Cooperative Education of College Students' Ideological and Political Health Education from the Perspective of Network Public Opinion

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Abstract: With the development of the Internet, the public information on the Internet has spread rapidly. The tendentious comments and opinions on the Internet have disrupted people's peaceful life, and also brought a huge impact on the learning environment of college students. Ideological and political health education has always been one of the focuses of colleges and universities. The educational environment in the Internet era has brought convenience and certain challenges to this type of education. In an open network environment, online public opinion focusing on the epidemic has quietly formed. As an important group of online public opinion, college students must be able to accurately identify online public opinion information, and not let the so-called "rumors" affect themselves. This paper studies the collaborative education of college students' ideological and political health education from the perspective of network public opinion. Combining the advantages of online public opinion, it built an online classroom. The specific educational strategies were put forward based on the concept of collaborative education. Finally, a precise positioning of the educational activities of college students. Experiments shown that the method proposed in this paper optimized the teaching environment and improved the teaching efficiency by 7.85%.

1. Introduction

Network public opinion refers to the popular network public opinion with different views on social issues on the Internet. It is a form of expression of social public opinion. Since 2019, the network public opinion brought by COVID-19 has never stopped, which has also had a huge impact on the ideological and political thinking of college students. What the COVID-19 has brought is not only the reflection on the dialectical relationship between man and nature, it is more a kind of in-depth reflection on the existence of life, survival situation, crisis response, learning and life

reshaping, etc. for college students, with the help of cyberspace under the background of the Internet. As the backbone of online groups, college students can publicly express their beliefs, attitudes, opinions and emotions to the whole society through online digital platforms. Similarly, in this environment, colleges and universities should use the network platform to strengthen public opinion guidance and give college students the correct educational content.

Ideological and political education can not only expand students' knowledge, but also improve their comprehensive quality. In recent years, more and more research work has been done in this area. Yinxiang Z investigated the psychological pressure and interest in different health education contents of college students in a university, and put forward suggestions on how to integrate ideological education with psychological education [1]. Cheng P introduced the main contents of psychological education and ideological education, then focused on the relationship between them, and finally proposed strategies to integrate them [2]. Wang J used the theory of synergy to study the ideological education and mental health of college students, and finally found that the current political and mental health education in colleges and universities was not strong, and the growth environment of students needed to be optimized [3]. Susanto R U discussed the relationship between ideological education and mental health education, analyzed their necessity and credibility, and finally gave a new educational idea combining the two [4]. Narwana K studied the common points and internal connections between mental health education and college students' ideological education from five aspects: theoretical basis, subject system, educational level, educational content, and educational essence. The research results provided suggestions for the next development of college students' ideological education [5]. Rany B expounded the importance of ideological education and mental health education respectively, and expressed his views on how to combine ideological education and mental health education [6]. Vijaykumar S D analyzed the difference and connection between these two parts through the exploration of the development process of the relationship between ideological education and mental health education in colleges and universities, and pointed out the necessity of coordinated development and mutual promotion [7]. These studies on students' ideological and political education were relatively detailed, but they were not related to online public opinion.

In the context of the Internet era, online public opinion has become an important factor affecting social stability, and many scholars have also joined the ranks of researching online public opinion. Marks M S proposed a method to predict changes in network public opinion using a convolutional neural network model. Experiments showed that the method was accurate and effective [8]. Nyabola N designed a method to control the continuous fermentation of public opinion using Wiki (multi-person collaborative writing system) technology, and verified the effectiveness of the method through experimental simulation [9]. Mostert F proposed a network public opinion hotspot detection model, and used related algorithms to classify texts. Experiments showed that this method has a good effect in improving the detection efficiency [10]. Simanovskij A E derived a model for describing the topology of public opinion based on complex network theory. The results showed that the proposed model can well reflect the distribution of public opinion [11]. Zhang Y used artificial intelligence technology to design a public opinion monitoring system. Practice showed that the system has achieved good results in monitoring [12]. Guerra M A used data mining technology to point out the main content of the public opinion early warning mechanism, and finally formulated the linkage response strategy [13]. Si I proposed a hierarchical structure framework for public opinion research, and then investigated the problems existing in public opinion research and proposed solutions [14]. The above studies on network public opinion are relatively specific, but they are not related to ideological education.

The corona virus disease pandemic has changed the learning environment and educational environment of college students, and any type of teaching is carried out in the form of online

courses. Usually, educational activities work best with face-to-face communication. In the epidemic environment, teaching activities can only be carried out through online platforms. This article first analyzes the advantages of Internet public opinion to ideological and political education in the epidemic environment, and then the specific educational content is displayed in the form of online classroom. Combined with the text preprocessing algorithm, related teaching data is clustered. Finally, a new educational method is provided for college students in the form of collaborative education.

2. Internet Public Opinion and Educational Activities from the Perspective of Its

Internet public opinion refers to the opinions on social issues that are popular on the Internet, or it can be said that the public expresses different opinions and views on a hot event.

