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Research Article

Action of College Chinese Education and Information Fusion Teaching Based on the Background of Big Data

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In order to meet the needs of the development of the times and the cultivation of innovative talents, various countries have carried out a series of educational reforms. It seeks more diversified talent training methods through innovative education and teaching methods. With the development of science and technology and the diversification of information, the integration of multilevel, distributed, and massive information has become the development direction of various disciplines. Therefore, this research is based on the background of big data, exploring the way of university Chinese education and information fusion teaching under the education reform and helping students establish a systematic subject knowledge system. This article chooses two parallel classes of similar level as the experimental group and the control group. It analyzes the results of the four aspects of the students' ancient and modern language and writing analysis, college students' Chinese reading comprehension, college students' Chinese writing application, and college students' language expression and communication through test papers. The experimental results of this article show that the P values of these four aspects are all less than 0.05, indicating that the learning effect of the experimental group is higher than that of the control group.

1. Introduction

1.1. Background. With the rapid economic development, social technology has entered the public's field of vision, and artificial intelligence, robots, and big data are no longer just imagined [1, 2]. They are gradually changing people's living standards, improving people's work efficiency, and leading the advancement of mankind. However, these have not been vigorously promoted in education, especially in the classroom teaching of college Chinese; some teachers still have the original teaching mode. If things go on like this, students who are curious about social information and knowledge will gradually lose their interest in learning because of this traditional teaching model. Therefore, based on the background of the big data era, Chinese teaching should be combined with information fusion to realize the high efficiency of Chinese teaching. However, there are not many related studies on the application of information fusion technology in the education industry through the search of relevant materials. Therefore, it provides a reference for future related research in school education and social training industry.

1.2. Significance. With the application of new technologies such as big data, cloud computing, and artificial intelligence, the education industry has ushered in unprecedented challenges and opportunities. The traditional education industry is gradually moving towards informatization, and various teaching applications have emerged. However, how to combine subject teaching and information fusion based on the background of various teaching applications, so as to obtain more efficient teaching, still faces many problems. This shows that the research in this article has practical significance.

1.3. Related Work. With the development and popularization of social informatization, information fusion can exert an influence that cannot be underestimated in all walks of life. In order to optimize the fault diagnosis of the Rocket Hydraulic Drive Servo System (HDSS), Liu et al. proposed an information fusion diagnosis method based on D-S evidence theory and BP neural network. Their research shows that the multisensor information fusion fault diagnosis method improves the reliability of HDSS [3]. The information fusion method of INS/GPS navigation system based on filtering technology is the current research hotspot. In order to improve the accuracy of navigation information, Liu et al. proposed a navigation technology based on adaptive Kalman filter with attenuation factor to suppress noise. The algorithm continuously updates the measurement noise variance and processes the noise variance of the system by collecting estimated and measured values, which can suppress white noise. According to the test results, the accuracy of their proposed algorithm is 20% higher than that of the traditional adaptive Kalman filter [4]. In the classification of hyperspectral image (HSI), it can use the combination of spectral information and spatial information to improve the classification performance. In order to better characterize the variability of spatial features at different scales, Hong et al. proposed a new framework called multiscale spatial information fusion (MSIF). MSIF consists of three parts: multiscale spatial information extraction, local one-dimensional embedding (L1-DE), and information fusion. First, they use spatial filters of different scales to extract multiscale spatial information. Then, they used L1-DE to map the spectral information and spatial information of different scales into one-dimensional space. Finally, they use the obtained one-dimensional coordinates to mark the unlabeled spatial neighbors of the labeled sample [5]. Shibo et al. proposed a dangerous cargo container monitoring system based on multisensor. In order to improve the accuracy of monitoring, multiple sensors will be used inside the dangerous goods container. Shibo et al. proposed a multisensor information fusion solution for dangerous cargo container monitoring. They elaborated on information preprocessing, homogeneous sensor fusion algorithm, and information fusion based on BP neural network. The application of multisensor in the field of container monitoring has certain novelty [6]. At the same time, the realization of diversified courses and information management in the education industry has become a concern of scholars. In his research, Shim revealed the shortcomings of Chinese classics as a liberal art through its transformation process and present state and proposed ways to improve it. He suggested that the curricula of Chinese studies should be developed in the direction of providing the overall foundation of Oriental studies, rather than carefully reading the original works. Textbooks should also take into account the specific conditions of students for detailed analysis and choose texts based on a diverse society. In addition, it is necessary to set up courses that consider the differences of students' abilities [7]. Taking Russia as an example, Albekov et al. study the factors that promote the effectiveness of university education. They determined the management point of view to maximize the effectiveness of university education. Their research shows that the most important factor in the effectiveness of university education is the number of universities and the number of faculty and staff. The viewpoint of maximizing the efficiency of university education is related to human capital management [8]. In summary, it cannot be seen that in recent years, information fusion has not only been studied in the aviation field but has also very good application prospects in the civil field. With the advancement of social science and technology, information fusion technology has become a new trend in research in various countries. But there are not many practical studies on education. Therefore, in order to further promote the development of education, the practical research of subject education and information fusion teaching brooks no delay.

1.4. Innovation. Driven by the needs of military technology, automation, and intelligence, information fusion has received extensive attention from academia and industry, and many new theories and methods have been made in recent years [9–11]. However, in recent years, most of the research on college Chinese education has remained at the theoretical level. Therefore, this article adopts action research, starting from practice, and tries to explore the teaching mode of combining college Chinese education and information fusion. It seeks to improve the teaching efficiency of Chinese, so that students have better growth.

2. College Chinese Education and Related Theories of Information Fusion

2.1. Big Data Background. With the advent of the era of big data, all walks of life in society are affected by big data. The traditional teaching mode of colleges and universities has also been greatly impacted by big data. Based on the arrival of new teaching reforms based on big data platforms, we can reform traditional courses [12, 13]. Colleges and universities from various countries have built big data platforms, such as China's Youmu course. The platform categorizes and organizes the massive information of a large number of users by building different data models and abstracts different user images. This can not only push the most suitable high-quality teaching resources for individuals but also optimize and organize teaching resources to promote more humane and better quality teaching resources, which can also set a warning line for the user's image. It conducts specific observations on specific students and provides real-time guidance. This reduces the emergence of problematic students and promotes the healthy development of students in the process of growth. For example, under a big data platform such as Youmu class in a Chinese college, the teaching and research group of the school conducted a preliminary teaching reform attempt on the university Chinese course. It also compares the differences with the traditional teaching mode through the five links of preview, lecture, homework, extracurricular tutoring, and testing [14].

