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AIGC-Empowered Optimization of Foreign Language Classroom Management in Higher Education and Multi-Level Decision-Making Models

Hui Xu[1,*]
[1] Public Basic Courses Department, Wuhan Institute of Design and Sciences, Wuhan, Hubei, 430000, China
Corresponding authors: (e-mail: uniqueariel@163.com).

Abstract The development of artificial intelligence technology brings new opportunities for education management. This paper proposes a classroom management optimization method for foreign language teachers in colleges and universities based on AIGC technology, and constructs a multilevel decision model by improving Apriori algorithm. The system design contains six functional modules: teacher management, class creation, student information, course information, evaluation management and classroom assessment, and the improved association rule mining algorithm is used to extract the association relationship between classroom evaluation indicators. The experimental results show that under the parameter settings of minimum support 0.3, minimum confidence 0.5 and minimum interest 0.3, the improved algorithm extracts 12 strong association rules, which effectively suppresses the generation of misleading rules compared with the 24 rules of the traditional Apriori algorithm. Video analysis shows that the average number of abnormal behaviors per 20 seconds in the experimental class using the system is 4.15, which is lower than that of the control class, which is 5.13, and the classroom participation of students is significantly improved. The system provides an intelligent solution for foreign language classroom management in colleges and universities, which helps teachers accurately grasp students' learning status and improve teaching quality.

Index Terms AIGC technology, foreign language classroom management, Apriori algorithm, association rules, multilevel decision making, video analysis

I. Introduction

The rise and development of the informationization era has brought about a great change in the mode of social operation and people's learning and working modes. As an important branch of cultivating international language talents, foreign language teaching in colleges and universities must follow the trend of the times, grasp the opportunities of informatization, and actively explore a road of reform of foreign language teaching that adapts to the development law of the informationization era, so as to ensure the benign integration and cycle of informatization and foreign language teaching [1]. At present, more and more informatization technology is applied to foreign language teaching, such as updating and sharing teaching resources on some educational websites and the application of multimedia in foreign language classrooms [2], [3]. These resources not only facilitate teachers' teaching work, but also provide more convenience for students' foreign language learning, so that teachers and students can grasp more information and resources for more effective learning [4]-[7].

However, these large amounts of information and resources are not all effectively managed and constructed, which leads to the fact that although the information and resources are very rich, they do not prompt teachers to form efficient teaching decisions [8]-[10]. To change this status quo, it is necessary to have a systematic classroom management optimization path to form a unifying effect on foreign language classroom education, so as to build an information-based teaching system [11], [12]. The integration of generative artificial intelligence (AIGC) into foreign language classroom management can provide technical guarantee for the innovative work of foreign language teaching, and help the innovative path of foreign language teaching in colleges and universities through all kinds of initiatives, so that it can be neutralized and developed in the flood of education reform in the new era [13]-[15].

In this paper, an intelligent classroom management system integrating AIGC technology is constructed, and the traditional data mining algorithm is improved to extract the deep correlation relationship among the classroom evaluation indexes, and then a multilevel decision-making model is established. The study firstly designs a system architecture containing multiple functional modules to realize the comprehensive management of teachers, students, courses and other information; secondly, it improves the Apriori algorithm, introduces pruning technology to reduce the size of the candidate set, and improves the accuracy of association rule mining; finally, it verifies the

effectiveness of the system through experiments, and adopts the video analysis method to objectively assess the changes in students' classroom participation.

II. AIGC-based classroom management system design for foreign language teachers in colleges and universities

This chapter takes the improved Apriori algorithm as the core, and designs a classroom management system for foreign language teachers in colleges and universities based on AIGC, and realizes classroom management optimization based on multi-level decision-making based on the mined correlation information.

II. A.System architecture design

Through the use of this system, foreign language teachers in colleges and universities can personalize the classroom management and assessment system according to their own specialties, courses and students' characteristics, improve students' learning motivation through interesting classroom random questioning, on-site recording of students' status, and crisis crowd setting, etc., and assist the teachers in grasping and recording students' classroom learning first-hand materials in a timely manner, so as to effectively improve the effect of classroom teaching by the teachers.

