



University Ideological and Political Multimedia Network Teaching Based on MOOC

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Abstract. The past, the accuracy of information retrieval based on P2P technology is low, which leads to poor students' ability to master knowledge and students' performance is not high. In order to solve this problem, this paper designs the University Ideological and political multimedia network teaching based on MOOC. According to the MOOC based College Ideological and political multimedia network teaching module, teaching resources are shared from the user end, student learning information storage, online examination, user management and function. The "3 + 2" mode is used for basic teaching, and the weighted average method is used to minimize the loss of resource allocation. The personalized recommendation model is constructed, and the interference data are eliminated by the collaborative filtering operator to complete the personalized recommendation. Under the support of network teaching mode. The experimental results show that the teaching method has high retrieval accuracy, students' ability to master knowledge is firm, and students' highest learning score reaches full score, which has good teaching effect.

Keywords: MOOC · University ideology and politics · Multimedia technology · Network teaching

1 Introduction

With the continuous updating of modern educational technology and educational concept, multimedia assisted teaching with network as the core is more and more applied to teaching work, which is the main development trend of Education Science [1]. As a subject with strong ideas and advanced scientific concepts, ideological and political course not only transfers important knowledge to students, but also plays an important role in the process of students' growth [2]. The application of multimedia technology in the process of ideological and political education and the full use of modern information technology are conducive to improving the effectiveness of ideological and political education. In the conventional teaching, the information source is very limited, influenced by the traditional teaching ideas, many teachers' teaching methods are often a blackboard, a piece of chalk, a book, which is difficult to stimulate students' learning enthusiasm [3]. The traditional teaching model with teachers as the center and students

as the object, although it maintains the authority of teachers to a certain extent, cannot reflect the status of students' cognitive subjects. To a certain extent, the teaching effect is too dependent on the teacher's personal knowledge reserve and skill level, ignoring the interaction between the two parties in the teaching activities, which has a certain negative impact on the teaching efficiency. In the past, an ideological and political classroom automatic assistance platform designed based on P2P technology was used to use the entire network node calculations to fully tap the space resources that exist on the network. Although this method has high resource utilization, the information retrieval function is poor, resulting in dissatisfaction with platform auxiliary effects. In response to this problem, design MOOC-based university ideological and political multimedia network teaching system. Based on the user-end module, the student learning information storage module, online test module and user management and function module design based on MOOC-based university ideological and political multimedia network teaching module, under the MOOC-based university ideological and political multimedia network teaching module, realize university ideological and political teaching Innovation of Models, complete the design of MOOC-based university ideological and political multimedia network teaching system. The MOOC teaching mode breaks the inherent teaching method, and it is popular among the teachers in the university.

2 Multi Media Network Teaching Module of University Ideological and Political Education Based on MOOC

The introduction of multimedia technology has changed the traditional teaching mode in college teaching practice. In the MOOC teaching mode, professional teachers can use multimedia technology, combine scientific and technological elements, and use text, pictures, video and other methods to conduct strict ideological and political knowledge and logical thinking on students Lively explain [4]. Give full play to the functional effects of hearing and vision, and change the interactive learning mode between subjects. MOOC teaching mode based on multimedia technology provides a convenient and efficient information exchange channel for collaborative learning. For example, through the cloud service, you can share teaching resources everywhere, teachers can participate in the entire process of students learning, thus improving students' thinking ability and thinking in class [5]. The design of College Ideological and political multimedia network teaching module based on MOOC is shown in Fig. 1.

As shown in Fig. 1, the platform can be independent of network teaching resources, effectively integrate scattered resources, and provide convenience for the acquisition and full use of teaching resources. Cloud storage in a multimedia environment has strong security storage capabilities. Teachers and students can save a lot of cloud storage resources and provide users with stable and safe services. Using the network teaching environment provided by multimedia technology, teachers can access public teaching tools, use existing teaching resources, and teachers can teach online in real time, which is convenient for students to learn [6].