Information regarding medicine, technology, and health management data is referred to as health information. Key fundamental resources for the advancement of health Health information can be gathered, compiled, and analyzed to reveal the internal workings and external relationships of population health and needs, health development, and health service activities, as well as the corresponding social health issues. This information can then be used to better organize, control, and manage health and related activities.

A system called a decision support system was created on the foundation of a more in-depth application idea for management information systems. The decision support system in the network environment will take on a new structure as a result of the Internet's growing popularity. Since shared resources and concurrent shared services are provided on the network in the form of servers, the decision resources of the decision support system, such as data resources, model resources, and knowledge resources, open up new possibilities for the system. The path of development for decision support systems is toward decision support systems in network environments.

(1) Related Functions and Dissemination Methods

The functions of network public opinion mainly include information transmission, educational guidance, supervision and prediction, as shown in Figure 1.
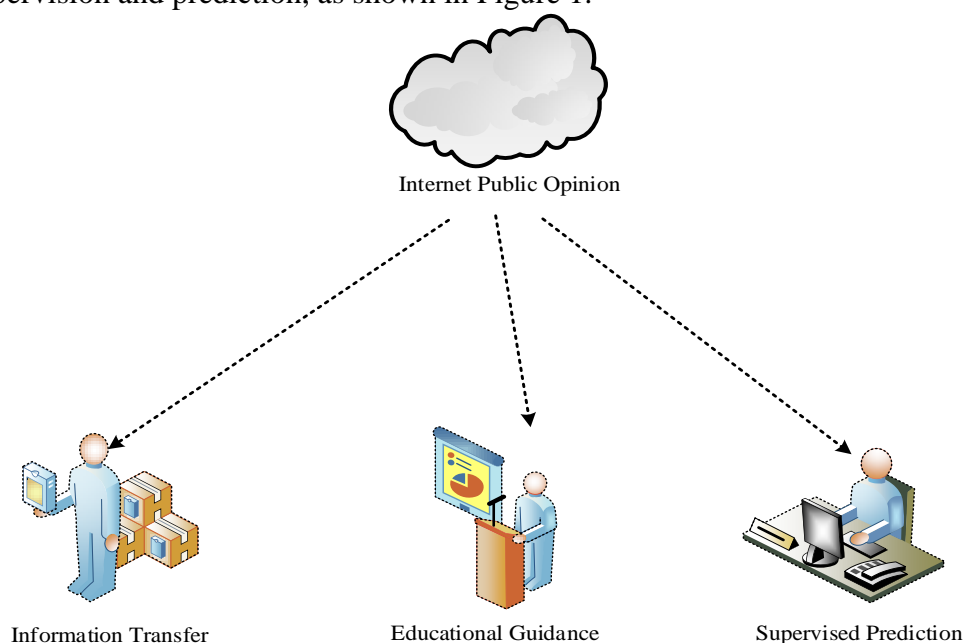

Figure 1. Functions of Internet Public Opinion

Information transfer function. The public can not only learn about hot events in China and other countries through online public opinion, but also express their views on the event by expressing their opinions on the Internet [15].

Educational guide function. As a new carrier of education for college students, online public opinion can reflect the recent ideological trends of college students, which allows teachers to formulate teaching methods and content in a targeted manner.

Supervised prediction function. This function means that teachers make predictions on public opinion by collecting the remarks published by college students on the Internet, and take appropriate measures to prevent the formation of negative public opinions.

Figure 2 shows the way of dissemination of network public opinion, which is mainly disseminated through e-mails, newsgroups, online chat, electronic bulletin boards, and online advertisements.
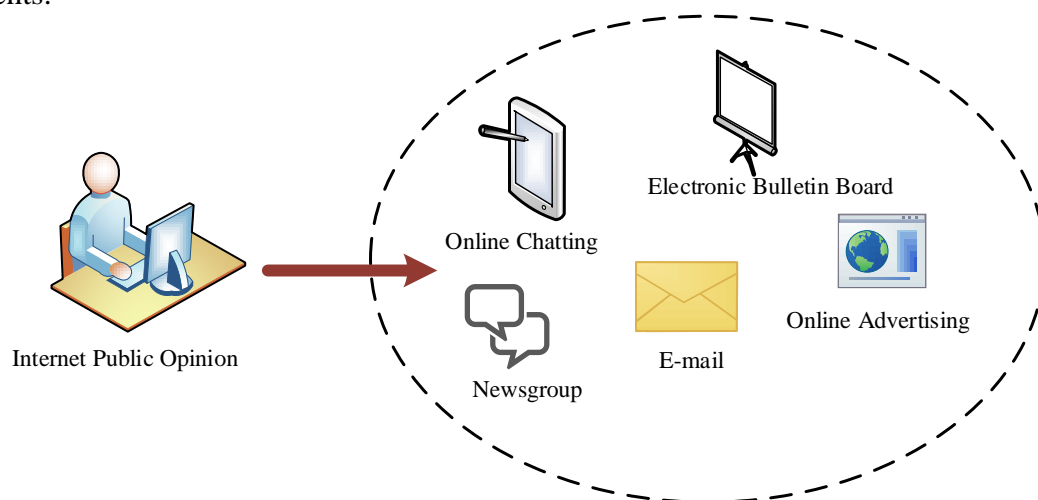

Figure 2. Dissemination Form of Network Public Opinion

(2) Educational Measures under the Network Public Opinion

Colleges and universities can incorporate college students' grades into the comprehensive college evaluation test by carrying out online education courses, so as to urge college students to eliminate bad online public opinion information subjectively. Then, an education-themed website can be established to promote core values and positive energy through the website [16].