The overall structure of the system is shown in Figure 1, which is divided into six basic modules: teacher management module, class creation and management module, student information management module, course information management module, evaluation management module, classroom assessment management module and so on. Among them, the classroom assessment management module is the core of this system, which covers the core functions such as student roll-call and evaluation records for designated classes and courses.

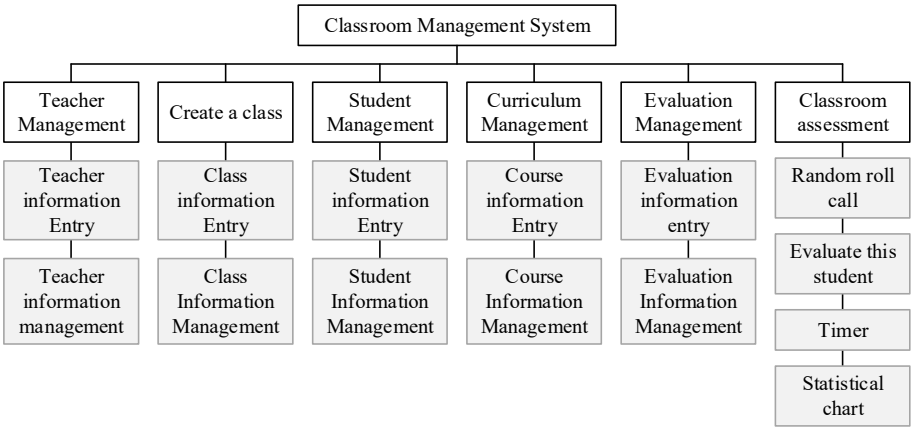

Figure 1: Architecture of the classroom management system

II. B.System database design

II. B. 1) System database E-R diagram design

The system starts with the overall design of the system's database based on the requirements of the requirements analysis, from the perspective of the user's use case requirements, functional requirements, including the conceptual design of the system database, and the graphical design of the system database. The system adopts a traditional and stable conceptual model for the overall design of the classroom management system database, which summarizes the teacher, course, class, student, and evaluation entities, and the system E-R diagram is shown in Fig. 2.

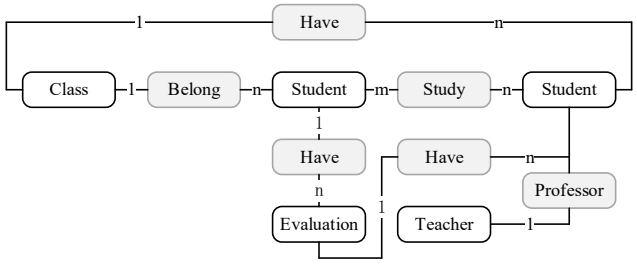

Figure 2: E-R Diagram of the Classroom management system

II. B. 2) Design of system database entity attributes

The setting of database entity attributes follows database design principles to ensure the uniqueness of each entity attribute. The specific design of entity attributes includes: teacher information entity attributes include work number, password, name, college. Class information entity attributes include class number, class name, college, major, class size. Student information entity attributes include student number, name, gender, class number, class name, and photo. Course information entity attributes include course number, course name, semester, number of hours, number of weeks in the course, and class name. Evaluation information entity attributes include evaluation number, commendation description, commendation score, description to be improved, score to be improved. The design of entity attributes is completely based on the most precise needs of teachers, and the system can be further optimized or improved according to the actual use of teachers.

II. C.System Function Module Design

(1) Teacher Management Module

Before using this system, the first thing that teachers have to do is to log into the Teacher Management Module to enter their information and change their personal passwords according to the initial account and password assigned to them by the system. Teachers need to enter personal information including their work number, name, college and other basic information.

(2) Class creation and management module

After teachers enter their personal information, they first need to create classes and enter class information according to their own courses, including class number, class name, college affiliation, major affiliation and class size. And through this module, you can modify and delete the courses you want to take in this semester.