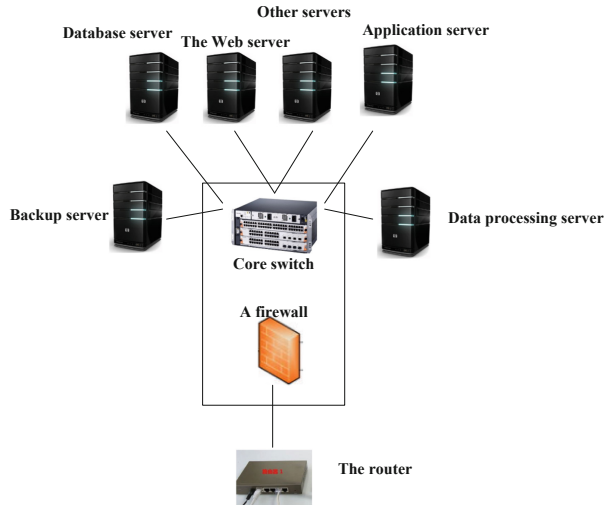


Fig. 1. University ideological and political multimedia network teaching module based on MOOC

2.1 Client Module

The client of the MOOC-based multimedia network teaching module of university ideology and politics is mainly students and teachers. In the classroom, the two parties interact through the network, while the interaction outside the class is only the student and the network. The user end module is shown as in Fig. 2.

The teacher stores all teaching content in the resource library according to the user-side module shown in Fig. 2. In the classroom, the interaction between teachers and students can supplement student knowledge at any time [7]. Students use personalized data collection methods to add teacher-student interaction information on the basis of the basic content of the basic courseware displayed by the teacher, which can be stored in personalized notes after the students themselves supplement it [8].

2.2 Student Learning Information Storage Module

After students add relevant knowledge points, they are stored in personalized notes. This process requires memory to store massive amounts of information. The memory can store binary data under the MOOC-based university ideological and political multimedia network teaching module, and form a storage function circuit with physical form in the integrated circuit, such as a memory stick [9]. The memory installed in the computer can be divided into memory and external memory according to its purpose. External memory is usually a magnetic medium, which can store information for a long time. Memory is a storage component on the motherboard that can be used to store the currently executing program for temporary use. Store programs and data. The student learning information storage module is shown in Fig. 3.

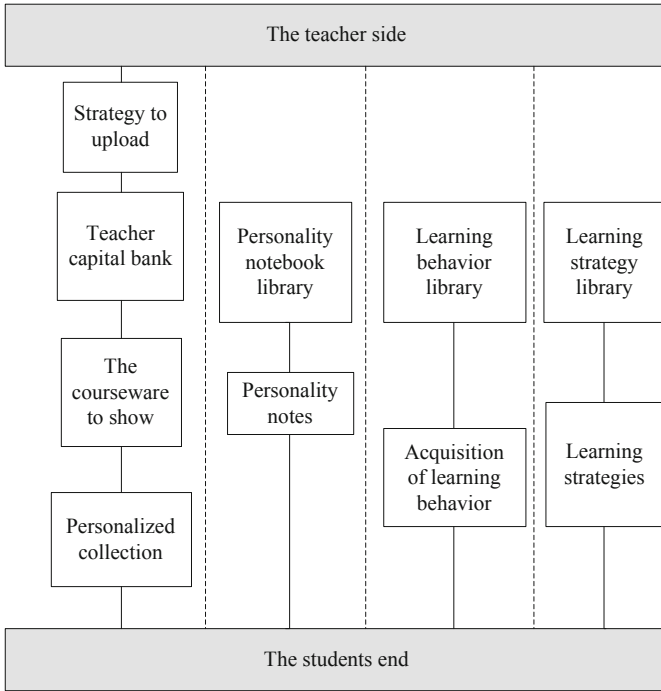


Fig. 2. Client module

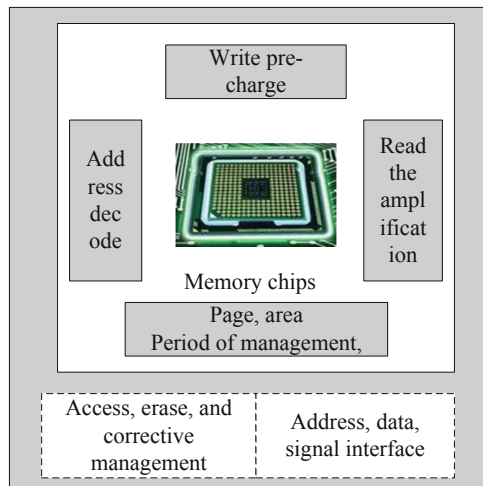


Fig. 3. Student learning information storage module

The storage strategy management mode is composed of a large number of memory cells, together with address decoding and read-write control circuit, forming a memory chip. Memory chip, control chip and power module integrated circuit board form a storage product, from the storage unit to the storage integrated circuit is to achieve information storage.

