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Application of Big Data in English Teaching Evaluation and Feedback System

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With the rapid development of information technology, big data has become a hot topic in the field of education. In English teaching, an evaluation and feedback system is key to improving teaching quality. This study explores the use of big data technology for the evaluation and feedback system of English teaching, with a view to improving teaching efficiency and students' learning effectiveness. First, the feasibility and necessity of big data technology in English teaching evaluation were determined through a literature review and analysis of existing systems. Second, a prototype of a big data-based English teaching evaluation and feedback system was designed and implemented, comprised of a model for grammatical error recognition and scoring, a model for predicting students' English proficiency development, and a model for implementing a feedback mechanism. Specifically, a neural network model was constructed using RNN, which is able to process time-series data to implement the grammatical error recognition kernel scoring. A prediction model of students' English proficiency development is a support vector machine (SVM) used to predict students' general English proficiency level, Y. Finally, a real-time feedback model based on Item Response Theory (IRT) was implemented using a dynamic adaptive strategy. Finally, the teaching and learning data before and after the use of the system were collected and analyzed through an experimental study. Results indicated that the English teaching evaluation and feedback system based on big data has a positive effect on college students' learning of English. The proposed system not only improves their learning outcomes, but also helps to stimulate learning motivation, change learning attitudes, and obtain better results at different knowledge points. The findings of this study demonstrate that big data technology can effectively integrate and analyze teaching evaluation information and provide teachers with real-time, personalized feedback.

Keywords: big data, English language teaching, evaluation and feedback

1. INTRODUCTION

In today's era of rapid information technology development, big data technology, with its incomparable advantages and far-reaching influence, has become an important engine for innovation, upgrading and changing many aspects of industries around the world [1]. In the field of education, especially in regard to the teaching of English, which has become the international language central to globalization [2], how to skillfully and effectively use big data technology to optimize the teaching process, improve the quality of teaching, and carry out major changes to the traditional evaluation and feedback mechanism, has gradually become a major topic of concern and for both academics and practitioners, requiring solutions as a matter of urgency. Given the importance of English as an indispensable language tool for international communication and cooperation, the effectiveness of English teaching directly affects students' language acquisition, and also has a bearing on the students' cultivation of a number of other skills, and the improvement of teachers' pedagogical effectiveness [3].

Teaching evaluation involves the scientific measurement of students' learning processes and academic outcomes. The evaluation consists of the assessment of students' mastery of knowledge, skills and the degree of achievement of the course objectives, and also examines non-cognitive abilities such as learning attitudes, methods and habits. Through objective and fair evaluation, teachers obtain a better understanding of

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the learning status and progress of each student, providing accurate data support for subsequent teaching design and improvement. An effective feedback mechanism is the key to improving the quality of teaching [4]. Timely and accurate feedback can help students recognize their own strengths and weaknesses, encouraging them to reflect on their own learning behavior and adjust their learning strategies accordingly. Real-time feedback helps to address learning difficulties and guide students to learn from their mistakes, thus accelerating the learning process and improving learning efficiency. Teaching evaluation and feedback are also important tools that can be used by teachers to improve teaching.

Currently, in all aspects of English teaching practice, we are faced with the problem of a relatively homogenized and incomplete evaluation system. Generally speaking, the existing assessment methods focus too much on the summative assessment of students' learning outcomes, ignoring the important role of formative assessment. Although summative assessment can reflect students' stage-by-stage learning outcomes, it is unable to reveal in real time and in detail the difficulties, points of progress, and potential room for growth of their abilities in the whole learning process [5]. At the same time, the traditional feedback mechanism has obvious limitations in terms of real-time information collection, accuracy of data processing, and personalization of feedback content, making it difficult to address the diversified and dynamic learning needs of each student in the modern educational environment.

The aim of this study is to conduct an in-depth exploration, and empirically verify, the feasibility of applying big data technology to construct a new type of English teaching evaluation and feedback system [6]. Firstly, after systematically and comprehensively examining the relevant literature, we outline the theoretical framework and development trend of big data technology in the field of educational evaluation, so as to demonstrate its reasonableness and urgency in the evaluation of English teaching. Secondly, combining the characteristics of big data technology, a set of prospective and practical English teaching evaluation and feedback system prototypes are carefully designed and implemented. By exploring their application in actual teaching scenarios, we found that big data technology can achieve the deep mining and intelligent processing of the teaching data, thereby improving the decision-making and management related to teaching and learning. Finally, by means of rigorous comparative experiments and data analysis methods, we scientifically assess the actual impact and mechanism of this new evaluation and feedback system in improving teaching efficiency and improving students' academic progress [7].

