

Retraction

Retracted: Big Data Model of Higher Education Online Teaching Based on Intelligent Algorithm

Mobile Information 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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

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] X. Zhang, "Big Data Model of Higher Education Online Teaching Based on Intelligent Algorithm," *Mobile Information Systems*, vol. 2022, Article ID 2492952, 11 pages, 2022.

Research Article

Big Data Model of Higher Education Online Teaching Based on Intelligent Algorithm

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With the continuous development of society, the demand for processing large-scale data in many fields is increasing. Traditional processing training techniques have many limitations for big data analysis applications. Therefore, how to transform big data into general-purpose information becomes particularly important. This research mainly discusses the big data model analysis of higher education online teaching based on intelligent algorithms. The process of the experiment is to access how trainers interact or receive information stimulation in videos and courseware and how to cause relatively lasting changes in cognitive behavior. From the experimental research, we discovered the law of practical training and finally provided personalized teaching support services according to the needs and abilities of the trainers. On the other hand, the online training algorithm for big data analysis is studied, the methods needed to solve the big data mining task are discussed, and the online course training is recommended in many ways. Experimental data show that the algorithm of large-scale online training behavior data analysis on the behavior analysis results of online trainers is conducive to the improvement of online trainers' learning efficiency. The experimental results show that the algorithm of large-scale online training behavior data analysis can show good model analysis performance, which is conducive to the prediction of the training personnel, and the prediction accuracy reaches about 90%. It is found that the algorithm that implements large-scale online training behavior data analysis can effectively categorize the relationship between the trainee's visits. Through innovative data analysis methods, fast, efficient, and timely analysis of big data streams is realized.

1. Introduction

Through the research on the existing online teaching service models, it is found that most of the online teaching service models are linear and one way. Big data refer to the information that can be captured, managed, processed, and organized into a more positive purpose to help companies make business decisions within a reasonable time. The linear teaching service model can only complete the summative evaluation of the learning effect of the learners, and cannot achieve the purpose of real-time adjustment of the teaching status by teachers and learners. In the application of big data analysis, online learning algorithms are very important. With the continuous development of science and technology, the calculation of big data has gradually changed from batch calculation to online calculation, which is of great practical significance. The rapid development of the Internet

and information technology, and the globalization and informatization of training have gradually become a reality, as well as sharing training resources and opening training forms have become a hot topic in the field of training. Big data is not only a technology directly applied to higher education practice but also represents a new way of thinking and scientific research for higher education. Under this market background, a large-scale open higher education online training course, a new model of online course training, can of course arise at the historic moment. The online training platform represented by large-scale open higher education online training courses brings together the great attention and interest of institutions, commercial capital, Internet startups, and the general public in higher education training to participate in development and investment. Large-scale training resources and trainers, and various training data have been generated through diverse

network training behaviors. These data contain a lot of practical knowledge for researchers to explore and study, for the construction of curriculum knowledge base, analysis of training models, and research training laws. Therefore, in recent years, the researchers of practical training and the researchers of data mining have carried out the analysis of online training data from different perspectives, resulting in two new concepts of training analysis and mining of training data.

At present, the online teaching mode based on the teaching service support platform is different from traditional classroom teaching. Learners can no longer be limited by the learning time and learning place, but carry out independent learning based on their own learning habits and learning methods, which fully embodies learner-centered personalized teaching. At present, the domestic research related to the technology of practical training analysis is still in the initial exploration stage, and most of it has not yet taken shape. Most of the research is based on literature research and questionnaire surveys, and no actual operation is designed. Domestic analysis technology research on practical training is mainly on a theoretical level, influencing factors, and other theoretical levels. There is very little empirical research on data analysis based on the network platform. The behavioral data collection for online training is not thorough enough, and the data have not been visualized. It is not conducive to discovering hidden information [1]. Based on the major online platforms and applying data mining and analysis techniques, this article analyzes the frequency of platform modules that trainees are visiting, the status of online training courses, the interaction between trainers at different levels and the online platform, and the interaction between teachers and students.

