

The quality evaluation and development of university ideological and political teaching based on wireless network artificial intelligence

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ABSTRACT

Amnesty international is recognized as a key force in promoting social development, with higher education also facing the need for innovation. This paper explores new opportunities in educational theory and policy proposed in a recent initiative. The proposal emphasizes filtering ideology, political education, and public opinion to enhance the accuracy of ideological and political teaching. By incorporating personal suggestions through interviews, the model recommends learning materials tailored to student characteristics. System implementation and testing demonstrate its potential as a core tool for ideological education in colleges, supporting the integration of knowledge, politics, and technology to meet students' educational needs.

Keywords: artificial intelligence, ideological and political courses in colleges and universities, teaching quality evaluation, algorithm recommendation

1. Introduction

Teachers' self-evaluation is generally the teacher's self-reflection evaluation of the courses he undertakes this semester. Although this kind of evaluation because teachers are worried that low evaluation scores may affect their professional titles, etc., when they score themselves, their evaluation scores are generally higher [12, 7, 2]. Expert evaluation of teaching is generally the supervision experts organized by the school to conduct lecture evaluations on teachers' classroom teaching activities. Experts have rich teaching experience and can accurately point out the strengths and weaknesses of teachers' classroom teaching, which is more targeted for teachers. The disadvantage is that the

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number of experts is very small, and the number of teachers who can listen to the lecture is very small [4, 1]. For our school, the rate of expert lectures is about no more than that of this semester. Moreover, the courses he attends are mainly concentrated in the classrooms of teachers who have started new courses or new courses or courses that apply for the selection of teaching quality awards.

Leadership evaluation is generally conducted by leaders of relevant departments or related administrative management leaders. It has the same shortcomings as expert lectures, that is, the coverage is small, and due to the busy administrative affairs, it is difficult to guarantee the number of lecture hours [6, 10, 14]. Peer evaluation of teaching means that teachers who undertake the same or similar professional courses listen to each other and evaluate each other, which helps teachers to learn from each other and learn from each other's strengths. The disadvantage is that the feedback of the evaluation results is not effective, which generally reflects that the classroom teaching is very good, and the gap between the evaluation results between peers is almost small. For the teaching management department, such evaluation results have almost no reference, so this part of the evaluation basically plays the role of allowing teachers to communicate and learn from each other [3].

Student evaluation of teaching refers to an anonymous evaluation method made by students on all aspects of teachers' classroom teaching according to teachers' classroom teaching activities. In the space of "information spillover", the speed at which people create information far exceeds the speed at which the Internet processes information. Therefore, people must seek a way to clean up useless information and maximize the dissemination of useful information to solve the dilemma of being "flooded" by information. The most suitable way at present is to effectively connect people with information through algorithm recommendation technology. However, due to its own capital logic and tool rational characteristics, Ignoring the mining and pushing of information with social value and important significance, we choose the flow information with benefits available [11, 13]. At the same time, in the information dissemination pattern dominated by algorithms, the algorithm recommendation of "flow is king" wins users' attention and attracts users' eyes by pushing vulgar, vulgar and entertaining information, resulting in value disorder, behavior disorder, voice loss, and the opposition between capital logic and value rationality, Finally, it leads to the distortion of values. Not only that, in the age of intelligent media, the values of algorithm designers, mainstream media and users will have an impact on algorithm recommendation. Some algorithm designers, under the temptation of capital and power, deeply embed their subjective values in the process of algorithm recommendation design, and the instructions received and decisions made by algorithm decisions will also be affected by embedded values, Finally, the output results are deviated; Some mainstream media driven by interests exaggerate the reported information excessively. Influenced by wrong values and misleading information, it may even lead to the phenomenon of blindly following the trend, which raises a storm of public opinion in the society. In the long run, people's value orientation will be "tilted" or even "collapsed", which also makes people have to re-examine the algorithm technology; If algorithm recommendation technology wants to find a correct development path and direction, it needs ideological and political education to play its role in guiding the value. Instead of making algorithm recommendation technology "degenerate" or "change its flavor", it needs to make algorithm recommendation more "warm". Only by grasping the "steering wheel" of algorithm recommendation, can it "open" more steadily and accurately on the information highway, and algorithm recommendation can truly benefit the people; Only through the guidance of ideological and political education can we truly make the best use of algorithm technology, improve its credibility and communication, and maximize and optimize the social utility of algorithm recommendation.

