Evaluating the Quality of Internet-Based Education in Colleges Using the Regression Algorithm

Xuan Zhang

School of Preschool Education, Xi’an University, Xi’an, Shanxi 710065, China

Correspondence should be addressed to Xuan Zhang; xqjyxy@xawl.edu.cn

Received 30 April 2021; Revised 25 May 2021; Accepted 21 June 2021; Published 29 June 2021

Academic Editor: Fazlullah Khan

Copyright © 2021 Xuan Zhang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

An efficient and effective mechanism is required for quality education in schools, colleges, and universities. After the pandemic worldwide, every organization worked online from home instead of on the site. The educational institutes started online classes using various platforms. The quality of education using online classes is affected by numerous factors, including hardware, software, and the internet. Therefore, in this paper, the quality evaluation of internet education using a regression algorithm is proposed. The proposed system optimizes the hardware design and functions of the client end of the internet education of colleges and universities. It determines the time response data sequence of the grey prediction model and ensures that the proposed scheme’s prediction accuracy is high. By adopting the logistic regression, the rules for the overall evaluation of the education quality are formulated. The database of the rules for the overall evaluation of the education quality of the internet of colleges and universities is generated. Experimental results show that the response time of the education quality evaluation system is about 1.3 sec. The probability of failure is very low than the existing literature.

1. Introduction

With the rapid development of information and the wide application of the internet, the teaching means in colleges and universities are continuously improving. The 3D and virtual reality technology are used to improve students’ perception level and interest in learning. The students can actively participate in the learning process, improve the quality of education, and reduce the cost of running a school. The development of the economy provides educational resources, determining the development direction of education [1]. The education system and all kinds of schools should strengthen cooperation and sharing with external platforms and strengthen the education information infrastructure. Strengthen the development and application of educational resources, and strengthen the application of educational big data analysis and data mining strategies. It enhances the teachers’ ability in information technology and gives full play to the supporting and guiding role of informatization in education development. The introduction of “Internet Plus” can provide huge volumes of data and its analysis methods to formulate the education quality assurance and evaluation mechanisms. It can also achieve a wider circulation. It is an indispensable supporting technology for evaluating and analyzing modern internet education and the quality assurance mechanism. The quality assessment is easy as the essence of the internet is openness.

Because of the characteristics of openness and flexibility, no time and space constraints, and it can make up for the lack of college education resources, network education has developed rapidly. However, due to management oversight, quality problems become a bottleneck, restricting the development of online education. The rapid development of internet technology has brought new opportunities for the development of network education. Through the “Internet Plus” thinking, we can change the previous unified teaching materials, unified homework, unified assessment, and a single evaluation method for students. A data analysis team should be set up to collect teachers and students’ information, such as school roll and grade, registration, course selection, study, and examination information. In the literature, numerous methods are used for the quality
evaluation on internet-based college teaching. These studies have shown satisfactory results, but still, there is room for improvements. Therefore, this paper studies the evaluation method of internet education quality in colleges and universities. Based on the above analysis theory, this paper designs a comprehensive evaluation index system to improve the overall development of education quality and promote the reform of the education system.

The rest of the paper is organized as follows. In Section 2, optimization methods are discussed. In Section 3, stabilization and synchronization mechanisms are elaborated, followed by experimental results and discussion in Section 4. Finally, Section 5 concludes the paper and provides future research directions.

2. Quality Evaluation of Internet Education in Colleges and Universities

This section gives details about the weights of the index system for quality evaluation and the framework for quality evaluation.

2.1. Weight of the Index System for Quality Evaluation.

Suppose we want to establish a good evaluation of the teaching quality assurance mechanism. In that case, we should first make clear the factors that affect the teaching quality of teachers. Many principles should be strictly abided by in the formulation of the evaluation method of modern education quality assurance mechanisms, including goal orientation, scientific methods, and measurability. Based on the above three principles, diversified evaluation criteria and a corresponding evaluation index system are established. An educational evaluation model with strong adaptability is established. The evaluation method based on the “Internet+” education quality assurance mechanism should be based on the perfect evaluation index system and reasonably divide the weights of the current index system. The significance of the “Internet +” application lies in introducing a large number of accurate data and establishing a good analysis system so that the results of analysis have more value.