The innovations proposed in this study are: An English teaching evaluation and feedback system is constructed based on big data technology. To the best of our knowledge, this study is the first to integrate big data technology into the English teaching evaluation system, and to design a comprehensive and accurate prototype of an English teaching evaluation and feedback system. The system is able to collect and process a large amount of student learning data in real time and conduct in-depth analysis through intelligent algorithms, providing teachers with a scientific basis for teaching-related decision-making, while giving students personalized and timely learning feedback. 2. Identification of Grammatical Errors and Scoring Using RNN Models: In the area of grammatical error identification and scoring, the innovative use of recurrent neural networks (RNN) is used to construct a sequence annotation model, which effectively It solves the shortcomings of traditional methods in processing time-ordered linguistic data, realizes the accurate capture and quantitative assessment of students' grammatical errors in written expressions, and significantly improves the objectivity and accuracy of evaluation [8]. This system uses a dynamic adaptive feedback mechanism combined with item response theory (IRT) to provide targeted feedback based on students' immediate learning performance, and uses support vector machines (SVM) to establish a predictive model for students' English proficiency development and estimate the trend of students' future learning progress, thereby providing guidance for teachers to adjust teaching strategies and students to optimize their learning paths.

2. LITERATURE REVIEW

Under the current informatized education environment, the wide application of big data technology provides new perspectives and possibilities for the reform of English teaching evaluation and feedback systems. This section provides a literature review of the research on the application of big data in the evaluation and feedback system of English teaching, exploring its theoretical basis, practice mode.

With the increasing maturity and wide application of big data technology, its value in the field of education has gradually become widely recognized by academics and practitioners [9]. The core advantage of big data lies in its ability to acquire, integrate and deeply analyze massive, multidimensional teaching data in real time, a feature that has completely changed the operation of the traditional education evaluation system [10]. In English teaching, big data is no longer limited to the recording of students' single test scores; it is also able to comprehensively track and analyze students' learning behaviors, progress trajectories, and interactive activity data in all aspects of listening, speaking, reading and writing [11]. Hu [12] pointed out that big data has enabled educational evaluation to shift from a summative, result-oriented assessment model to a new process-oriented, development-oriented evaluation mechanism. By analyzing the learning process mapping generated by big data, teachers can acquire a deeper understanding of the specific difficulties, progress and potential developmental needs of each student in the process of language acquisition, and then provide more targeted teaching interventions and personalized learning paths [13]. The research of Li [14] further validates the positive role of big data in English language teaching. They found that the use of big data analysis tools can reveal the learning patterns and knowledge structures hidden behind a large amount of teaching data, help teachers pinpoint the shortcomings of their students' language skills, and accordingly formulate fine-tuned teaching plans and personalized feedback strategies. In addition, big data can

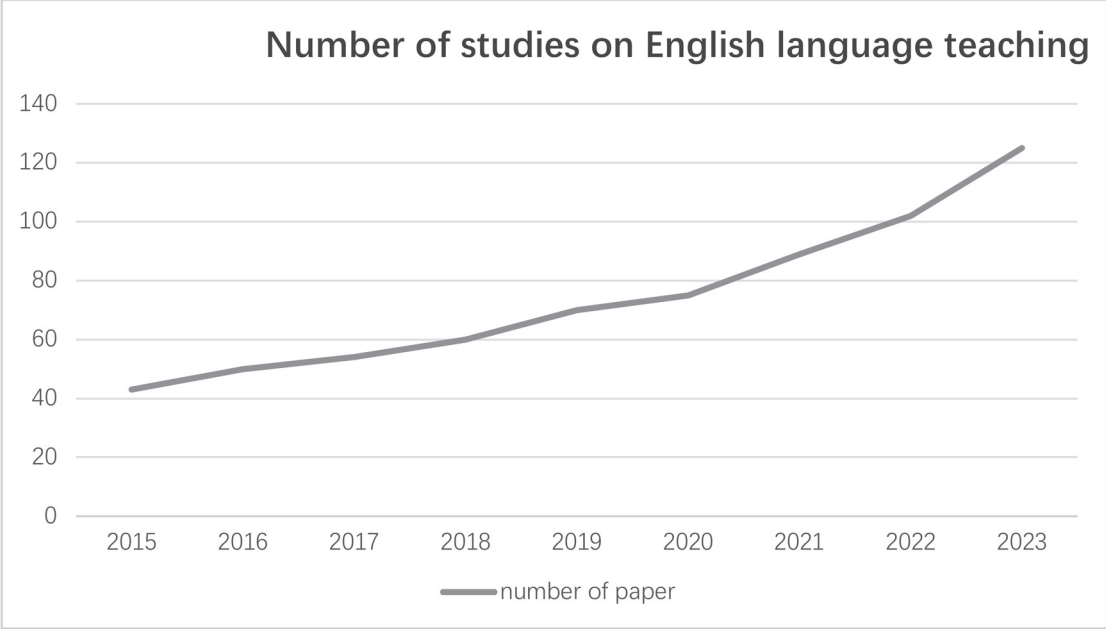

Figure 1 Changes in the number of English-related references.