The evaluation and development of the teaching quality of ideological and political courses in

colleges and universities based on wireless network AI will have far-reaching changes in different dimensions.

2. Wireless network artificial intelligence and teaching evaluation system

Its basic ideological and political teaching evaluation model paradigm is shown in Figure 1.

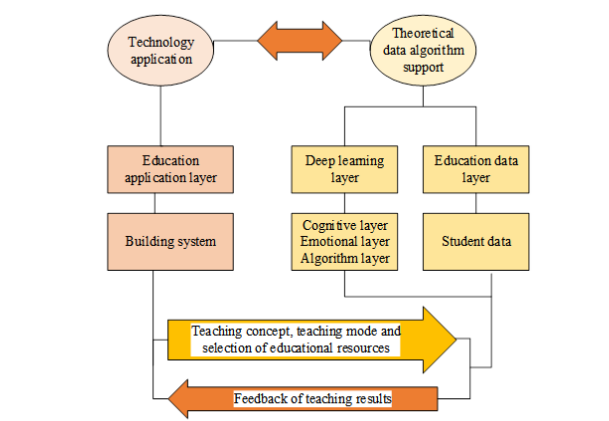


Fig. 1. Technical framework for the integration of education and artificial intelligence

To collect behavioral data, including language expressions and body language of students and teachers’ classes. Among them, the process of data mining for university ideological and political teaching quality evaluation is shown in Figure 2.

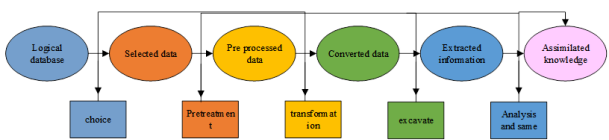


Fig. 2. Data mining process of university ideological and political teaching quality evaluation

The consequences of data mining cannot be predicted, but the problems that need to be mined need to be predicted. The data entered into the database is extracted through data sources, screening and subsequent data, as shown in Figure 3.

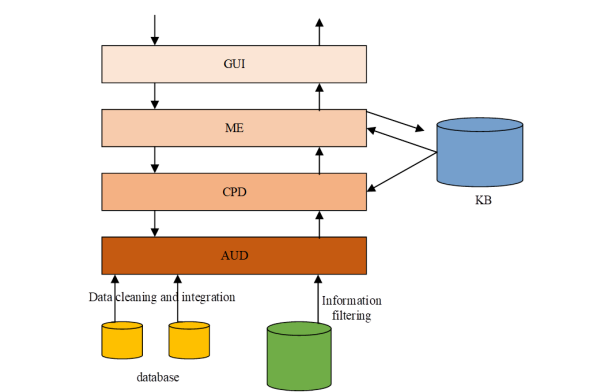


Fig. 3. The process of the quality evaluation engine of ideological and political teaching in universities

In this process, the symbol sent by the source takes the value of $u_1, u_2, u_3, \dots, u_r$, and the symbol V received by the sink takes the value of V1 and V2. The transition probability matrix is represented by a matrix, as shown in Eq. (1):

$$\begin{pmatrix} P\langle v_1 u_1 \rangle & P\langle v_2 u_1 \rangle & \cdots & P\langle v_q u_1 \rangle \\ P\langle v_1 u_2 \rangle & P\langle v_2 u_2 \rangle & \cdots & P\langle v_q u_2 \rangle \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ P\langle v_1 u_r \rangle & P\langle v_2 u_r \rangle & \cdots & P\langle v_q u_r \rangle \end{pmatrix}, \quad \text{where } \sum P\langle v_j u_i \rangle = 1, \quad i = 1, 2, \dots, r. \quad (1)$$

