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Retraction

Retracted: Research on Mobile Ideological and Political Teaching in Universities Based on the Android Platform

Mathematical Problems in Engineering

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] J. Chen and Y. Guan, "Research on Mobile Ideological and Political Teaching in Universities Based on the Android Platform," *Mathematical Problems in Engineering*, vol. 2022, Article ID 1214684, 8 pages, 2022.

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Research Article

Research on Mobile Ideological and Political Teaching in Universities Based on the Android Platform

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The traditional ideological and political teaching is very old-fashioned, the teaching content is very fixed, and the teaching methods are very old. Based on the analysis of the problems existing in the traditional teaching mode, this study proposes a cloud service architecture plan with cloud, network, and terminal as the core design ideas., clarifies the goals and problems to be solved, and then conducts functional requirements analysis. In the system design stage, the whole system is firstly designed as a whole, and then the business process in the teaching system is analyzed, the redundant business in the business process is found, and the process is reorganized. The mobile learning system based on the Android platform meets the existing teaching needs and can be expanded to a certain extent. It can achieve good results in teaching application and make certain contributions to the construction of educational informatization, improving learning efficiency and enhancing students' autonomous learning ability.

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1. Introduction

On the university campus, the intelligent terminal has become their best partner when the college students finish their classroom study. On the negative side, various intelligent terminals emerge endlessly, especially some entertainment software that fascinates young college students and consumes a lot of time and energy. How to make college students better receive education in the era of more and more advanced intelligent terminals? Given this, the concept of mobile teaching based on mobile learning arises at the historic moment.

The concept of mobile teaching was first proposed abroad as a form of mobile learning. On the one hand, mobile teaching and mobile learning are just different subjects. The same system is a learning platform for students and a teaching system for teachers. On the other hand, mobile teaching is a more advanced concept based on the concept of mobile learning, which adds more interactive functions and personalized learning settings. Mobile teaching takes the client as the carrier, allowing students to use the client for learning. In this process, teaching activities between teachers and students are increasingly reflected [1]. In addition, as early as 2014, according to the data released by Strategy Analytics, Android and iOS together accounted for nearly 96% of the global smartphone market, out of which iOS accounted for 12.3% market share, while Android accounted for 83.6% market share, still maintaining its dominant position [2]. The increasing purchase rate of Domestic Android phones among college students, as well as the high market share of Android phones in recent years, are important and practical reasons why this study chose to develop a mobile teaching auxiliary system for ideological and political courses based on Android.

At present, the domestic research on mobile teaching is relatively backward compared with foreign countries. There is no professional research team in China to study the theory and practice of mobile learning, and there are few academic research teams formed by educational institutions in the real sense [3]. The existing domestic research on mobile learning systems is mainly initiated by some M-learning providers, and their purpose is mainly to make profits in the market [4].

There are more than 20,000 tablet and mobile phone software and hardware developers in China, and more than 2

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million Apple and Android system developers. OEM and ODM are also very easy and convenient, and the technology applications are mature, which provides a very rich solution for the development of cloud, network, and terminal applications of university teaching in the future [5].

Mobile learning is based on digital learning, further combined with the mobile Internet technology and computer technology. The feature of being able to learn anytime, anywhere will bring new experience to learners, and change from the traditional learning mode with teachers as the main body to the learning mode with students' autonomous learning as the main body, so as to improve students' learning initiative and enthusiasm. The mobile learning mode should be regarded as the main learning mode in the future. However, mobile learning, as a new learning model, still has some problems [6]. This study analyzes and summarizes the research status at home and abroad and draws the following conclusions:

(1) In the current research, the feasibility of mobile education has been fully demonstrated, which can bring changes to the teaching model. The research focus is mainly on the feasibility of mobile education, resource development, short message service, WAP site construction, and other four aspects.

(2) In the current research, there is not much discussion on the user needs of the mobile learning system, what functions should be implemented, and what standards the system should abide by. The research on how to realize mobile teaching and how to implement it in colleges and universities is especially lacking, and the technical standards are not unanimous.

(3) In recent years, new technologies have constantly emerged in the field of communication and IT, which provide support for mobile learning platforms. At the same time, with the emergence of smartphones and tablet computers, the demand for mobile teaching platforms is also increasing.