(3) Student Information Management Module

After the teacher enters the general information of the class, he/she needs to enter the student information of the class one by one, including the student's student number, name, gender, class number, class name and photo, etc., so as to manage the student information uniformly on a class-by-class basis.

(4) Course Information Management Module

Through this module, teachers can enter and manage the information of the courses they need to teach in the current semester, including: course number, course name, course semester, number of hours, number of weeks, and class name.

(5) Evaluation Management Module

The main function of this module is to record different evaluations according to different courses. Evaluation management needs to be set up according to the characteristics of the course in a targeted manner.

(6) Classroom Assessment Management Module

This module is the focus of this system, teachers use this module to record, grade or evaluate the results of students' classroom question assessment. The teacher determines the courses and classes to be assessed in this class through the prompt dialog box, and then randomly asks students questions through the class list and records the results of students' answers by recording and evaluating them. The evaluation is divided into two parts: commendation descriptions and scores, and to be improved descriptions and scores, which are pre-set by the backend database system, and the content of the evaluation descriptions will be different according to the course, and finally the student's classroom performance will be assessed and evaluated according to the student's overall performance.

II. D.Application of Association Rule Mining Algorithms

II. D. 1) Data mining process design

The data mining process of the system in this paper is shown in Figure 3. The specific data mining process is as follows: the type of data to be mined is identified, the data in the database is converted, cleaned and other pre-processing, based on the identified data types through the association rule mining algorithm to implement data mining, and after the completion of the mining, the results are analyzed and evaluated, and are presented to the user through the client.

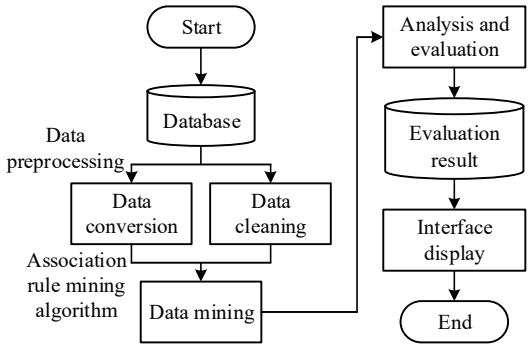

Figure 3: System data mining process

II. D. 2) Association Rule Mining Algorithm Design

(1) Association Rule Mining Algorithm

The underlying idea of the association rule mining algorithm Apriori [16] can usually be divided into two subproblems:

a) Discovery of frequent itemsets. According to the minimum support given by the user to find all the frequent itemsets greater than or equal to the minimum support, the frequent itemsets found may have an inclusion relationship, usually only for the frequent itemsets that are not included in the rest of the frequent itemsets of the set of frequent itemsets to be found, and such frequent itemsets that is, the generation of association rules is the fundamental.

b) Generation of association rules. Based on the minimum credibility given by the user, the association rules with credibility greater than or equal to the minimum credibility are found in the largest frequent itemsets.

(2) Apriori algorithm core

To realize the generation of all frequent sets, the Apriori algorithm uses a recursive approach, where the first frequent itemset K_1 and the second frequent itemset K_2 are generated one after the other, until some u-value occurs that makes K_u null, and the algorithm terminates. In the l th loop, the set of candidate l-item sets A_l is generated into the set of items in A_l which serves to generate the candidate set of the frequency set, and the generation of the items is accomplished by connecting the K_{l-1} frequency set with only one different item by $(l-2)$, and the final frequency set K_l is generated must be be some subset of A_l. It is necessary to verify each element within the database A_l to determine whether each element can be added to K_l, the verification of the database needs to be scanned several times, if there is a maximum of 15 items in the frequency set, then the database should be scanned 15 times, which requires a large I/O load, and several cycles will produce a large number of candidate sets, which results in the verification of the database still need to be scanned several times. Therefore, the shortcomings of Apriori algorithm is that the candidate set generation is too large and repeatedly scanning the database many times leads to long scanning time, which is the bottleneck of Apriori algorithm.