3. Collaborative Education Methods Combined with Online Public Opinion under the Corona Virus Disease Pandemic

(1) Preparation Before Collaborative Education (using online classrooms to establish mainstream awareness of ideological and political education)

As shown in Figure 3, around the theme of "epidemic", teachers can combine the content of online public opinion and use it as the main resource for educational work, such as the country's response measures, the public security maintenance of the people's police, the touching stories of medical staff, and the relief supplies in various regions are the main choices for online classes. By carrying out educational activities according to this theme, college students would be more motivated, more able to establish self-confidence from communication and interaction, and cultivate their own patriotic spirit.
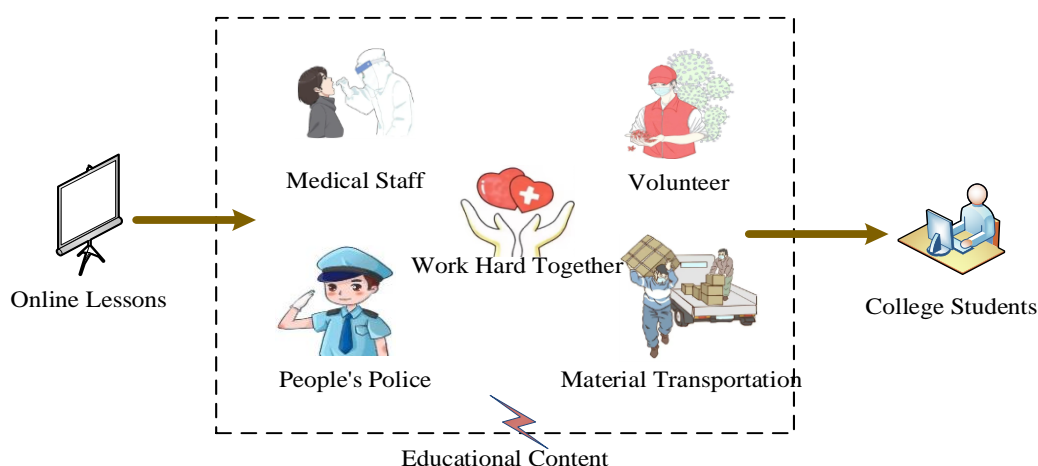
Figure 3. Online Classroom under the COVID-19 Pandemic

(2) Specific Strategies for Collaborative Education

As shown in Figure 4, the collaborative education strategy mainly includes two parts: management elements and spatial dimensions. The management elements involve ideology, educational philosophy, educational mechanism and teachers; the spatial dimension involves educational goals, educational methods, educational evaluation and educational environment.
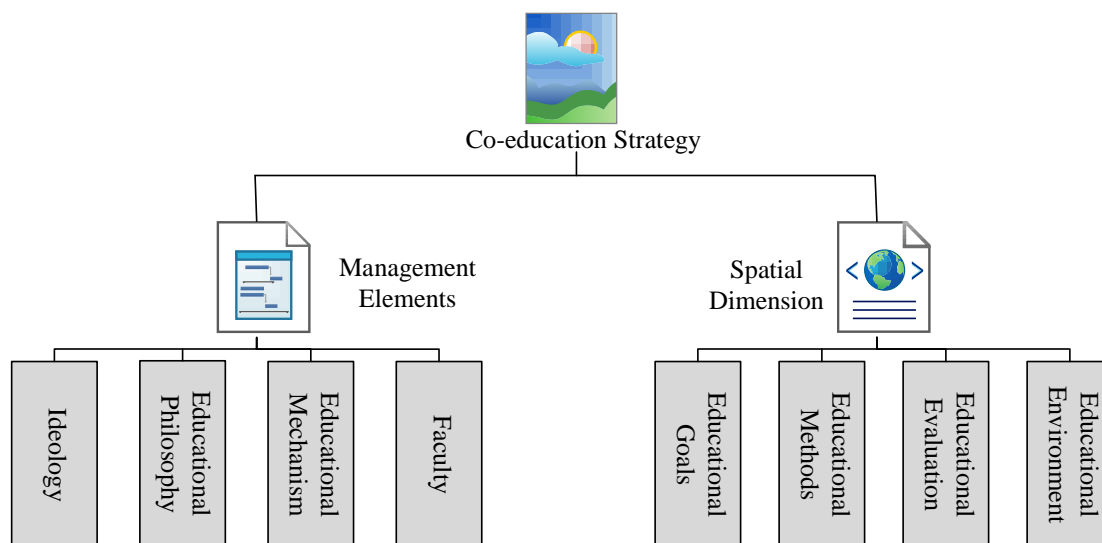

