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Research Article

Research on the Role of Big Data Technology in the Reform of English Teaching in Universities

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This paper provides an in-depth understanding and analysis of the reform of English teaching in colleges and universities by analyzing the role of big data technology for the reform through in-depth research and analysis. Based on the background of the era of education informatization, this study explores the transformative value of the integration of information technology and teaching activities and elaborates the relevant significance at the theoretical and practical levels. Based on this, the research method of this study is established. The realm of integration of information technology and teaching activities and its transformative value is taken as the focus of the study. The integration of information technology and teaching activities means that it is not only a simple superposition between information technology and teaching but also a process to explore the role and influence of information technology into teaching activities by deeply exploring the inner connection between the two, to complete the integration of information technology and teaching activities, and finally to realize the comprehensive development of student's personality.

1. Introduction

Along with the high speed of information dissemination and rapid economic development, computer Internet technology has been very commonly used in many fields, computational science entered the field of education, and the use of computer science in education was a new change achieved for traditional education [1]. The application of computers in pedagogy can also be referred to as Computer-Based Education (CBE). Computer-assisted education refers to the application of computers, multimedia, and other technologies in the field of education and teaching to assist in education and teaching. It is a combination of traditional education methods and rational use of educational resources to improve education standards. Traditional teaching has become outdated; the integration of technology and classroom has brought significant changes to education, and today, we are entering the era of big data, and data mining has been widely used in various industries to extract valuable knowledge and provide decision support [2]. This technology has also been gradually integrated into the field of education, opening a new horizon for the development of smart classrooms [3]. Technological advances and multimedia applications have brought opportunities for the transformation of traditional classroom teaching, and the rapid development of education informatization has provided opportunities for in-depth research on smart education and smart classroom, and smart education has become a hot topic in the development of education informatization [4]. With the progress of society and the development of science and technology, the application of information technology in the field of education has become extensive, and the development of smart education is the new form and requirement of the development of information technology, education informatization, and education reform in modern society. The arrival of the era of big data has driven the development of all occupations, and the field of education is also being deeply affected, and the penetration of advanced big data technology into the field of education is the trend of the future development of education informatization, which is bound to have a great impact on the profound changes in the field of education [5].

Innovation of smart classroom teaching mode is one of the important strategies related to the rapid progress of China's education, cultivating innovative talents, and

changing education mode, and it is also an inevitable trend to enhance teaching effect [6, 7], improve teaching quality, perfect teaching system, and promote education development, and it is about to become a trend of the times to put education development in the big data environment. This study focuses on the deep integration of new technology and teaching in the new era, explores the teaching model of the smart classroom under the big data environment, designs relevant smart classroom teaching cases, and implements them, which is of great significance to the innovation of teaching mode in the education field and has certain theoretical and practical significance to the development of smart education. At present, personalized learning has been effectively realized with the development of artificial intelligence, and it is obvious that artificial intelligence plays an important role in the fields of learning tutoring, learning assessment, and teaching optimization, which promotes the all-round improvement of teaching efficiency and better learning experience for students. Artificial intelligence [8–10] has gradually become an important factor in the development of education information technology, helping the innovative development of education and teaching. The development of information technology has not only brought a huge impact on the field of science and technology but also has an important role in the development of times that cannot be ignored. At present, the education field is actively introducing artificial intelligence technology, and the elements of teaching activities are constantly changing, promoting students' learning activities toward personalization and lifelong learning and pushing the whole education level from low-level crude education to high-level precise education.

This study analyzes the new educational technology of artificial intelligence and the impact of the pedagogical changes that will occur, as well as the basic characteristics of artificial intelligence its significance and impact on the pedagogical aspects, and explores the new concepts of the change of the elements of teaching activities and generation in the era of artificial intelligence. It is also helpful to explore the changes in teaching in the era of AI to expand teaching ideas. Therefore, it is of practical guidance in the future application of AI to optimize teaching methods and teaching techniques in the teaching process and students' learning methods. The learning platform of various online teaching modes provided by artificial intelligence technology is profoundly affecting the development of teaching as a process. The teaching in the era of artificial intelligence will overturn the traditional teaching model, the development of artificial intelligence enlightens the new ideas of teaching change development, and the teaching change profoundly affects the new direction of the future development of the young generation. In traditional education, the main channel for students to acquire knowledge is through teachers' lectures. However, in the era of artificial intelligence, human beings will need to reexamine the ways of acquiring knowledge to adapt to social changes, and the development of technology profoundly affects the change of teaching. This study analyzes the changes in teaching and learning in the age of artificial intelligence to provide a better understanding of teaching and learning in the age of intelligence. The smooth implementation of intelligent teaching requires the application of artificial intelligence in teaching as a condition. Exploring the changes in the elements of teaching activities and new concepts in the age of artificial intelligence can make personalized teaching and adaptive learning possible in the age of artificial intelligence, and this teaching method can optimize the traditional teaching methods, enhance teaching efficiency, improve teaching outcomes, enhance teaching participation, and promote teaching activities in the direction of intelligence, precise, and personalized direction.

2. Current Status of Research

The impact of AI technology on educational activities has become increasingly evident, and research on AI in education has become a focus of foreign academics and has yielded a variety of research results. Hasan et al. suggested that AI in education is a completely new research area, and this type of research is conducted on the premise that educational activities and artificial intelligence are closely linked [11]. Aho and Duffield suggested that educational AI is mainly used to improve students' participation in teaching activities and teachers' teaching efficiency with the help of the Internet teaching platform [12]. In the future, the focus of educational AI will be on the development of intelligent robots, which will try to improve students' learning efficiency by adding intelligent sensing devices. In addition, some scholars have conducted in-depth studies on the problems that arise after the application of AI in education to study the problems that may arise after the application of AI to education and the future development trend [13]. With the continuous development of AI technology, many researchers are now studying the design of machine learning algorithms intending to improve the efficiency of their interaction with humans [14]. Modern information technology has brought many changes to the development of education, and at the same time, the impact of changes in information technology has gradually risen to the national level [15]. According to the educational development planning documents released by the education department in China, information technology will play an important role in influencing the development of education, and information technology needs to lead education to modernization and drives changes in education [16].