(4) Although the mobile learning system at home and abroad have carried out extensive research and got rapid development, because of the complexity of the mobile learning platform, how to realize the communication and resource sharing between different platforms such as also the need for in-depth analysis, so the research of mobile learning platform at present is still in the stage of development. However, with the rise of mobile e-commerce and the development of Android programming technology, mobile teaching platforms based on Android technology will have a broad prospect.

2. Related Work

2.1. Research Status. As a new learning mode, mobile teaching is a successful application of mobile communication technology, mobile computing technology, and mobile Internet technology in the field of education, and its application results have attracted worldwide attention [7]. In recent years, a lot of research has been carried out on the application of mobile teaching abroad, including technical support, system architecture platform, the realization of learning materials, etc.

At present, the foreign application research of mobile teaching platforms is mainly concentrated in some developed countries. Since 2000, the object, method, and technology of mobile teaching have been deeply discussed in Europe, and the feasibility of the application of mobile teaching platform in practical teaching has been analyzed from a practical point of view, and more than 30 projects have been launched to study the mobile teaching platform [8]. Many universities have successively established their educational sites based on WAP, such as Griffith University and the University of Minnesota in the United States, and the University of Edmonton in Canada, etc. [9].

On this basis, The University of Birmingham has also carried out the HandLeR project, which is based on the development direction of future education and according to the needs of learners,and also plans to develop a mobile learning resource suitable for different ages and different learning needs. In the current research results, the study tool developed by this project is suitable for 9–11 years old children, and its actual experimental effect is very good [10].

China only put forward the concept of mobile teaching and mobile learning in 2001. In 2001, Peking University undertook the research and development of the Mobile teaching Theory and Practice project of the Ministry of Education and established the first mobile teaching laboratory in China. During the four years from January 2002 to December 2005, Peking University developed three different versions of the mobile learning platform. Among them, a mobile teaching platformwas mainly realized by a short message, which was mainly used for teaching information sharing on mobile networks and the Internet.

The Ministry of Education has been doing mobile education research at Peking University, Tsinghua University, Beijing Normal University, and other universities since 2002. In 2008, Beijing Normal University hosted the 5th International Conference on The Application of Wireless Mobile Technology in Education (WMUTE2008), which marked the start of China's mobile education and learning research in accordance with international norms [11]. According to the findings, the research is primarily focused on the feasibility of mobile education, resource development, short message service, WAP site design, and the other four factors. However, there is a distinct paucity of studies on how to achieve mobile teaching and how to put it into practice at colleges and universities [12].

Shanghai TV University has also carried out the practice of mobile learning, carrying out the "mobile Campus" plan, in which 80,000 students have used mobile phones to study. The mobile learning plan mainly carries out two parts of the function, with real-time notification and teaching guidance, to ensure the communication between teachers and students. In 2009, Beijing Normal University's Institute of Modern Education Technology developed the application mode and method of mobile teaching system in discipline teaching from the perspectives of classroom teaching mode and extracurricular mobile learning, as well as researching the application mode of mobile teaching system. The value and application of mobile teaching platforms in teaching are thoroughly validated by the analysis, as is the wide prospect of mobile teaching platform application [13].

2.2. Overall Functional Module Design. Based on the demand analysis of the mobile teaching system and fully considering the characteristics of mobile teaching, teachers, and students to facilitate the daily teaching and learning as the goal, the set mobile teaching system was composed of two components, the client and server and the server category includes user management, resources management, and announcement to inform management function module. [14–16], The client mainly reports functional modules such as course management, resource management, group discussion, and viewing news bulletins. The functional modules of the system are shown in Figure 1.

After the server is started, the client can interact with the server. The server responds to the request of the client and sends the required data to the client. In addition, another important function of the server is to provide an interface for the administrator to maintain the background data. The functions of the server are described as follows:

(1) User management function: after logging in to the server, the administrator can add, query, delete, and modify user information to maintain user information.

(2) Resource category management function: the administrator can add, delete and modify resource categories. At the same time, the administrator can maintain resource categories in the system.

(3) Announcement and notice management function: the administrator is responsible for the input and maintenance of announcement information to ensure the accuracy of the announcement and notice. The system automatically clears expired bulletins.