also help to monitor and improve teaching quality, promoting the optimal allocation of educational resources and improving teaching efficiency through the quantitative assessment of the effects of different teaching methods and strategies [15]. At the same time, Liu [16] reminds us that when applying big data technology to the evaluation of, and feedback for, English language teaching, close attention should be paid to the ethical issues associated with the data, as well as the validity and reliability of data analysis results. Only by ensuring the authenticity and completeness of the data sources, and combining the judgment of professional and experienced teachers, can we truly realize the great potential of the big data-driven intelligent teaching system in improving the quality of English teaching, cultivating students' independent learning ability, and adapting to the future needs of society.

Scholars have conducted in-depth investigations into the application of big data in English teaching assessment and personalized feedback, and have made a series of important findings. For example, in the assessment of writing ability, Liu and Zhang's study [17] used an intelligent correction system to analyze a large amount of data pertaining to students' written work, revealing subtle differences and common problems in individuals' use of grammatical structure, vocabulary richness, and accurate use, which provided teachers with a refined basis for evaluation that goes beyond traditional manual correction. Liu [18] focused on user behavior data on online learning platforms, and through the deep mining of students' interaction behaviors in multiple dimensions, such as reading time, completion of exercises, and participation in discussions, it is able to more comprehensively assess students' reading comprehension, knowledge mastery, and self-directed learning habits. These studies show that big data-based analysis can effectively capture learning process indicators that are difficult to observe by traditional means, thus improving the educational evaluation system. Mao and Zhang [19] pointed out the significant personalization advantages of big data-driven feedback systems for English language teaching. Such systems are able to track and analyze data on each student's performance in a variety of teaching and learning activities in real time, generating immediate feedback that addresses his or her specific needs and weaknesses. In addition, some of the adaptive learning systems mentioned in Miao's study [20] make use of advanced big data algorithms to dynamically monitor students' performance in vocabulary memorization, listening training, speaking practice, and other tasks. Based on the results of real-time data analysis, they automatically adjust the course content and recommend personalized learning resources, realizing precise guidance and efficient interactive feedback. However, although big data technology has shown unprecedented potential in optimizing English teaching evaluation and feedback, it still faces multiple challenges in terms of actual application. First, data privacy and security are key issues that cannot be ignored [21], and the collection, storage, and use of educational data must comply with legal requirements so as to ensure the safety and security of personal information. Secondly, the extraction of valuable information from a massive amount of complex educational data and transforming it into teaching strategies that are easy to understand and implement is also a difficult task [22]. The number of English-related references is shown in Figure 1.

Finally, we must remember that too much reliance on technological means and quantitative data, may lead to the educational community deviating from the concept of humanistic education, and overly pursuing the quantifiable improvement of performance at the cost of ignoring students' subjective feelings, emotional experiences, and the need for holistic development. Therefore, when constructing and improving the evaluation and feedback system of English teaching based on big data, it is necessary to strike a balance between technological progress and humanistic care in education, and ensure that technology serves the essential

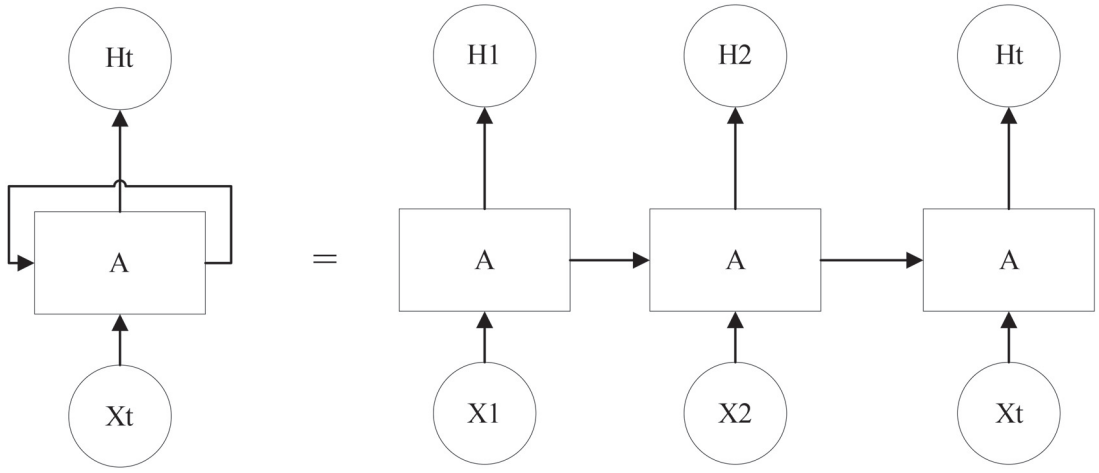

Figure 2 Neural network structure.

goal of education. In conclusion, the application of big data in English teaching evaluation and feedback systems has made significant progress, but further exploration and improvement are still needed.