In general, an integrated education system evaluation index system needs to have the following components:

1. Education quality indicators reached by the level of the education system can be of extensible construction.

2. Education indicators need to deal with the measurable data analysis and data of the education security mechanism at all levels. However, their measurement activities are only based on the current data summary and analyzed and judged at different levels. Therefore, the indicator system is more intermediate.

3. The index system can be used as a valuable symbol for judgment, so it is necessary to use specific school marks as reference data points or evaluation standards to ensure that the data attributes conform to the nature of education.

4. The system of educational indicators can be regarded as a set of statistics in essence.

Fundamentally, the specific design criteria of evaluation indicators need to follow the following three choices.

Firstly, starting with the analysis target of the evaluation target, the paper decomposes the evaluation target of the current educational activities in an ascending order. It obtains the essential attribute of the current evaluation information through analysis and discussion. Then, it extracts the attribute content that can grasp the essence of the analysis through analysis and screening. Finally, it determines the essential attribute of all content evaluations as the index, which is the simplified condition of the index system. Although this kind of target localization is simple, the overall workload is huge, which is not easy to grasp.

Secondly, start with the correlation of the educational security system because educational activities must have necessary internal relations. The development and change process of one thing will inevitably cause other related things. Because of the complex nature of causation, the developmental effects of change between things are also diverse. The establishment of indicators can be evaluated and analyzed according to the development and related educational activities.

Thirdly, the connotation of the evaluation goal grasps the correlation education system and essence analysis of attributes associated with things. According to these attributes, phenomena determine the target system. However, this kind of establishment to the economic correlation condition request is high. However, it adapts the polymorphism education safeguard mechanism, which generally has a strong application. The external characteristics of these attributes are highly complex with the related transaction evaluation factors. Therefore, this index system needs designers to have a comprehensive and in-depth understanding of the current evaluation type. Otherwise, it will inevitably encounter difficulties.

2.2. Framework for the Quality Evaluation.

Although the establishment of indicators can implement the current education quality assurance mechanism and carry out periodical testing and evaluation, it is influenced by many factors such as environment, teachers, and students, and different teaching indicators and evaluation orientations occupy different evaluation positions. Therefore, based on the selected indicator system and evaluation standards, it is necessary to establish an applicable evaluation system structure for the internet education quality of colleges and universities. In this way, the whole evaluation method can be more authentic and measured.

The design uses the “Internet +” thought, establishes the logical data system, through the data information and the big data appraisal, and clears the current target weight. The logic operation environment of evaluation information data needs the help of the simulation data management and analysis program in the field of “Internet +.” The whole operating environment needs to upload all the evaluation indicators and current student information data and use the program
to carry out preliminary classification and analysis. In the endoplasmic data core, the data root system is established, and then according to the data relation request, the corresponding analysis environment is established; the overall structure is shown in Figure 1. The entire instructional data information environment can be seen as a domain-driven architecture dominated by data cores or as an entity part with clear weights. In order to effectively analyze the traditional logic, a more accurate weight calculation method is proposed to optimize the structure of the information computing environment data table, including staff information optimization, user information optimization, student information optimization, registration information optimization, and school information optimization.

3. Evaluating Education Quality Using Regression Algorithm

In this section, we demonstrate various components of quality evaluation of internet education in colleges and universities.

3.1. Hardware Design and Functional/Software Optimization. The internet education system in colleges and universities is a teaching and application system based on the internet. It creates a three-dimensional internet education environment with the least economic cost and time cost. It completes the sharing of teaching resources and plays an important role in improving the quality of internet education in colleges and universities [2–4]. The overall system build process is as follows.

First of all, this system will use Windows Server 2016 as an operating platform, ASP, NET as a key development tool, and Windows Server 2016’s optimized performance so that the system has better efficiency.

Secondly, according to the actual situation and application level of network teaching and multimedia teaching technology, the economy and reliability of system design and operation shall be taken into full consideration. The system’s overall structure shall be a three-layer browser/server model (browser/server, B/S).