2.3 Online Exam Module

The main function of the online examination module is that after students log into the examination system, a group of test papers for each student are randomly generated. The difficulty of each test paper is the same, and the difficulty is determined by the teacher. After the end of the examination, the paper will be directly handed to the server. After logging in the system, the teacher can operate the test paper, grade and enter the student's score [10–12]. Students can log in the background management to query personal test results. Figure 4 shows the sequence diagram of the whole detection process.

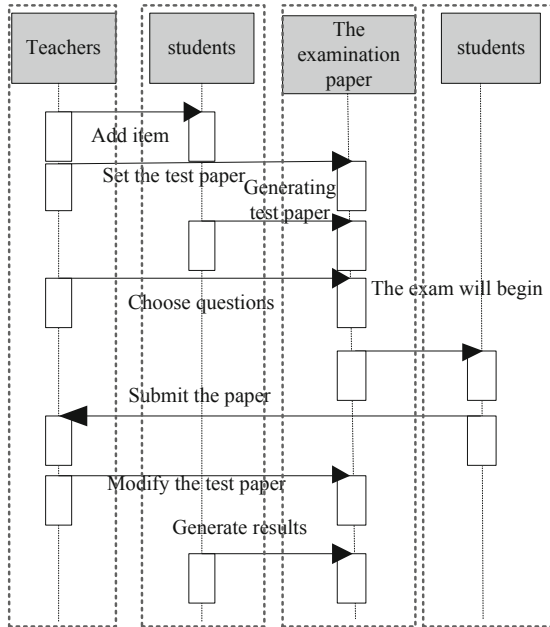


Fig. 4. Sequence diagram of online exam

2.4 User Management and Function Module

In the administrator management function module, its function is to submit the instructions issued by the system and manage the users. This part includes publishing the latest

dynamic information on the website, assigning the system account number of teachers and students, setting the top, deleting post permissions, etc.

User Management Module

The main function flow of the administrator is as follows:

Administrator space → access system → input user name and password → match → system announcement user management, educational administration management, forum management → exit system; administrator space → access system → input user name and password → end of mismatch.

The user management module is used for current user consent management, which can realize information modification and update. After logging in, the user management object is transferred to the add user interface, and the user information is entered and submitted to the user list, and the information is successfully returned.

After the administrator opens the new interface, input the user number, name and address information. After confirmation, the administrator submits the saved user list and displays the saved user list in the interface.

Functional Module

(1) Knowledge point system modelling tool

The arrangement of curriculum knowledge points plays a leading role in the course. It integrates the network teaching system, sorts out teaching resources and guides students to carry out personalized learning, so as to help teachers push resources and complete students' personalized correction. By setting course knowledge points, teachers can use knowledge point system modeling tools to match and push curriculum resources and related knowledge points in question database resources according to students' specific learning progress before class, so as to form a set of resources closely connected with knowledge points, and realize knowledge points filtering and reconstruction.

(2) Teacher terminal system

The teacher terminal system is applied to mobile terminals such as mainframes, tablets and mobile phones to provide statistical analysis tools for classroom interaction. In the process of preparing MOOC videos, resources and materials, teachers can select existing resources from the system "course resources" and push the targets that can be selected. The editing and processing of teaching resources requires the use of knowledge point system modeling tools to accurately push teaching resources. In the classroom, the student terminal system provides interactive tools to meet the interaction between teachers and students in the classroom.

(3) MOOC classroom interactive system

In the design process of MOOC classroom interaction system, data analysis is mainly in-depth interaction, timely analysis of classroom data, and the interactive system functions are concentrated in the most commonly used functions in classroom teaching, discarding fragmentary functions, so that the communication between teachers and students is more convenient.

3 A MOOC-Based Multimedia Network Teaching Mode of University Ideology and Politics

The traditional teaching mode usually adopts the teaching method of teachers, but with the continuous improvement of ideological and political level, the introduction of MOOC university ideological and political basic courses, and according to my country's university teaching standards, the mode has become more detailed. Under the MOOC-based university ideological and political multimedia network teaching module, the innovation of university ideological and political teaching mode is realized, fully mobilizing students' enthusiasm for ideological and political learning, and improving students' ideological and political quality and practical operation ability.