3. PROTOTYPE OF A BIG DATA-BASED EVALUATION AND FEEDBACK SYSTEM FOR TEACHING ENGLISH AS A FOREIGN LANGUAGE

3.1 Data Sources

Data acquisition is a crucial first step in the design and implementation of a prototype of an English teaching evaluation and feedback system based on big data technology. The system is intended to provide real-time, accurate and instructive feedback by collecting, integrating and analyzing a large amount of student learning data to improve the quality and efficiency of English teaching. The system integrates diversified data sources to comprehensively cover the learning process and performance of students. First, it interfaces with various online homework submission platforms and e-testing systems to automatically collect objective data such as students' homework completion and test scores, such as homework submission time, accuracy rate, time spent on answering questions, as well as the distribution of scores on standardized exams and classroom quizzes and students' performance on individual questions. Secondly, in-depth mining of online learning behavior data, the Learning Management System (LMS) monitors students' activity on the course platform, including log-in frequency, online learning hours, video viewing behavior, etc., and records specific information about their activities such as vocabulary memorization, browsing of reading material, interactive games and so on, in the English learning apps or websites. Further, intelligent classroom technology is used to capture students' participation in real classroom environments, combining facial recognition, voice recognition and other means to obtain data such as the number of times that students speak and their degree of concentration. This data is combined with teachers' subjective assessment of students' participation in classroom activities such as group work and role-playing, forming a three-dimensional understanding of students' level of engagement in the classroom. In addition, to monitor students' independent learning process, the Adaptive Learning System tracks their individual learning paths, identifies difficulties and records self-regulated learning strategies, as well as statistics on their individualized access to extracurricular supplementary resources, such as e-library borrowing records, online literature access, and so on. Finally, the system also regularly monitors students' learning needs, interests and areas of difficulty by means of questionnaires and feedback mechanisms to guide teaching improvement, and collects highly subjective information on students' self-perception and mutual evaluation through peer and self-assessment to give teachers a better understanding of students' learning status [23, 24].

3.2 Grammatical Error Recognition and Scoring Models

We use recurrent neural networks to construct a sequence annotation model; the neural network structure we use is shown in Figure 2. It is intended to accurately identify and quantify students' grammatical errors in writing. First, we convert students' written sentences into a sequence of word embedding vectors $E = (e_1, e_2, \ldots, e_n)$, where each e_i represents a low-dimensional feature vector of the corresponding word. These word embedding vectors are obtained using pre-trained word embedding models such as the Word2Vec technique. Specifically, we choose a word vector model trained by deep learning on a large-scale corpus, which can effectively capture the semantic meanings of words and their relevance in contextual environments, and thus provide strong information support for subsequent grammatical error detection. We use an LSTM network to process these word embedding vectors. LSTM is a special type of RNN that is capable of learning long-distance dependencies and is appropriate for processing sequence data. For each word e_i in the sequence, LSTM updates its hidden layer state h_i by the following formula: $h_i =$