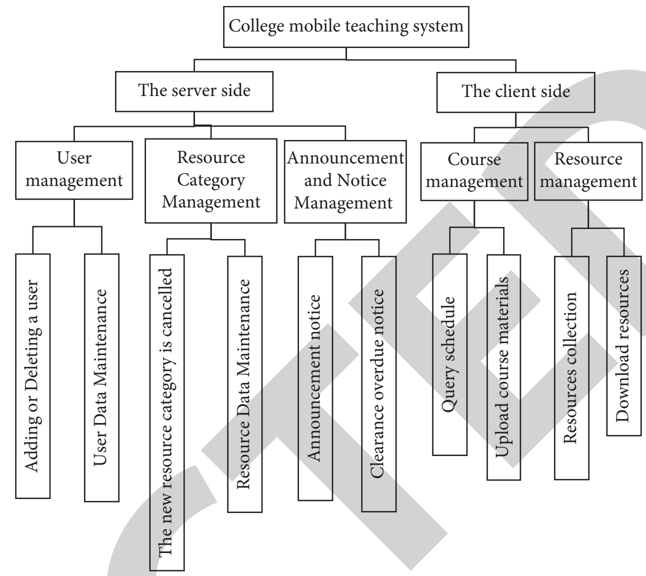

Figure 1: Functional module diagram of mobile teaching system in colleges and universities.

3. Android-Based Mobile Teaching Auxiliary System Design

It offers a big quantity of instructional materials and encourages users to contribute to them. Users can utilize the mobile teaching support client to learn with teachers' recommendations, and the system also proposes learning resources based on its recommendation algorithm when faced with a large database.

In the learning recommendation module, students are recommended to choose a variety of course materials. First, there is a rolling recommendation system page on the home page, which is a recommendation display for learning activities. Then the following drop-down list shows teachers' recommendations and recommendations made by the system using its recommendation algorithm.

This system is the recommendation system interface, the display of video course masters forum, website links, reference materials, current affairs and politics, current affairs, teacher recommendations, and other materials. However, for personalized recommendations, recommendation algorithms will be used to train preferences for specific users. Users' preferences are considered to be their preferences for certain items. For example, a student likes to watch current political news, so politics is a potential preference of the same student. So we can use the user's preference model to judge the user and recommend specific learning materials for the former user. However, for a specific user, his preference in the current time stage is different from his learning preference in the future, and the user's interest will shift with the transfer of his concern. So in the current system function range, the user's preference extraction is very important.

In the playback view module of the ideological and political class teaching view, we use the conversion between the two interfaces. First of all, the system will give feedback on a list of videos according to the search or recommendation module of the system. For these video materials, we designed VideoLitActivity to operate the page. After clicking, we entered the course video module and used PlayerActivity to play the course view. Of course, the real-time interaction with the server is still set up as adapter class, designed course introduction, course catalog, course evaluation, and bullet-screen view class insertion, such as the Video class, as well as the HttpContants class, Basebean class, and MyHttpClient class. The class design of part of the course viewing module is shown in Figure 2.

The data type returned by the interaction with the server is represented by the BaseBean class. The server side must have an accessible interface class. We use HttpConstants and Use the MyHttpClient class as the access data library class. The classes that control the login user interface are represented by the LoginActivity class, and the RegisterActivity class shows the classes that control the registration mode. The login and registration classes are inherited