Knox firstly studied in depth the factors related to the change of teaching methods and made a detailed analysis of the direction of the change of teaching methods, pointing out that the change in teaching methods is not to negate the past teaching traditions but to optimize and improve the teaching methods based on absorbing the advantages of traditional teaching activities, and the scholars also studied the direction of the reform of teaching models, which believed that the reform of teaching models would mainly focus on four directions, such as optimizing teaching resources and innovating teaching organization [17]. Tian et al. designed two types of collaborative learning models, formal and subformal, and through the study and analysis of these two models, they proposed that the intelligent terminal devices

and platforms used in the smart classroom can help teachers to grasp students' learning situation and provide rich learning resources to students [18]. It is also possible to provide students with a wealth of learning resources, enabling resource sharing and interoperability between teachers and students [19]. Teacher-student interaction directly determines student learning outcomes, and interactive learning among students promotes achievement and social-emotional development. Council member, after extensive research and analysis, indicated that a high frequency of classroom interactions helps students develop self-confidence in their learning and that students are motivated to learn and actively participate in classroom learning activities [20]. Xiao and Yi showed that teachers who frequently ask challenging questions and provide students with cues other than words are effective in driving students' cognitive development [21].

Firstly, through the analysis of the existing literature, the value orientation of the integration of information technology and teaching activities is clarified, the feasibility of the research problem is determined, and the exact connotation and way of the integration of information technology and teaching activities are determined based on this; secondly, the realm of the integration of information technology and teaching activities is explored from the theoretical level, and the profound influence of information technology on teaching activities is elaborated to provide theoretical support for the practical level; finally, the changes brought about by information technology to teaching activities are identified, and the main characteristics of each change element are sought, based on the classroom analysis. Finally, based on theory and practice, the transformative value of the integration of information technology and teaching activities is analyzed at the practical level, to provide lessons for future classroom teaching.

3. Analysis of the Role of Big Data Technology in the Reform of English Teaching in Colleges and Universities

3.1. Improved Big Data Technology Design. The big data environment is a branch environment in the information technology environment, in which the smart teaching model is carried out, which is the culminating stage in the development of information technology education while creating fever in the field of education [22]. Technology can realize the communication between human language and machine language; build data models to comprehensively record and collect behavioral data; use data collection, data intelligence analysis, real-time analysis of learning data, real-time pushing of resource data, dynamic feedback results, and other mutual combinations to promote the construction of the big data environment; and complete the construction and implementation of the wisdom classroom model in the new era of the big data environment so that students experience the teaching process interactive [23]. In addition, I will promote the rapid development of education in the direction of informatization and wisdom by making the teaching process interactive, intelligent, data-based, and dynamic. The key to completing intelligent learning lies in how to use the terminal tools and big data analysis techniques in the big data environment to grasp the real-time learning dynamics of students, analyze student learning data, create educational big data, provide feedback on teaching effects, make full use of the big data environment to create intelligent education, and complete the intelligent classroom in the big data environment.

Advances in science and technology and multimedia applications have brought opportunities for the transformation of traditional classroom teaching. The rapid development of educational informatization provides an opportunity for in-depth research on smart education and smart classrooms. Smart education has become a hot topic in the development of educational informatization.

The advent of the big data era has caused a phenomenon of data in various forms gradually spreading into life and society, and of course, the education field is also constantly receiving the changes brought by big data. The generation of educational data has become an important asset and resource for the development of education informatization. By bringing together multidimensional, multilevel, and multifaceted teaching data and then comprehensively organizing and analyzing them through data analysis methods, I can analyze teaching behavior in real-time and provide optimal decisions for education and generate smart education. There are many elements involved in wisdom education, and these elements are closely related to each other wisdom teaching, and the implementation of teaching is largely carried out by various advanced technologies, relying on the wisdom teaching environment, and the collision between big data and classroom rubs out the spark of wisdom, which in turn generates wisdom classroom. The input of big data technology is the premise of smart education, and the smart classroom is the environment that provides the possibility and opportunity for smart education with three-dimensional interaction, multidirectional communication, comprehensive attention to students, timely feedback on learning, and reconstructing the teaching model.

$$y_B' = y_A * -v^y{}_{AC} * (t_B + t_A), \tag{1}$$

$$N = \frac{O + \bar{O}}{K}. \tag{2}$$

The processed data can better reflect the number of user clicks on online courses, making the mining of association rules more accurate. One of the characteristics of artificial intelligence is human-machine collaboration. Specifically, human-machine cooperation means that humans and machines work together to play their roles in their respective areas of expertise. The media theory favors the theoretical aspect of the integration of information technology and teaching activities and only considers information technology as the basis of teaching practice [24]. Although it appears in teaching activities as a physical tool or means, it still fails to view the integration of information technology and teaching activities but only from the perspective

that the functions and characteristics of information technology have an impact on teaching activities. Mediation theory is biased toward the practical aspect of the integration of IT and teaching activities, and to a certain extent, it has realized the shift from "theoretical activities focusing on the characteristics of IT to practical operations focusing on IT," so that IT can participate in solving difficult problems in teaching activities. However, the pursuit of practical operation will lead to procedural and mechanical teaching activities, which will lead to excessive technical rationality and loss of objective judgment on teaching activities. Innovative smart classroom teaching mode is one of the important strategies related to the rapid progress of my country's education, the cultivation of innovative talents, and the change of education mode.

The relational theory is a paradigm of integration combining theory and practice, emphasizing the symbiotic organic integration of information technology and teaching activities and attacking the deep integration of information technology and teaching activities from a holistic, comprehensive, and dialectical standpoint, which fundamentally shakes the methodological problem of integration of information technology and teaching activities, as shown in Figure 1.

Data mining discovers knowledge in the form of constraints, patterns, laws, concepts, rules, visualizations, etc. The uncovered knowledge can be used by decision-makers or experts to improve the existing knowledge system, and in the field of education, it can be used by learners, administrators, teachers, and other actors to intervene in the process of education and teaching for inappropriate teaching or content that is not suitable for learners' learning. The main tasks of data mining are twofold: classification-prediction [25, 26] tasks and descriptive tasks [27]. The classification predictive task learns a model from known classified data and uses that model to interpret new unknown classified data to obtain a classification of those data. Depending on the class labels, they are called classification tasks and prediction tasks, respectively. There are many application areas of data mining, and the process of data preparation requires clarifying the requirements, understanding the data background of the relevant domain and the data sources, etc. Individualized teaching and adaptive learning in the era of artificial intelligence can be made possible. This teaching method can optimize traditional teaching methods and improve teaching efficiency.