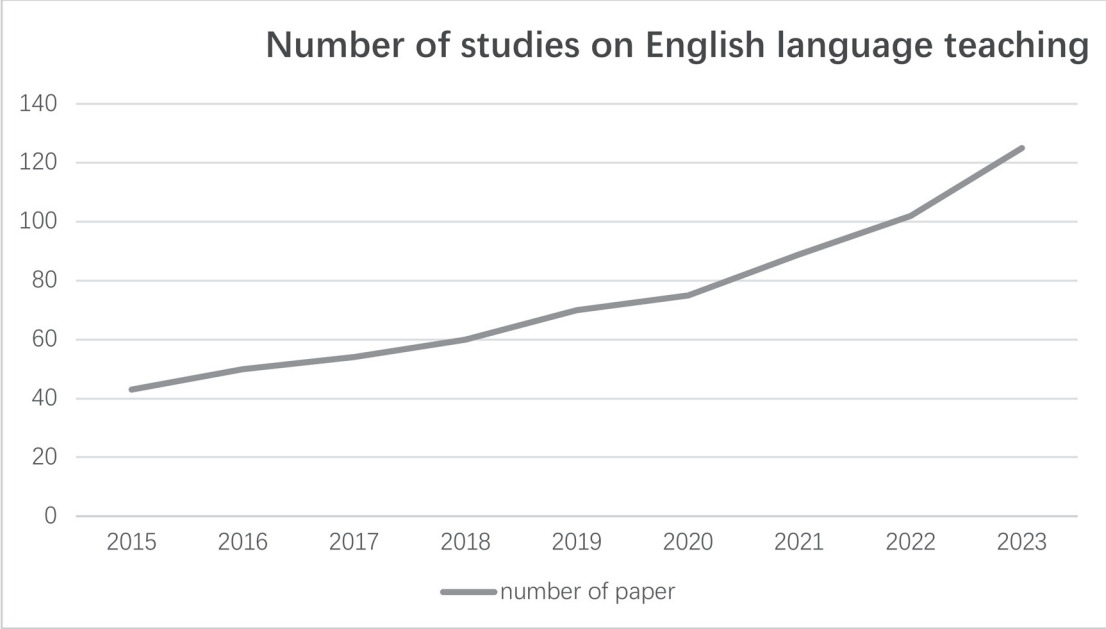

Figure 3 SVM flow

$LSTM(e_i, h_{i-1})$. Then, we use the $softmax$ function to compute the probability distribution of each word's label y_i: $P(y_i|e_i, h_{i-1}) = softmax(W_h h_i + b_y)$, where $W - h$ and b_y are the model parameters, and y_i is the predicted labels of the word w_i, such as "correct", "subject-predicate incongruence", etc. The model is trained by maximizing the joint probability of all the training samples and updating the parameters using a back-propagation algorithm to minimize the cross-entropy loss function:$L = -\sum_{i=1}^{n} \log P(y_i|e_i, h_{i-1})$. In this way, the model is able to learn how to identify various types of grammatical errors in students' writing and grade them accordingly. This not only helps teachers to quickly and accurately assess students' writing level, but also provides students with specific suggestions for improvement and promotes their language proficiency. We can also extend the model to more complex tasks, such as identifying the severity of different error types and weighting the scores according to the impact of the errors. This will make the evaluation more detailed and personalized, and better meet the needs of teaching and learning. As the model continues to be optimized and trained, we expect it to play a greater role in actual teaching and learning [25].

In addition, we have constructed a prediction model for students' English proficiency development, which is a support vector machine (SVM) in order to predict students' comprehensive English proficiency level Y. The specific application of SVM is shown in Figure 3.

In SVM, the central goal is to determine an optimal hyperplane, which is represented as a straight line in two dimensions and as a hyperplane or hypersurface in higher dimensional spaces. This hyperplane maximizes the spacing between sample points of different classes. For non-linearly differentiable datasets, we map the original feature space to a higher dimensional space via kernel function mapping, making the samples linearly differentiable in the new space. The formula for the prediction hyperplane $w^T x + b = 0$ of linear SVM, w is the normal vector of the hyperplane, which represents the weights of the features, x is the input feature vector, and b is the offset term, which determines the position of the hyperplane. When dealing with nonlinear problems, we introduce the kernel function (K(x,x')), which is able to convert the inner product in the low-dimensional space to the inner product in the high-dimensional feature space. The decision function of the nonlinear SVM can be expressed as: $f(x) = \sum_{i-1}^{N} \alpha_i y_i K(x_i, x) + b$. Where N is the number of training samples. $y_i$is the label of the ith training sample (usually takes the value +1 or -1 in binary classification problems). α_i is the Lagrange multiplier, which reflects the contribution of each training sample in the decision function. $K(x_i, x)$ is the kernel function, which specifically $K(x, x') = \exp\left(\frac{\|x-x'\|^2}{2\sigma^2}\right)$ measures the similarity between the samples x_i and the new sample x in the high-dimensional space. B is the bias term. The goal of training an SVM is to solve the Lagrange multiplier α_i and the bias term b by an optimization algorithm, such as gradient descent, in order to obtain a maximally spaced support vector solution [26].

In practice, before building an SVM-based model for predicting students' English proficiency, the data need to be thoroughly preprocessed. Then, appropriate kernel functions and their parameters (e.g., regularization parameter C and kernel parameter γ) are established. Then the training set is used to train the model and subsequently test it to determine its level of performance. In this way, we will be able to ascertain students' English proficiency and provide data to support educational interventions.

3.3 Implementation of Feedback Mechanisms

Based on students' real-time proficiency assessment results, the Intelligent Teaching System adopts a dynamic adaptive strategy to customize a personalized learning path for each

student. The system integrates a variety of advanced educational technologies and analytical models to generate a real-time learning report indicating the current state of the student's English proficiency and recommending the next stage of learning accordingly.