2.1.1. Preliminary Study of College Chinese. In the course of learning the course, preview is a very important step. Each student can understand the difficulty of the knowledge points through the preview and then improve their learning efficiency. Teachers can also fully understand the level of knowledge that students have now mastered in order to achieve the goal of high teaching effect. Therefore, a good preparation before class is the most important task before class. However, in the traditional teaching mode, teachers determine the focus and difficulty of teaching based on teaching experience and syllabus. In fact, this is not necessarily suitable, and it is easy to cause a huge gap between the classes taught by teachers with rich teaching experience and teachers who lack teaching experience [15]. However, under the big data platform, teachers can search for relevant teaching chapters in the Youmu course database in a more targeted way during preview. They can also view the preview tasks and scores of different majors and different classes on the university language platform in recent years and then determine the focus and difficulty of the preview after sorting.

2.1.2. The Teaching of University Language. In traditional teaching, teachers mainly teach, and there is not much interaction between teachers and students [16]. Under the big data platform, the main focus is to improve the core quality of students, which is different from traditional teaching. Learning materials and learning tasks can be pushed to students online via mobile phones or classroom network devices [17–20]. The interaction between teachers and students in the classroom can clearly and intuitively introduce and teach the key points and difficulties to be taught in the classroom. It uses online resources to push knowledge points in the form of cartoons, etc., which can more stimulate students' enthusiasm and initiative in learning in the classroom.

2.1.3. Homework in College Chinese. Under the traditional teaching mode, the homework of college Chinese usually can only be small composition or essay practice, which is relatively simple and boring [21]. On the big data platform, teachers can arrange multiple choice questions, true or false questions, and interesting essay questions, which are richer and more interesting. And when the teacher finishes talking about a knowledge point, students can practice in class in time and train targeted on the platform based on past data. This enhances the core competence of students in college Chinese. On the big data platform, teachers can flexibly choose review questions and question types. This allows the left homework to cover the chapter knowledge points taught in the classroom. It can answer questions online and automatically mark papers; they can see the wrong questions of the students and find the places where the students' knowledge is not firmly grasped. This in turn can push the test questions in a targeted manner, so that students can consolidate the knowledge they have learned.

2.1.4. Extracurricular Tutoring of College Chinese. On the big data platform, teachers and students do not need to specifically arrange a time to meet; they can push the relevant learning materials of extracurricular tutoring online. Teachers online supervise students to study in a timely manner, complete the learning content, and expand the knowledge of the students. And through the continuous accumulation of relevant extracurricular tutoring materials on the platform by teachers, it is more conducive to the construction of the university Chinese big data platform.

2.2. Information Fusion Technology. Information fusion technology is a technology that processes various information to meet the various needs of users. It is also called data fusion technology [10, 22, 23]. Multifeature attributes or the presence of multiple sensors perceives data. The actual work of information fusion technology is to obtain a description of the perceived object by eliminating the contradiction between various information. Therefore, it is also called multisource information fusion or multisensor information fusion [11, 24]. The process of multisensor information fusion is shown in Figure 1.

Redundant information is information repeated between sensors, while complementary information is external information sensed by sensors, which are independent of each other. Redundant information and complementary information are obtained by the multisource system through the data information of the sensor group [25–27]. The relationship between redundant information and complementary information is shown in Figure 2.

The sensor data has information redundancy in both time and space, that is, the continuity and consistency in time and the correlation of attributes in space. Based on this redundant information, there are temporal redundant information fusion methods and spatial redundant information fusion methods.

2.2.1. Data-Level Information Fusion Algorithm Based on Time Dimension. The data-level information fusion algorithm based on time dimension is mainly aimed at single sensor data, using redundant information in time for single-attribute time information fusion. It extracts redundant information in the time domain and frequency domain from the sensor data sequence in the window and establishes a mathematical model of attribute changes. According to the measurement data of the sensor, the optimal estimation function of the attribute change is given, and the fusion result is obtained [28, 29].

Frequency domain feature extraction is a data sequence composed of$N$data collected in time window $[t_i, t_{i+1}]$, and this data sequence usually contains important features of the measured attribute. It uses the frequency, amplitude, phase, and other parameters of each harmonic component in the signal obtained by frequency domain analysis to realize the description of the measured attribute characteristics.

For the data sequence $\{x | n = 0, 1, 2, \cdots N - 1\}$ in the window, its discrete Fourier transform is

$$X(k) = \sum_{n=0}^{N-1} e^{-i(2\pi/N)nk} x(n), \quad k = 0, 1, 2 \cdots N - 1. \tag{1}$$

The power spectrum estimation is defined as

$$S(\hat{\omega}) = \frac{1}{N} \left| \sum_{n=0}^{N-1} x_n e^{-jwn} \right|^2. \tag{2}$$