Figure 4. Specific Modules of Collaborative Education

A. Collaborative Strategies for Managing Elements

a. Ideological synergy. Marxism is the foundation of education, laying the foundation for the direction of education, and the guiding position of Marxism must not be shaken at any time. In a special period, the innovation of higher education education should be carried out under the premise of following Marxism.

b. Synergy of educational concepts. Adhering to the people-oriented educational philosophy, people should look at educational issues from the perspective of college students, always pay attention to the ideological progress of college students, give full play to their subjective initiative, and improve their self-development ability.

c. Synergy of educational mechanisms. Education cannot be accomplished by one person, but is

formed by the joint education of the entire educational team. A scientific and reasonable management system can provide students with a good educational environment and integrate ideological and political education into other disciplines. In addition, during the epidemic period, the financial system should be adjusted reasonably to provide guarantee for education funds.

d. Collaboration of teachers. The improvement of the ideological level of college students is inseparable from the training of teachers, and the strength of teachers is an important guarantee for education. Under the new crown epidemic environment, stricter requirements must be put forward for the selection of online course teachers in colleges and universities. In the current environment, teachers must have the correct political orientation and a strong sense of social responsibility.

B. Collaborative Strategies for Spatial Dimensions

a. Synergy of educational goals. Today's society's requirements for talents are more complex, and they also pay more attention to a person's ideological quality. Therefore, every discipline should regard ideological and political education as an important goal.

b. Synergy of educational methods. Education methods must keep pace with the times. Under the new crown epidemic, the educational environment has changed, so the educational methods must also be changed accordingly. The Internet public opinion guidance method and the self-help education method are more suitable for the current environment. On the one hand, college students should improve their ability to distinguish and select positive information from the Internet public opinion as educational content; on the other hand, college students can use the Internet platform to search online educational readings and watching various educational live videos for self-education purposes.

c. Collaboration of educational evaluation. Different from other disciplines, ideological and political education has its own complexity. When evaluating it, it is not feasible to only stand on the personal standpoint, it must be integrated with the society.

d. Synergy of the educational environment. Education is a subtle process, and the educational environment plays a role in rendering and edifying. Under the current conditions, while retaining basic teaching facilities, people should actively use network information technology to optimize the educational environment and maximize the impact of the environment.

4. Application of Text Preprocessing in Ideological and Political Education under Network Public Opinion

College education from the perspective of network public opinion would inevitably generate a large amount of data. Coupled with the existence of the new crown epidemic, there would be more and more texts to be processed. This paper uses text preprocessing and related algorithms to process data in education.

a. Word Segmentation Processing

The word segmentation method based on statistics is to perform word segmentation according to the mutual information [17], and the expression is as follows:

$$M(a,b) = \log \frac{G(a,b)}{G(a) \cdot G(b)} \quad (1)$$

In the formula, $M(a,b)$ represents the mutual information degree of two words. $G(a,b)$ represents the adjacent probability of words a and b. $G(a)$ and $G(b)$ represent the probability of a and b appearing in the document respectively.

b. Text Representation Model

This paper adopts vector space model (VSM) to represent various texts in educational activities. Assuming that the document is d, then the representation of document d is:

$$V(d) = \{t_1, w_1(d);...;t_i, w_i(d);...t_n, w_n(d)\} \,(2)$$

In the formula, t_i is the entry item, and $w_i(d)$ is the weight of t_i in document d.

The above content is defined by the term frequency (TF) method, and the calculation form is as follows:

$$tf_i df_i(d) = tf_i(d) * idf_i(d) \,(3)$$

In the formula, $tf_i(d)$ is the probability that the i-th word appears in text d, and $idf_i(d)$ is the ability of this word to distinguish this text from other texts in the text set, which can be calculated by Formula (4).

$$idf_i(d) = \log(N / n_i) \,(4)$$

Combined with Formula (4) and the effect of text length on weights, Formula (3) can be improved as:

$$TFIDF_i(d) = \frac{tf_i(d) * idf_i(d)}{\sqrt{\sum_{k=1}^{n} (tf_i(d) * idf_i(d))^2}} \,(5)$$

In the formula, k is the number of terms in text d.

c. Text Feature Selection

In this paper, information gain (IG), mutual information (MI), χ^2 statistics (CHI), word weight (TS) and word entropy (EN) are used in text feature selection.

Information gain is a commonly used text feature selection method. Its main idea is to calculate the difference between the information entropy before and after the text feature item appears in the document [18]. Its expression form is:

$$IG = \sum_{i=1}^{m} G(Q_i)\log_2\left(\frac{1}{G(Q_i)}\right) - G(w)\sum_{i=1}^{m} G(Q_i \mid w)\log_2\left(\frac{1}{G(Q_i \mid w)}\right)$$
$$- G(\hat{w})\sum_{i=1}^{m} G(Q_i \mid \hat{w})\log_2\left(\frac{1}{G(Q_i \mid \hat{w})}\right) \,(6)$$

In the formula, $\{Q_i\}_{i=1}^{m}$ is the category set Q in the target space. w is the feature entry. $G(w)$ is the frequency of the entry w. $G(\hat{w})$ is the frequency that the entry does not appear. $G(Q_i)$ is the probability of occurrence of the i-type value, and $G(Q_i \mid w)$ represents the conditional probability that the entry belongs to class i when it appears.