The data obtained through the data preparation process is the raw data, and in the data selection step, the raw data needs to be filtered to obtain relevant data and samples, i.e., the target data. In this process, the raw data usually needs to be processed using operations in the database. Further processing of the data, there is no shortage of redundant, irrelevant, and interfering data in the target data, which needs to be preprocessed according to the principles of data consistency and completeness. For missing items, the missing data can be restored by statistical methods by time series and known changes as much as possible. Data transformation refers to the reprocessing of data to adapt to database access and reduce the amount of data.

$$\mathrm{TSED}(B) = \sqrt{\left(x'_B + x'_B\right)^2 - \left(y'_B + y'_B\right)^2},$$
$$T_i = \{(x_1, y_1, t_1), (x_2, y_2, t_3), \cdots, (x_m, y_m, t_m)\}. \tag{3}$$

The key to intelligent learning lies in how to use terminal tools and big data analysis techniques in a big data environment to master the real-time learning dynamics of students, analyze student learning data, create educational big data, and provide evidence-based feedback on teaching effects. In determining data mining objectives, according to the user's requirement statement, the purpose of data mining is clarified. There are many types of knowledge in the data mining process, and the methods of knowledge discovery used according to different requirements are the same, so determining the mining objectives in this step is to lay the foundation for the next step. Selecting a suitable algorithm according to the mining target determined in the previous step is a key step in the whole data mining. Usually, the algorithms of data mining are classification, association rules, summarization, clustering, etc. The knowledge extracted in the previous step is interpreted, redundant and irrelevant knowledge is removed, and then, the above process is repeated until the user's needs are met. The final step is the presentation of the knowledge, delivering the results in a way that the user can understand.

$$d_c\left(T_i, T_j\right) = \frac{l_{c1}^2 - l_{c2}^2}{l_{c1}^2 + l_{c2}^2}. \tag{4}$$

Association rules refer to two things that are implicitly connected under a rule, and this connection needs to be discovered by data mining algorithms because of its implicit nature. Specifically, an association rule is an implicit rule such as $X \longrightarrow Y$. X is called the lead (left-hand-side (LHS)), and Y is called the successor (right-hand-side (RHS)) of the association rule, and the lead and successor can predict the value of other attributes based on the attribute of one. The association rule algorithm introduces the concepts of support and confidence, the former refers to the probability of containing several items in the dataset at the same time, and the latter refers to the probability of occurrence of B in the dataset under the condition of occurrence of A, conditional probability.

$$P(A|B) = \frac{P(AB)}{P(B)}. \tag{5}$$

The interrelationship between support and confidence can be transformed by probability calculations as follows.

$$\mathrm{Conf}(Y|X) = P(Y|X). \tag{6}$$

In addition to the two concepts of support and confidence in association rules, frequent itemset is also an extremely important concept; itemset is a set of items contained in a transaction and its subsets, and frequent itemset

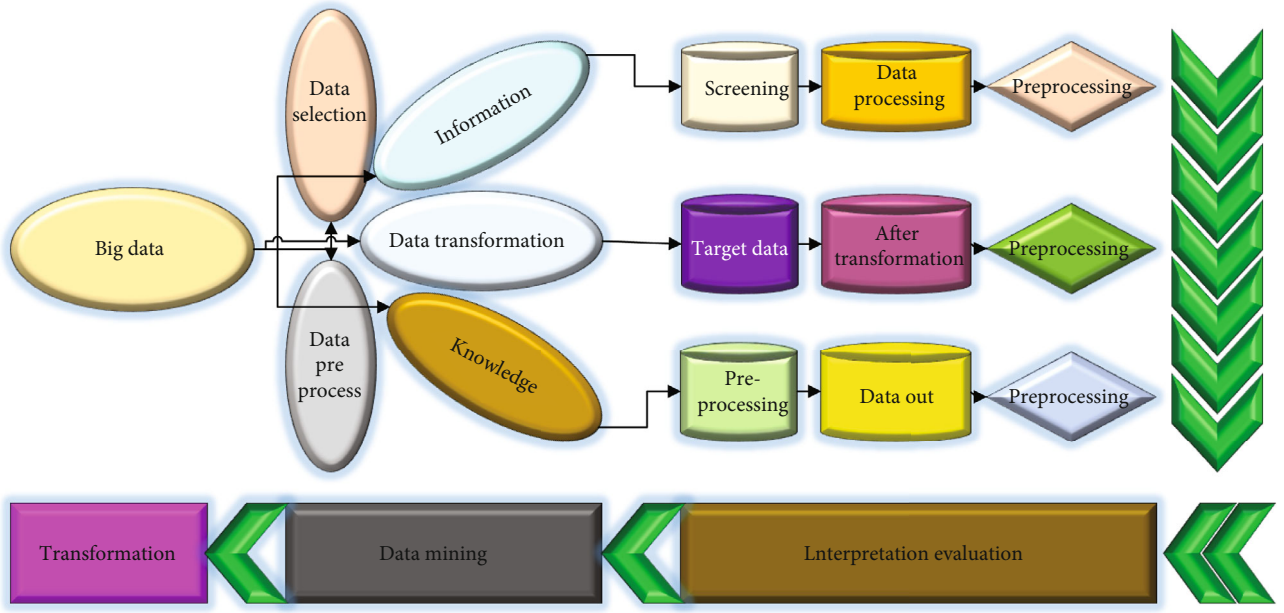

Figure 1: Data mining process.

is the set of these items that appear frequently in multiple transactions; the meaning of mining frequent itemsets is to find out the implicit association information between items in a transaction. The significance of mining frequent itemset is to find out the implicit association information between items in a transaction, which is the basis of the association rule data mining algorithm, and the following analysis of common association rule mining algorithms, as shown in Figure 2.

The investment of big data technology is the prerequisite for the development of smart education, and the smart classroom is the environment. It provides the possibility and opportunity for smart education to provide three-dimensional interaction, multidirectional communication, comprehensive attention to students, timely feedback on academic conditions, and reconstruction of teaching models. The processing of data in a complete system is extremely complex and cannot be clearly described by a data flow diagram, and a flow diagram cannot describe multiple data processing at all. The meaning of user data flow diagrams expressing data processing is lost, and there is no way to communicate with users through data flow diagrams. For the data flow diagram to effectively describe the data flow of each functional module, the data flow diagram needs to be divided layer by layer. The data flow diagram is divided into functional modules in a top-down, outside-in, layer-by-layer manner. This can be used to communicate with users or as a basis for developers to design and develop the system.