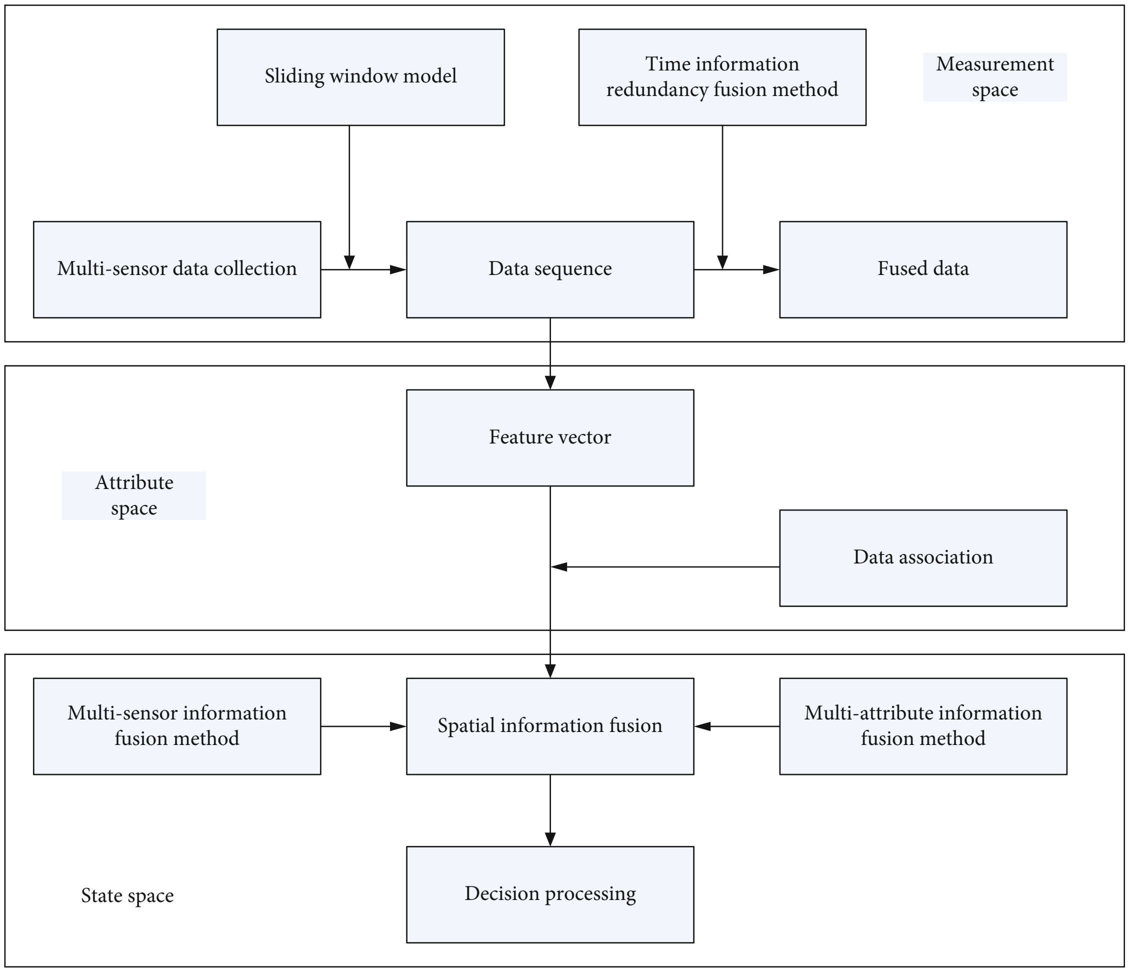

Figure 1: Multisensor information fusion process.

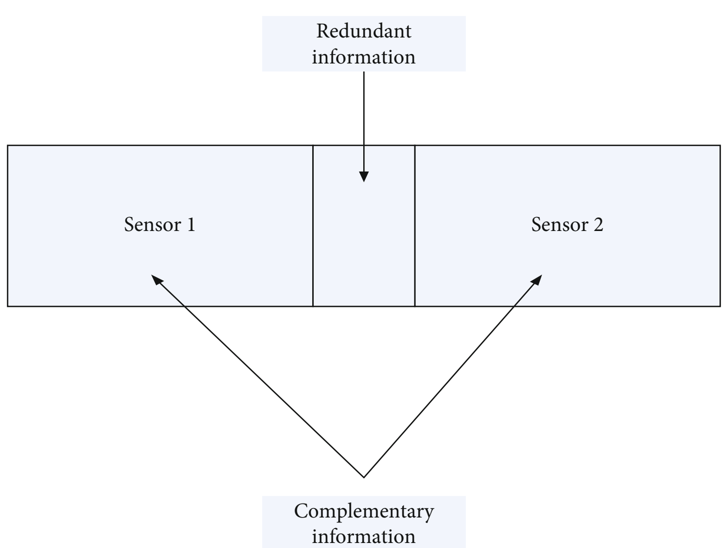

Figure 2: The relationship between redundant information and complementary information.

It can also be expressed as

$$S(\overset{\wedge}{\omega}) = \frac{1}{N}|X(\omega)|^2. \quad (3)$$

The signal is conserved in the process of transforming the signal from the time domain to the frequency domain, namely,

$$\sum_{n=0}^{N-1} |x_n|^2 = \sum_{k=0}^{N-1} |S(k)|^2. \quad (4)$$

Therefore, $S_k(k = 0, 1, 2 \cdots N - 1)$ can be regarded as an energy division of the original signal in the frequency domain space. In order to reduce the interference of noise to the frequency domain selection, this paper defines the power spectrum probability P_k.

$$p_k = \frac{S_k}{\sum_{k=1}^{N} S_k}. \quad (5)$$

The frequency domain whose power spectrum probability is less than a given threshold P_0 is regarded as the noise corresponding spectrum, and its main frequency part is reserved. Therefore, the dominant frequency distribution $\vec{f} = (f_0, f_2, \cdots f_i, \cdots, f_{n-1})$ of the monitoring data signal is obtained, and this is used as the frequency domain distribution of $f_i(x)$, as shown in the following formula:

$$f_i(x) = \sum_{j=0}^{n-1} \left(a_{ij} \cos 2\pi f_j x + b_{ij} \sin 2\pi f_j x \right), \quad t_i \leq x \angle t_{i+1}. \quad (6)$$

where $\vec{f}$ represents the main frequency distribution and a_{ij} and b_{ij} indicate amplitude.

From the above analysis, it can be seen that the vector composed of frequency domain distribution and frequency domain amplitude is used as the characteristic vector of the signal.

Extraction of the amplitude spectrum feature determines the amplitude in each frequency domain, and then, an estimate of $f_i(x)$ can be obtained. This is shown in formula (7) to formula (10). Among them, it is assumed that the mean and variance of the known environmental noise are $E(\sigma)$ and σ^2, respectively. Given the monitoring data $F_i(t) = f_i(t) + \sigma_i(t)$, assuming that the unbiased estimate of $f_i(x)$ is $f_i'(x)$, then

$$F_i(t) = f_i'(t) + \sigma_i'(t) = f_i(t) + \sigma_i(t), \quad (7)$$

where $\sigma_i'(t)$ is an estimate of $\sigma_i(t)$.

The difference between $F_i(x)$ and $f_i(x)$ is expected to be $E(\sigma)$, namely,

$$\sum_{j=0}^{N-1} \left[F_i(t_j) - f_i(t_j) \right] = E(\sigma). \quad (8)$$

The variance of the difference between $F_i(x)$ and $f_i(x)$ is σ^2:

$$\sum_{j=0}^{N-1} \left[F_i(t_j) - f_i(t_j) \right]^2 = \delta^2. \quad (9)$$

For amplitude constraints,

$$\sqrt{\alpha_{ij}^2 + \beta_{ij}^2} - \delta \leq \sqrt{a_{ij}^2 + b_{ij}^2} \leq \sqrt{\alpha_{ij}^2 + \beta_{ij}^2} + \delta. \quad (10)$$

From the above, the amplitudes $\vec{a}$ and $\vec{b}$ of at each frequency can be obtained, that is, the characteristic vector of the amplitude spectrum.

2.2.2. Feature-Level Information Fusion Algorithm Based on Spatial Dimension. Feature-level data fusion belongs to the middle-level fusion. It first extracts a set of characteristic information from the raw data collected by each sensor. It then uses the feature-level information fusion method to fuse each group of feature information. The feature-level fusion process is the mapping process from an n-dimensional measurement space to an m-dimensional attribute space [30, 31], as shown in Figure 3.

Feature-level attribute association fusion mainly includes three steps: feature vector selection, multisensor data association, and association fusion between attributes based on simple relationships [32].

The first point is the selection of feature vectors. The feature-level data fusion object is the feature vector. The requirement for the feature vector is that it can fully reflect the characteristics of the signal. And it has an objective compression rate and at the same time guarantees the loss of as little original information as possible. The eigenvector of the window signal expressed in the form of a complex number is shown in the following formula:

$$\vec{F}_f = \{\cdots, 0, \cdots, (a_{i0} + i \cdot b_{i0}), \cdots, 0, \cdots, (a_{im} + i \cdot b_{im}), \cdots, 0, \cdots\}, \quad 0 \leq m \angle n_f, \quad (11)$$

$$\vec{F}_g = \left\{\cdots, 0, \cdots, (\alpha_{i0} + i \cdot \beta_{i0}), \cdots, 0, \cdots, \left(\alpha_{ij} + i \cdot \beta_{ij}\right), \cdots, 0, \cdots\right\}, \quad 0 \leq j \angle n_g,$$
$$\vec{F}_h = \{\cdots, 0, \cdots, (\lambda_{i0} + i \cdot \gamma_{i0}), \cdots, 0, \cdots, (\lambda_{ik} + i \cdot \gamma_{ik}), \cdots, 0, \cdots\}, \quad 0 \leq k \angle n_h, \quad (12)$$

where (a_{im}, b_{im}) represents the cosine and sine components at frequency f_m corresponding to the change in the frequency domain of the signal.