The expression form of mutual information (MI) can be written as:

$$MI(w, Q) = \sum_{i=1}^{m} G(Q_i)\log_2 \frac{G(w \Delta Q_i)}{G(w)G(Q_i)} \,(7)$$

Among them, $G(w)$ is defined as the probability of occurrence of w. $G(Q_i)$ is defined as the probability of occurrence of Q_i, and $G(w \Delta Q_i)$ is defined as the probability of occurrence of w and Q_i at the same time.

The specific evaluation function is:

$$MI(w,Q) = \log_2 \frac{X \times N}{(X+Z) \times (X+Y)} \quad (8)$$

Assuming that w never appears in Q, then $MI(w,Q)=0$, and then the following method is used to solve:

$$MI_{avg}(w) = \sum_{i=1}^{m} G(Q_i)MI(w,Q) \quad (9)$$

$$MI_{max}(w) = \max_{i=1}^{m} \{MI(w,Q_i)\} \quad (10)$$

The disadvantage of the mutual information algorithm is that it is greatly affected by the input edge probability [19], which can also be seen from Formula (11).

$$MI(w,Q) = \log(G(w \mid Q)) - \log(G(w)) \quad (11)$$

χ^2 Statistics are defined as follows:

$$\chi^2(w,Q) = \frac{r[G(w,Q)G(\hat{w},\hat{Q}) - G(w,\hat{Q})G(\hat{w},Q)]^2}{G(w)G(\hat{w})G(Q)G(\hat{Q})} \quad (12)$$

In the formula, $G(\hat{w},Q)$ means that there is no feature entry w in the text.

When entry w and category Q are independent, and the χ^2 statistic is zero, then each class and entry in the training set can be expressed according to the χ^2 statistic as:

$$\chi^2_{avg}(w) = \sum_{i=1}^{m} G(Q)\chi^2(w,Q) \quad (13)$$

$$\chi^2_{max}(w) = \max_{i=1}^{m} \{\chi^2(w,Q)\} \quad (14)$$

The simplified χ^2 statistical method is shown in Formula (15):

$$\chi^2(w,Q) = G(w,Q)G(\hat{w},\hat{Q}) - G(w,\hat{Q})G(\hat{w},Q) \quad (15)$$

It can be concluded from the calculation that the simplified χ^2 statistical method has obvious advantages over the original method, which not only reduces the features to a large extent, but also improves the efficiency.

The calculation form of word weight is:

$$TS(t) = g(t \in d_j \mid t \in d_i), d_i, d_j \in Q \cap \sin(d_i, d_j) > \beta \quad (16)$$

In the formula, β is the threshold, and its main function is to judge the relationship between two texts.

The formula for word entropy is:

$$E(t) = -\sum_{i=1}^{N} \sum_{j=1}^{N} (F_{i,j} \times \log(F_{i,j}) + (1 - F_{i,j}) \times \log(1 - F_{i,j})) \quad (17)$$

Among them, t refers to a certain feature. $F_{i,j}$ represents the similarity between data d_i and d_j, and Formula (18) can be simplified as:

$$F_{i,j} = e^{-\alpha \chi dist_{i,j}} \quad (18)$$

Among them, $dist_{i,j}$ refers to the distance between the two numbers after feature t is removed.

d. Text Similarity Calculation

In the VSM model, there are usually two methods for calculating text similarity: Euclidean distance and cosine similarity [20].

The first calculation formula is:

$$dist(i, j) = \sqrt{\sum_{k=1}^{n}\left(w_{ik} - w_{jk}\right)^2} \quad (19)$$

The second calculation formula is:

$$sim(i, j) = \left(\sum_{k=1}^{n} w_{ik} w_{jk}\right) / \sqrt{\left(\sum_{k=1}^{n} w_{ik}^2\right)\left(\sum_{k=1}^{n} w_{jk}^2\right)} \quad (20)$$

It is easy to obtain through calculation that cosine similarity performs better in measuring text relevance, that is to say, it is more correct to use cosine similarity when doing text preprocessing.

## 5. Experimental Results of New Educational Methods

In order to better understand the impact of online public opinion and the new crown epidemic on educational activities, a survey was conducted on the opinions of college students from three universities A, B, and C. The method is an online survey. There are 100 people in each university, 300 people in total, and the survey results are shown in Table 1.

Table 1. The Impact of Online Public Opinion and COVID-19 on Educational Activities

College name	influences		does not affect	
	number of people	proportion	number of people	proportion
College A	74	24.7%	26	8.7%
College B	87	29%	13	4.3%
College C	91	30.3%	9	3%

From the data in Table 1, it can be clearly seen that more than 250 people in the three colleges and universities believed that online public opinion and the new crown epidemic have an impact on educational activities. Less than 50 people believed that online public opinion and the new crown epidemic had no impact on educational activities. Both in terms of specific numbers and proportions, it is confirmed that online public opinion and the new crown epidemic have an impact on educational activities.