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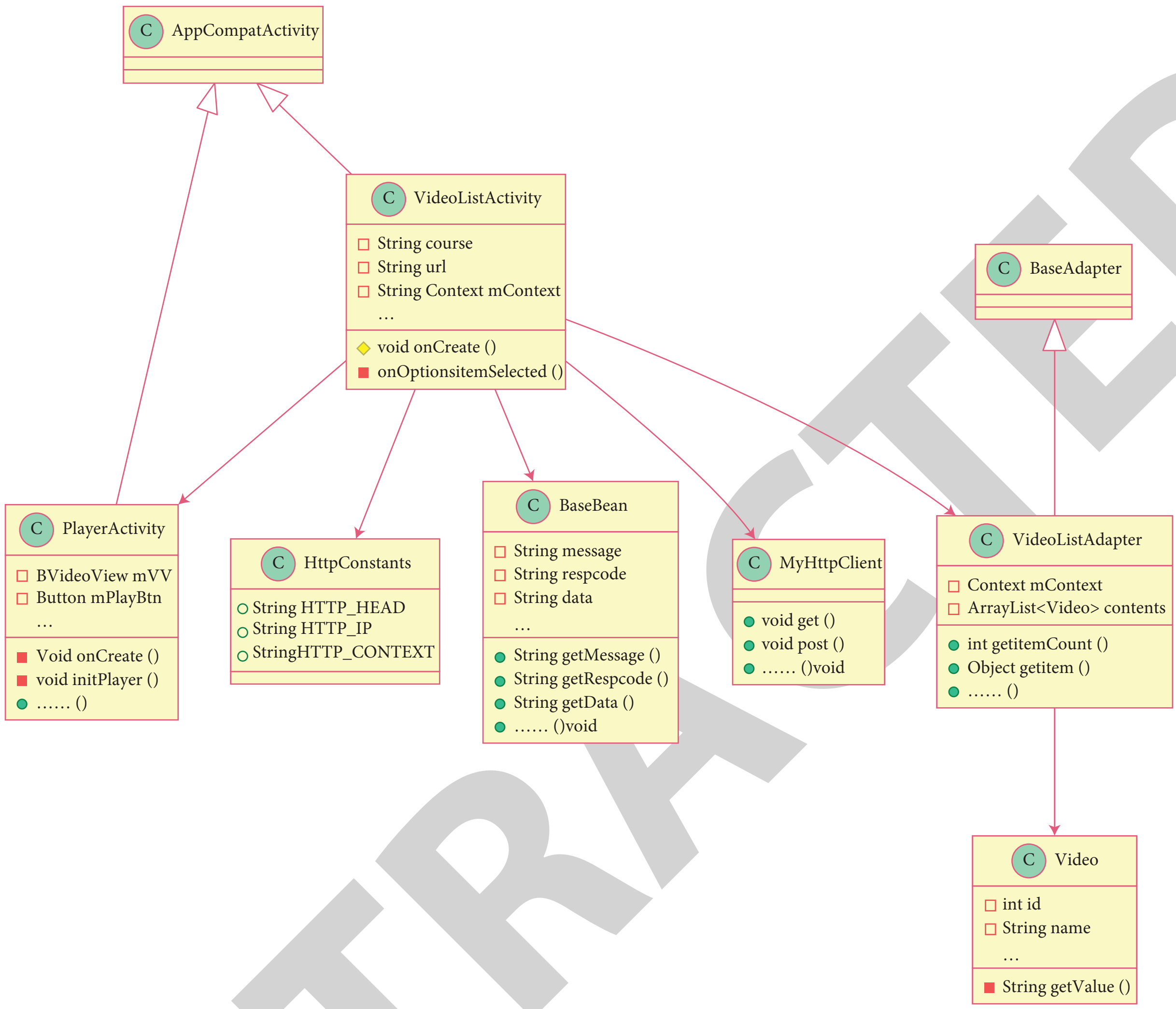

Figure 2: Class diagram of the course view module part classes.

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CompatActivity classes. The class diagram for login registration is shown in Figure 3.

The recommendation algorithm based on the bipartite graph model is used in our mobile teaching auxiliary system of ideological and political courses. This system assumes a total of U users and V courses. If a single user U has selected course V, then there will be a relational edge between users U and V in the graph model.

Let the score of user *Ui* and Uj in *n*-dimensional term space be expressed as vector Rui respectively, then the similarity between user *Ui* and user Uj is sim (*Ui*, *Uj*):

$$\mathrm{sim}\left(U_i, U_j\right) = \frac{R_{U_i} \cdot R_{U_j}}{\left\|R_{U_i}\right\| * \left\|R_{U_j}\right\|}, \quad (1)$$

where *Ui*, *Uj* represents different customer groups. Table 1 is taken as an example (assuming a total of 5 active users) to illustrate the calculation method of similarity among users. The number 0 in Table 1 means that user *Ui* has not watched this video, and the number 1 means that user *Uj* has watched this video.