(3) Improvement of Apriori algorithm

In order to improve the Apriori algorithm and enhance the efficiency of the algorithm, pruning techniques are added to the algorithm to reduce the size of the candidate set A_l amount. The pruning technique adds to the algorithm the property that a certain itemset belongs to the frequency set and all its subsets are frequency sets, if there exists a $(l-1)$ subset of a candidate itemset within A_l that does not belong to the frequency set (K_{l-1}), this candidate itemset can be pruned away, and this method is able to minimize the cost of support for the calculation of the entire candidate set.

II. D. 3) Application of Improved Apriori Algorithm to the System

The association rules on the basis of constraints are obtained based on the improved Apriori algorithm.

Definition 1: Let the set of n different items be $J=\{j_1,j_2,\cdots,j_n\}$, and the set of administrations for J be B, with each administration including several items $j_1,j_2,\cdots,j_l$, and association rule can be expressed as:

$$E\cap Q\Rightarrow F\cap Q_f \tag{1}$$

where Q_e and Q_f both denote constraints. E and F denote itemsets, $E\subset J, F\subset J$, while $E\cap F=\mu$, μ means that when the management includes both E itemsets that satisfy Q_e constraints, and F itemsets that satisfy Q_f constraints, then there exists constraints on E and F. association.

Definition 2: Let the management set B contain the above constrained association rules, then the support of the E-itemset under the constraint Q_e is:

$$Support(E)=\frac{Support\_count(E)}{m} \tag{2}$$

where, m and $Support\_count(E)$ denote the number of data and the number of times the E item set appears in the management, respectively. The management with $b\%$ within the management set B includes both the management with Q. constraints on E and F with Q_f constraints.

In terms of credibility, the credibility of $(E \Rightarrow F)$ can be defined if $E \subset J, F \subset J$ and also $E \cap F = \mu$:

$$confidence(E \Rightarrow F)=\frac{Support\_count(E \cup F)}{Support\_count(E)} \tag{3}$$

where, $Support\_count(E \cup F)$ denotes the number of times the E, F itemsets together appear in the management. Within the management set B, there exists $a\%$ of E itemsets with Q_e constraints within E itemsets with Q_f constraints at the same time.

By applying the above association rule mining algorithm to the AIGC-based classroom management system in colleges and universities, it is able to mine various aspects of users' foreign language education information, and carry out the corresponding classroom management based on the mined association information to improve the management performance of the system.

III. Experiments and analysis of results

In this chapter, the proposed improved Apriori algorithm is used for association rule extraction of foreign language classroom evaluation indexes, and the effectiveness of the designed classroom management system is experimentally verified.

III. A. Extraction of association rules for foreign language classroom evaluation indexes in higher education institutions

III. A. 1) Experimental environment

In this section, based on the preprocessed dataset, the traditional Apriori algorithm, the Apriori algorithm based on probabilistic interest degree and the improved Apriori algorithm adopted in this paper are used to mine association rules on the transformed foreign language classroom evaluation data of colleges and universities, respectively. The experimental environment is shown in Table 1.

Table 1: Experimental environment

Project	Value
Processor	i7-7700HQ (3.8 GHz) CPU
Memory	32GB
Operating system	Microsoft Windows 11 Pro
Programming language	Python3.13.1
Develop software	Jetbrains PyCharm 2023.2

III. A. 2) Analysis of misleading suppression effect

After many repeated experiments, the minimum support $S_{\min}=0.22$, the minimum confidence $C_{\min}=0.5$, and the minimum interest $I_{\min}=0.6$ are set. At this point, 24 association rules can be obtained using the traditional Apriori algorithm. Many of these association rules are meaningless or misleading, and some of the misleading rules are shown in Table 2. Only 12 association rules can be extracted after the introduction of interest degree.