3.2. Role Design in the Reform of English Teaching in Higher Education. After the functional requirements analysis of a system is completed, the basic functions to be performed by the system are defined. However, if you want to ensure that a system performs a specific function in a stable and orderly manner, you need the system to meet certain non-functional requirements as well. This is because a system can be influenced by the external environment when it is running, and the frequent interactions within the system can also bring unexpected results [28]. The analysis of non-functional requirements of the system is to ensure that the system can run stably and perform the functions provided by the system with quality. First, the level of development of information technology determines the characteristics of students in teaching activities. In the teaching activities, the students' development is partly supported by information technology, which gradually increases from the initial functions of storage and transmission to the functions of processing and even substitution, replacing part of the students' work and to some extent leading to their liberation. There are many application fields of data mining. In the process of data preparation, it is necessary to clarify the requirements and understand the data background and data sources of related fields. Information technology, mainly radio and television, has broken the boundaries of teaching activities, making it possible for all people to learn, and students appear as the public at the social level, while the boundaries of teaching activities in the digital era are more blurred, the requirements for students' information-theoretical level and ability to process information are higher, and the people to be trained in teaching activities are closer to social people. From the perspective of human sociality, the development of students in teaching activities cannot be separated from information technology, whose most basic interaction is mutual dialogue based on language, and it is in the different dialogues that students participate in learning activities and then construct their knowledge structure, to become social people who master knowledge, ability, and literacy. Based on this understanding, after the integration of information technology and teaching activities, the characteristics that

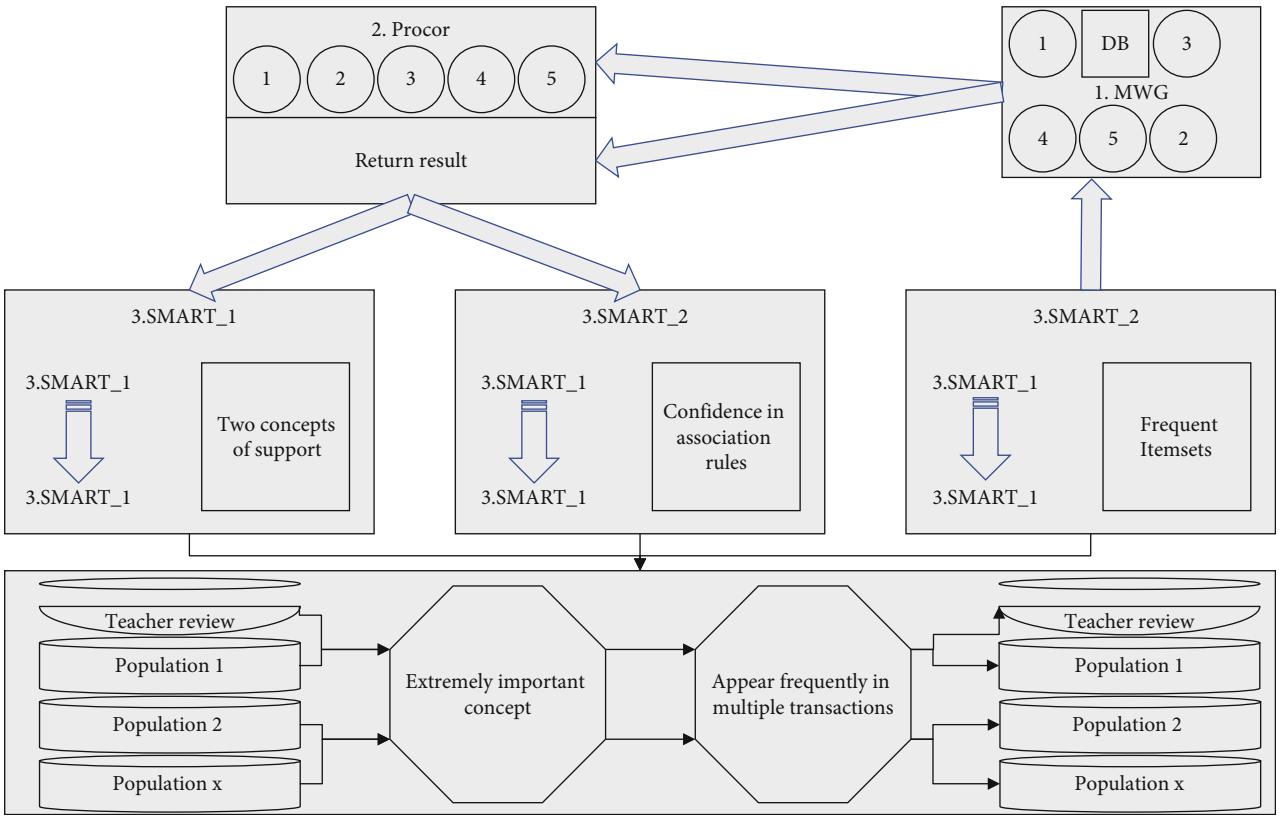

Figure 2: Top-level data flow diagram of the system.

students exhibit in teaching activities and the characteristics of the person to be cultivated are closely related to the level and degree of development of information technology, as shown in Figure 3.

The process of integration of information technology and teaching activities is the process of keeping pace with the times, and it is easy to see that with the rapid development of information technology, it is the trend to promote the change of teaching activities with the help of new technology development. The integration of information technology and teaching activities spans two subject areas, namely, information technology and education [29]. The use of information technology leads the development direction of informatization of teaching activities, while the results of informatization in the teaching field also promote the practice and application of information technology. Based on this, the innovative leading characteristics of the integration of information technology and teaching activities are mainly manifested in the following two points. First, innovation leads to the development of information literacy of teachers and students. Since information technology has been introduced into teaching activities, teachers' and students' information literacy has been emphasized. Teachers need to rely on information literacy to interpret information technology knowledge and use information technology equipment, to optimize the teaching process and improve the teaching effect; students need to rely on information literacy to screen the required information, learn to obtain information, and effectively use the obtained information, to diagnose their learning process and improve the learning effect. Secondly, innovation leads to the development of educational theory and practice. Since the integration of information technology and teaching activities involves a special intersection and integration of disciplines, on the premise that the theory of technical support for teaching and learning is ahead of the updated iterations of technological development, the combing of this lineage not only has a guiding role for future educational practice but also has a model role for the application and promotion of the integration of information technology and teaching activities in the future. This information is the association rule information and is the basis of the association rule data mining algorithm.

However, with the deepening of the integration of information technology and teaching activities, teaching activities become an open whole, and teaching activities no longer contain only unchanging knowledge, but more knowledge is generated by dialogue, cooperation, and interaction between teachers and students through the integration of information technology and teaching activities, which is the product of the interaction between the subject of knowledge and the object of knowledge, and will change with the degree of integration of information technology and teaching activities. Thinking from the perspective of human sociality, the development of students in teaching activities cannot be separated from information technology. The most basic communication is language-based dialogue. It is a product of the interaction between the subject of knowledge and the object of knowledge and will change with the degree