$a_{im} + i \cdot b_{im}$ is the plural form of (a_{im}, b_{im}).

The second point is multisensor data association. How to judge whether the data from different sensors represent the

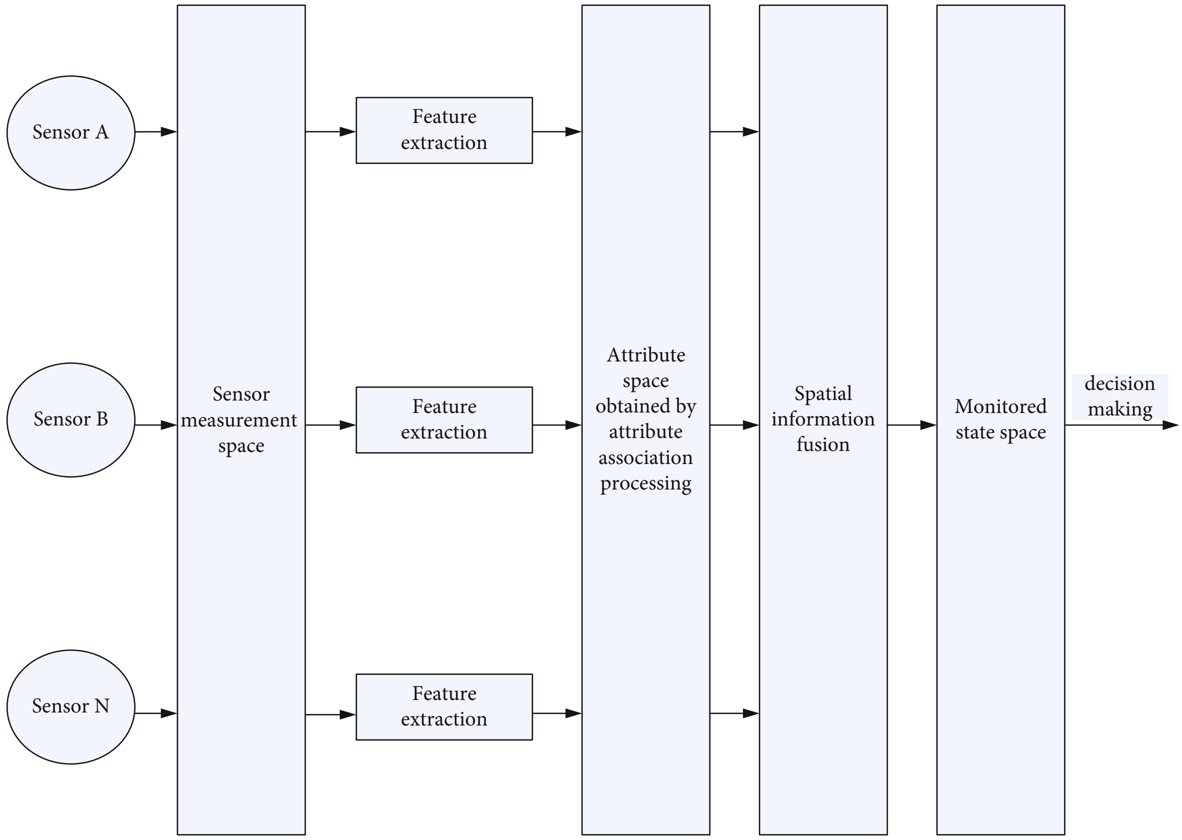

Figure 3: Feature-level information fusion process.

same target is the problem of data association. Therefore, the cosine value of the angle between feature vectors $\vec{F}_1$ and $\vec{F}_2$ can be used as a measure of the mutual support S_f of different sensors, namely,

$$S_f = \frac{\vec{F}_1 \cdot \vec{F}_2}{\left|\vec{F}_1\right| \times \left|\vec{F}_2\right|}. \tag{13}$$

When the cosine value reaches a certain threshold and can maintain long-term strong correlation, this means that the two sensors have a strong correlation and are used to measure the same attribute. This method can be used for the fusion of multiattribute information.

The third point is the fusion between attributes based on simple relationships. The main use of spatial information fusion is to use the interrelationships between attributes to merge information between attributes. Fusion based on simple relationships can be performed through linear relationships.

(1) Linear relationship extraction. There is a simple linear relationship between sensor monitoring data, as shown in the following formula:

$$z = ax + by + c, \tag{14}$$

where x, y, z indicate measurement data of different attributes and a, b, c represent the coefficients corresponding to different attributes

The specific relationship of the three sensor data can be expressed as

$$f_i(x) = a \cdot g_i(x) + b \cdot h_i(x) + c. \tag{15}$$

After decomposition, the frequency amplitude of $f_i(x)$ is the linear sum of the amplitudes of $g_i(x)$ and $h_i(x)$ at different frequency components. It is expressed in vector form as

$$\begin{aligned} \vec{a} &= a \cdot \vec{\alpha} + b \cdot \vec{\beta}, \\ \vec{b} &= a \cdot \vec{\beta} + b \cdot \vec{\gamma}. \end{aligned} \tag{16}$$

Then, the same linear relationship exists between the feature vectors:

$$\vec{F}_f = a\vec{F}_g + b\vec{F}_h. \tag{17}$$

When determining the relationship between different attributes, only the eigenvectors of the corresponding attributes need to be extracted to form the eigenvector matrix. If there is a linear correlation between the row vectors in the matrix, it means that there is a linear relationship between the corresponding attributes. The state of another property can be estimated from the linear correlation and the state of the known property.