Finally, the implementation of teaching activities in colleges and universities under the web environment has three users: students, teachers, and system administrators. The actual needs of various types of users are prerequisites for creating the effect of the higher education system [5]. The system must have various subsystems shown in Figure 1.

As shown in Figure 1, teachers can use this system to complete the organization and manage teaching resources, including submission and deletion, update, and upload resources. Using this system, we can implement all kinds of online learning and complete the learning task independently. The effectiveness of each subsystem is described as follows:

(1) Teacher lesson preparation subsystem: the system integrates the mainstream multimedia creation and production tools at this stage. It provides sufficient convenience for teachers and network instructional design. After all kinds of teaching resources generate web files, they are transferred to the fixed directory of the server.

(2) Teaching live subsystem: the system uploads the teaching material to the server in time. It then uses encoder software to encode and compress the live video and audio signals to obtain the streaming media files. These are transmitted to the network by the server, and the students in the client can use the live connection to watch teaching.

(3) University teaching subsystem: the process of teacher’s course teaching is real-time shot by using the digital camera. The unique video editing program is started, and the audio and video in the camera are transmitted to the server through the interface to generate streaming media files. The students select the teaching video in the classroom on demand using the particular video player on the client to complete the learning task.

(4) Courseware download subsystem: the teacher transfers to the administrator interface through identity authentication. The teacher transfers the prepared courseware to the fixed directory of the server by using the courseware upload function. Students can click the link of courseware on the main page and enter the download interface to realize full autonomous learning.

(5) Online examination subsystem: after the students log in to the system, they can choose the test items and types. The system will automatically select any test questions from the database to form the test paper. After the students have answered all the questions, click to hand in the paper. The system will automatically approve and get the examination results.

(6) Tutoring and answering subsystem: the system can provide an online interactive platform for teachers
and students. Students can ask questions to teachers, and teachers can answer questions in real time. It can also publish typical questions on the web page, which truly shows the effectiveness of counseling and answering.

(7) Job management subsystem: teachers use bulletin boards to publish homework on the internet. After students finish their homework, they use the system’s e-mail to transmit it to the teachers’ mailbox in the e-mail mode. The teacher completes the homework approval and sends it to the student e-mail.

(8) Teacher studio subsystem: the system can organize and protect teaching resources. After teachers log in to the system, they add, delete, upload, and update all kinds of teaching resources.

The above is the composition of the higher education system. The specific hardware structure of the higher education system is as follows.

3.1.1. Collector Design. The st8735 chip produced by SD Company is selected. The chip has a high sampling capacity and can collect 8 channels of data at the same time. The maximum sampling rate of the collector is 460 kbps, the maximum total sampling speed is 1492 kbps, and the sampling conversion accuracy is 8 bits. It can collect a large capacity of teaching-related data [6]. In the signal conditioning and filtering circuit design of the collector, the sampling signal is regulated to the standard range through the voltage sensor. In order to ensure that the sampling signal does not appear crosstalk, the processed sampling signal needs to be filtered. In the overall evaluation system of internet education quality in colleges and universities, each kind of cycle sampling is 128 points, and the sampling frequency is controlled at 10.6–14.8 kps. In order to improve the accuracy of the collected teaching-related data, it is necessary to measure the 25th harmonic in the evaluation system, as shown in Figure 2. It is the signal conditioning and filtering circuit diagram of the collector.

The collector can get a voltage signal of 1–8 V. The diode in Figure 2 is mainly used to protect the power supply voltage, and the sensor in Figure 2 can prevent crosstalk [7].

3.1.2. Microprocessor Design. The sampling rate of the overall evaluation system of internet education quality in colleges and universities can reach 4 GBPS. The microprocessor needs to have high data processing ability and realize multichannel control, teaching-related data transmission, and acquisition control. Based on the above conditions, the microprocessor selected in this paper is the latest generation processor launched by Samsung. The chip of the microprocessor is a high-performance processing chip launched by the Samsung company. The chip has a dual-core structure, and its core frequency can reach up to 450 MHz, which can be used to calculate a large number of teaching-related data [8]. The structure of the microprocessor is shown in Figure 3.