The informatization of higher education is an effective way to promote the reform and innovation of higher education and improve the quality, and it is the innovation frontier of the development of educational informatization. Scholars such as Qian et al. implemented their method and used tracking-driven evaluation based on real online behavior datasets to evaluate their performance [2]. Scholars such as R have proposed a scheme called PPSA, which encrypts user-sensitive data to prevent the privacy leakage of external analysts and aggregation service providers, and fully supports the selective aggregation function for online user behavior analysis, while ensuring different privacy measures [3]. Analysis work and computer simulations show that Asparouhov and Muth C, Carpenter, and Kenward methods are the most flexible because they produce calculation results that maintain different covariance structures within and between clusters. Therefore, these methods are suitable for random interception models that establish level-specific relationships between variables. On the booming and ubiquitous Internet, a large number of online user behaviors are generating everyday data. More and more people are committed to mining rich behavioral data to extract valuable information for research purposes or business interests. However, the privacy of network users is therefore exposed to the risk of exposure to third parties.

This article aims to find out the characteristics of trainees' online training behaviors and perform actual

operations by analyzing and evaluating various training behavior data of trainers on the network teaching platform, and proposes training support service strategies and various aspects. It is recommended to provide data support and multiple references for teaching quality assessment, monitoring, and implementation of teaching reform. The experimental results show that the large-scale online training behavior data analysis algorithm can show good model analysis performance, which is conducive to the prediction of the training personnel, and its prediction accuracy reaches about 90%. Taking the static information of the trainees and the dynamic information of the typical behavior of browsing online courseware materials as the research object, the methods of statistics, visualization, classification, and clustering are used to analyze and explore the influencing factors of online training behavior. Through analysis, several problems and influencing factors of online training are obtained. The existing online training support services have not yet reached the level of personalization, diversification, systematization, and specialization. We have constructed a conceptual training support service system framework of convenience, interactivity, times, and openness and put forward reasonable suggestions and practical countermeasures. It is found that the area with a high economic level has a higher proportion than other areas, which requires us to analyze large-scale online training.

2. Large-Scale Online Training Behavior

2.1. Online Training. The informatization of higher education is highly valued by the state, and the process is advancing rapidly. The technical system of big data includes many advanced information technologies, such as cloud computing, file system, indexing and query technology, and data analysis technology. Many of these technologies are also used in the process of higher education informatization. Online training is a direction of current college teaching reform. It means that trainers can use personal computers, mobile phones, and other equipment to carry out training through online login sites at irregular times and places. Compared with traditional training, current online training relies on information technology to incorporate more interactive elements, such as more fashionable comments and barrage, so it is widely welcomed by post-95 trainers [4]. At the same time, the training is mainly based on the online form, and compared with traditional teaching, the time is different. The trainees can use their free time to listen to lessons and do homework online, take exams, participate in interactive forum discussions, ask questions, and are allowed to receive training. People are free to arrange their own progress; if a certain period of time is free, you can learn a little more, as long as you train the complete course within the specified completion time and participate in the corresponding course review link.

2.1.1. Online Training Operation. The proportion of mobile Internet users is as high as 96.3%, and the dominant position of the mobile Internet has been strengthened in many ways;

it reflects the continuous growth of online training, not only in the scale of platform construction but also in the creation of platform courses and the number of users [5, 6]. The training platform is the first brand of general practice training that Superstar Group strives to build. It has four major compulsory courses of comprehensive quality, ability work, growth foundation, and public compulsory courses. It is regarded as the core literacy sector. The development and evolution of history, human understanding of thought and self, literary accomplishment and artistic appreciation, scientific discovery and technological innovation, economic activities and social management, Chinese classics and cultural inheritance have formed its basic framework. Until now, the platform has successfully opened 218 courses of general electives each year, and the number of general courses is increasing at the rate of 30 every year. It is widely used in domestic universities, especially those in Zhejiang Province. At present, our school integrates all the courses applied in the training platform into the general elective courses of the training platform, so that the majority of trainees can make full use of the extracurricular time to carry out the teaching and practical training of the general elective courses [7].

2.1.2. Duration of Online Training. According to the statistics of the Erya platform, the training time of the trainers is counted, and it is found that their main training time is from 4 o'clock in the day to 8 o'clock in the evening. The aggregated data show that trainees usually have much longer training time than weekend time.

2.2. Employee Training Behavior Based on Big Data

2.2.1. Diversified Information Acquisition Methods. With the rapid development of the Internet and cloud computing, the way employees get information is changing rapidly [8]. The development and progress of mobile communication technology also have a significant impact on the vocational training and behavior development of trained employees. At present, the training of employee behavior is developing from the initial traditional training to the later digital informatization training, to the current mobile informatization training, and the future big data informatization training in four stages [9, 10]. The in-depth exploration of training combined with the user's personalized needs and the improvement of training services have gradually developed into the main development characteristics of big data informatization training. The direct relationship between the development of vocational training and the training of employees to obtain information is shown in Figure 1.