(2) Linear relationship fusion. From the eigenvector matrix, different measurement data with linear relationship can be determined, and these data come from different sensors. There may be multiple sensors measuring the same attribute, or the attribute measured by a certain sensor is a linear combination of the measured attributes of several other sensors. As shown in Figure 4, the sensor information can be fused by the weighted fusion algorithm

Under the combined effect of monitoring attribute$x$and noise (including the influence of sensors), the result is data x_1 and x_2, if the noise satisfies a Gaussian distribution with a mean value of zero and a variance of δ_1^2 and δ_2^2, respectively. As shown in Figure 5, the two distributions have a common area, indicating that the measurement data x_1 and x_2 have a supporting relationship.

$$\begin{cases} \alpha_1 = \dfrac{S_1}{(S_1 + S_2)}, \\ \alpha_2 = \dfrac{S_2}{(S_1 + S_2)}, \end{cases} \tag{18}$$

where α_1 and α_2 are expressed as the weight of the fusion of the two monitoring data. The obtained fusion estimation result is

$$x' = \alpha_1 x_1 + \alpha_2 x_2. \tag{19}$$

Similarly, for n sensors, the support and fusion weight of each monitoring data are

$$S_i = \sum_{j \neq i}^{n} P_j(x_i), \qquad \alpha_i = \frac{S_i}{\sum_{j=1}^{n} S_j}. \tag{20}$$

Then, the fusion estimation expression of n monitoring data is

$$x' = \sum_{i=1}^{n} \alpha_i x_i. \tag{21}$$

(3) Multiattribute information fusion. Multiattribute fusion is based on the redundant information that exists between the measured attributes. It uses the method of information fusion to remove the uncertainty of measurement attributes. Multiattribute information can be fused by means of multisensor information fusion

The measurement accuracy of n sensors is independent of each other, so the accuracy x' of attribute x can be expressed as

$$\delta_x^2 = \sum_{i=1}^{n} \alpha_i^2 \delta_i^2. \tag{22}$$

In the same way, the y measurement accuracy y' of the attribute is

$$\delta_y^2 = \sum_{j=1}^{m} \beta_j^2 \delta_j^2. \tag{23}$$

The equivalent sensor is a linear combination of attributes x and y after fusion, and its measurement accuracy is expressed as

$$\delta_7^2 = a^2 \delta_x^2 + b^2 \delta_y^2. \tag{24}$$

The multisensor information fusion method fully mines the associated information between attributes and uses this relationship for information fusion. It provides mutual support between attributes, reduces the uncertainty of information, and improves the accuracy of fusion.

2.3. Effective Teaching Theory. The evaluation index of the effectiveness of teaching refers to whether the student has a certain development in the learning process [33]. The effectiveness of the deep integration of information fusion technology and subject teaching refers to classroom teaching activities supported by information fusion technology. This enables students to benefit from their studies, improve their comprehensive abilities, and gain development. From the perspective of students, study time is the foundation, and students can obtain certain learning results through a period of study. It is not only the improvement of learning ability but also the improvement of learning efficiency. Similarly, the learning experience is also a key point that cannot be ignored. Students get a positive learning experience, and their learning efficiency will also increase, thereby promoting the improvement of learning effects. Therefore, in addition to learning time and learning results, learning experience is one of the goals of effective learning. From the perspective of teachers, most teachers teach based on their personal teaching experience or teaching process, and there is no teaching model that can be copied or referenced. Therefore, to model the teaching experience, teachers compile their own experience into a teaching model and think about the rationality of the model. In the teaching process, teachers think about which technologies should be used in each link of the model. This not only provides teachers with thinking points in teaching but also is a way to implement the combination of information fusion technology and subject teaching.

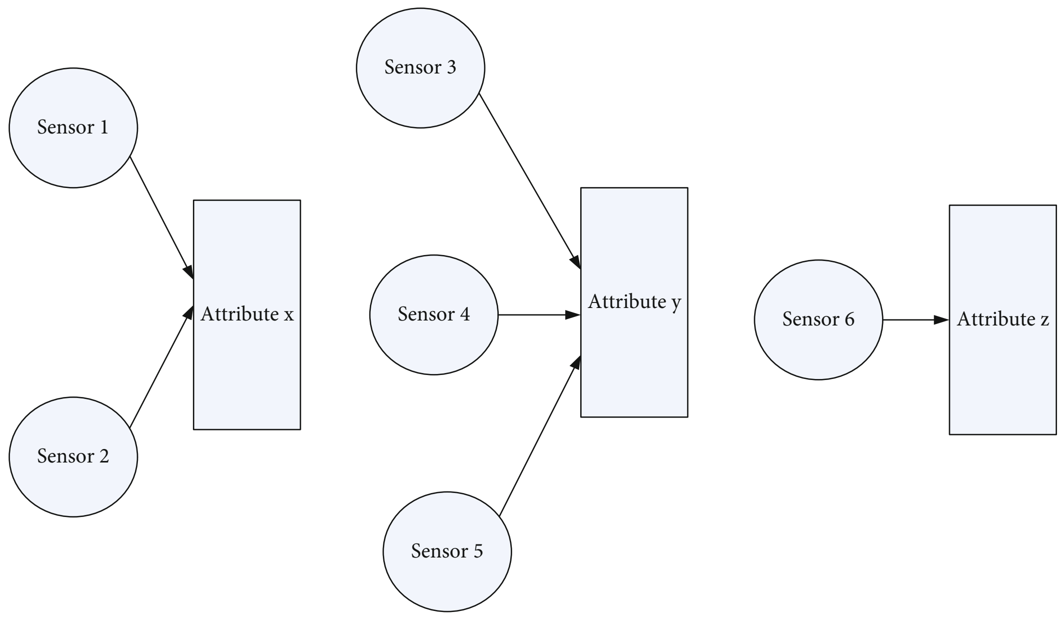

Figure 4: Multisensor system.

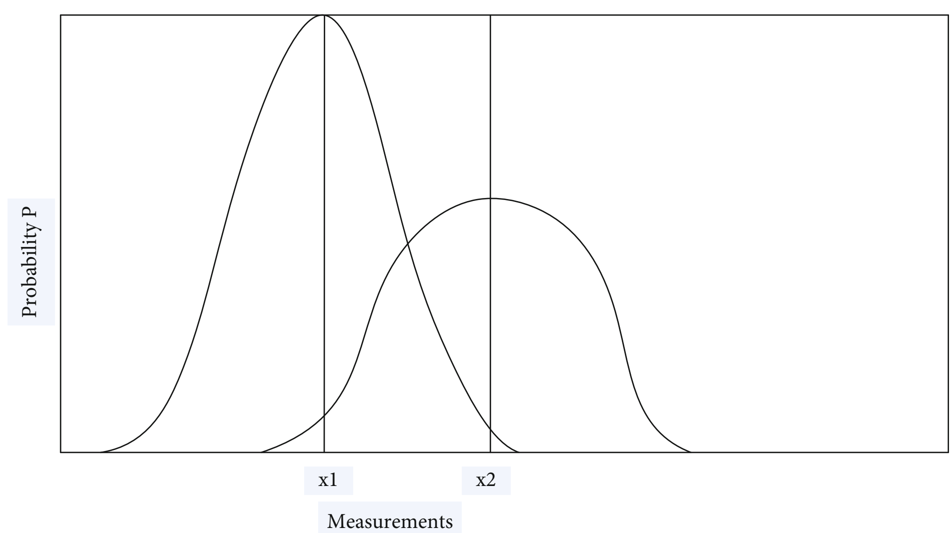

Figure 5: Probability distribution of measured values x_1 and x_2.