In order to verify whether the co-education method proposed in this paper is effective or not, the number of people taking classes under the conventional method and the new method was investigated. The specific time is within 5 weeks, and the subjects of the survey are 300 college students from a department in University A. The survey method is still online survey, and the survey situation is shown in Figure 5.
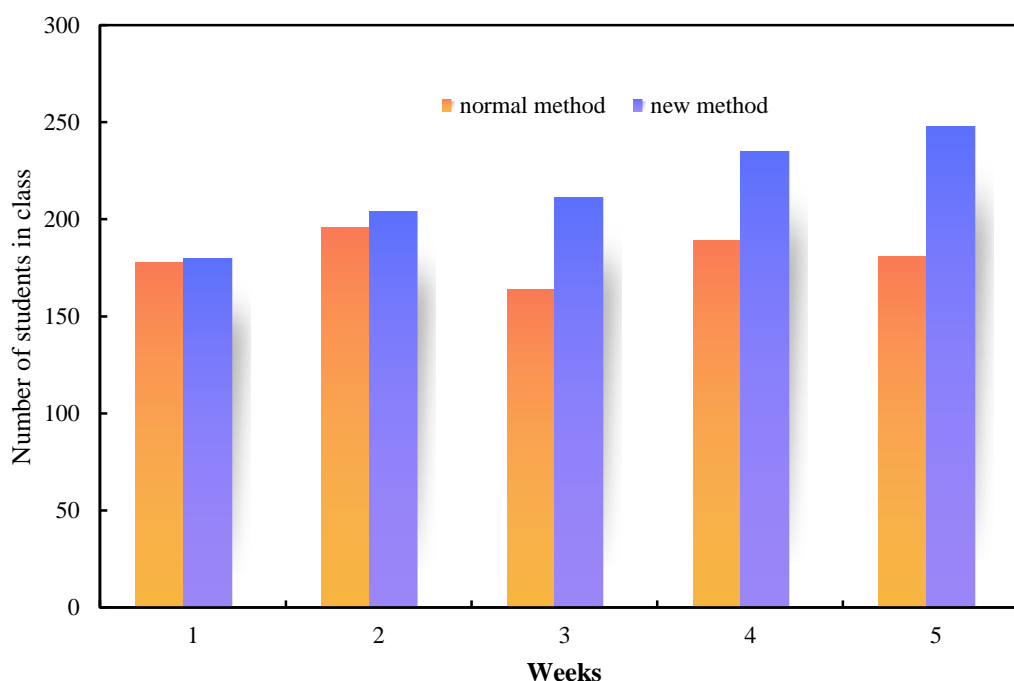
Figure 5. The Number of Students Attending the Two Methods in 5 Weeks

From the bar chart in Figure 5, it can be seen that in the week with the least class in the five weeks, more than 150 people attended the class, that is, more than half of the people attended the class, which also showed the importance that college students attach to the course from the side. Comparing the number of people who attend classes with the two methods, it can be concluded that the number of people who attend classes with the new method was higher than that of the general method within 5 weeks, and every week was more than the previous week. The number of people attending classes under the conventional method was unstable, sometimes high and sometimes low. From the growth trend of the number of people, it can be seen that with the extension of time, the effect of the new method in educational activities was getting better and better.

In any subject, students' interest is very important. Only when they are interested in teaching activities can they study well. This paper compares the changes in the interest of college students in teaching activities within 7 weeks under the conventional method and the new method, and the comparison results are shown in Figure 6.

It can be seen that under the conventional method, students' interest in teaching activities was only higher than that of the new method in the first week, and was lower than that of the new method in the following weeks, and the trend was obvious, and the highest interest rate was not higher 70% than that of the new method. In contrast, students' interest in teaching activities under the new method was relatively low in the first week, and the remaining weeks were on a steady upward trend, and the overall interest rate was much higher than that under the conventional method, which also proved that the new education method proposed in this paper can improve the students' interest in teaching activities to a certain extent.