As can be seen from Figure 1, the diverse characteristics of employee training needs have been realized, and the training behaviors have shown diverse trends. At the same time, the difficulty in obtaining information has a great influence on the training behavior of employees. Due to the difficulty in obtaining the above information, the diversity of information sources is difficult to

guarantee, so the training gradually shifts from diversification to singleness [11].

2.2.2. Mainstream Online Learning Algorithms. In recent years, the multitask online learning algorithm, group LASSO online learning algorithm, and multicore online learning algorithm that have become research hotspots are called nonlinear because they are different from the traditional single task, single kernel function learning, and independent feature learning online learning algorithms "Traditional online learning algorithm" [12, 13]. Because these nontraditional online learning algorithms can better meet certain specific scenarios, such as biological gene recognition and other big data analysis needs, it has become one of the important directions of online learning algorithm research [14]. Supervised learning is the machine learning task of inferring functions from a labeled training dataset. The mainstream online learning algorithm is based on supervised learning, that is, a pattern or function is learned from the training sample set, and the analysis result of the new sample is speculated according to this pattern [15]. Taking the learning of classification models as an example, suppose the input data are a series of paired samples as shown in [16]

$$\{(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)\}, \quad (1)$$

$$x_i = R^{d+1}, \quad y_i \in \{-1, +1\}. \quad (2)$$

Since the classification can only belong to one, it is often arbitrary and inappropriate, while the label is different, and the requirements are not so strict. Among them, the feature vector of the corresponding sample and the classification label of the corresponding sample are the number of features and the total number of samples in the training set. The patterns to be learned are as follows:

$$\begin{aligned} f(x) &= w^T x, \\ w &= [w_1, w_2, \dots, w_d, w_{d+1}], \\ x &= [x_1, x_2, \dots, x_d, 1]. \end{aligned} \quad (3)$$

Among them, the weight vector of the pattern is the target vector to be learned. If the second type of sample is linearly separable, then there is a hyperplane:

$$f(x) = w^T x = 0. \quad (4)$$

The two types of samples can be correctly separated. At the moment of training, the algorithm will predict the classification labels of the samples, namely,

$$\hat{y}_i(x) = \text{sign}(w_i^T x) \in \{-1, +1\}. \quad (5)$$

2.2.3. Self-Space Model. In the formula, is the number of bits of data sent or received, the distance between two nodes is constant, and the value is related to the network environment; represents the effect of training, and represents the negative impact of training. When the network upload rate is less, the training efficiency is proportional to the square of

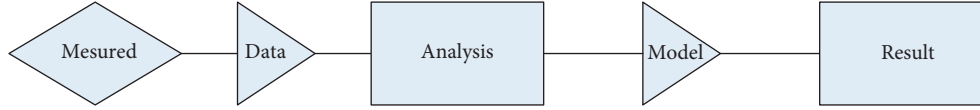


FIGURE 1: The composition of the sensor.

the network upload rate, which is called the self-space model. When the network upload rate is greater, the training efficiency is proportional to the fourth power of the network upload rate, which is called the attenuation model [17].

The energy consumed by the node calculation is calculated according to the following formula:

$$E_C = NCV_{dd}^2. \quad (6)$$

Data mining is a decision-support process that helps decision makers adjust market strategies, reduce risks, and make correct decisions.

In this era of big data of training institutions, the comprehensive processing and ability of massive information data resources are becoming more and more important. As a professional service manager of a training service organization, one must not only be familiar with the service management of professional training organizations but also must possess multidisciplinary knowledge such as massive data mining and analysis, computer information technology, and mathematical statistics [18]. The construction and development of big data training also put forward higher technical requirements for the training of future project managers in the construction of training service teams. Must master the knowledge and service management skills of massive data mining and data organization in the context of massive data resources and the concept of massive information services such as subject information services, embedded information services, information resource retrieval, information mining and analysis, and information data organization. Management skills and service management capabilities, and the comprehensive development and capabilities of training institutions for projects will gradually become a core content for the training of future talent management capacity building [19, 20]. The big data management platform provides big data security, operation, and maintenance integration management functions centered on big data technology, and can manage system software and hardware monitoring, big data cluster monitoring, service monitoring, and system accounts through a visual interface. The educational big data management platform can also manage students' learning behaviors (knowledge viewing, knowledge collection, knowledge evaluation, etc.). The online teaching big data system is shown in Figure 2.