Among them, the probability of occurrence by formula (2)-(4):

$$\begin{bmatrix} U \\ P \end{bmatrix} = \begin{bmatrix} u_1 & u_2 & \cdots & u_r \\ P(u_1) & P(u_2) & \cdots & P(u_r) \end{bmatrix}, \quad (2)$$

$$\log \frac{1}{p(u_i)} = -\log p(u_i), \quad (3)$$

$$H(u) = \sum_i p(u_i) \log_2 \frac{1}{p(u_i)} = -\sum_i p(u_i) \log_2 p(u_i). \quad (4)$$

In this formula, the uncertainty about P can be defined as Eq. (5):

$$H(U | |v_j\rangle) = \sum_i p(u_i | |v_j\rangle) \log_2 \frac{1}{p(u_i | |v_j\rangle)}. \quad (5)$$

The teaching quality evaluation model has only two types of inputs: U1 and U2. The calculation formulas of mutual information are Eqs. (6)- (8):

$$H(U) = \sum_i P(u_i) \log_2 \left(\frac{1}{P(u_i)} \right), \quad (6)$$

$$H(U | V) = \sum_j p(v_j) \sum_i p(u_i | v_j) \log_2 \left(\frac{1}{p(u_i | v_j)} \right), \quad (7)$$

$$I(U, V) = H(U) - H\langle U|V \rangle. \quad (8)$$

When $p(u_i)$ or $p(u_i|v_j)$ is zero, the logarithm is defined as zero

3. Methods

3.1. Data preprocessing and index system construction

The courses undertaken by the teachers at the School of Petroleum Engineering are characterized by strong professionalism, and the courses are narrowly applicable to majors, which are only applicable to the majors of the college. Moreover, the major of the School of Ideological and Political Science is a characteristic major of the school and has won the title of national characteristic major. Therefore, this college is selected as a typical analysis, as shown in Table 1.

Table 1. Basis for the evaluation of teaching quality of the college of ideological and political science

Serial No	Teacher Name	title	Gender	Teaching attitude	In teaching	Teaching party	teaching effectiveness	Evaluation grade
1	Teacher 1	Lecturer level	male	A	A	B	A	satisfied
2	Teacher 2	Lecturer level	male	A	B	A	B	satisfied
3	Teacher 3	Professor level	male	A	A	B	A	satisfied
4	Teacher 4	Professor level	female	B	B	A	A	satisfied
5	Teacher 5	Professor level	male	A	B	A	A	satisfied
6	Teacher 6	associate professor	female	B	B	C	B	satisfied
7	Teacher 7	associate professor	male	A	A	B	A	satisfied
8	Teacher 8	associate professor	male	A	A	B	A	Quite satisfied
9	Teacher 9	associate professor	female	B	A	B	C	satisfied
10	Teacher 10	Lecturer level	male	A	A	B	A	Quite satisfied
11	Teacher 11	Lecturer level	female	A	B	A	A	satisfied
12	Teacher 12	Lecturer level	female	B	B	A	A	satisfied
13	Teacher 13	associate professor	male	A	A	B	A	satisfied
14	Teacher 14	associate professor	female	C	A	C	C	satisfied
15	Teacher 15	Professor level	male	A	A	B	A	satisfied
16	Teacher 16	associate professor	female	A	B	A	A	Quite satisfied
17	Teacher 17	associate professor	male	A	A	A	A	satisfied
18	Teacher 18	Professor level	male	A	B	A	A	satisfied
19	Teacher 19	Lecturer level	female	A	A	B	A	satisfied
20	Teacher 20	Professor level	male	A	A	A	B	satisfied
21	Teacher 21	Lecturer level	male	A	A	A	A	Quite satisfied
22	Teacher 22	associate professor	female	B	C	B	B	satisfied
23	Teacher 23	associate professor	female	B	A	B	B	satisfied
24	Teacher 24	associate professor	male	A	A	A	A	satisfied
25	Teacher 25	associate professor	female	A	A	B	A	satisfied
26	Teacher 26	Professor level	male	C	A	C	C	satisfied
27	Teacher 27	Professor level	female	A	A	B	A	satisfied
28	Teacher 28	associate professor	male	A	A	A	C	Quite satisfied
29	Teacher 29	associate professor	male	A	B	A	A	satisfied
30	Teacher 30	Lecturer level	female	A	A	A	A	satisfied
31	Teacher 31	associate professor	male	A	A	A	B	satisfied
32	Teacher 32	Lecturer level	female	C	B	C	C	satisfied
33	Teacher 33	associate professor	male	B	A	B	B	Quite satisfied
34	Teacher 34	associate professor	male	A	A	A	A	satisfied
35	Teacher 35	associate professor	female	B	B	A	B	satisfied
36	Teacher 36	Lecturer level	female	A	B	A	A	Quite satisfied
37	Teacher 37	Lecturer level	male	C	A	C	C	satisfied
38	Teacher 38	associate professor	female	A	A	B	A	satisfied
39	Teacher 39	Lecturer level	male	A	A	A	A	satisfied
40	Teacher 40	Lecturer level	female	B	A	B	B	satisfied
41	Teacher 41	Lecturer level	female	A	A	A	A	satisfied
42	Teacher 42	Professor level	male	C	C	A	A	satisfied
43	Teacher 43	Lecturer level	female	A	A	A	A	satisfied
44	Teacher 44	Lecturer level	female	C	A	C	C	satisfied
45	Teacher 45	associate professor	male	A	A	A	A	satisfied
46	Teacher 46	associate professor	female	A	A	A	A	satisfied
47	Teacher 47	associate professor	male	A	B	A	A	satisfied
48	Teacher 48	Lecturer level	female	A	A	A	A	satisfied
49	Teacher 49	Lecturer level	male	A	C	A	A	Quite satisfied
50	Teacher 50	Professor level	female	A	A	A	A	Quite satisfied