Take Rule 1 in Table 2 as an example. In the real world, the support for the intrinsic correlation between the indicator item "online teaching resources" and "the structure and overall quality of the teaching team" is not high, and it is difficult to reveal the logical implication relationship between resource and personnel affairs. However, Rule 1 shows that when online teaching resources are rated as "excellent", the structure and overall quality of the teaching team will be rated "medium" with a high probability, which is far-fetched. Similarly, Rule 2 shows that there is a correlation between conditional and human transactions, which is difficult to establish.

Table 2: Extracted some meaningless or misleading association rules

Serial number	Rules
1	Online teaching resources [Excellent]→ Teaching team structure and overall quality [Medium]
2	Practical teaching conditions [Excellent]→ Course leader and main instructor [Good]

Further, the parameter settings of $C_{\min}$ and $I_{\min}$ are changed respectively, and the extraction rule experiments are conducted using the traditional Apriori algorithm, Apriori algorithm with probabilistic interest degree, and the improved algorithm under different conditions in order to examine the filtering effect of improved Apriori algorithm on the extraction of interesting rules.

Under the combined conditions of $C_{\min}=0.4$, $I_{\min}=0.6$, the changes in the number of association rules extracted by the three algorithms are shown in Figure 4. It can be seen that, under the premise of setting the confidence and interest degree parameters, as the support degree increases, the number of rules extracted using the improved Apriori algorithm starts to decrease more than using the traditional algorithm, and finally approaches gradually, while the number of rules extracted by the improved Apriori algorithm is partially more than the probabilistic interest degree of the Apriori algorithm, but the overall trend is still less than the probabilistic interest degree of the Apriori algorithm, and the overall trend is still less than the probabilistic interest degree of the Apriori algorithm. Degree of interest Apriori algorithm, indicating that the Apriori algorithm with the addition of the degree of interest can reduce the generation of misleading rules, while the improved Apriori algorithm in this paper can reduce the generation of misleading rules even more.

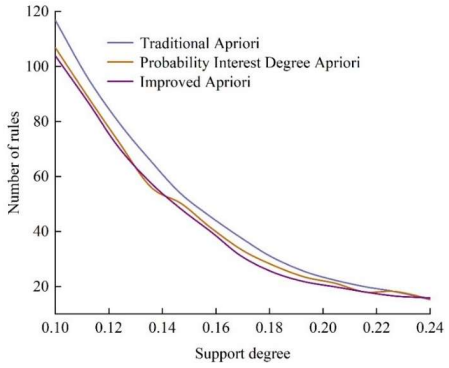

Figure 4: Compare the number of extraction rules ($C_{\min}=0.4$, $I_{\min}=0.6$)

The variation in the number of association rules extracted by the three algorithms when the combination conditions are $C_{\min}=0.3$ and $I_{\min}=0.6$ is shown in Figure 5. It can be observed that with the support and interest parameters set, as the confidence level increases, the number of rules generated using the improved Apriori algorithm starts off much less than using the traditional Apriori algorithm and ends up gradually approaching, while the overall trend of the number of rules generated by the improved Apriori algorithm is less than that of the probabilistic interest level Apriori algorithm, suggesting that the introduction of the interest level helps to reduce the number of misleading rules generated, but its effect is still some way off from the improved Apriori algorithm.

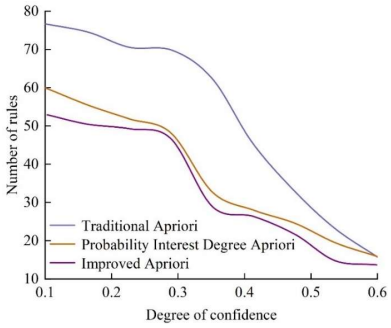

Figure 5: Compare the number of extraction rules ($C_{\min}=0.3$, $I_{\min}=0.6$)

Under the condition that the parameters are set to $C_{\min}=0.3$, $I_{\min}=0.4$, the change in the number of association rules extracted by the three algorithms is shown in Figure 6. Under the premise of setting the support and confidence parameters and introducing the degree of interest in the Apriori algorithm, the number of rules extracted by the probabilistic degree of interest Apriori algorithm gradually becomes less as the degree of interest increases. The overall trend is observed that the number of rules produced by the improved Apriori algorithm is less than the probabilistic interest degree Apriori algorithm. In comparison, mining using traditional Apriori algorithm, the number of rules extracted does not change, indicating that the introduction of the degree of interest reduces the generation of misleading rules, but the improved Apriori algorithm in this paper is more advantageous.