The learning time of students in different course resources constitutes a matrix T :

$$T = \begin{bmatrix} t_{11} & \cdots & t_{1n} \\ \cdots & \cdots & \cdots \\ t_{n1} & \cdots & t_{nm} \end{bmatrix}. \quad (7)$$

The total duration of learning all course resources is recorded as P_S :

$$P_S = \frac{P_{Si}}{m}. \quad (8)$$

2.3. Algorithms for Online Learning

2.3.1. Online Learning Algorithm of Perceptron. Perceptron is a model of classification learning machine that belongs to the field of machine learning bionics. It has many more complex algorithms, so it is fully used in machine learning algorithms. When the classification is correct, its weight vector is "rewarded" so that the weights do not change [21]. When an error occurs in the classification, it "punishes" the vector and corrects the error so that it can be converted into the correct direction. It often punishes the samples in the wrong classification by summation. The weight is different from the general proportion. It not only reflects the percentage of a factor or indicator but also emphasizes the relative importance of the factor or indicator.

T is a subscript set in a misclassified sample, and $JP(w)$ is a risk functional. The algorithm of the perceptron belongs to a reward and punishment algorithm. It can fully solve the problem of separability between linearity. Its appearance has promoted the development of machine learning to a certain extent. First-order perceptron, which has certain convergence, can continuously update the formula of the perceptron to calculate big data [22]. The information storage supported by teaching services is shown in Figure 3.

2.3.2. Passive-Active Algorithm in Online Learning. The online passive-active algorithm is a convex optimization model that has a global optimal solution and can be implemented and verified. Its main core idea is to think on the basis of a sample support vector machine and effectively transform the maximum of the vector machine [23]. In addition, there is an update rule in the passive-active algorithm, that is, the algorithm will not update when there is no error in the newly generated data, but when the new data are wrong, it will actively update to ensure the accuracy of the data.

2.3.3. Online Sparse Solution Learning Algorithm. The sparse solution learning algorithm is generated in the overall training through batches, to obtain the optimal value on the boundary [24]. However, in the online learning algorithm, because the training method used is a random gradient descent method, it is very possible to ensure the sparsity of the calculated solution, so the gradient intercept method can be used to obtain an effective sparse solution by changing the updated weight value set to 0 to make the number of generated features larger, and a sparse weight vector can be

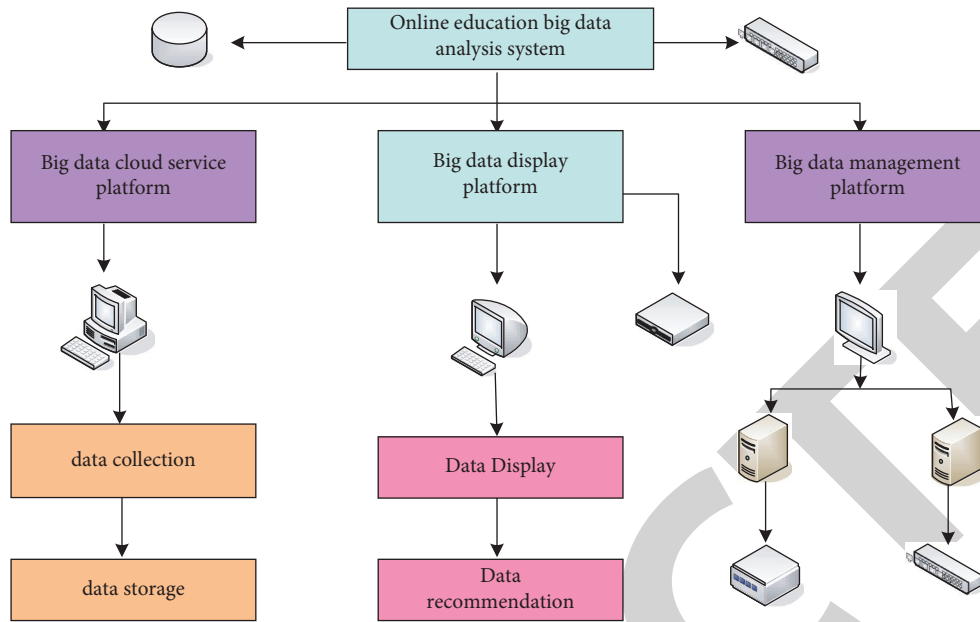


FIGURE 2: The online teaching big data system.