For the assessment of knowledge mastery at various points, the system applies the item response theory, a sophisticated psychometric tool, to quantify students' knowledge mastery level. Through the formula: $P(s_i|\theta_s, b_j) = \frac{1}{1+e^{-(\theta_s - b_j)}}$. In this way, the system is able to accurately depict the students' proficiency level at each knowledge point. Also, a certain threshold criterion is set so that if a vocabulary word is answerd correctly below a certain percentage of the average, it is marked as a knowledge point to be reinforced. Specifically, in building a vocabulary test score analysis system, we can set up a method to assess the correctness of students' memorization of specific vocabulary words. Assuming that we have a vocabulary test dataset of students S which contains the number of correct answers C_{Si} and the total number of attempts T_{Si} for each vocabulary word V_i, then the correct rate of memorization R_{Si} for that vocabulary word can be expressed with the following formula: $R_{Si} = \frac{C_{Si}}{T_{Si}}$. The system can also set an average correctness rate $\bar{R}$ and a threshold ratio α . If the percentage of students correctly memorizing a vocabulary word V_i is R_{Si} lower than $\bar{R} - \alpha \times \bar{R}$, i.e. $R_{Si} < R^- - \alpha \times R^-$, then the vocabulary word is marked as a point that needs to be reinforced. This system helps teachers to identify students' weaknesses in vocabulary acquisition and provide targeted instructional support. In this way, students can more effectively improve their weak areas in language learning. In order to optimize students' learning strategies, the system builds a model of question-answering strategies based on their performance on various types of questions, and suggests targeted strategies for addressing them. Through in-depth analysis of data such as the number of times students attempted different question types and the frequency of errors, the system can pinpoint the specific question-answering methods that need to be improved, so as to guide students to adjust their learning approach and improve the efficiency of question-answering. In summary, the intelligent feedback mechanism not only provides detailed and real-time personalized chemistry reports; it also dynamically generates highly targeted personalized learning paths and resource recommendations based on students' academic strengths and weaknesses, ensuring that each student can continue to improve his or her English along the most appropriate path [27, 28].

4. EVALUATION AND FEEDBACK SYSTEM FOR ENGLISH LANGUAGE TEACHING

In our carefully constructed English teaching evaluation and feedback system, the integrated English education and evaluation subsystem was born after the model proposed in Section 3 was successfully integrated into the core aspects of the teaching subsystem. This subsystem operates independently and also interacts efficiently with other key subsystems through advanced interface technologies and data exchange protocols, thus jointly promoting the intelligence, integration and personalization of the entire teaching environment.

The English teaching evaluation and feedback subsystem works closely with the course management subsystem to synchronize learning content and progress information in real time. When teachers set new learning tasks or update teaching resources on the course management platform, the evaluation and feedback subsystem can immediately access and combine these data to provide each student with accurate assessment indicators, and generate corresponding practice questions and adaptive tests based on the new content to ensure timely and targeted evaluation. The system is tightly integrated with the student's personal learning profile subsystem for two-way interaction of learning data. On the one hand, it reads historical learning records and individual characteristics from students' profiles as the basis for formulating personalized learning strategies and formative assessment; on the other hand, the system also transmits the results of each assessment back to the personal profiles, dynamically updating the students' learning growth curves and proficiency distribution maps, so that the teacher can intuitively understand the progress trajectory of each student as well as the teaching points that require more attention. The system is also strongly linked with the classroom interaction and activity participation subsystem. In the classroom, teachers use smart devices to collect real-time data on students' speeches, questions, and answers, which are instantly analyzed by the evaluation and feedback sub-system to show students' classroom performance scores in real time, prompting students to actively participate in the discussion and enhancing the vitality of the classroom. At the same time, the system can also provide differentiated evaluation and suggestions for participation in different activity forms (e.g. Group discussion, role-playing), encouraging diversified learning styles. Given the importance of home-school cooperation, the system also interfaces with the parent communication subsystem to send customized reports to parents on a regular basis, so that they can understand their children's learning progress and areas requiring improvement in school, and then work together with the school to help their children's academic development. In order to continuously optimize and iterate the effectiveness of teaching, the Evaluation and Feedback Subsystem is also integrated with the Teaching Research and Quality Monitoring Subsystem. Based on big-data-driven teaching decision support, the system can help teachers identify common problems and trends in the teaching process, provide powerful data support for teaching reforms, and promote the overall improvement of teaching quality. The English teaching evaluation and feedback subsystem is depicted in Figure 4 [29, 30].

In summary, the English teaching evaluation and feedback subsystem, as a key node, not only realizes the fine management and personalized guidance of the English learning process in the internal operation mechanism, but also establishes an intelligent and all-round education ecosystem comprising teaching, learning, evaluation and management through the effective interaction with other teaching subsystems under the global perspective, which enables English teaching to be more scientific, humanized and intelligent.