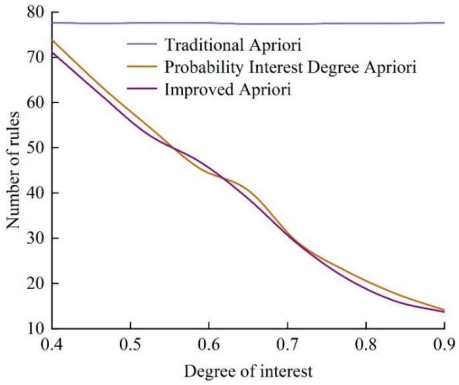

Figure 6: Compare the number of extraction rules ($C_{\min}=0.3$, $I_{\min}=0.4$)

In summary, the number of extracted rules decreases with the increase of support, confidence, and interest respectively, within the respective setting range of the parameter combinations of support, confidence, and interest. Using this paper's algorithm extracts fewer rules than using the traditional Apriori algorithm and the probabilistic Apriori algorithm, which can effectively inhibit the generation of meaningless and misleading association rules, and improve the efficiency of data mining and the accuracy of the knowledge implied in the data.

III. A. 3) Analysis of rules for extraction

Setting $S_{\min}=0.22$, $C_{\min}=0.5$, and $I_{\min}=0.6$, the improved Apriori algorithm is run, and 12 strong association rules are extracted. Some of the rules and their parses are shown in Table 3.

Examining the extracted association rules, the importance of human factors for curriculum construction can be found. Rules 1-4 in the table show that in a teaching team, the quality of textbook selection, teaching reform and instructional design can be improved by utilizing teachers' motivation. This inspires foreign language teaching administrators in colleges and universities to pay attention to the core guiding position of talents in the process of course construction, and to pay enough attention to the selection of course leaders and main teachers. For the construction of the teacher team, teachers with higher academic qualifications and longer teaching experience should be prioritized as course leaders, while maintaining a balanced academic structure and age structure, so as to improve the level of course teaching design, teaching reform and research, and lay the foundation for the improvement of teaching quality.

Next, we examine the role of teaching resources as a material guarantee for curriculum development. Rules 5, 6 and 9 show that all kinds of teaching resources have a fundamental material guarantee role for course content selection and teaching design. This inspires foreign language teaching administrators in colleges and universities that in curriculum construction, resource allocation should be more inclined to teaching resources.

Following the examination of the role played by pedagogical reform and research in curriculum construction, Rule 10 shows that the enhancement of pedagogical reform and research is conducive to the improvement of the quality of course content. For teaching researchers, teaching reform and research should be emphasized to play the role of keeping up with the times in curriculum construction. Rule 12 shows that the improvement of course content has a guiding role in classroom teaching practice, and in order to improve the practice of foreign language classroom teaching, it is necessary to improve the content of the course first, which is conducive to the improvement of classroom teaching practice.

Finally, the role of information technology and teaching methods in supporting the construction of the curriculum is examined. Rules 7, 8 and 11 show that the comprehensive use of information technology and multiple teaching methods is conducive to the improvement of instructional design, teaching reform and research. On the contrary, lack of IT literacy and outdated IT-based teaching methods will, with a higher probability, lead to poorer quality of

instructional design. As foreign language teaching administrators in colleges and universities, they should pay attention to the supportive and bridging roles of teaching methods and information technology in playing the roles of teacher's initiative and material guarantee of teaching resources, on the one hand, to improve the level of educational informatization of the school, on the other hand, to create an atmosphere of learning and improving information technology by strengthening the construction of the campus culture of information technology, and at the same time, to introduce the social resources, to increase the training of the teachers, and to improve the teachers' informatization literacy and mastering more skills in using tools based on modern information technology.