3.1 Basic Teaching Mode

For university ideological and political course education, MOOC teaching mode is adopted, with the help of inter-school cooperation resources, the introduction of excellent teaching methods from other schools, and the use of MOOC-based university ideological and political multimedia network teaching modules to establish their own unique courses, students can set free course selection passwords Enter the multimedia network system for course learning. In MOOC courses, the introduction of learning and updating resources, and corresponding teaching arrangements and course notifications according to the actual situation of the school, to meet the individual needs of the university's ideological and political MOOC teaching mode.

In the practical application of College Ideological and political education, the "3 + 2" mode is adopted for ideological and political teaching. Among them, "3" is the three key stages of teaching, which are before class, in class and after class; "2" is the two key factors of teaching mode, which are online and offline respectively. In one semester, the University Ideological and political multimedia network teaching process based on MOOC is as follows (Fig. 5).

Through the courses based on the university's MOOC platform, students can choose real-name courses through the course selection password, and once the course selection is successful, they can obtain all relevant course materials through online inspection. In this teaching model, students need to improve their self-learning awareness and group collaborative learning ability. For this reason, relevant teaching activities are arranged during the pre-class, in-class, and after-class phases of learning, and they are successively launched online and offline.

- (1) In the pre class stage, teachers need to refine the content of the course, and analyze the development trend of computer system. Different groups focus on discussing the difficulties encountered by the group in carrying out tasks, and communicate with other groups. The successful completion of each task includes two parts: autonomous learning and collaborative learning. Therefore, students should actively complete the online MOOC video learning task in the discussion area, students can exchange their learning experience under the line to help them complete the task.

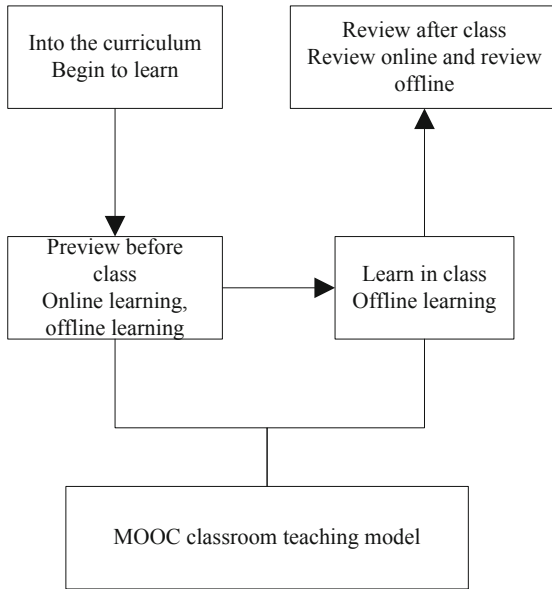


Fig. 5. University ideological and political multimedia network teaching process based on MOOC

- (2) The classroom stage is the core part of this stage. Based on the MOOC classroom concept, students are the main speakers. Each group needs to select a group representative to report on the learning results, and other group members can supplement after the report. Teachers can help students when they are unable to answer the questions. According to the reports of each group, teachers propose central discussion topics, guide students to engage in active discussions, engage in thinking collisions, and consolidate learning. The teacher summarizes the class and completes offline learning.
- (3) The after-school stage is to evaluate the entire teaching process, using staged evaluation and summative evaluation to test students' learning effects. Staged evaluation is done through online discussion and offline homework; summative evaluation needs to use staged testing methods to test students to help students check for knowledge gaps.

3.2 Personalized Recommendation Teaching Mode

The mobile multimedia aided teaching platform of University Ideological and political course is a mobile learning system based on client. The website provides a large number of learning materials and supports users to share learning materials. For massive database, users can learn through the mobile teaching assistant client through teacher recommendation, and the platform can also recommend learning materials according to their own recommendation methods. Recommendation based on chart model is also an important method. The algorithm of chart model is to establish different two-dimensional relationship models for different users and projects. If the user selects the course, the binary file of user and course will be formed.

Assuming that $A, B, C, D \dots$ is the user and $a, b, c, d \dots$ is the resource of Ideological and political class, the bipartite graph and resource allocation process are constructed.