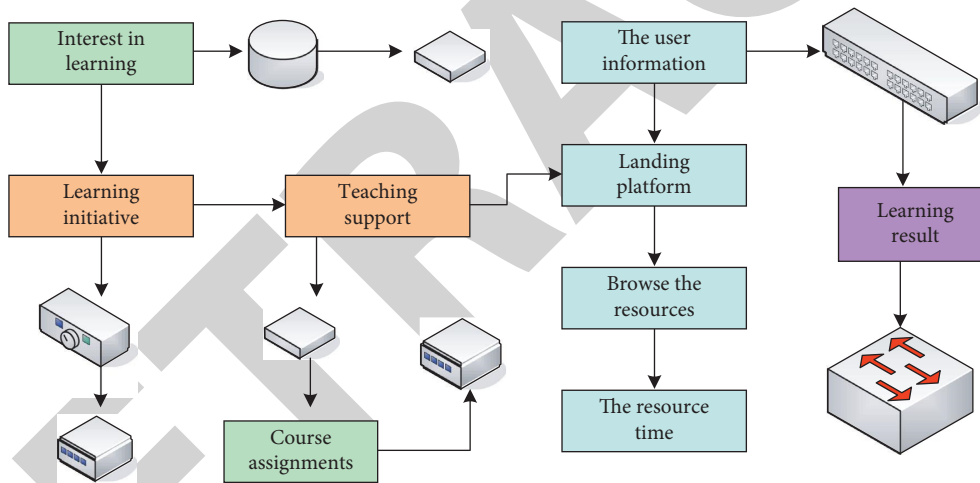


FIGURE 3: The information storage supported by teaching services.

generated. Compared with the stochastic gradient descent method, this method can reduce the damage to the performance of the online learning algorithm. The information and data of homework submitted by users are stored in the cloud classroom background database. The original data of homework submitted by learners can be obtained by querying relevant data tables, as shown in Table 1.

TABLE 1: Obtaining the original data of homework submission information of learners.

Username	Start time	End time	Submit time
A	13:20	14:20	14:20
B	13:19	14:20	14:15
C	13:22	14:20	14:10

2.4. Scalability of Big Data Streaming. In big data streaming computing, data are generated in real time and dynamically increased. As long as the data source is active, the data will be continuously generated and continuously increased. It can be said that the amount of potential data is unlimited, and it cannot be quantified with specific data [25]. During data calculation, the system cannot save all data:

- (1) There is not enough space in the hardware to store these infinitely growing data.

- (2) There is no suitable software to effectively manage so much data, and the system needs to have good stability to ensure long-term stable operation of the system. The online learning algorithm uses a streaming computing mode and does not store streaming data, but directly performs real-time calculations of the data in memory. However, online learning algorithms for nonlinear models are based on kernel functions. When the sample classification

is wrong, the sample will be added to the support vector set (or called the effective set); at the same time, the online learning algorithm automatically updates the ownership value coefficient in the effective set according to the kernel function of the current sample. Therefore, the online kernel function has a scalability problem. However, as the number of samples increases, the number of support vectors in the effective set will continue to increase. If the number of samples is infinite, the number of support vectors in the set tends to be infinity.

3. Online Training Experiment

3.1. Experimental Setup

3.1.1. Experimental Algorithm. With the rapid development of training big data, the analysis of training behavior has gradually become an important research direction for training workers. Through the training analysis of training big data, we can deeply study the training process and situation of the trainers, discover the training laws, and finally, provide personalized teaching support services according to the needs and abilities of the trainers. Based on the online training platform, the online learning algorithm using perceptron, the passive-active algorithm in online learning, and the online sparse solution learning algorithm are comparatively studied. The online training behavior of trainers provides visual data basis and supports improving the training effect of trainees and optimizing the design of teaching systems.

3.1.2. Experimental Ideas. This article uses historical data to study the implementation of large-scale online training behavior data analysis algorithms, train and verify machine training prediction models, and are widely used in customer selection of experimental group models to control the control group variables; the experimental group selected the data of online customers and online customers' activity behavior analysis for model analysis and verification. A comparative study of online learning algorithms using perceptrons, passive-active algorithms in online learning, and online sparse solution learning algorithms.

3.2. Experimental Procedure

- (1) By investigating the frequency of trainers accessing online platform modules during the training phase, online training behavior algorithms are used to analyze and count the data of the corresponding modules.
- (2) Compare visit records of visitors by category

The frequency records of the above-mentioned trainees' access to the online platform module during one training stage are recorded and collated and compared. The main comparison modules include the visit time period, whether to visit other websites at the same time when visiting this website, the types of other websites visited, the test pass rate after

training, the job execution rate after training, and the comparison of the progress of the training process at different stages of development.