Table 3: Some of the extracted association rules are meaningless or misleading

Serial number	Rules	Support degree	Degree of confidence	Degree of interest
1	Course director and main instructor [Excellent]→ Textbooks and related materials [Excellent]	0.267	0.584	0.536
2	Structure and overall quality of the teaching staff [Excellent]→ Textbooks and related materials [Excellent]	0.238	0.563	0.592
3	Course director and main instructor [Excellent]→ Teaching reform and research [Good]	0.359	0.595	0.681
4	Course director and main instructor [Excellent]→ Teaching design [Excellent]	0.265	0.621	0.732
5	Teaching materials and related materials [Excellent]→ Teaching design [Excellent]	0.283	0.586	0.544
6	Online teaching resources [Excellent]→ Course content [Excellent]	0.249	0.644	0.651
7	The application of information technology [Chinese]→ Instructional design [Poor]	0.274	0.617	0.773
8	The use of multiple teaching methods [Excellent]→ Teaching reform and research [Excellent]	0.295	0.585	0.639
9	Textbooks and related materials [Good]→ Course content [Medium]	0.307	0.627	0.695
10	Teaching reform and research [Excellent]→ Curriculum content [Good]	0.224	0.575	0.598
11	The application and effects of multiple teaching methods [Excellent]→ Teaching design [Excellent]	0.238	0.584	0.535
12	Course content [Good]→ Course practice [Medium]	0.226	0.593	0.628

III. B. Video analysis and evaluation methods

In the previous section of this paper, the association rule mining algorithm of the designed classroom management system was experimented with the purpose of verifying the effectiveness of this classroom management system. In order to ensure the objectivity of the experimental results, this section adopts the approach of intelligent analysis, in which the two classes are video-recorded throughout the whole process of the experiment, as a way to obtain objective video data and enhance the persuasiveness of the experimental results. Among them, the experimental class adopts the classroom management system for college foreign language teachers designed in this paper, and the control class adopts the conventional classroom management mode.

III. B. 1) Captured raw video data

Before the experiment started, i.e., before the foreign language teacher taught the students in the classroom, a high-definition digital video camera was placed in the front of the classroom, to the right of the podium, with the lens facing the students, to capture the students' behavioral actions in the classroom.

Due to the limitations of the shooting conditions, some students in the classroom were not captured, here, we only analyze the students who could be captured in the camera, 36 students in the experimental class were in the visible range, and 35 students in the control class were in the visible range, and there was not much difference in the number of students in the visible range.

III. B. 2) Video data processing

Next, the collected foreign language classroom video data of college students are preprocessed to remove redundant information, and then the key frame extraction is carried out, which is researched on the behavioral analysis based on static images. For the extraction of key frames of the classroom student video data, that is, the video coding time period of the cut, there are 2s, 20s, 1min many kinds of methods, because the students are more active, the attention can not be concentrated for a long time, there will be a big change of action in a short period of time, we take a frame every 20s, that is, every 20s cut once. We take the video of one complete lesson of each experimental class and control class as a unit, and slice the obtained video data, which is convenient for us to count the data.

III. B. 3) Analysis of experimental results

After every 20s of video slicing, the experimental class and the control class obtained 90 pictures respectively. Drawing on the classroom management system and the Flanders interaction analysis method, the obtained pictures were coded and recorded to count the number of students who had abnormal behavioral situations every 20s, which included talking to each other, lying on their backs, sleeping, eating, and so on. Because the two classes were taught by the exact same foreign language teacher using the exact same instructional design, the abnormal behaviors of the two classes were comparable based on the fact that the two classes were parallel classes and there were no significant differences in various aspects. Because of the large number of students, it is more time-consuming to count alone, and it is recommended to work with the raw video data. The fewer the abnormal behaviors, the higher the overall class participation. The more abnormal behavior, the lower the overall classroom engagement. Some of the statistics for the two classes are shown in Table 4.