3. Teaching Action Practice Based on Information Fusion in the Context of Big Data

In this experiment, two parallel classes with equivalent levels under natural teaching conditions were selected as the teaching objects. It adopts the traditional teaching mode and the teaching mode of university Chinese education and information fusion technology based on the background of big data. It teaches the same content through the overall teaching model and is completed by the same teacher. According to the teaching effect and the interview with teachers, the application effect of this teaching model is analyzed. The teaching mode of practical research in this article is shown in Figure 6.

This paper tests the four aspects of college students' mastery of ancient and modern language analysis, college students' Chinese reading comprehension, college students' Chinese writing application, and college students' language expression and communication effects. This article analyzes the learning effects of these four aspects under the two teaching modes through test paper testing. The test papers were distributed in the experimental group and the control group, and 70 copies were distributed in these four areas, and 70 copies were recovered. The experimental result data were all performed on the computer with SPSS statistical analysis software for independent sample T test.

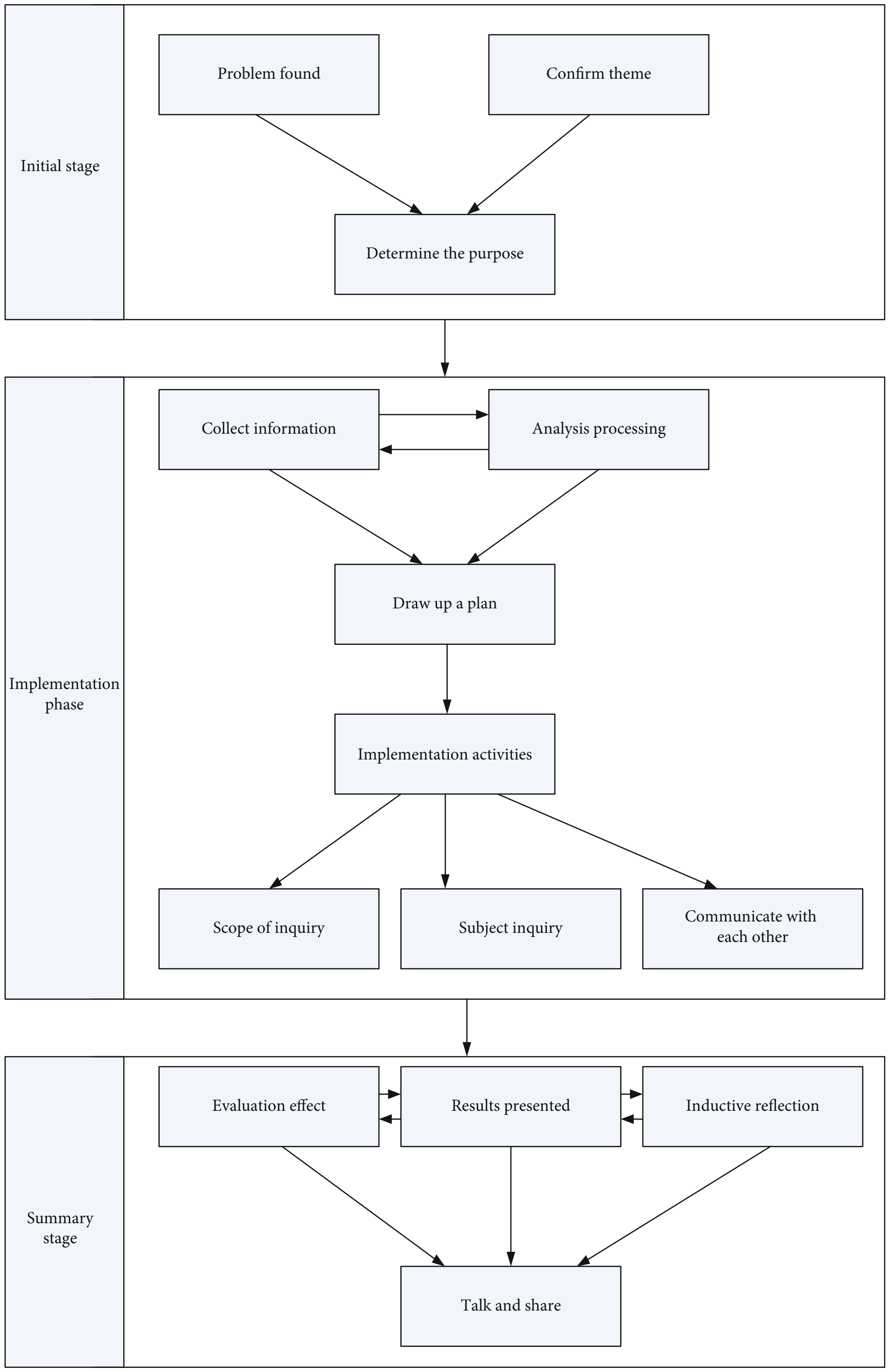

Figure 6: The teaching mode of college Chinese education and information fusion technology based on the background of big data.

3.1. The Effect of Students' Chinese Learning

(1) The effect of college students on the analysis and mastery of ancient and modern languages

The students' mastery of the analysis of contemporary ancient languages and characters is obtained through the test paper, and the content of the test paper is mainly based on the words and words in the course they have learned. It is to analyze the students' understanding of words and the effect of using them under the two teaching modes through test paper tests. The analysis result is shown in Figure 7.

It can be seen from Figure 7 that the average teaching effect of the experimental group is 19.4222. The control group was significantly lower, with an average value of only 11.4000. Through further independent sample T test, the P value is 0.043 less than 0.05, which is significant. This shows that the performance results of the two teaching modes are significantly different. From this point of view, the learning effect of the experimental group was significantly higher than that of the control group. The sample T test of the pretest and posttest ancient and modern language analysis mastery of the experimental group is shown in Table 1.

(2) The effect of college students' Chinese reading comprehension

Similarly, it learns about students' reading comprehension through examination paper tests. It chooses to take the extracurricular reading that is similar to the school teaching content as the test content. The main analysis is shown in Figure 8.

As shown in Figure 8, it is obvious that the mean value of 31.3000 in the control group is lower than the mean value of 41.4222 in the experimental group through the comparison of the mean values of teaching effects. It can be explained that the average performance of the experimental group is higher than that of the control group. Through further independent sample T test on the teaching effect values of the two groups, the P value is 0.002, which is significant. Therefore, from the perspective of learning effects, the experimental group is higher than the control group. The sample T test of the pretest and posttest reading comprehension of the experimental group is shown in Table 2.

(3) The effect of college students' Chinese writing application

Through the test of writing training, the effect of improving students' writing ability under the two teaching modes is tested. The data analysis is shown in Figure 9.

It can be found from Figure 9 that the standard deviation of the experimental group is smaller than that of the control group, indicating that the performance fluctuation range of the experimental group is smaller than that of the control group. Through further testing of the teaching effect values of the two groups, the P value is 0.016 less than 0.05, and the conclusion is significant. It can be seen from the effect of Chinese writing application that the learning effect of the experimental group is higher than that of the control group. The sample T test of the pretest and posttest writing application in the experimental group is shown in Table 3.