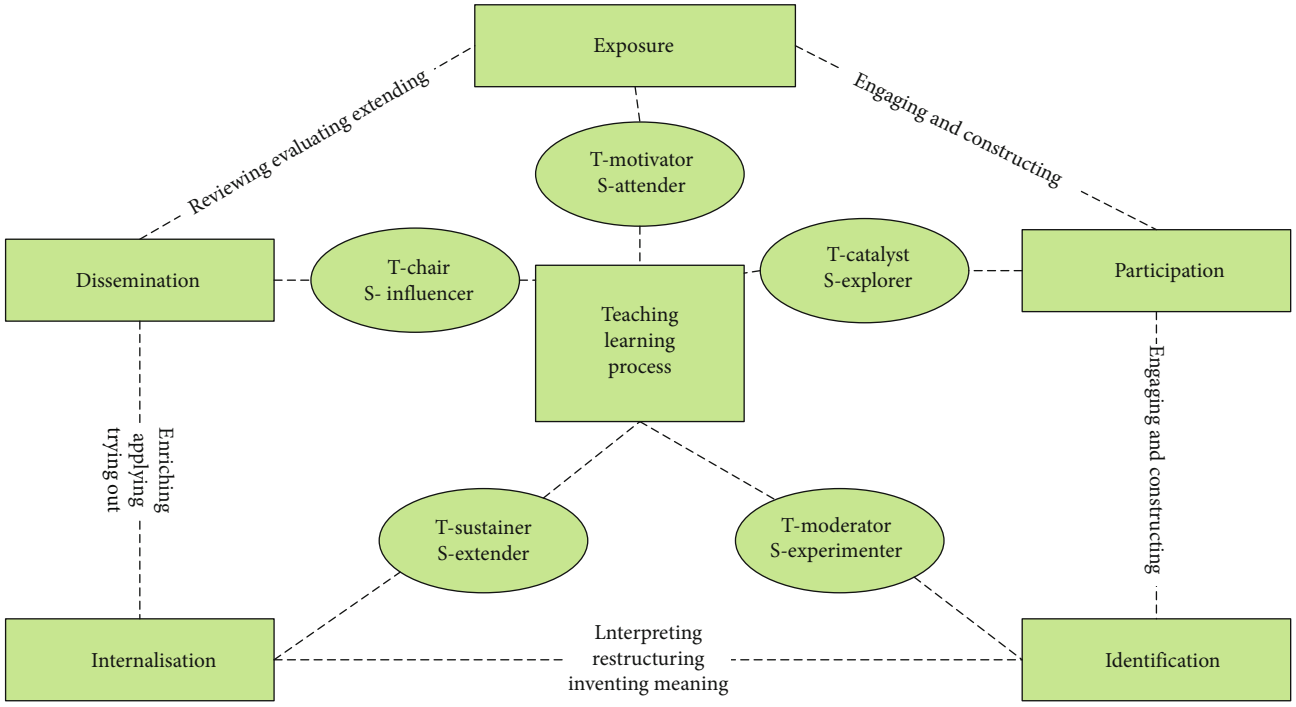

Figure 3: Framework of English teaching reform in higher education.

of integration of information technology and teaching activities and is closely related to the inner experience of the subject of knowledge, such as with the deepening of the integration of the two; the knowledge of the subject of knowledge will be continuously improved and accumulated, or the knowledge will be revised. In this process of generating knowledge, knowledge is dynamic and open, constantly changing, and it is not an absolute objective truth, nor is it a closed and stable system.

The postmodern view of knowledge highlights the fluidity of knowledge, advocates the self-construction and generation of knowledge in the process of flow, and emphasizes the openness of knowledge, such as Dewey believes that knowledge is never fixed and eternal; it is the starting point and result of the process of inquiry and as a tool in the process of inquiry can test and confirm the process of practice. In the process of such repeated communication, the knowledge structure of teachers and students will change, and they will integrate their understanding and thinking based on their own experience, to construct the corresponding knowledge. In short, just as the poststructuralist Derrida believed that the real world that people face is a huge system with infinite openness and possibilities, and it does not have the ultimate origin and can be considered as certainty; knowledge is also created through the integration of information technology and teaching activities, which makes the interaction between the subject of knowledge and information technology in the educational field and thus promotes the dynamic process of knowledge construction of the subject of knowledge, as shown in Figure 4.

Through the timely feedback technology in the smart classroom, dynamic evaluation of students' learning process can be realized. In the teaching process, teachers send test questions online and set the answer time, and students can join the classroom to get the test questions and be asked to turn in the paper within the specified time, which is conducive to the cultivation of students' time concept [30]. With the use of an intelligent learning system, not only can the learning process be transparent and the learning results be visualized, but the teacher can also correct and test the quality of students' learning. After the students' answers are completed, the teacher can analyze the results of the answers to understand the students' learning effects and provide timely feedback to the students, motivate them to learn and make up for their shortcomings with the help of the teacher, and adjust the teaching program based on the students' learning ability. Under the premise that the theory of technical support for teaching and learning is ahead of the update iteration of technological development, the combing of this context not only has a guiding role for future educational practice, but its educational practice exploration will also be used for the application and promotion of the integration of future information technology and teaching activities. It has an exemplary role.

Students are the subjects of learning, and they should also be guided to actively participate in the assessment process. Introducing students into the evaluation system also means that students can self-evaluate, reflect on their successes and shortcomings in learning, discover effective learning methods, and improve their learning ability, which also plays an important role in improving students' personalities. At the same time, students can evaluate each other, supervise each other in mutual evaluation, make progress together, and develop good habits of listening to others' opinions with an open mind, treating others sincerely, and good teamwork spirit. Therefore, we should establish an open and relaxed

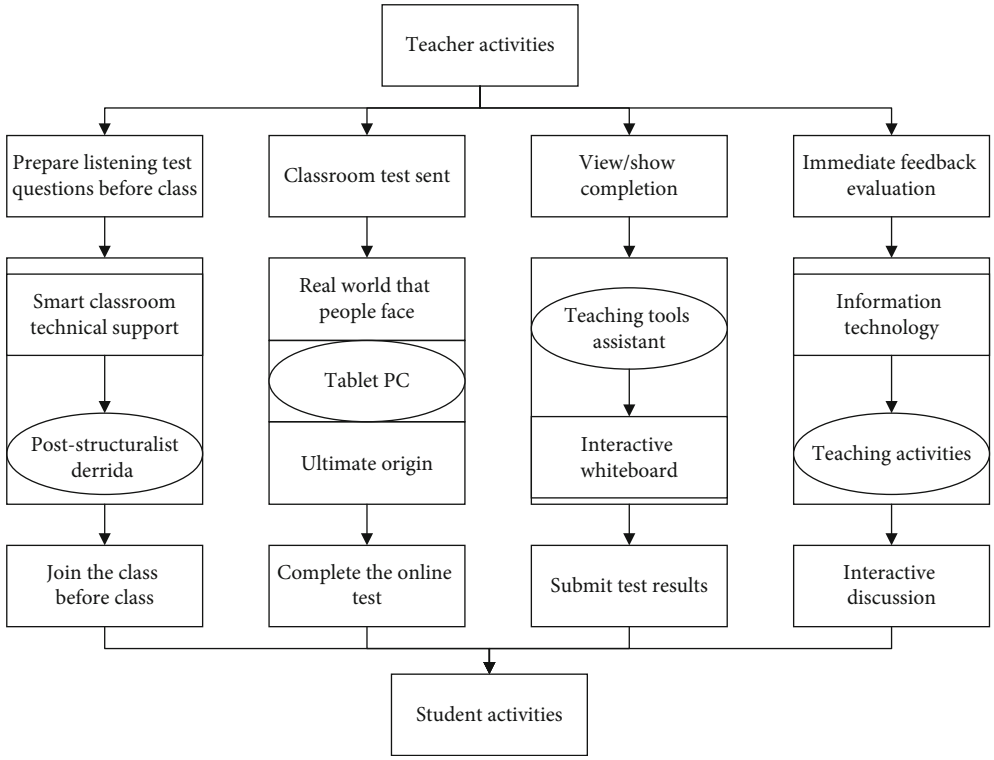

Figure 4: Timely feedback process in the classroom.