Assuming that there are U users and G courses, if a single user chooses a course, then there is a relational edge in the graph model recommendation. If other users also select the item, then the value is assigned 1, otherwise it is 0. The algorithm recommendation process mainly has two steps, namely:

Step 1: According to the current user preferences, select the ideological and political classroom resources that users like;

Step 2: select courses according to the target users, obtain the resource values, and then assign the user preferred resources to the associated objects according to the selection relationship.

Assuming that there are i tasks and j resources are shared, the final implementation of the resource allocation is in a non-negative $i * j$ matrix, which is:

$$0 \sum_{j=1}^i \phi_j = 1 \quad (1)$$

In formula (1), ϕ_j represents resources, and the cloud service evaluation index of information interaction process is as follows:

$$R_{ij}^{(t)} = \sum_{j=1}^i \phi_j q_m \quad (2)$$

In formula (2), q_m represents the evaluation index. When there are multiple tasks with a negative global utility loss value, in order to make the goal fair, the weighted average method is used to minimize the resource allocation loss. The autonomous auxiliary platform built with multimedia technology can help teachers teach better and students learn better, build communication channels between teachers and students, and improve teaching efficiency.

According to the above analysis, the cloud service evaluation index of information interaction process has heterogeneous influence on potential factors. Testing the feedback results obtained is an important step to verify the quality of information exchange. Taking accuracy as the standard to measure the accuracy of personalized recommendation results, the personalized recommendation model is constructed as follows:

$$P = \frac{|m_a \cap T|}{|m_a|} \times 100\% \quad (3)$$

In formula (3): m_a represents user recommendation results; T represents a set of courses that users have rated high. In the process of accurate measurement, the higher the score and the higher the correlation, the more accurate the personalized recommendation will be, thereby completing the personalized recommendation of the teaching mode.

Due to the existence of interference data in the personalized recommendation process, it is necessary to eliminate the interference data with the help of collaborative filtering operator.

$$\lambda'_{iz} = \frac{\exp(\lambda_{iz})}{\sum_{z=C(i)} \exp(\lambda_{iz})} \quad (4)$$

In formula (4), λ_{iz} represents the collaborative filtering operator. Formula (4) can be used to obtain the collaborative filtering operator after the interference data is eliminated, and then substituting the operator into formula (5) to accurately describe the heterogeneous impact of the interaction between different users on potential factors.

$$Q_i = \mu \left(\omega \cdot \left\{ \sum_{z=c(i)} \lambda_{iz} u_{iz} \right\} + s \right) \quad (5)$$

In formula (5), μ is the activation function; s is the deviation; u_{iz} vector is the preference feature between the user and the course; ω is the preference parameter.

By constructing a preprocessing data set consisting of a bag of words data set, the set contains a bag of words data set and corresponding things data set, and according to collaborative filtering, all interest patterns are added to the interest pattern set to complete the elimination of interference data.

3.3 Assessment Mode

In order to ensure that students can complete online and offline learning in a timely manner, facing the investigation characteristics under the mixed teaching mode, from the perspective of stimulating MOOC, the traditional assessment mode is changed to make students pay more attention to the learning process and improve their active participation. The specific assessment mode is as follows:

- (1) Before the next discussion, teachers need to publicize the offline discussion mechanism of computer thinking to students, and feedback student performance to individuals in real time, which is convenient for motivating and warning students' learning attitude.
- (2) When conducting on-site discussions, save the entire video recording so that teachers and students can review after class, consolidate knowledge, and ensure the fairness and openness of the assessment.

Students' final scores are composed of online and offline parts, as shown in Table 1. Through the data provided by the course platform, online activities such as watching videos, completing online assignments, and conducting online discussions can be carried out online; offline scores mainly depend on students' reports and final scores.

Table 1. Performance assessment

Basic score/100						
Part one	Basic capabilities 45%					
	check work attendance 50%	Video viewing 20%	Homework performance 30%	Mid term results 60%		
Part two	Network thinking ability 55%					
	Online performance 50%			Offline performance 50%		
	MOOC video viewing 50%	Online performance 30%	Results of online discussion 20%	Discussion results 30%	Participation achievements 30%	Final assessment 40%

4 Experiment

In order to verify the effectiveness of MOOC based College Ideological and political multimedia network teaching, experimental tests are needed.

4.1 Test Content Settings

A black box test was done. In the course of MOOC-based university ideological and political multimedia network teaching, the content of the black box test is shown in Table 2.