The first-level indicators of domestic and foreign evaluation systems are summarized, and the specific contents are shown in Table 2. In general, teaching design, course content, and technology platform are the first-level indicators common to most evaluation systems. Content organization, content presentation, learning methods, belong to the teaching work of teachers, so they can be divided into secondary indicators of teaching methods, but they can also be divided into secondary indicators of course content. To a certain extent, teaching methods and course content are closely related. Teachers design teaching and put course resources on online platforms. Therefore, when setting the first-level indicators, teaching methods and course content can be separated or combined. Technical support covers a wide range, such as teacher-student interaction, platform services, system

support, evaluation and evaluation, interface arrangement, virtual classroom environment, etc., all require the use of technical means, so they can be summarized into the secondary indicators at the technical support level. Other unique first-level indicators are divided according to the actual situation and education level of each country and will not be repeated here [5, 8, 9].

Table 2. Reference table for the first-level indicators of teaching quality evaluation in ideological and political classrooms

	Serial No	Name of evaluation system	Level I indicators
abroad	1	Online Learning Certification Standards	Teaching design, teaching products, teaching interface, platform services
	2	Online Learning Quality	Curriculum development and system structure
	3	QM Quality Standard	Course overview, course application technology, learning objectives and evaluation teaching resources, teacher-student interaction, platform support and usability
	4	Quality Label of Open Education	Institutional level and curriculum level
	5	MOOC Teaching Quality Evaluation Index System	Cognition, learning methods, acceptance and virtual classroom environment of employability training
	6	MOOC Design Quality Assurance Standard	Teaching and technology
domestic	7	CELTS-2.1 Online Course Evaluation Specification	Course content, teaching design, interface arrangement and technical support
	8	Evaluation Indicators of National Excellent Courses	Teaching effects
	9	Recognition Standards for Excellent Online Open Courses	Course team, course teaching design, teaching activities and influence, application effect and influence, and course platform support services
	10	Evaluation System for Course Improvement	Content organization, content presentation, teaching methods, curriculum implementation and promotion

Therefore, basic operations such as proper typesetting, prominent focus, clear picture quality, moderate subtitles, and reasonable composition greatly affect students' ideological and political teaching quality. Hardware facilities, optimized platform services. These courses have many electives and a large number of evaluations, which are representative are shown in Table 3.