evaluation atmosphere, focus on teacher evaluation while also encouraging students to participate, realize the diversity of evaluation subjects, and help students to reflect in self-evaluation, teacher evaluation, and mutual evaluation, thus promoting the realization of self-learning and development.

4. Analysis of Results

4.1. Performance Analysis of Improved Big Data Technologies. The purpose is to compare the performance of two association rule mining algorithms in a stand-alone environment and analyze the characteristics of the two algorithms to validate the analysis of the two association rule mining algorithms in this chapter, but when the dataset reaches 20,000 items, the execution efficiency of the two algorithms in a stand-alone environment decreases significantly due to the small memory and even fails to run. When the improved association rule algorithm in a parallel environment is used to test the performance of the algorithm on the dataset with less than 20,000 items, it is found that the running time of the algorithm when the data volume is too small is not much different from that of the dataset with 20,000 items, and both are larger than the running time in the stand-alone environment. These are closely related to the inner experience of the cognitive subject. For example, as the degree of integration of the two deepens, the knowledge of the cognitive subject will continue to be improved and accumulated, or the knowledge will be revised. The reason is that since the parallel environment is suitable for large data processing, the algorithm runtime when the data volume is too small is no longer dominated by multinode chunking, and the runtime is mainly determined by data transfer and copying. The following is the performance analysis of the improved parallel association rule mining algorithm with a parallel environment and a dataset of 20,000 items, as shown in Figure 5.

The number of the initial population is set to 15; the expected number of questions of each type in the test paper is 20, 5, 10, 7, and 5. The maximum number of iterations is 1000, the expected value of fitness is 0.98, the coverage of knowledge points is 0.3, the difficulty coefficient is 0.4, the number of selectors is 10, the number of individuals generated by the cross operator is 20, the total score of each set of questions is 100, the number of questions in the question bank is from 1 to 5000, and the questions in the initial population are selected from 1 to 5000 to combine the questions that satisfy the conditions.

The results of the performance analysis are shown in Figure 6 for 10 experiments conducted under the above initialization conditions with knowledge point coverage of 0.3 and 0.7.

The performance comparison in Figure 6 shows that the average running time of the algorithm is 592.28 ms, and the average number of iterations is 18.4 when the knowledge point coverage is 0.3, and the average running time of the algorithm is 15953.08 ms, and the average number of iterations is 341 when the knowledge point coverage is 0.7; i.e., the performance of the algorithm is improved by 96.29% when the knowledge point coverage is reduced by 40%. The algorithm process shows that when the threshold value of knowledge point coverage is too high, the number of iterations increases significantly, and too low, the quality of the completed paper is affected because the knowledge point

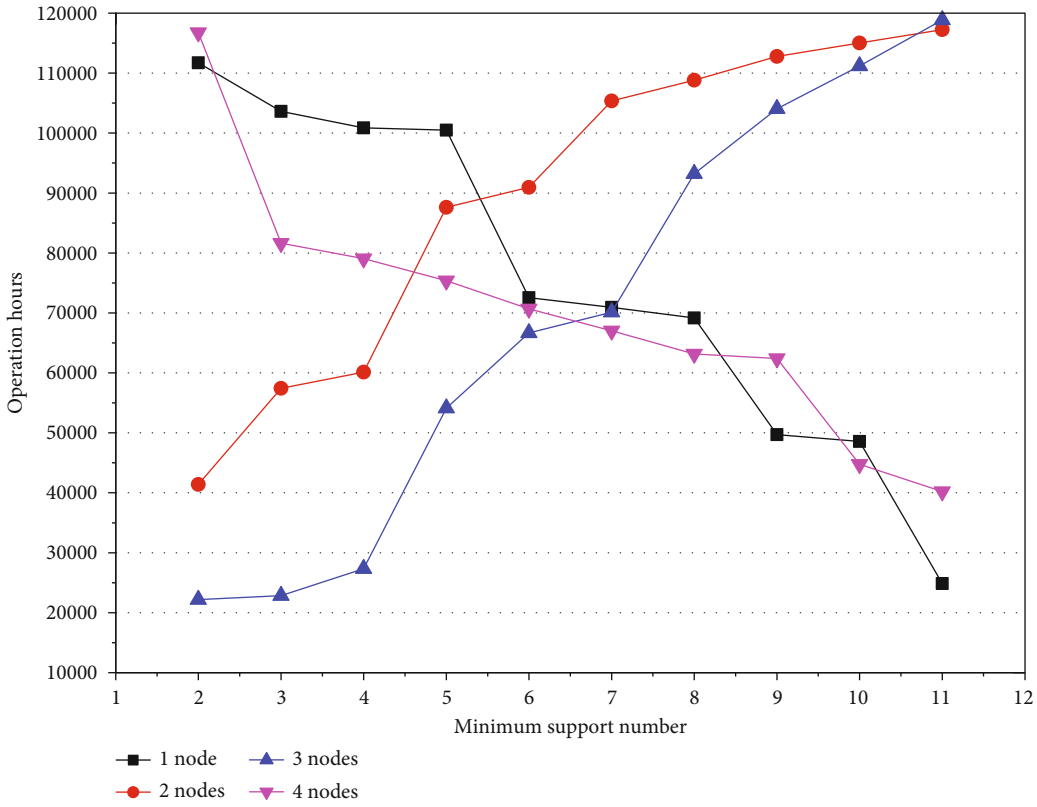

Figure 5: Comparison of algorithm efficiency in parallel environments.