(4) The effect of college students' language expression and communication

It tests students' language expression ability by setting specific communication situations for the experimental group and the control group. The experimental results are shown in Figure 10.

Through independent sample T test, P value 0.029 is less than 0.05, and the conclusion is significant. This shows that the results of the two groups are significantly different. It is not difficult to see from Figure 10 that the mean value of the experimental group is higher than that of the control group, and the standard deviation is also smaller than that of the control group. This shows that the average performance of the experimental group is not only higher than that of the control group, but also the performance fluctuation range is small and relatively stable. The sample T test of the pretest and posttest language expression and communication of the experimental group is shown in Table 4.

3.2. The Effect of Teacher Teaching. After the teaching practice is over, this article discusses the teacher's feelings and views on the teaching model through interviews with teachers, and there are three main points.

First, teachers believe that the greatest advantage of this teaching model is that the initiative in the classroom is in the hands of students, and students are more willing to express themselves. This not only exercises students' language skills but also gives them room for independent thinking. In the teaching process, students are very motivated. Students are willing to participate in the classroom and express their ideas more directly. This not only allows them to have a healthy learning environment in their studies but also allows teachers to understand the situation of students, which is more conducive to teachers' targeted teaching.

Second, this teaching model brings a positive learning atmosphere, and students are more willing to communicate. Students with better grades can actively communicate their study habits and their own understanding of knowledge, while students with lower levels can encourage them to show more by expressing their opinions. Students learn from each other and promote each other. In this teaching mode, a very good growth environment has been created.

Thirdly, the teachers provided some suggestions worth considering for the teaching model. Teachers believe that the combination of university Chinese education and information fusion technology will not only help students' enthusiasm for learning but also make students more willing to communicate in such a good atmosphere. This will improve the ability of information integration and reflect on their own shortcomings, so as to promote the healthy growth of students in ideological and political.

4. Discussion

This paper conducts a practical research on college Chinese education and information fusion teaching action based on

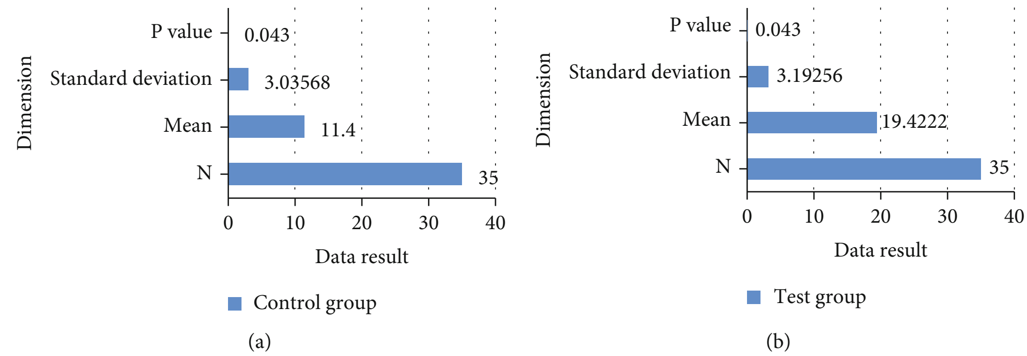

Figure 7: Independent sample *T* test of college students' mastery of ancient and modern language and character analysis: (a) independent sample *T* test of the control group; (b) independent sample *T* test of the experimental group.

Table 1: Pretest and posttest of the experimental group *T* test.

	Dimension	Category	Mean	Standard deviation	*t*	*P* value	Conclusion
The mastery of ancient and modern language analysis	Word sound	Pretest	3.5300	1.27436	-6.767	0.001	Significant
		Posttest	6.2056	1.16523			
	Font	Pretest	6.0000	1.24623	-2.045	0.003	Significant
		Posttest	7.0000	1.06572			
	Word meaning	Pretest	4.0722	0.10369	-4.540	0.001	Significant
		Posttest	5.0400	0.08965			

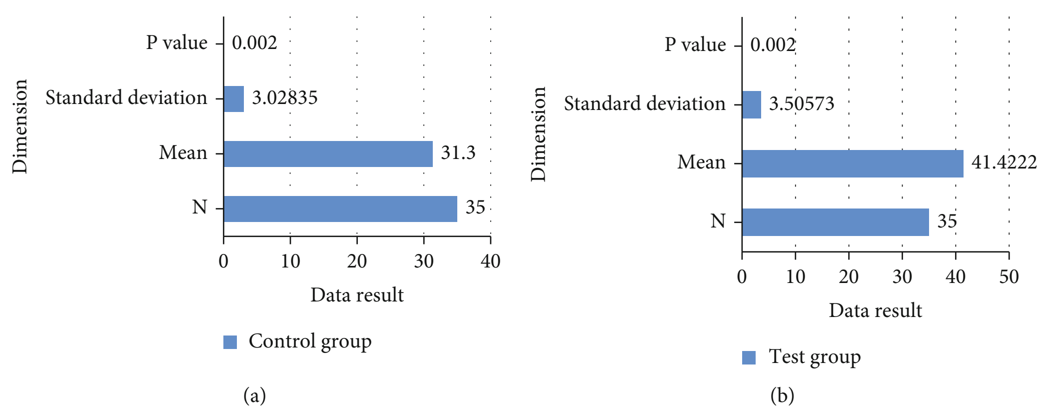

Figure 8: Independent sample *T* test of the effect of college students' Chinese reading comprehension: (a) independent sample *T* test of the control group; (b) independent sample *T* test of the experimental group.

Table 2: Sample *T* test of reading comprehension in the pretest and posttest of the experimental group.

	Dimension	Category	Mean	Standard deviation	*t*	*P* value	Conclusion
Reading comprehension	Read the article aloud	Pretest	4.0400	1.17072	-1.762	0.007	Significant
		Posttest	5.0556	0.78652			
	Overall perception	Pretest	4.3400	1.28068	-2.277	0.002	Significant
		Posttest	5.4400	1.10207			
	Integrate information	Pretest	4.0600	1.18208	-4.087	0.001	Significant
		Posttest	5.6400	1.10480			
	Appreciation and evaluation	Pretest	4.3556	1.47511	-4.512	0.001	Significant
		Posttest	6.1222	1.00872			Significant
	Form an explanation	Pretest	5.1222	0.61682	-2.285	0.002	Significant
		Posttest	6.0422	1.26808			Significant