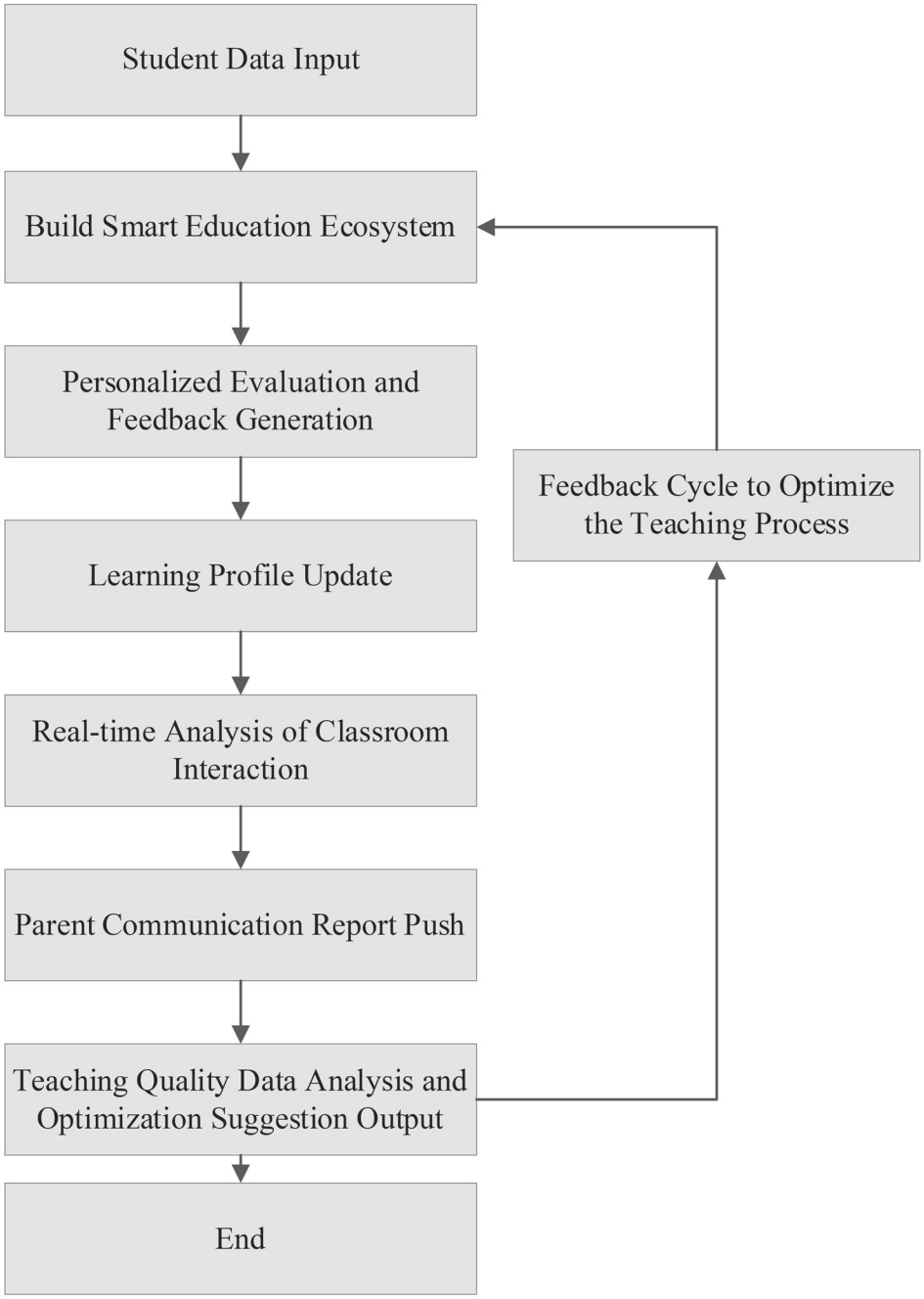

Figure 4 Operational flow of the evaluation and feedback subsystem for English language teaching.

5. EXPERIMENTAL EVALUATION

In this study, university students in different grade levels and with variations in English proficiency, were recruited for out experiments. Twenty classes totaling 1,000 students representing a range of majors, ensuring a broad representativeness, were selected. These students were randomly assigned to the experimental group (using a big data-based English teaching evaluation and feedback system) and the control group (retaining the traditional teaching evaluation) to ensure that the experiment yielded comparable and valid results.

A rigorous experimental study was designed in order to scientifically assess the effectiveness of the practical application of a big-data-based English teaching evaluation and feedback system in university classes. Specifically, the experiment was conducted to determine whether the proposed system improved college students' English learning outcomes, increased their motivation to learn, and changed their attitudes to learning.

For the experiment, firstly, two classes of similar size and English proficiency were selected as samples from different grades in the university, and an experimental group (using a big data-based teaching evaluation and feedback system) and a control group (following traditional teaching methods) were set up; students were randomly assigned to one of the two groups. Prior to the start of the experiment, all participants were required to take an English proficiency test to obtain

Table 1 Comparison of English proficiency test scores before and after the experiment.

Groups	Number of students	Average score on pre-test	Average post-test score	Percentage increase
Experimental group	50	78.2	86.1	10.09%
Control subjects	50	78.5	81.8	4.20%

Table 2 Comparison of changes in learning motivation before and after the experiment.