Table 3. Reference table of course data for ideological and political classroom teaching quality evaluation

Course name	School	Total attendance (recent 5 times)
Basic Principle of Marxism	Fujian Agriculture and Forestry University	15082
Basic Principle of Marxism	Wuhan University	220092
Basic Principle of Marxism	Nanjing University of Aeronautics and Astronautics	33958
Outline of Modern Chinese History	Zhejiang University	58538
Outline of Modern Chinese History	Central South University	22096
Outline of Modern Chinese History	Wuhan University	83575
Situation and policy	Nanjing Normal University	130626

3.2. Model construction

The teaching evaluation view is shown in Figure 5. The business activity diagram of the personalized recommendation module is shown in Figure 4. Students or teachers of ideological and political courses post topics and reply through the discussion function. The teaching evaluation view use case mainly

includes the post topic use case. Post topic use cases include post reply, view reply, view topic list and other use cases. The use case diagram of the teaching evaluation module is shown in Figure 6.

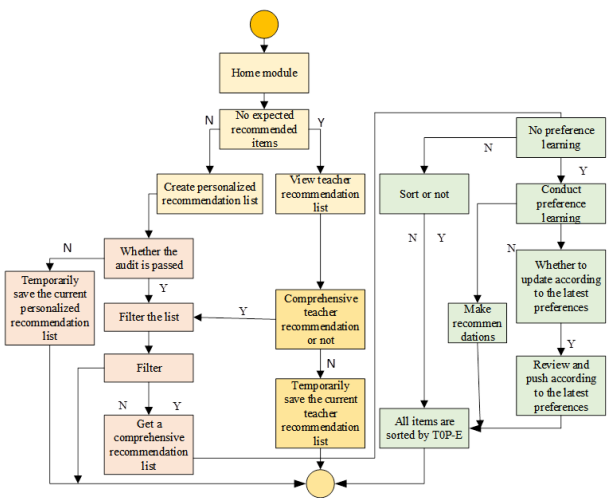


Fig. 4. Business activity diagram of teaching quality evaluation module

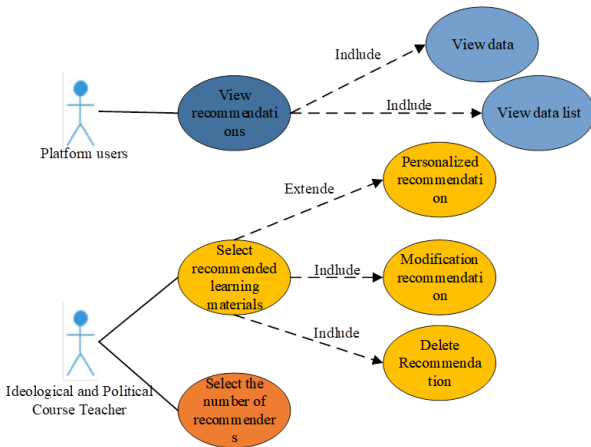


Fig. 5. Use case diagram of teaching quality evaluation view

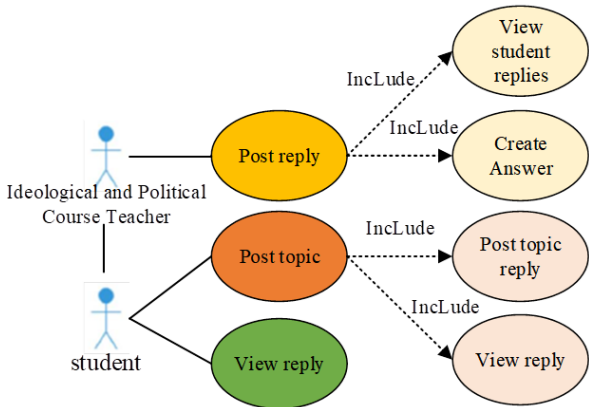


Fig. 6. Use case diagram of the teaching evaluation module in ideological and political classrooms