In Figure 3, the microprocessor has abundant internal memory resources and a data cache structure. It can serve data input, processing, and control and provide fast teaching data sharing for the education quality evaluation system. The microprocessor also has 256 kB on-chip RAM and many peripherals. It has six UART interfaces, four SPI interfaces, and six USB interfaces. In addition, two 32-bit universal timers are set outside the microprocessor. Many interfaces can facilitate data transmission. The voltage of the microprocessor is stable, 1.8 V. The interface voltage of various external interfaces is 1.2 V. The power consumption is 2 MW in the sleep mode and 500 MW in normal operation. It can process the teaching data collected by the collector in real time and has strong teaching-related data processing ability and control ability [9–11].

3.1.3. Memory Design. Tiy73465 chip produced by TI company is selected as the memory chip. The chip can integrate large-capacity data, store data, and provide dual bus configuration, efficiently completing the dual computer communication function. Arbitration logic is set in the memory. The memory can read and write any dual-port address at any time. The memory circuit diagram is shown in Figure 4.

There are address decoding circuits and data control circuits in the memory, which need to be connected with the CPU of the memory. It can be seen from Figure 4 that the teaching data attributes and data address stored in the
3.1.4. Evaluator Design. The core of the evaluator is a microprocessor. The highest frequency of the crystal oscillator is 18.325 MHz, which can be divided into CPU. The lowest frequency of the crystal oscillator is 12.346 kHz. The evaluator can work at 200 MHz with low power consumption and simple use. It has 45 interrupt sources and 120 I/O ports. The power circuit of the memory can provide working voltage for each piece of hardware of the evaluator. The voltage of the power circuit is controlled between 1.3 V and 3.3 V, and the maximum power of the circuit is 1.2 W. Because the evaluator is equipped with a microprocessor and memory, the power supply circuit adopts two power supply modes. One is to supply power to the microprocessor through an 8 V DC power supply. The other is to supply power to the memory through a 4 V AC power supply. Network power supply mode can also be used. This power supply mode converts AC voltage into DC voltage through the Internet. The peripheral memory of the evaluator can assist the memory of the evaluation system to store some teaching data, mainly responsible for the storage of some missing teaching-related data.

4. Internet Education Quality Evaluation Using Regression Algorithm

In this section, we demonstrate various components of quality evaluation of internet education in colleges and universities using regression algorithm.

4.1. Grey Prediction Model of Internet Education Quality in Colleges and Universities. Grey prediction model needs less modeling information, convenient operation, and high modeling accuracy. It is widely used in various prediction fields and is an effective tool to deal with small sample prediction problems. Therefore, its application to the quality evaluation of college internet education can predict the characteristic quantity of college internet education quality at a certain time in the future.

Step 1. Set the original sequence \( x^{(0)} = (x^{(0)}_1, x^{(0)}_2, \ldots, x^{(0)}_n) \). Generally, the processing method of one-time accumulation generation \( X^{(0)} \) of the sequence is adopted [14], i.e., 1-AGO,

\[
X^{(1)} = \begin{pmatrix} x^{(1)}(1), x^{(1)}(2), \ldots, x^{(1)}(n) \\ x^{(0)}(1), x^{(1)}(1) + x^{(0)}(2), \ldots, x^{(1)}(n-1) + x^{(0)}(n) \end{pmatrix}.
\]

(1)

Step 2. The grey prediction model is a dynamic mathematical model composed of a single-variable first-order differential equation:

\[
x^{(0)}(k) + az^{(1)}(k) = b.
\]

(2)

\( k = 1, 2, 3, \ldots, n \), the sequence \( x^{(1)} \) is generated employing the nearest neighbor, and \( z^{(1)}(k) = 0.5[x^{(1)}(k) - x^{(1)}(k-1)] \); get

\[
z^{(1)}(k) = \begin{pmatrix} z^{(1)}(2), z^{(1)}(2), \ldots, z^{(1)}(n) \end{pmatrix}, \quad k = 2, 3, \ldots, n.
\]

