, which is far more than another marketing strategy with a total sales amount of 5.5w yuan. By comparing the data, it can be seen that in the long run, the neural network-based marketing strategy model is more in line with the market rules, which can improve the market economic benefits and make products purchased by more consumers to obtain more benefits.

Figure 8 shows the water heater market under different marketing strategies. Figure 8(a) shows a graph of changes in the market share of water heaters. It can be seen from the figure that the market share of water heaters under the neural network-based marketing strategy is slowly increasing as a whole, with an increase of 8.1% in 4 months; the market share of water heaters under the marketing strategy based on data mining is slowly declining, with a decrease of 4.8% in 4 months. Figure 8(b) shows the change of heat in the water heater market. It can be seen from the figure that the water heater market under the neural network-based marketing strategy is lower than another marketing strategy in the first 2 months, but it has been increasing in the later period. The water heater market under the marketing strategy based on data mining is very hot in the first two months, but the heat dropped sharply in the next two months. These data show that the neural network-based marketing strategy model can effectively improve product share. Although the market popularity is insufficient in the early stage, the popularity in the later stage continues to increase. From a long-term perspective, the marketing effect of this marketing strategy model is better.

4. Conclusions

This paper studied the teaching practice of marketing courses for college students under the Internet and innovated the traditional teaching mode of marketing courses, as well as showed the superiority of the teaching mode of marketing courses under the Internet through experimental comparison. This paper selected the experimental objects for marketing practice and compared the effects of two marketing strategy models based on Internet algorithms. The experimental results showed that: (1) Compared with the traditional teaching mode of marketing courses, students were more interested in the teaching of marketing courses under the Internet background and they could obtain more practical opportunities. (2) The marketing strategy model based on neural network could well improve the market economic benefits and effectively increased the product share, which was more in line with market laws. However, there are still some problems in the research of this paper. For example, when products are marketed using different strategies, seasonal effects are not considered. There may be

differences in the purchasing power of products in different seasons, which can lead to biased results. Therefore, in the future research, it is necessary to further improve and develop the research to make the experimental results more scientific.

Data Availability

The data of this paper can be obtained from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this work.

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References

- [1] A. A. Alalwan, N. P. Rana, and Y. K. Dwivedi, "Social media in marketing: a review and analysis of the existing literature," *Telematics and Informatics*, vol. 34, no. 7, pp. 1177–1190, 2017.
- [2] T. M. Key and A. J. Czaplewski, "Upstream social marketing strategy: an integrated marketing communications approach," *Business Horizons*, vol. 60, no. 3, pp. 325–333, 2017.
- [3] A. Payne and P. Frow, "Relationship marketing: looking backwards towards the future," *Journal of Services Marketing*, vol. 31, no. 1, pp. 11–15, 2017.
- [4] J. M. Crick, "Teaching marketing to non-marketers: some experiences from New Zealand and the UK," *Education + Training*, vol. 60, no. 9, pp. 1070–1083, 2018.
- [5] A. R. Abdou, A. Matrawy, and P. C. van Oorschot, "CPV: delay-based location verification for the internet," *IEEE Transactions on Dependable and Secure Computing*, vol. 14, no. 2, pp. 130–144, 2017.
- [6] D. L. Alderson, J. C. Doyle, and W. Willinger, "Lessons from a first-principles approach to understanding the internet's router-level topology," *ACM SIGCOMM - Computer Communication Review*, vol. 49, no. 5, pp. 96–103, 2019.
- [7] T. Saarikko, U. H. Westergren, and T. Blomquist, "The internet of things: are you ready for what's coming?" *Business Horizons*, vol. 60, no. 5, pp. 667–676, 2017.
- [8] V. Stocker, G. Smaragdakis, W. Lehr, and S. Bauer, "The growing complexity of content delivery networks: challenges and implications for the internet ecosystem," *Telecommunications Policy*, vol. 41, no. 10, pp. 1003–1016, 2017.
- [9] E. Ascarza, P. Ebbes, O. Netzer, and M. Danielson, "Beyond the target customer: social effects of customer relationship management campaigns," *Journal of Marketing Research*, vol. 54, no. 3, pp. 347–363, 2017.