Assuming Si is the set of all videos watched by user *Ui*, the similarity between user *Ui* and user *Uj* can be defined as follows:

$$\mathrm{sim}\left(U_i, U_j\right) = \frac{\left|S_i\right| \cap \left|S_j\right|}{\left|S_i\right| \cup \left|S_j\right|}. \quad (2)$$

The similarity of user U1 and user U2, user U3, user 4, and user 5 can be calculated according to formula (2):

$$\begin{aligned}
\mathrm{sim}\left(U_1, U_2\right) &= \frac{\left|S_1\right| \cap \left|S_2\right|}{\left|S_1\right| \cup \left|S_2\right|} = 0.6, \\
\mathrm{sim}\left(U_1, U_3\right) &= \frac{\left|S_1\right| \cap \left|S_3\right|}{\left|S_1\right| \cup \left|S_3\right|} = 0.6, \\
\mathrm{sim}\left(U_1, U_4\right) &= \frac{\left|S_1\right| \cap \left|S_4\right|}{\left|S_1\right| \cup \left|S_4\right|} = 0.4, \\
\mathrm{sim}\left(U_1, U_5\right) &= \frac{\left|S_1\right| \cap \left|S_5\right|}{\left|S_1\right| \cup \left|S_5\right|} = 0.5.
\end{aligned} \quad (3)$$

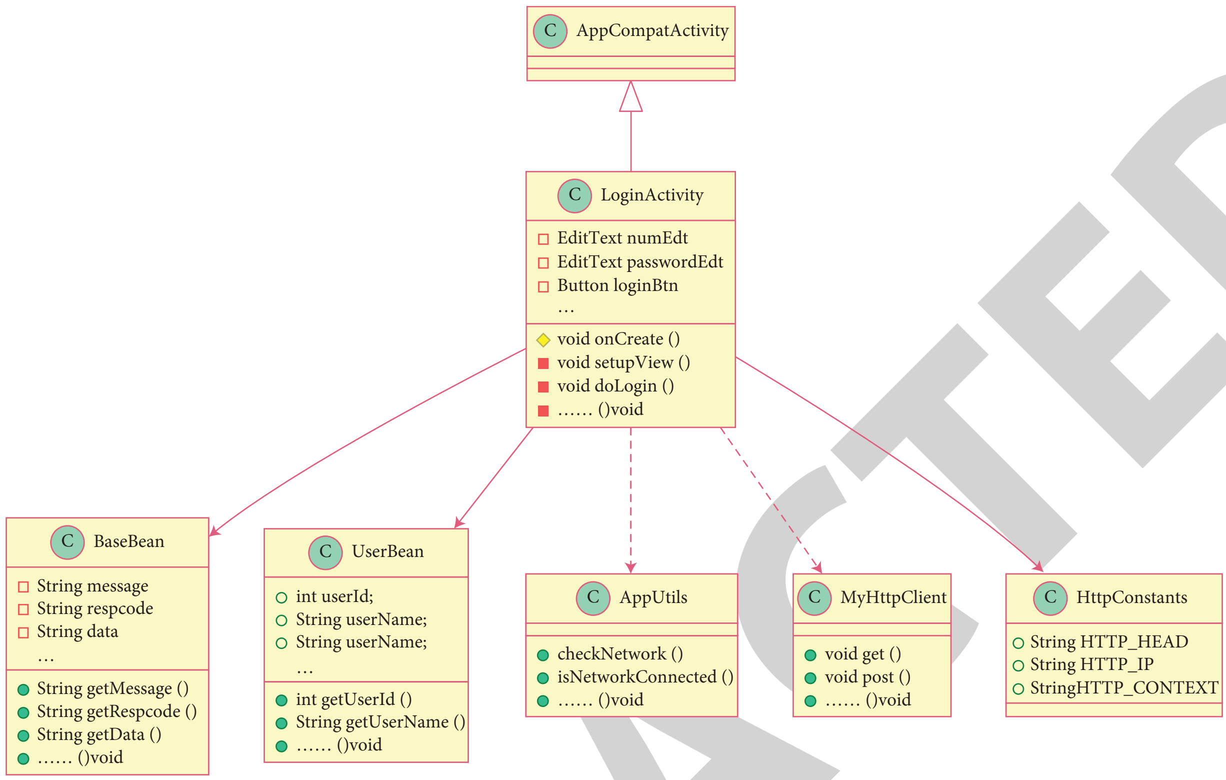

FIGURE 3: My account module part class diagram.

TABLE 1: Video viewing record of representative users.