- (3) Build visitor training module model

Through the processing and analysis of the above data, establish a model for the efficiency of trainers' participation in training, and from the following dimensions: access time, access time period, whether the website is visited at the same time to visit other websites, if you visit other websites, visit the type of website, the pass rate of the test after the training results, the implementation rate of the posttraining results, and one-by-one comparative analysis.

- (4) Summarize experimental data and draw conclusions

According to the model of the training efficiency of the participants participating in the training, the online learning algorithm using the perceptron, the passive-active algorithm in online learning, and the online sparse solution learning algorithm are compared and selected. Among them, the algorithm is used to analyze the relationship between the trainer and the frequency of website visits, the coaching time of the trainer and the online time of the trainer, the monitoring of different dimensions in different time periods and various parameters of different dimensions, and the training behavior analysis of the trainee participation.

4. Online Training Discussion

4.1. Behavior Analysis of Trainees

- (1) Figure 4 and Table 2 show that the module with the most frequent visits by trainees is the discussion area, which is mainly concentrated in the latter part of the training phase. Explain that the synchronous or asynchronous interactions between trainers are mainly concentrated in the latter part of the training phase. At this time, the most cost-effective way may be communication and interaction with peers. Therefore, the constructivist training method in the later stage of the training stage still plays an important leading role in the training of the trainers. In the early and middle stages of the first phase of practical training, the trainees mainly visited the practical training module mostly on how to watch the courseware of the video studio and how to conduct self-study instruction. This shows that in the early and mid-term of the whole training, the main purpose of the trainer is to access how to watch the trainer interact with each other in the video and courseware or to receive stimulation materials, which may cause relatively lasting changes in cognitive behavior. At this time, the teaching methods of cognitive behaviorists in the training process can play a very important guiding role in the training of trainees, indicating that large-scale online training behavior data analysis is necessary.

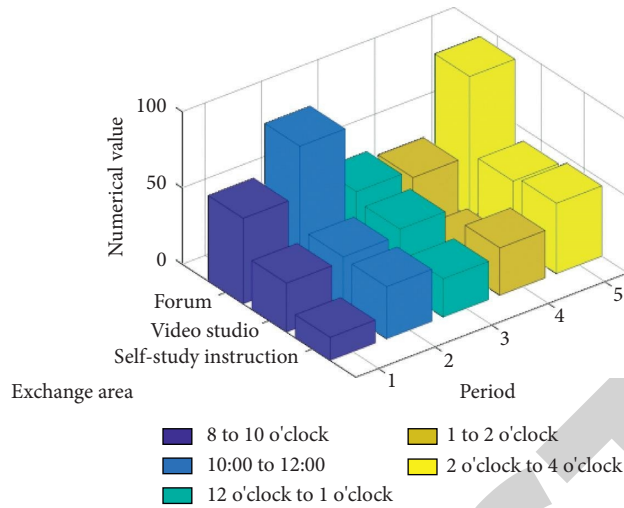


FIGURE 4: Number of people staying in different periods.

TABLE 2: Number of people staying in different periods.

	8 to 10 o'clock	10:00 to 12:00	12 o'clock to 1 o'clock	1 to 2 o'clock	2 o'clock to 4 o'clock
Forum	56	89	45	40	92
Video studio	32	35	39	12	42
Self-study instruction	15	34	25	31	46

(2) Table 3 and Figure 5 can be seen that in the early and middle term of the semester, the main modules visited by the trainees are video courseware and self-study guidance. This shows that in the early and mid-term of the training, the trainees mainly watched the video courseware to interact or receive stimulation materials, which caused relatively lasting behavior changes. Compared with the traditional degree of response, at this time, the cognitive behaviorism education teaching method plays a leading role in the actual training of trainees. It is worth pondering that the low participation rate of video answering may be due to the change in the support variables that affect the training effect of the trainees during the video answering, allowing fewer opportunities for training. Because video answering requires real-time participation within a certain period of time, trainees cannot withdraw from the video studio for practical training due to contradictions in engineering. It can be seen from Table 3 and Figure 5 that the status of the trainees at different time points is different. From the analysis results, it can be seen that the teacher can more easily master their training style, pay attention to the entire process, and provide timely guidance.