- [10] X. Yang, H. Li, L. Ni, and T. Li, "Application of artificial intelligence in precision marketing," *Journal of Organizational and End User Computing*, vol. 33, no. 4, pp. 209–219, 2021.
- [11] L. Li and J. Zhang, "Research and analysis of an enterprise E-commerce marketing system under the big data environment," *Journal of Organizational and End User Computing*, vol. 33, no. 6, pp. 1–19, 2021.
- [12] G. He, "Enterprise E-commerce marketing system based on big data methods of maintaining social relations in the process of E-commerce environmental commodity," *Journal of Organizational and End User Computing*, vol. 33, no. 6, pp. 1–16, 2021.
- [13] S. Ivanaj, G. B. Nganmini, and A. Antoine, "Measuring E-learners' perceptions of service quality," *Journal of Organizational and End User Computing*, vol. 31, no. 2, pp. 83–104, 2019.
- [14] K. Y. Chau, K. M. Y. Law, and Y. M. Tang, "Impact of self-directed learning and educational technology readiness on synchronous E-learning," *Journal of Organizational and End User Computing*, vol. 33, no. 6, pp. 1–20, 2021.
- [15] J. Y. Hong, H. Ko, L. Mesicek, and M. B. Song, "Cultural intelligence as education contents: exploring the pedagogical aspects of effective functioning in higher education," *Concurrency and Computation Practice and Experience*, vol. 33, 2019.
- [16] C. A. Tavera Romero, J. H. Ortiz, O. I. Khalaf, and W. M. Ortega, "Software architecture for planning educational scenarios by applying an agile methodology," *International Journal of Emerging Technologies in Learning*, vol. 16, no. 8, pp. 132–144, 2021.
- [17] A. F. Hayes, A. K. Montoya, and N. J. Rockwood, "The analysis of mechanisms and their contingencies: process versus structural equation modeling," *Australasian Marketing Journal*, vol. 25, no. 1, pp. 76–81, 2017.
- [18] B. L. Fossen and D. A. Schweidel, "Television advertising and online word-of-mouth: an empirical investigation of social TV activity," *Marketing Science*, vol. 36, no. 1, pp. 105–123, 2017.
- [19] C. H. Sampaio, W. J. Ladeira, and F. Santini, "Apps for mobile banking and customer satisfaction: a cross-cultural study," *International Journal of Bank Marketing*, vol. 35, no. 1, 2017.
- [20] M. Safa, S. Samarasinghe, and M. Nejat, "Prediction of wheat production using artificial neural networks and investigating indirect factors affecting it: case study in Canterbury province, New Zealand," *Journal of Agricultural Science and Technology A*, vol. 17, no. 4, pp. 791–803, 2018.
- [21] H. Shimabukuro and B. Semelin, "Analysing the 21 cm signal from the epoch of reionization with artificial neural networks," *Monthly Notices of the Royal Astronomical Society*, vol. 468, no. 4, pp. 3869–3877, 2017.
- [22] A. I. Ivanov, P. S. Lozhnikov, and A. E. Sulavko, "Evaluation of signature verification reliability based on artificial neural networks, bayesian multivariate functional and quadratic forms," *Computer Optics*, vol. 41, no. 5, pp. 765–774, 2017.
- [23] G. Canziani, R. Ferrati, C. Marinelli, and F. Dukatz, "Artificial neural networks and remote sensing in the analysis of the highly variable Pampean shallow lakes," *Mathematical Biosciences and Engineering: MBE*, vol. 5, no. 4, pp. 691–711, 2008.
- [24] L. Xu, C. Jiang, and J. Wang, "Information security in big data: privacy and data mining," *IEEE Access*, vol. 2, no. 2, pp. 1149–1176, 2017.
- [25] X. S. Yan and L. Zheng, "Fundamental analysis and the cross-section of stock returns: a data-mining approach," *Review of Financial Studies*, vol. 30, no. 4, pp. 1382–1423, 2017.
- [26] A. L. Buczak and E. Guven, "A survey of data mining and machine learning methods for cyber security intrusion detection," *IEEE Communications Surveys & Tutorials*, vol. 18, no. 2, pp. 1153–1176, 2016.
- [27] Y. Ye, T. Li, D. Adjeroh, and S. S. Iyengar, "A survey on malware detection using data mining techniques," *ACM Computing Surveys*, vol. 50, no. 3, pp. 1–40, 2018.