User	Video 1 mmc1	Video 2 mmc2	Video 3 mmc3	Video 4 mmc4	Video 5 mmc5
U1	1	0	1	1	1
U2	0	1	1	1	1
U3	1	0	1	1	0
U4	0	1	1	0	1
U5	0	1	0	1	0

If the threshold $Q = 0.5$ is set, the neighbors of the user include user1 and user5. In addition, if there is no watch record user, the user's basic information can be used as the basis for calculating the similarity, the calculation methods similar to the users have to watch record, just change Table 1 of the video to use each of the different users' information characteristics (such as log in number, grade, class, professional) to replace, if a particular information feature the same assignment 1, assignment 0 otherwise if you can calculate the similarity and find out the neighbor users.

The main principle of fuzzy clustering for users of teaching resources is to cluster users through user description files, that is, the level of users' interest in the target teaching resources. User's interest degree description can be expressed in the vector space model and clustering is used to choose representative users as the clustering centers, according to the calculation for the current user, and the similarity clustering center is used to dynamically adjust the clustering center continuously, until it meets the preset threshold, eventually to produce target teaching resources fuzzy clustering of users. The calculation formula of similarity is as follows:

$$\operatorname{sim}(w, v) = \frac{\sum_{k=1}^{n} (\mu_k(w) - \overline{\mu}(w) * \mu_k(v) - \overline{\mu}(v))}{\sqrt{\sum_{k=1}^{n} (\mu_k(w) - \overline{\mu}(w))^2} * \sqrt{\sum_{k=1}^{n} (\mu_k(v) - \overline{\mu}(v))^2}}. \quad (4)$$

After the user fuzzy clustering center is determined, N users in the cluster where the user to be recommended are selected according to the similarity, and the prediction of the target teaching resource R by the user to be recommended is completed according to the interest degree of the N nearest users in the target teaching resource. The calculation formula is as follows:

$$S(w, v) = \overline{SA}_w + \frac{\sum_{v=1}^{n} \operatorname{sim}(w, v) * \left(SA_{v,r} - \overline{SA}\right)}{\sum_{v=1}^{n} \operatorname{sim}(w, v)}. \quad (5)$$

Sim (w, v) represents the similarity between user w and its nearest neighbor user v.

The selection of interest degree is defined as suppose U is the set of all URLs in the website session, H is the set of all browsing subpaths, $k(k = L, 2..., n)$ The selection interest of various choices is formula (6) as follows:

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$$P_A = \frac{A_k}{\left(\left(\sum_{i=1}^{n} A_i\right)/n\right)}. \quad (6)$$

The degree of interest in access time is defined as follows: U is the set of all URLs of website sessions, H is the set of all subpaths of browsing, and the first m bits of them are the same; $m+L$ bits have N different choices; Ti represents the sum of access time for users to enter the next page through the ith choice, where $k(1(k=L, 2..., n)$. The interest degree of access time selected is formula (7), which is as follows:

$$P_T = \frac{T_k}{\left(\left(\sum_{i=1}^{n} T_i\right)/n\right)}. \quad (7)$$

Considering the choice interest and access time interest comprehensively, the path interest is composed of choice interest and access time interest, and formula (8) is as follows:

$$P = \alpha \times P_A + \beta \times P_T, \quad (8)$$

where $a+b=1$, and b is the adjustment coefficient. By setting the size of a and b, the role of PA and PT in calculating path interest can be changed. The algorithm uses path interest degree to represent user interest degree for calculation and recommendation.

4. Experimental Results and Analysis

The experimental data set is based on the basic education and teaching resource database of Lianyungang Educational Center to validate the effectiveness and quality of the recommendation approach provided in this article. The resources cover nearly 10 TB capacity of all subjects in primary and secondary schools, with more than 9,000 registered users and more than 1,000 daily visits. Through sorting, 31,000 evaluation data of 300 users' interest in 1600 teaching resources were collected, and the sparsity level of the data set was $1-31000/(300 * 1600) = 0.9354$. The value is an integer from 0 to 5. The higher the value is, the higher the user's interest in the teaching resource is.