4.2. Performing Data Analysis according to Different Dimensions

(1) During the design of the teaching system, the test is used to determine whether the teaching materials have effectively prepared the trainee for the purpose of training. A total of 16 courses in the training phase

are selected. The average test scores of the trainers in the training phase and the frequency of visits to the online courses website of the trainers are shown in Table 4 and Figure 6. We use the perceptron's online learning algorithm, the passive-active algorithm in online learning, and the online sparse solution learning algorithm to analyze force major factors such as student time, personal emotional problems, and learning efficiency. It can be seen from the table and graph that under several algorithms, the personal-emotional impact factors of the trainers are relatively large, almost twice that of other factors. After the analysis results are collected, the trainee probabilities are calculated. After verification, the agreement reached about 90%. It can be seen that the algorithm for large-scale online training behavior data analysis can analyze the entire process of the trainer's training, thus achieving the prediction of online training behavior.

(2) To measure the teaching results according to whether the trainer has successfully achieved the training goal, the influence of the ability propensity variable must be considered. The different levels reflect the importance and difference in the trainees' ability tendency. The actual training situation of the trainee online course website is shown in Table 5 and Figure 7, respectively. As can be seen from Table 5 and Figure 7, the various responses of the trainees can be predicted by the behavior data analysis algorithm, the frequency of the trainees' visits, the duration of the visits, the self-satisfied learning satisfaction, and the love of learning subjects The degree is related to

TABLE 3: Trainees' response and improvement in tradition in the experimental environment (%).

	Experiment group 1	Experiment group 2	Experiment group 3	Experiment group 4
Watch video courseware to interact or receive stimulus materials	54	67	56	55
Video Q&A engagement	78	79	67	54
Enter video studio training	35	34	54	78

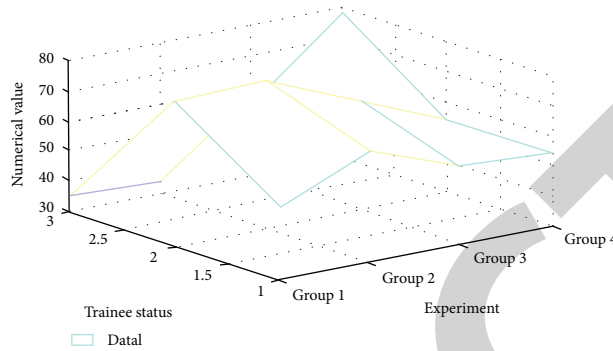


FIGURE 5: Trainees' response and improvement in tradition in the experimental environment (%).

TABLE 4: The actual training results and the frequency of interviews.

	Trainer's time	Personal-emotional problems	Learning efficiency	Other force majeure
Online learning algorithm of perceptron	21	45	13	21
Passive-active algorithm in online learning	26	46	23	5
Online sparse solution learning algorithm	18	43	24	15

Various factors account for the frequency of the algorithm (%).

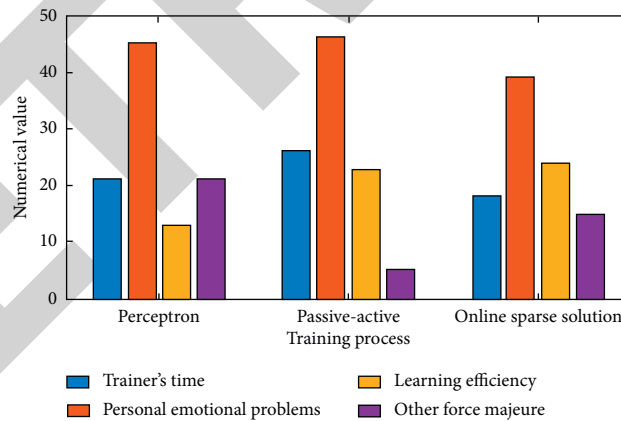


FIGURE 6: The actual training results and the frequency of interviews. Various factors account for the frequency of the algorithm (%).

TABLE 5: Relations between large-scale online training algorithms and regions.