Table 4: The number of people with abnormal movements in the two classes

Experimental class			Control class		
Slice serial number	Time points /min	The number of people with abnormal movements	Slice serial number	Time points /min	The number of people with abnormal movements
1	1/3	5	1	1/3	6
2	2/3	5	2	2/3	6
3	1	3	3	1	6
4	4/3	2	4	4/3	6
5	5/3	2	5	5/3	6
6	2	3	6	2	5
7	7/3	3	7	7/3	3
8	8/3	2	8	8/3	2
9	3	3	9	3	4
10	10/3	3	10	10/3	3
11	11/3	4	11	11/3	3
12	4	5	12	4	3
13	13/3	5	13	13/3	5
14	14/3	5	14	14/3	6
15	5	5	15	5	6
16	16/3	5	16	16/3	5
17	17/3	5	17	17/3	6
18	6	5	18	6	7
19	19/3	5	19	19/3	7
20	20/3	5	20	20/3	7
21	7	6	21	7	8
22	22/3	6	22	22/3	8
23	23/3	5	23	23/3	9
24	8	3	24	8	9

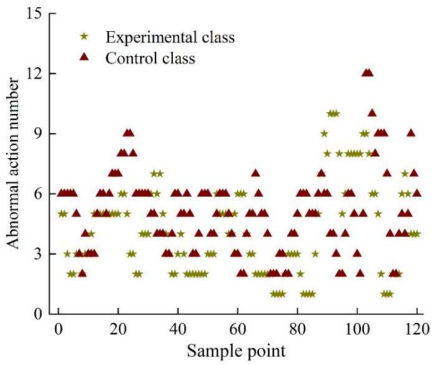

Figure 7: Scatter plot of abnormal action distribution at each time point

The scatter plot of the distribution of abnormal actions at each time point is obtained as shown in Figure 7. It can be observed that there is no pattern in the number of abnormalities in the two classes, but in general the number of abnormalities in the experimental class at each time point will be lower than that of the control class.

By calculating the average for the overall number of abnormal numbers, it can be seen that the total number of abnormal behaviors in a lesson in the experimental class was 498, with an average of 4.15 per 20s, while the total number of abnormal behaviors in a lesson in the control class was 615, with an average of 5.13 per 20s. It can be seen that the number of abnormal people in the experimental class is lower than the control class. The lower the number of abnormal people, the higher the overall participation in the classroom, so the overall participation of the experimental class is slightly higher than that of the control class.

In addition, in the process of actual foreign language teaching, we also found some phenomena, in the group discussion, for the experimental class, the students in the class are actively involved in it, and the progress and rhythm of the discussion in the group are controlled by someone, and when someone in the group speaks, the others will listen carefully. In the control class, when the group discussion is conducted, the active ones are always a few people in a few groups, and the majority of them are male students, some students have nothing to do and do not participate in the discussion, the time of the group discussion is delayed, the progress is slow, and when the group is looking for a representative to summarize the speech, the members of the group are also excusing themselves from each other. These phenomena can also reflect to some extent that the foreign language classroom management system used in the experimental class is superior to the traditional classroom management mode in the control class.

IV. Conclusion

The classroom management system for foreign language teachers in colleges and universities based on AIGC technology has successfully realized the intelligent upgrade of teaching management. The improved Apriori algorithm performs well in association rule mining, and the 12 strong association rules extracted reveal the intrinsic connection between talent factors, teaching resources, teaching reforms and information technology applications in curriculum construction, providing a scientific basis for teaching management decisions. The six functional modules of the system cover the whole process of classroom management, realizing accurate recording and evaluation of students' learning status. The video analysis experiment fully verifies the practicality of the system. The total number of abnormal behaviors in one class in the experimental class is 498, which is significantly lower than that of 615 in the control class, indicating that the system can effectively enhance students' classroom participation and learning motivation. Through the analysis of 90 slice images, it was found that the class with the intelligent management system performed more actively in interactive sessions such as group discussions, and the distribution of student participation was more balanced. The system provides a feasible path for the digital transformation of foreign language teaching management in colleges and universities, and has important practical value for improving teaching quality.

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