Table 2. Black box test content

Serial number	Test content
1	Ideological and Political Course Information Retrieval
2	Export student information
3	Student information mastery
4	Student's result

4.2 Ideological and Political Course Information Retrieval Test

Two teaching modes are used to test the information retrieval situation of ideological and political courses, and the comparison results are shown in Fig. 6.

It can be seen from Fig. 6 that as the number of people retrieved using P2P-based technology increases, the accuracy of retrieval also decreases. When the number of retrieved people is 70, the retrieval accuracy reaches a minimum of 50%; the use of multimedia-based technology increases with the number of retrieved people. The search

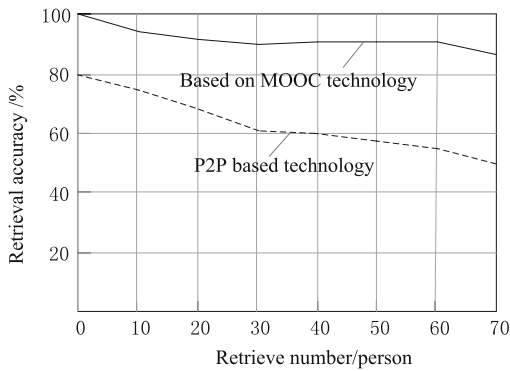


Fig. 6. Comparative analysis of information retrieval accuracy of Ideological and political courses of two teaching methods

accuracy has also changed. When the number of searchers is 70, the search accuracy is at least 88%. It can be seen that the accuracy of information retrieval using this technology is high.

4.3 Test Students’ Ability to Master Knowledge

The P2P-based technology teaching method and the certification-based MOOC teaching method were used to compare and analyze the students’ knowledge mastery ability. The test results are shown in Table 3.

Table 3. Comparison results of two teaching methods on students’ knowledge mastery ability

Project		Teaching method based on P2P technology	Based on MOOC teaching method
Teaching schedule or not	Interaction between teachers and students	Mastering ability /%	Mastering ability /%
No	Yes	41	81
Yes	No	32	79
Yes	Yes	60	85
No	No	25	75

It can be seen from Table 3 that in the absence of teaching time arrangement, there is a 40% difference in students’ ability to master knowledge; in the absence of interaction between teachers and students, the difference is 47%; in the case of both, the difference is 25%; in the absence of both, the difference is 50%. It can be seen that the improvement of teachers’ teaching methods based on MOOC teaching method can improve students’ ability to master knowledge.

4.4 Student Achievement Test

With a full score of 100, the P2P technology-based teaching method and the MOOC-based teaching method were used to compare and analyze student performance. The test results are shown in Table 4.

Table 4. Comparative analysis of the results of the two teaching methods on student performance testing

Number of students/person	Teaching method based on P2P technology	Based on MOOC teaching method
2	130 min	200 min
4	342 min	398 min
6	628 min	695 min
8	735 min	795 min
10	943 min	996 min
12	1158 min	1196 min

It can be seen from Table 4 that students using P2P-based teaching methods have lower scores, while those using MOOC-based teaching methods have higher scores, close to full marks.

Through the above analysis results, the use of a MOOC teaching method network teaching system has a large academic performance of students, and the teaching effect is better.

5 Concluding Remarks

MOOC is a new teaching method which is popular all over the world. It has a great impact on the teaching of information technology in our country. Therefore, this paper proposes a multimedia network teaching based on MOOC in university ideological and political teaching. We should continue to promote the integration of teaching resources, improve the teaching quality and the use efficiency of network information, so as to expand the teaching benefit area.

Although the teaching method has basically achieved the needs of functional objectives, it is still in the preliminary research stage, and its application in real teaching is not mature, so it needs many improvements. In order to obtain more detailed data information, it is necessary to improve the multimedia network teaching mode.

(1) Strengthen course modules and interactive functions

The mobile teaching auxiliary platform is an important platform for college ideological and political teachers to integrate excellent teaching resources, and the function of webcasting courses should be actively expanded. At the same time,

mobile phone-assisted teaching systems should adopt open participation and interactive communication methods to further highlight the characteristics and thinking of ideological and political theory courses in the information age.

(2) Realize continuous operation of the platform

The normal use of the mobile teaching auxiliary system for ideological and political courses requires the normal operation of the client system. However, customer maintenance usually requires a powerful technical maintenance team, lacks research and writing process, and more power needs to be integrated to achieve continuous platform operations.

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