	Frequency of visits	Duration of visit	Self-feeling	Favorite situation
Economically developed area A	0.54	0.42	0.36	0.41
Moderately economical area B	0.36	0.23	0.24	0.34
Economically backward zone C	0.21	0.31	0.19	0.22
Extremely poor area D	0.34	0.24	0.28	0.24

the use of the algorithm in the online course. It is found that the algorithm that implements large-scale online training behavior data analysis can effectively

categorize the relationship between the trainee's visits, and the frequency and duration of the visit can be classified. It is found that it is related to the area

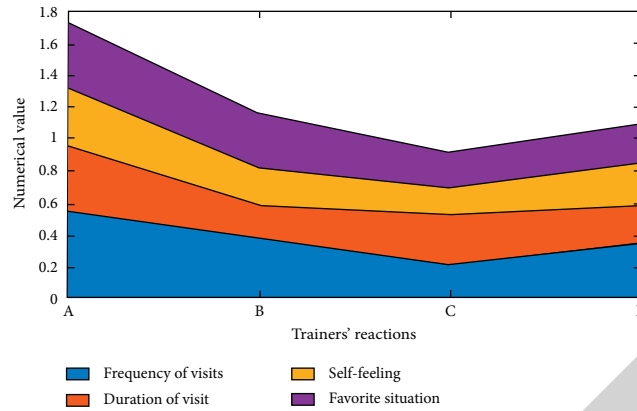


FIGURE 7: Relations between large-scale online training algorithms and regions.

TABLE 6: The number of posts between teachers and students.

Poster	Title	View <i>n</i>	Reply <i>n</i>
1	See the video of the lecture on the following website	35	20
2	What was discussed on March 4th!	514	80
3	Discussion on March 18	310	54
4	Discussion on March 22	321	23

TABLE 7: User password and modification status.

User name	Create time	Modify
2021220	2021/8/25	1
2021222	2021/8/23	2
2021223	2021/8/20	3
2021224	2021/9/25	1

where the trainer is located, and the relevant data are compared with the regional average income. It is found that the area with a high economic level has a higher proportion than other areas, which requires us to analyze large-scale online training. Take into account the regional economic level.

The data required by the study in this section are all stored in cloud classroom background data Treasury, and the required data can be obtained and screened out by querying relevant data tables such as user information table, course information table, and forum information table. The number of posters, topics, views, and replies is saved in the data table of teacher-student Posting interaction. The number of posts between teachers and students is shown in Table 6.

By querying the user information table in the cloud classroom background database, the user password and modification status information are obtained, as shown in Table 7.

5. Conclusions

- (1) Through the experimental research of this paper, it is found that in the era of the development of big data, although it has brought certain opportunities to online learning algorithms, it has also brought many

challenges. Due to the traditional learning technology of batch machines in the past, the development of the times can no longer meet the specific needs of analyzing big data, so the online learning algorithm has become a more useful tool for modern streaming data learning by directly calculating the data in real time in memory. The algorithm of large-scale online training behavior data analysis can play a very important leading role in the teaching method of cognitive behaviorists in the training process and show the large-scale online training behavior. The data analysis algorithm is related to the time period and the communication area. The main learning fully reflects the individualized teaching centered on the learner. As the main channel for the development of educational informatization, online learning has become one of the research hotspots in the fields of distance education, individualized education, and lifelong learning. However, the traditional classroom teaching mode has certain limitations. For example, learners need to study under the conditions of specified time, place, and learning group, which is not conducive to promoting the development of personalized teaching and lifelong learning.

- (2) The algorithm for large-scale online training behavior data analysis is very important. The algorithm for large-scale online training behavior data analysis can analyze the entire process of the trainer's training, thus achieving online training. On the other hand, the area where the trainees are located is related, and the relevant data are compared with the regional average income. It is found that the areas with high economic levels have a higher proportion than other areas, which requires us to analyze large-

scale online training. The regional economic level should be taken into account. Therefore, with the continuous development of science and technology, the calculation of big data has gradually changed from batch calculation to online calculation, which is of great practical significance.

- (3) This article aims to study the algorithm of large-scale online training behavior data analysis. By analyzing the training of big data, we can find the training process and situation that can deeply study the trainer, discover the training rules, and finally provide personalized teaching support services according to the actual needs and abilities of the trainer. On the other hand, the online training algorithm for big data analysis is studied, and the methods to solve the difficulties caused by the mining of big data tasks are explored, and various practical recommendations can be made for the online course training. The research data show that the large-scale online training behavior data analysis algorithm's behavior analysis results for online training personnel are conducive to the improvement of online trainers' learning efficiency. The research results show that the large-scale online training behavior data analysis algorithm can show good model analysis performance, which is conducive to the prediction of the training personnel, and the prediction accuracy reaches about 90%.

Data Availability

This article does not cover data research. No data were used to support this study.

Conflicts of Interest

The author declares no conflicts of interest.

Authors' Contributions

The author has read the manuscript and approved for submission.

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