Any subject would have grades, and the same is true of ideological and political courses. One of the purposes of this paper's new educational method is to improve the grades of college students. In order to verify whether the new method can improve students' grades, a survey was conducted on the number of qualified and excellent students in a class in A college within 5 weeks under the application of the new method, and compared with the traditional method. The total number of people is 100, and the survey results are shown in Figure 7 and Figure 8.
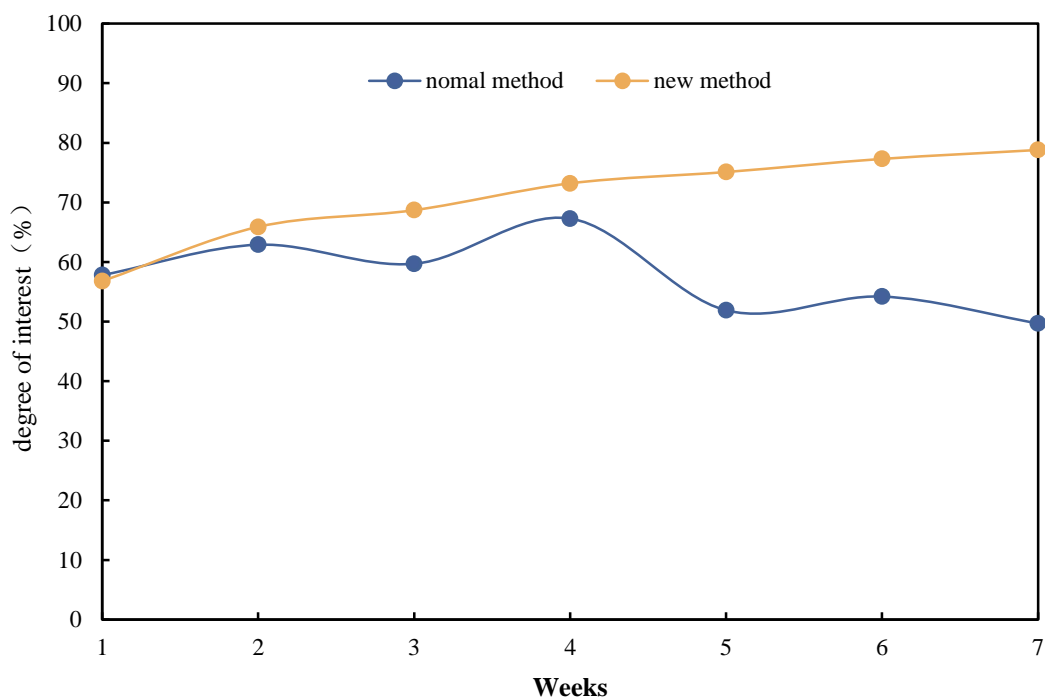
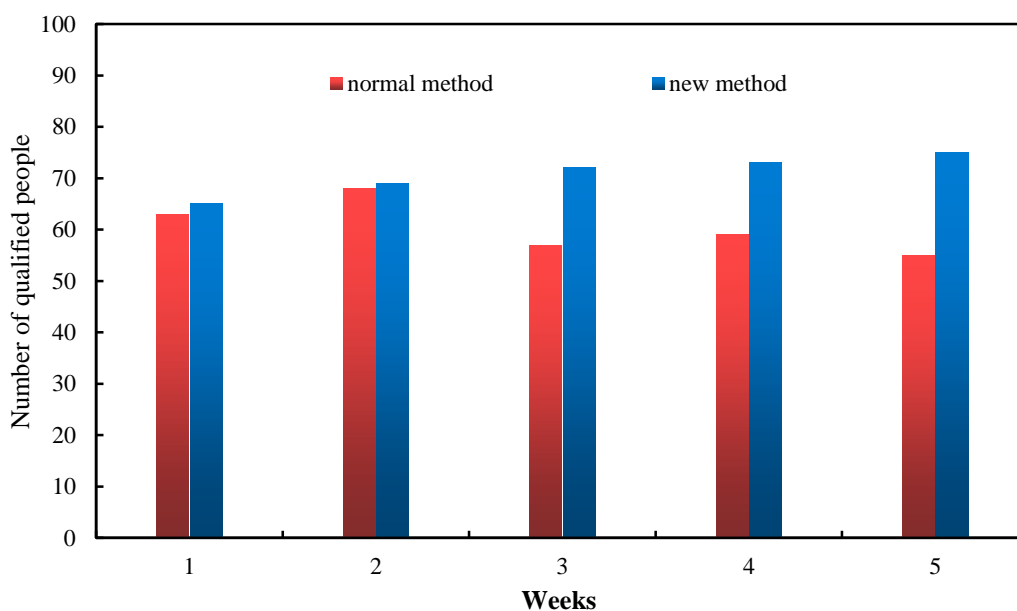*Figure 6. Changes in the Interest of College Students in Teaching Activities within 7 Weeks*

Figure 7. Changes in the Number of Qualified People under the Two Methods

In the bar chart above, Figure 7 represents the change in the number of qualified students under the two methods, and Figure 8 represents the change in the number of excellent students in the two methods. Judging from the changes in the number of qualified people, the number of people who passed the new method exceeded the conventional method from the first week, and also exceeded it in the second week, and even opened the gap in the next few weeks. The number of qualified people under the conventional method was fine in the first two weeks, but dropped a bit more in the next few weeks. Judging from the changes in the number of outstanding students, the number of students