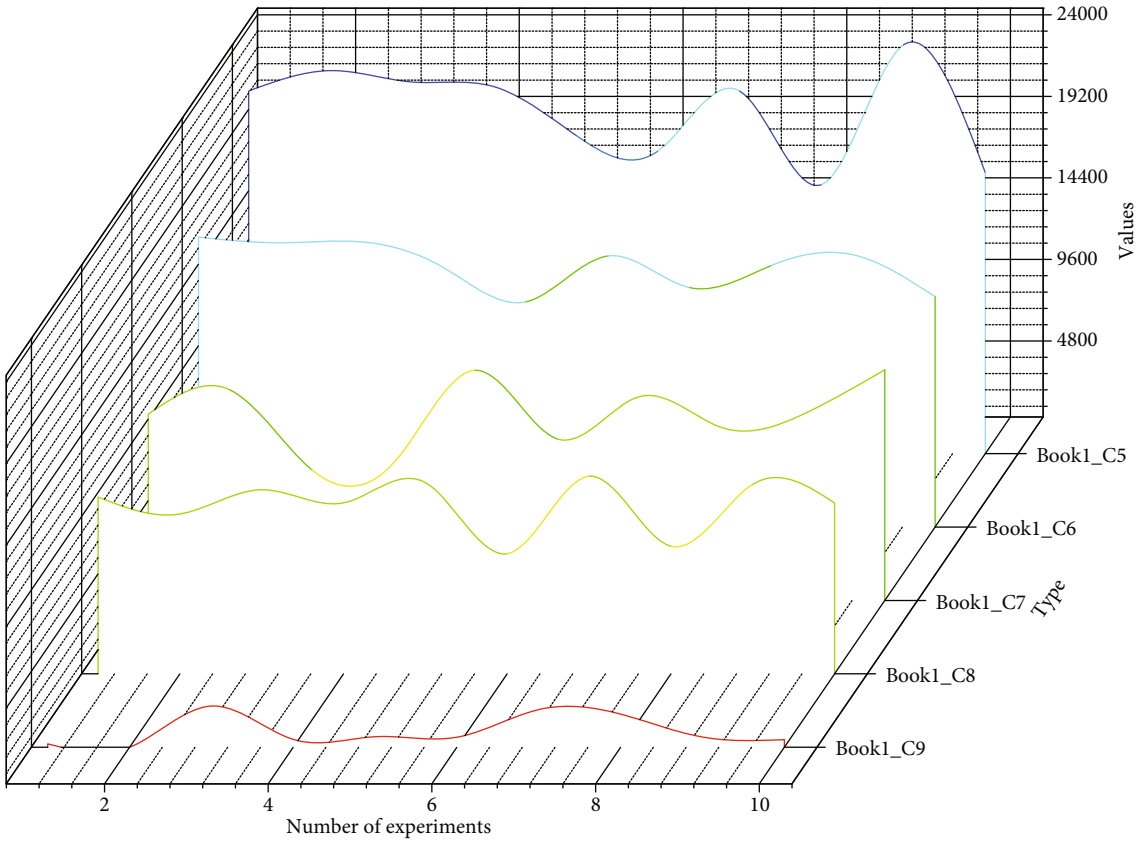

Figure 6: Performance comparison of different knowledge point coverage.

coverage of the completed paper is not extensive enough. The automatic paper formation system is based on a randomized algorithm, automatic paper formation system based on a backward matching algorithm, and automatic paper formation system based on a genetic algorithm. Finally, the improved genetic algorithm is implemented on the application of automatic volume formation based on the optimization of coding, cross-variance, and selectors, and the improved genetic algorithm is simulated and analyzed on simulated experimental data. It is necessary to establish an open and relaxed evaluation atmosphere, pay attention to teacher evaluation and encourage students to participate, realize the diversification of evaluation subjects, and help students to reflect on self-evaluation, teacher evaluation, and mutual evaluation.

4.2. Analysis of English Teaching Reform Results. The design of the wisdom classroom teaching model in the big data environment provides a reference for the application and innovation of the teaching model, but how to conduct a scientific, comprehensive, and accurate evaluation of the teaching effect in the wisdom classroom teaching has aroused the concern of relevant educators, and the effective customization and optimization of the teaching program by evaluating the application effect of the classroom teaching model are also an urgent research level for the development of information-based education. The quality of "wise" teaching and "intelligent" learning is also in urgent need of research, to improve the quality of "wise" teaching and "wise" learning.

The number of selector selection is 10 times, the number of individuals generated by the crossover operator is 20, the expected test paper difficulty coefficient is 0.67, and the total score for each set of questions is 100 points. The SSA algorithm is used to analyze the data and predict the learning behavior of each student, to detect any risk of misunderstanding during the course. The course instructor can rely on the algorithms and models submitted by the platform to study the learning outcomes and conditions of the students during the teaching process and then intervene to provide the students with the right type of course and resources for their situation. When conducting the analysis, the focus is on obtaining information that includes outcomes and learning behaviors, as well as course performance and learning characteristics, and analyzing students' learning behaviors and performance by providing timely feedback. Interventions are made for poor conditions in them. Through the application of this system, students' performance has all obtained a certain degree of improvement, both in terms of learning effect and learning performance, which obtained a substantial improvement compared to the previous one. It is evident that this intelligent platform is more effective in practical application, and it is based on this effect that other schools have also imitated and adopted this system at the same time, as shown in Figure 7.

From the data analysis of the survey results, we can see that the mean value of students' classroom participation is low except for "I listen attentively, take notes, and pay attention in class." Students can participate in classroom teaching activities, listen attentively, take notes, and pay attention in class, but they are not very active in answering questions raised by the teacher, asking questions they do not understand, presenting discussion results, listening to others' reports, and evaluating others, and they cannot actively speak, present reports, and evaluate, and they have not yet developed the habit of active thinking and questioning. They have not yet developed the habit of active thinking and questioning. According to the standard deviation of "I enthusiastically present the results of my group's discussion on the stage in class," the standard deviation of 1.166 is greater than 1.000, which shows that there is a significant difference in the initiative of different students in the class to present the results of group learning.

As shown in Figure 8, among the students' language, the part of reading aloud accounts for 38%, the proportion of students' passive responses is 33%, the proportion of active responses is 21%, and the proportion of students' active questions is only 1%, so most students have not yet developed the habit of actively responding and actively asking questions. Given this problem, teachers should pay attention to further guiding and encouraging students to think positively, motivating them to express their own opinions, organizing more discussions and exchanges, thinking in discussions, and improving students' enthusiasm to participate in classroom learning. The percentage of students' intergroup assessment is small at 7%, which indicates that students participate in intergroup assessment learning activities less frequently. To address this problem, teachers should further motivate more students to actively participate in intergroup assessment learning activities through certain teaching methods to improve student's evaluation and reflection skills.