(3)

Step 3. The whitened equation (shadow equation) of the dynamic mathematical model in the above Step 2 is

\[
\frac{dx^{(1)}}{dt} + ax^{(1)} = b.
\]

(4)
Among them, \( a \) is the development grey number, and \( b \) is the endogenous control grey number. The effective interval of \( a \) is \((-2, 2)\). The least square method is used to solve the parameter sequence \( \tilde{a} = (a, b)^T = (B^T B)^{-1} B^T Y \). 

\[
\tilde{a} = (a, b)^T = \left(B^T B\right)^{-1} B^T \cdot Y_n.
\]

(5)

Among them, \( B = \begin{pmatrix} -1/2(x^{(1)}(1)+x^{(1)}(2)) & 1 \\ -1/2(x^{(1)}(2)+x^{(1)}(3)) & 1 \\ \vdots & \vdots \\ -1/2(x^{(1)}(n-1)+x^{(1)}(n)) & 1 \end{pmatrix} \), and \( Y_n = [x^{(0)}(2), x^{(0)}(3), \ldots, x^{(0)}(n)]^T \).

**Step 4.** Determine the time response data sequence of the grey prediction model as follows:

\[
\tilde{x}^{(1)}(k+1) = \left[ x^{(0)}(1) - \frac{b}{\alpha} \right] e^{-\alpha k} + \frac{b}{\alpha}
\]

(6)

**Step 5.** Calculate the simulated value \( x^{(1)} \) of the model:

\[
\tilde{x}^{(1)}(1), \tilde{x}^{(1)}(2), \ldots, \tilde{x}^{(1)}(n) = (x^{(0)}(1), x^{(0)}(1) + x^{(0)}(2), \ldots, x^{(0)}(n-1) + x^{(0)}(n)).
\]

(7)

**Step 6.** Restore the analog value:

\[
\tilde{x}^{(0)}(k+1) = \tilde{x}^{(1)}(k+1) - \tilde{x}^{(1)}(k).
\]

(8)

**Step 7.** Check the error. In order to ensure that the grey prediction mathematical model has high prediction accuracy and credibility, the mean square error ratio is introduced. Generally, the smaller the values of \( e^{(0)}(k) \), \( S_x \), and \( C \) and the larger the value of \( P \), the better the accuracy of the model. When the grey number is \( a \in [-0.3, 2] \), the prediction accuracy of the first step is more than 98%, and the prediction accuracy of the second and fifth steps is more than 97%, which can be used for medium- and long-term prediction.

\( C = S_y/S_x \) is the ratio of mean square deviation. For given \( C_0 > 0 \), when \( C < C_0 \), the model is called the qualified model of the ratio of mean square deviation; \( P = P(Iq^{(0)}(k) - \bar{Q}) < 0.6745S_x \) is called the small error probability; for given \( P_0 > 0 \), when \( P > P_0 \), it is called the small error probability qualified model.

4.2. Evaluation Rules of Education Quality Based on Logistic Regression. Using logistic regression technology to formulate the overall evaluation rules of education quality needs to take one of the two values of response probability modeling. Therefore, assuming that the random variable of the kth overall evaluation of education quality is \( X_k \) and the probability of the existence of education quality is \( P \), the relationship between probability \( P \) and random variable \( X_k \) of the overall evaluation of education quality is as follows:

\[
P = P_r \left( Y = 1 \left| X_1 = x_1, \ldots, X_n = x_n \right. \right) = \frac{e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n}}{1 + e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n}}.
\]

(9)

where \( Y \) is the response variable; \( n \) is the total quantity of education quality, namely, \( n = \{1, 2, \ldots, k, k+1, \ldots, n\} \); and \( \beta_0, \beta_1, \beta_2, \ldots, \beta_n \) is the nonlinear parameter of the overall evaluation of education quality.