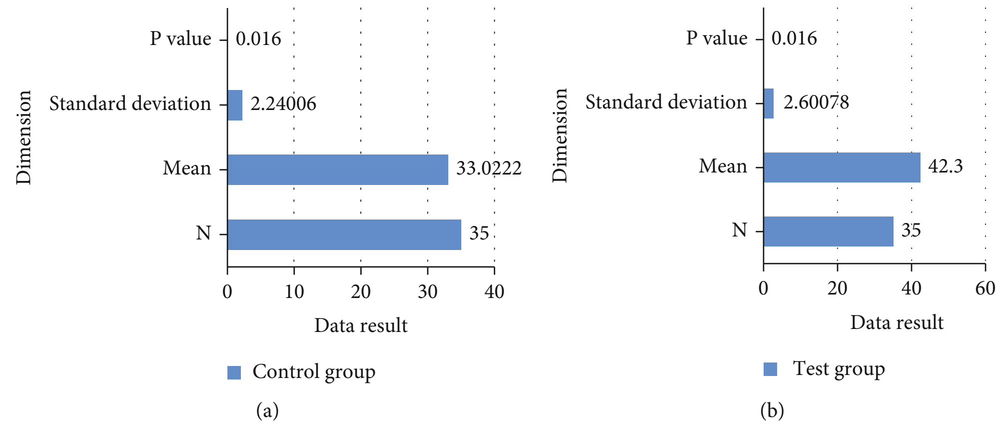

Figure 9: Independent sample T test of the application effect of college students' Chinese writing: (a) independent sample T test of the control group; (b) independent sample T test of the experimental group.

Table 3: Sample T test of the writing application of the pretest and posttest in the experimental group.

	Dimension	Category	Mean	Standard deviation	t	P value	Conclusion
Writing application	Examining questions accurately	Pretest	4.2722	1.02015	-3.236	0.001	Significant
		Posttest	5.3722	0.83104			
	Appropriate selection	Pretest	4.5400	0.63341	-5.800	0.001	Significant
		Posttest	6.2400	1.10764			
	Language expression	Pretest	4.8556	1.58032	-1.716	0.007	Significant
		Posttest	6.0556	1.44438			
	Rigorous structure	Pretest	5.0722	1.50065	-1.561	0.011	Significant
		Posttest	6.3222	1.42430			Significant
	Writing norms	Pretest	5.2722	1.44632	-2.180	0.002	Significant
		Posttest	6.5722	1.08142			Significant

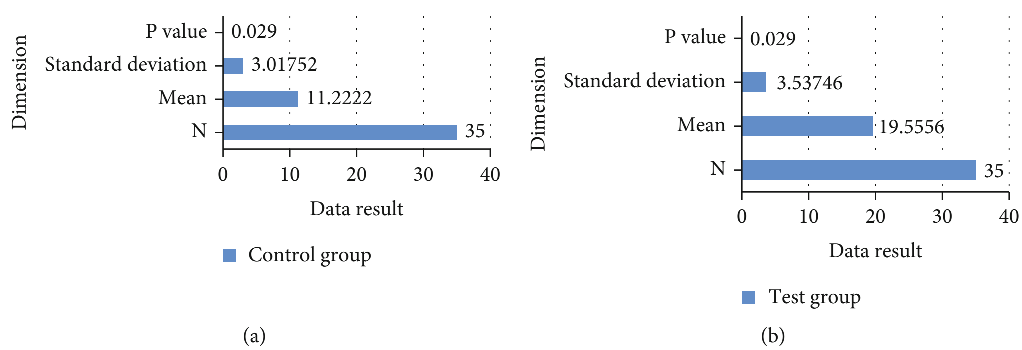

Figure 10: Independent sample T test of the effect of college students' language expression and communication: (a) independent sample T test of the control group; (b) independent sample T test of the experimental group.

Table 4: Sample T test of language expression and communication in the pretest and posttest of the experimental group.

	Dimension	Category	Mean	Standard deviation	t	P value	Conclusion
Verbal communication	Concise	Pretest	3.0722	1.74158	-5.560	0.001	Significant
		Posttest	4.7222	0.83878			
	Coherent	Pretest	6.1056	1.21306	-2.042	0.004	Significant
		Posttest	7.1000	1.22538			
	Decent	Pretest	4.8000	1.22410	-1.701	0.008	Significant
		Posttest	5.6400	0.87806			

the background of big data through test paper testing. From the data analysis results, the four aspects of the data show that the results are relatively good. With the support of information fusion technology in the analysis of ancient and modern languages and characters, students have a better understanding of language and characters. This can communicate smoothly with people at work, with smooth sentences and clear expression. This will be a very good help for students after entering the society. In terms of language reading comprehension, this is undoubtedly the idea to help students understand the article. Through abstract thinking and reasoning judgment, the realization of the mastery of the subject of the article will be very helpful to cultivate students' thinking activities. In the writing application part, in addition to cultivating students' ability in language understanding, students also need to cultivate clear thinking and rigorous structure. Therefore, after passing the writing training, students gradually master the logic and skills of writing. In terms of expression and communication, the use of language is not only in writing but also in daily life. Through the setting of the language situation in the classroom, it not only exercises the students' language expression ability but also makes them feel the importance of proper, concise, and accurate language in daily life, so as to reflect on their own shortcomings, point out, and improve themselves in a targeted manner.

5. Conclusion

This article is based on the action research of college Chinese education and information fusion teaching under the background of big data. Through examination papers, it conducted action research on the effects of ancient and modern language analysis, college students' Chinese reading comprehension, college students' Chinese writing application, and college students' language expression and communication. In this paper, an independent sample T test was performed on the experimental results of the experimental group before and after the test. From the performance of students, the results of the experimental group's performance before the test need to be strengthened. In terms of parsing ancient and modern languages, students will not actively communicate, and the learning method is mainly based on classroom explanations. Most students do not have a good understanding and use of words, and in terms of reading comprehension, students cannot successfully complete the course content and analyze the corresponding themes. In terms of writing application, some students are not proficient in the application of similar sentence patterns or writing techniques and description methods. The expression communication part is better for simple daily communication, but the expression of subjective issues needs to be strengthened. After the action research, students will express their opinions more enthusiastically and engage in communication with their classmates. Through communication with each other, they learned how to learn more efficiently. Students understand their own shortcomings, understand that they have many areas for improvement, and are more willing to explore with classmates to find solutions. This shows that college Chinese education and information fusion teaching make the content of Chinese teaching more vivid and diversified. From the perspective of students' learning effects, this teaching model has a certain effect.

This research has achieved some results. However, due to the limited research time and ability of the researchers, this article still has many shortcomings. The premise of this teaching mode is that teachers have the ability to make topics and information literacy, so that they can deal with various problems in the teaching process. At the same time, students also need to have the corresponding abilities, such as concisely and clearly explain their own problems and directly address the doubts in the relevant teaching content. This prevents teachers from affecting the teaching process in order to solve the problem of students with different levels of information. Therefore, before conducting college Chinese education and information fusion teaching, it is necessary to conduct curriculum training on exploration and exchange of relevant topics for teachers and students. There are many teaching courses and limited time. Teachers need to spend more time to guide students to build knowledge through communication and learning. In the future teaching, what still needs to be explored and considered is how to make the language ability of college students in all grades more systematic. It needs to ensure that the ability goals of different grades form a complete system that is not single but is leveled by difficulty.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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