Due to the differences in students' abilities and personalities, the presentation session is still the stage for the top students to perform. These students with stronger speaking ability actively speak and perform in the group discussion, help the group to complete the task, and take the initiative to present on the stage. Some students who are introverted and not strong in speaking ability are more passive in the discussion and practice session and have low initiative and participation in the presentation of results. Other students, who are used to the traditional classroom teaching model, are more dependent on the teacher and lack a sense of active learning. For example, students rarely take the initiative to answer questions, think actively in class, and rarely put forward their own opinions or disbeliefs. Teachers should pay more attention to guiding students' thinking by asking questions while reducing learning activities that organize students to read aloud and repeat mechanically and using various forms of interaction to encourage students to answer actively. Some students are introverted and poor in oral English. They are relatively passive in the discussion and practice sessions, have low initiative in the presentation of results, and have low participation. There are also students who are accustomed to the traditional classroom teaching mode and are highly dependent on teachers and lack the awareness of active learning. When introducing new lessons and assigning tasks, with the help

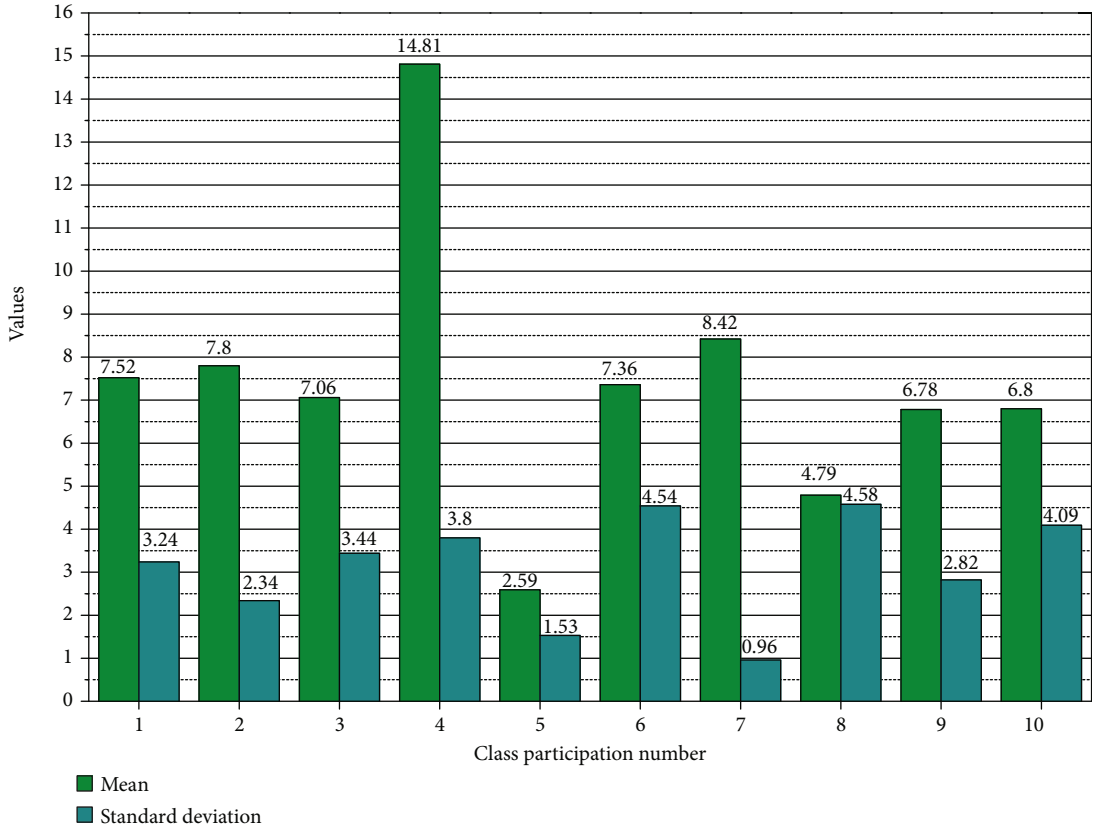

Figure 7: Results of the survey on the effectiveness of classroom interaction.

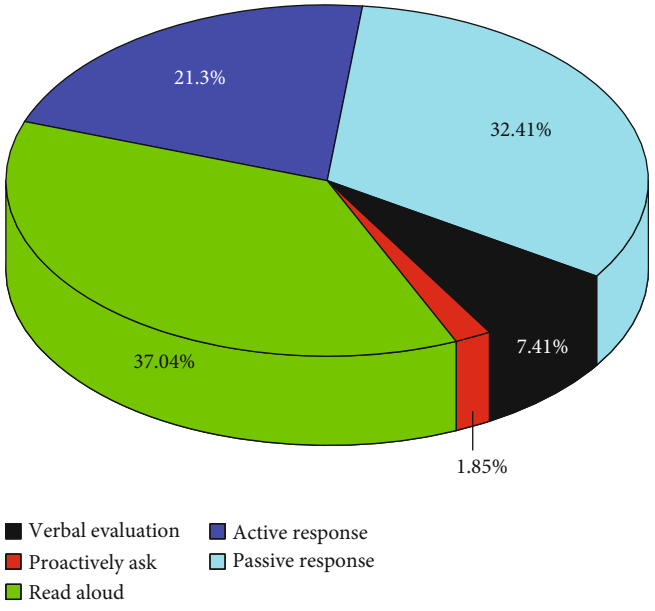

Figure 8: Percentage of each part of students' speech.

of interactive whiteboards and tablet PCs and the rich multimedia learning resources in the cloud platform, teachers should introduce topics close to life, create vivid and interesting learning situations to mobilize students' multiple senses, stimulate students' desire to continue exploring and learning, design questions and tasks that fit the topic and are close to students' nearest developmental zone, with a clear hierarchy, and focus on overall class participation, to effectively promote teacher-student interaction and student-student interaction.

5. Conclusion

The fuzzy comprehensive analysis method was used to evaluate and analyze the comprehensive application effect of this model. The factors affecting the teaching effect after the implementation of this model were first investigated and analyzed, and the relevant index sets were designed by adopting the valuable opinions of experts and teachers, and then, the validity of the indexes was verified, and it was concluded that the classroom teaching effect was good after the application of this model. The development and design of the system fundamentally reduce the teachers' workload and improve efficiency. Our existing examination system is to manually correct the papers, which is a very troublesome and heavy workload, so this oral examination system design can change the limitations of this existing oral examination, promote the quality of teaching and learning, and improve students' listening and speaking skills. The system is designed to create a communication platform for teachers, students, and administrators in daily English-speaking exams, simplify the process of speaking exams, make the traditionally tedious and complicated exam process simple and easy to operate, and make speaking exams as easy to operate as other exams. Changing the original one-to-one model saves workforce, strengthens students' training and test frequency, helps improve the efficiency of daily teaching management, and greatly reduces the labor intensity of English teachers. At the same time, the introduction of big data technology improves the efficacy of the English-speaking test system, which in turn improves the efficiency of teachers to focus on teaching and research.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

All the authors do not have any possible conflicts of interest.

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