In (9), the overall evaluation parameters of education quality are nonlinear and need to be linearized by logit transformation:

\[
g(x_1, \ldots, x_n) = \log \left( \frac{P}{1 - P} \right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n,
\]

(10)

where \( g \) is the logit transformation. According to formula (2), when evaluating the operation parameters of education quality, there is a probability of education quality \( P \) for each parameter. The \( P \) values obtained are connected by time series in the coordinate system, and the probability of the education quality occurrence of each parameter can be obtained.

The above calculation process is transformed into a compiler to complete the formulation of the overall evaluation rules of education quality.

4.3. Preidentification of Different Types of Education Quality. According to the established database of overall evaluation rules of education quality, the preidentification model of education quality is established in the system. Assuming that the probability of the occurrence of education quality obtained by formula (9) is \( P \), the time series generated is \( \{t_1, t_2, \ldots, t_i, \ldots, t_n\} \), which is also the input series for evaluating education quality, in which \( i, n \) represents the prediction point of the time series. The initial value of system preidentification education quality is \( b \). Then, the model embedded in step \( P \) of \( m \) dimension is as follows:

\[
y_{n \to P} = \sum_{i=1}^{n-m} (a_i - a_i^*) K(t_i, t_{n-m+p}^*) + b,
\]

(11)

where \( K \) represents the number of model training; \( a_i \) represents the \( i \)th sample of the identification of the quality of education; \( a_i^* \) is multiple identification samples representing the quality of the first education; and \( t_{n-m+p}^* \) is the true value of the \( n \)th data, and \( t_n \) represents the predicted value of the \( n \)th data.

So far, the quality evaluation method of internet education in colleges and universities has been completed. Through the hardware and software design of the system, teachers can focus more on their curriculum arrangement or scientific research, writing teaching plans. They can very effectively complete the assignment, correction, and feedback of classwork. They can make the students’ information access mode more convenient and campus life become diversified and professional to improve the efficiency and quality of learning.
5. Experimental Analysis

In order to verify the practical application of this method, simulation experiments are carried out. The experiment is divided into two stages: preparation and experimental process. There are many variables during the experiment, and the specific variable diagram is shown in Figure 5.

In the experimental stage, 60 students from a certain university were selected as the test targets. Three groups of experiments were carried out. In terms of gender ratio, the proportion of men and women was half. Before the experiment, the students are tested to ensure the validity of the data. After completing the pretest, 60 students were divided into three groups, using [1, 15] in the literature and this method for practical teaching. Combined with the measurement of the scale, the learning effect of different groups of students was counted. The test platform is shown in Figure 6.

The software and hardware environment of the test platform of the system is shown in Table 1.

The teaching behavior designed in this paper is shown in Table 2.

Based on Tables 1 and 2, the response time of [1, 15], and the method operation in this paper is counted and analyzed. It is regarded as the response time of the system. The response time results of the three methods are shown in Table 3.

According to Table 3, when the three methods are controlled to handle the same operation at the same time, the response time of the method in document [1] is about 5.5 sec. The response time of the system is the longest; the response time of the method in [15] is about 5.2 sec. The response time of the system is longer. The response time of this method is about 1.3 sec, and the response time is the shortest, and the application performance is the best.

Taking the analysis results of the education quality evaluation index as the database, the paper selects [1, 15] and the proposed method to test the probability of the system accident. The less the probability of the accident occurrence, the better the evaluation stability. The test results are shown in Figure 7.

As can be seen from Figure 7, under the time limit, the accident probability of the designed education quality evaluation system is less than the existing methods. The
average accident probability is low, and the operation stability of the evaluation system is better, which can be applied to practice.

6. Conclusion

Despite the rapid development of information network technology, its application in education lags. Educational technology is only “computer + network,” and the improvement of education quality and effect evaluation is the most important. Therefore, this paper constructs an evaluation method of university internet education quality based on a regression algorithm. This paper constructs the education quality evaluation system and establishes the overall evaluation rules of education quality based on logical regression. It preidentifies different types of education quality and completes the evaluation of university internet education quality.

In future research, we should actively use internet thinking and strengthen the supervision, tracking, and management of students’ learning. It is only possible through online and offline linkage, strictly enforcing examination discipline. By providing personalized learning services according to students’ individual needs, students are encouraged to manage independently. It cultivates students to become professional talents with subject consciousness and family feelings.