The average absolute deviation MAE (MAE) is used to assess the recommendation method's prediction accuracy. The average absolute deviation (MAE) between the actual and projected value of resource consumers' interest in resources is the average absolute deviation. The lower the MAE, the more accurate the advised prediction. If the data set for the anticipated value of users' interest in teaching resources is {$P1$, $P2$,..., Pn} and the data set for the actual value is {ql, q2,..., qn}, then

$$\text{MAE} = \sum_{i=1}^{n} \frac{\left|p_i - q_i\right|}{n}. \quad (9)$$

The number of nearest neighbors of the target user of instructional resources increases from 20 to 50 during the trial, with a step size of 5. The MAE of the standard collaborative filtering recommendation method and the fuzzy cluster-based recommendation approach suggested in this study are calculated and compared in Figure 4, and the experimental results are shown.

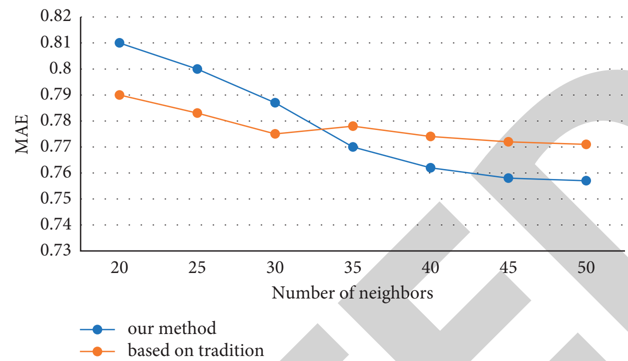

Figure 4: Experimental results.

From the experimental results in Figure 4, it can be seen that compared with the traditional collaborative filtering recommendation method, the recommendation method based on fuzzy clustering has a smaller MAE value, indicating that the accuracy and quality of the teaching resource recommendation predictions are better than the simulation results of the method in this study. The rate of descent is faster and more realistic. This is because the traditional collaborative filtering recommendation algorithm searches the nearest neighbor of the target user in all user Spaces, while the fuzzy clustering-based recommendation algorithm searches in the user space after clustering, so the accuracy of recommendation is greatly improved. Moreover, with the increase in the number of neighbors of target users recently, the larger their MAE difference value is, indicating that the recommendation prediction accuracy and quality advantage of the fuzzy clustering-based recommendation method is more obvious. In addition, by further enlarging the experimental data set, it is found that the recommendation method based on fuzzy clustering takes into account the similarity of clustering users' interests in the relevant teaching resource set and reduces the search scope of the nearest neighbor of the target user. The sparsity, cold start, and real-time recommendation speed of the traditional collaborative filtering recommendation method can also be greatly improved.

The experiment was divided according to the proportion of the training set and the test set from 0.1 to 0.9, and then MAE values of the three collaborative filtering methods were calculated respectively. Each MAE value was obtained by conducting at least ten experiments, and then the average value was calculated. The experimental results of the three recommendation algorithms are shown in Figure 5.

According to the experimental results, the MAE value of the dual clustering recommendation algorithm is the smallest, indicating the highest recommendation accuracy. Therefore, the dual clustering recommendation algorithm designed in this topic has obvious advantages and application significance.

The number of users for the collection and test of this recommendation system is limited, and there is a small amount of traffic and data collection at ordinary times, so there is a large problem of sparsity. Table 2 shows part of the user project score matrix data after algorithm processing. In

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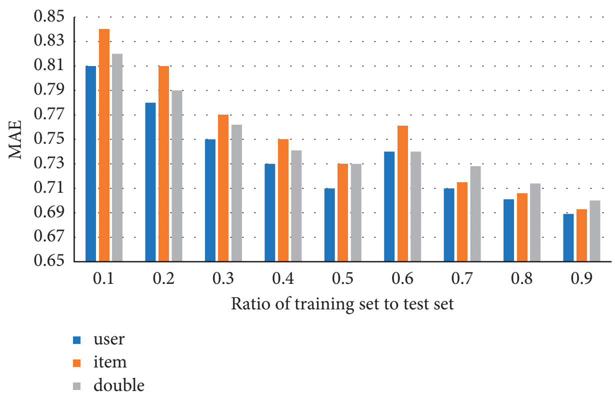

Figure 5: MAE experimental result diagram of the recommendation algorithm.

Table 2: The user project score matrix after partial processing.