Groups	Number of students	Pre-test mean motivation score	Mean motivation score on post-test	Trends
Experimental group	50	3.2	3.8	Rise significantly
Control subjects	50	3.1	3.3	Slight increase

Table 3 Comparison of changes in learning attitudes before and after the experiment.

Groups	Number of students	Pre-test mean attitude score	Post-test mean attitude score	Trends
Experimental group	50	3.0	3.5	Significant improvement
Control subjects	50	3.0	3.1	Slight improvement

Table 4 Comparison of differences in mastery levels by knowledge points.

Point of knowledge (math.)	The experimental group's mastery rate increased	Control group mastery rate increased
Grammatical	15%	5%
List of words (e.g. For language teaching purposes)	10%	3%
Reading comprehension	20%	8%
Compose	12%	4%

baseline data and to collect relevant information about their initial motivation and attitudes toward learning. Throughout the experiment, students in the experimental group received real-time personalized learning guidance and feedback using a teaching evaluation and feedback system based on big data technology, while the traditional teaching mode was used with students in the control group, without the big data system.

At the end of the experiment, all students took the same English proficiency test again, and the data on learning motivation and attitudes were again collected in order to compare and analyze the changes in the indicators before and after the experiment. In order to ensure the reliability and validity of the experimental results, we paid close attention to and controlled the potential interfering factors. For instance, we ensured that the two groups of students initially had a similar English proficiency level. Also, we made sure that the experimental group was able to master the use of the system. At at the same time, we controlled for differences in external conditions such as the provision of additional teaching resources or tutoring. Throughout the experimental process, we strictly followed a standardized data collection process, striving for accuracy and consistency and preventing the influence of subjective bias. By means of the statistical comparative analysis of the pre and post-test scores, changes in the learning motivation and learning attitude of students in the experimental group and the control group, we found that the English teaching evaluation and feedback system based on big data improved the English learning outcomes of college students, thus providing strong empirical support for its promotion and optimization in the field of higher education [31].

As can be seen in Table 1, compared with the control group, the experimental group have a more significant increase in their average score on the English proficiency test (10.09% increase) after using the big data-based English teaching evaluation and feedback system, indicating that the system helps to improve the English learning outcomes of university students.

As can be seen in Table 2, by comparing the results of the pre-test and post-test of the learning motivation questionnaire, we found that the learning motivation of the students in the experimental group increased significantly (the average score increases from 3.2 to 3.8), while the motivation of the students in the control group also increased to some extent, but the increase is smaller. This suggests that a teaching evaluation and feedback system based on big data may have a positive impact on students' motivation to learn.

Table 3 shows that, according to the results of the learning attitude survey, students in the experimental group show a significant change in their attitudes toward English learning after the implementation of the proposed Teaching Evaluation and Feedback System, with the average score increasing from 3.0 to 3.5. Conversely, the control group show only a slight improvement. This suggests that the system has the potential to encourage students to develop a more positive and proactive attitude to their learning.

As can be seen from Table 4, the comparative analysis of the mastery level of each knowledge point, indicates that the experimental group has higher mastery improvement in

all the knowledge points examined, especially in reading comprehension and grammar.

6. CONCLUSION

In this study, an innovative prototype system was designed and successfully implemented after an in-depth exploration was conducted of the application of big data technology in English teaching evaluation and feedback systems. The proposed system integrates a grammar error recognition and scoring model, a model for predicting students' English proficiency development, and a model for real-time feedback mechanism, which fully demonstrates the enormous potential of big data technology to improve teaching quality and learning effectiveness. We constructed a sequence annotation model. Meanwhile, a prediction model of students' English proficiency development was built using a support vector machine (SVM), which can accurately predict the development trend of students' overall English proficiency. The real-time feedback model adopts dynamic adaptive strategies and Item Response Theory (IRT), which realizes personalized and real-time teaching feedback, helps teachers make targeted teaching adjustments according to students' learning status, and helps students understand their strengths and weaknesses in time to optimize their learning strategies. The experimental study demonstrated that the application of the proposed English teaching evaluation and feedback system based on big data significantly improves the English learning outcomes of college students, and can stimulate learning motivation, improve attitudes to learning, and improve the mastery of each knowledge point. This strongly proves the advantages of big data technology in integrating and deeply analyzing teaching evaluation information, which provides strong support for achieving more effective teaching and better learning outcomes.

However, this study also has certain limitations. For example, although the system has achieved significant results in English language teaching, the application and promotion of the system in interdisciplinary fields and at different levels of education still need to be further explored and improved. In addition, the handling of large-scale complex teaching data more efficiently and an in-depth exploration of the learning laws behind the data, are technical issues that need to be addressed in the future.

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