Data Availability

The datasets used and/or analyzed during the current study are available upon request to the author.

Conflicts of Interest

The author declares that he has no conflicts of interest.

Acknowledgments

This research was supported by the Subject of the 13th Five-Year Plan of Shaanxi Education Science in 2018, the Reform and Exploration of the Teaching Mode of Mathematics Education for Preschool Children under the Background of the Integrated Curriculum (SGH18H303).
References

[1] Y. Feng, "An evaluation method of PE classroom teaching quality in colleges and universities based on grey system theory," *Journal of Intelligent and Fuzzy Systems*, vol. 38, no. 6, pp. 1–12, 2020.

[2] D. Li, "Research on innovation and entrepreneurship of business education in colleges and universities based on computer big data mining technology," *Journal of Physics: Conference Series*, vol. 1744, no. 3, Article ID 032053, 2021.

[3] G. Q. Zhang and J. Wang, "Quality evaluation of Ideological and political education for college students in the internet plus era," *Ideological and Political Education Research*, vol. 35, no. 1, pp. 140–143, 2019.

[4] S. Lu, H. Guyun, Q. Wang, J. Wang, W. L. Zhao, and H. G. Lu, "Construction and practice of classroom teaching quality evaluation system in colleges and universities under internet plus perspective," *China Information Technology Education*, vol. 2, no. 7, pp. 106–108, 2019.

[5] L. Jing, "Research on the quality evaluation of Ideological and political education in colleges and universities under the new era of big data," *Journal of Social Science of Jiamusi University*, vol. 38, no. 2, pp. 176–180, 2020.

[6] Y. F. Peng, Y. F. Liu, and K. F. He, "The teaching quality evaluation method of university teacher based on VPMCD," *Jiaoyu Jiaoxue Luntan*, vol. 5, no. 35, pp. 67–69, 2019.

[7] W. Q. Xia, G. Wang, and C. Du, "A study on the teaching quality monitoring and evaluation system in higher education institutions under the era of "internet +"," *Journal of Anhui Vocational College of Metallurgy and Technology*, vol. 30, no. 1, pp. 50–52, 2020.

[8] X. M. Gao and G. H. Zeng, "Research on the evaluation system of practical teaching quality in higher vocational colleges–reconstruction of index system based on internet platform," *Modern Vocational Education*, vol. 11, no. 32, pp. 202–204, 2019.

[9] Y. P. Chen, "Construction of teaching quality evaluation index system of MOOC and SPOC integration under the "Internet plus" environment in higher vocational colleges," *Vocational & Technical Education Forum*, vol. 6, no. 7, pp. 64–72, 2019.

[10] S. Z. Zhang, "Problems and Strategies of classroom teaching in colleges and universities under the background of "internet plus education"," *Inner Mongolia Coal Economy*, vol. 306, no. 13, pp. 227–228, 2020.

[11] X. F. Hong, "Positioning students: the enlightenment of American teaching evaluation to Chinese university teaching evaluation," *Journal of Hunan University of Science and Engineering*, vol. 40, no. 12, pp. 102-103, 2019.

[12] Z. H. Wang, "Research on the construction of "student centered" teaching ecology of higher vocational education in the context of new era," *Journal of Taiyuan Urban Vocational College*, vol. 212, no. 3, pp. 108–110, 2019.

[13] Z. Lu, "Research on the internal control system and evaluation of universities under the "internet plus""," *Guangxi Quality Supervision Guide Periodical*, vol. 233, no. 5, pp. 59-60, 2020.

[14] Q. Q. Yang and X. S. Zhang, "Research on the quality evaluation method of college english precision teaching under the background of big data," *Journal of Liaoning Institute of Science and Technology*, vol. 22, no. 5, pp. 59–65, 2020.

[15] J. Zhang and X. Li, "Impact of public health emergencies on the comprehensive education of medical students in colleges and universities from the perspective of narrative medicine," *Revista Brasileira de Medicina do Esporte*, vol. 27, no. spe, pp. 31–33, 2021.