	1	2	3	4	5	6	7	8	9
1	2.322	2.223	2.655	3.522	2.968	2.657	2.672	2.235	2.553
2	2.22	2.295	2.672	2.273	2.735	2.265	2.582	3.852	2.872
3	3.672	2.562	3.728	2.367	5.829	2.729	2.27	2.389	2.728
4	2.289	2.283	2.293	2.293	2.928	2.983	3.872	2.282	2.23
5	2.27	2.29	2.572	2.282	2.222	2.293	2.283	2.982	2.872
6	2.375	2.985	2.738	2.265	3.872	2.972	2.752	2.852	2.822
7	2.552	2.578	2.62	2.265	2.325	3.992	2.256	3.223	2.822
8	3.652	2.563	2.762	2.592	2.952	2.73	2.825	3.995	2.553

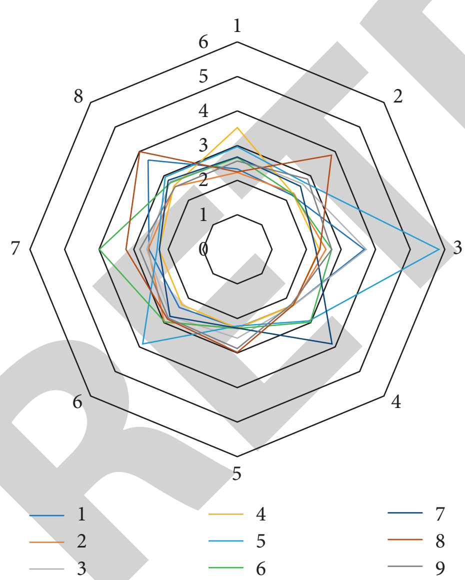

Figure 6: Shows the user project score matrix after partial processing.

addition, we display the scoring matrix through the radar chart, as shown in Figure 6, so that we can more intuitively observe the distribution of scoring at all levels.

Therefore, the MAE value calculated through the experiment is generally large, with the maximum MAE value of 0.94 and the minimum MAE value of 0.82 when the K value is 14, as shown in Figure 7.

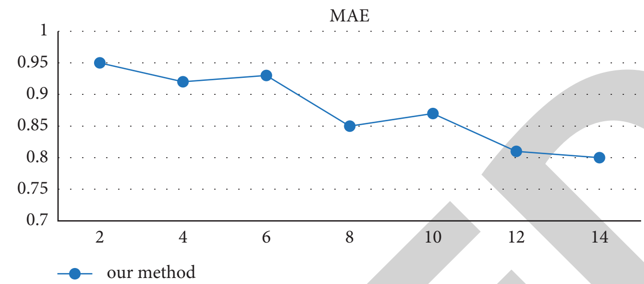

Figure 7: MAE distribution.

According to the recommendation results, MAE still shows a downward trend when the number of neighbors increases step by step, but the value of the whole foot is still too large. The recommendation effect will be more obvious only when the number of neighbors is larger.

5. Conclusion

This study investigates the current status of ideological and political teaching and proposes to develop an Android-based mobile teaching assistance system for ideological and political courses in colleges and universities based on on-demand analysis. On the basis of in-depth demand analysis, four functional modules are introduced: home page module, all courses module, course view module, and my account module. These modules are mainly to meet the functional requirements of the Android-based mobile teaching assistance system for ideological and political courses in colleges and universities. Since the role of the mobile teaching assistance system for ideological and political courses is mainly carried out remotely, there is a certain gap in the guidance of professors to students. In response to this demand, the system implements the recommendation system function, improves the integrity of the tutor's recommendation, and also provides personalized recommendation. This creates a breakthrough for some limitations of ideological and political education, and to a certain extent reflects the value-leading characteristics of ideological and political courses. Although the system has achieved the needs of its functional goals, in the face of the rapid development of international and domestic technology, the growing desire of college students for new and better learning methods, and the ever-changing impact of mobile learning, the function of the system is highly imperfect. The mobile teaching auxiliary platform for ideological and political courses in colleges and universities is a platform for integrating the wonderful teaching of famous teachers of ideological and political courses in colleges and universities, and the online live course module should be expanded. At the same time, the mobile teaching assistance system should follow the route of open participation and interactive communication, and further reflect the characteristics and styles of public participation, advancing with the times, and integrating into the life of information-based ideological and political theory courses.

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Data Availability

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

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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