under the new method was lower than that of the conventional method in the first week, because the students were not very comfortable with the new method. The number of outstanding performers has been increasing since the second week, while the number of outstanding performers under the conventional method has continued to decline from the third week.
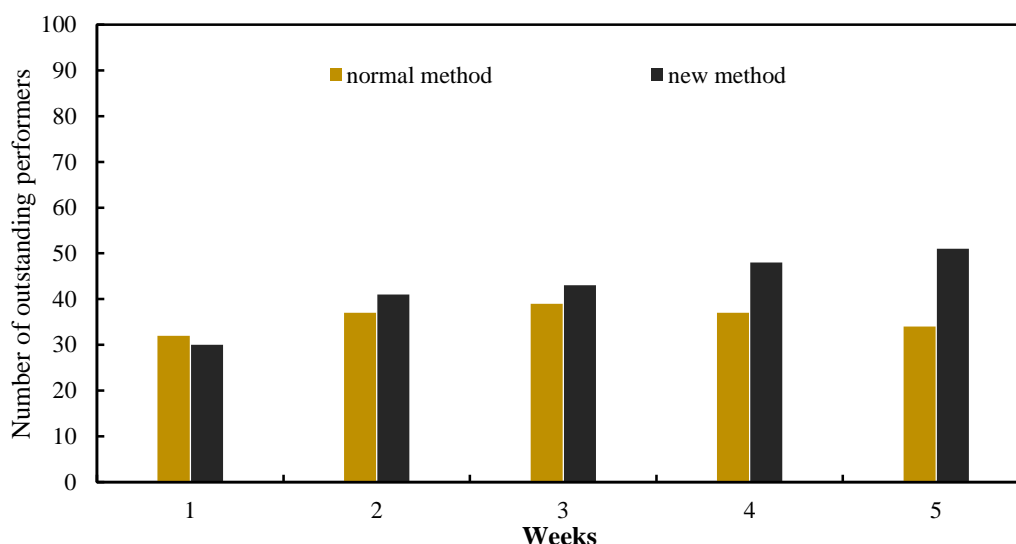

Figure 8. Changes in the Number of Outstanding Performers under the Two Methods

During the epidemic, although teachers did not teach face-to-face in many cases, the teaching efficiency can still be shown. In order to verify whether the new method can improve teaching efficiency, the teaching efficiency under this method within one year was analyzed, and the teaching efficiency under the conventional method was compared. The results are shown in Figure 9.
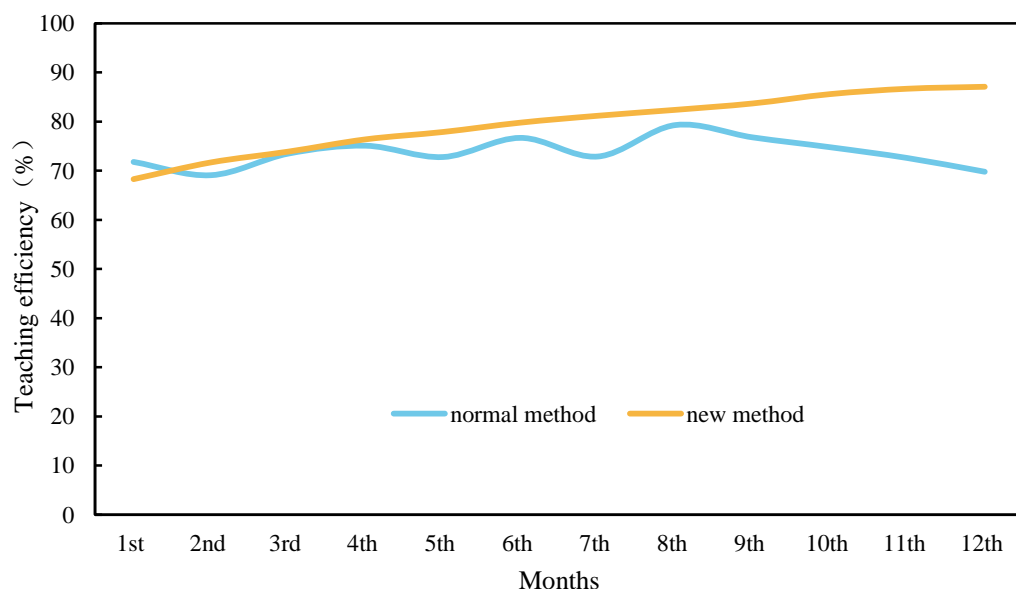

Figure 9. Changes in Teaching Efficiency under Two Methods in One Year

As can be seen from the figure, the teaching efficiency under the new method presented a gently rising curve, which means that the teaching efficiency under this method was relatively stable, and as time goes by, the application of the method became more mature, and the teaching efficiency increases steadily. In contrast, the teaching efficiency of the conventional method was higher than that of the method in this paper except for the first month, and the teaching efficiency of the remaining months was lower than that of the new method, and the fluctuation trend was too large, and even has a downward trend in the last few months. In contrast, the teaching efficiency under the new method was 7.85% higher than that of the conventional method.

6. Conclusion

The arrival of the corona virus disease pandemic has brought difficulties to the development of education work, coupled with the continuous fermentation of online public opinion, educational activities are even worse. At this stage, educators should not sit still, but should combine the advantages of online public opinion to provide college students with educational resources, innovate educational content, and change educational methods. The decision support system of the network environment determines the network speech and network resources that are helpful for students' ideological and political learning by analyzing the network public opinion, and combines the social network public opinion with the ideological and political health education of college students. In addition, teachers can arrange a more appropriate teaching environment according to the concept of collaborative education, and propose better coordinated teaching methods. Only in this way can the level of education be improved and the comprehensive quality of college students be improved.

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If any, should be placed before the references section without numbering.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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