4. Case study

There are 50 samples in this training set, and the samples have 6 evaluation attributes. The result of the conditional entropy operation is Eqs. (9) - (14):

$$E(1) = -\frac{8}{10} \log_2 \left(\frac{8}{10} \right) - \frac{2}{10} \log_2 \left(\frac{2}{10} \right) = 0.721928, \quad (9)$$

$$E(2) = -\frac{19}{22} \log_2 \left(\frac{19}{22} \right) - \frac{3}{22} \log_2 \left(\frac{3}{22} \right) = 0.3006586, \quad (10)$$

$$E(3) = -\frac{11}{16} \log_2 \left(\frac{11}{16} \right) - \frac{4}{16} \log_2 \left(\frac{4}{16} \right) - \frac{1}{16} \log_2 \frac{1}{16} = 0.861875, \quad (11)$$

$$E(4) = 0, \quad (12)$$

$$E(\text{job title}) = \frac{10}{50}E(1) + \frac{22}{50}E(2) + \frac{16}{50}E(3) = 0.552475, \quad (13)$$

$$\text{Gain}(\text{job title}) = I(U) - E(\text{job title}) = 0.880113 - 0.552475 = 0.3276384. \quad (14)$$

Only 7.14% and 7.69% of the four were "very interested", did not make good use of online teaching resources" these two options accounted for a relatively high proportion, more than 40%. In addition to choosing the option of single teaching method and boring teaching content, junior and senior students also chose "teacher-student room". Lack of communication and interaction, difficult and "theory separated from practice" also accounted for more than 40%. Teaching content, teaching mode, interaction method, and practical training are all factors. The student evaluation data integration table is shown in Tables 4–6.

Table 4. Student's ideological and political course evaluation interest form

option	Subtotal	proportion
Very interested	65	11.34%
be interested	147	26.03%
commonly	294	51.87%
uninterested	42	7.27%
Very uninterested	21	3.55%

Table 5. Students' interest in ideological and political courses in all grades

grade	Very interested	be interested	commonly	uninterested	Very uninterested
Freshman	10.39%	24.05%	49.54%	8.48%	7.56%
Sophomore	13.89%	28.99%	50.62%	56.01%	0.83%
Junior	7.15%	25.01%	64.28%	1.78%	1.78%
Senior	7.68%	21.16%	53.86%	15.39%	1.93%

Discretize continuous attributes of data. In the teaching evaluation data table, the four aspects of the teaching evaluation attributes, and the total score are all continuous scores. Because the last column is divided according to the range of the total score between 90-100 points is satisfactory, between 80-90 points is relatively satisfactory, between 60-80 points is acceptable, and 60 points Below

is dissatisfaction. For the four attributes of teaching evaluation, we discretized them according to the evaluation score, and each attribute is divided into four grades, A grade, B grade, C grade and Class D to replace the original evaluation score. The mining library table after data preprocessing is shown in Table 7.

Table 6. Student evaluation data sheet

Serial No	Teacher Name	Teaching attitude	content of courses	teaching method	teaching effectiveness	Total score $\pm$ standard deviation	Evaluation grade
1	Teacher1	18.78	27.55	27.77	18.82	92.91 $\pm$ 11.99	satisfied
2	Teacher2	19.22	27.95	27.95	19.23	94.76 $\pm$ 10.05	Satisfied
3	Teacher3	17.4	26.18	16.18	17.39	87.07 $\pm$ 29.76	Quite satisfied
4	Teacher4	17.55	26.65	26.66	18.42	89.74 $\pm$ 12.09	Quite satisfied
5	Teacher5	17.65	25.36	25.37	17.81	86.17 $\pm$ 15.99	Quite satisfied
6	Teacher6	18.95	28.12	28.03	19.18	94.25 $\pm$ 14.39	Satisfied
7	Teacher7	19.31	28.52	28.66	19.49	95.95 $\pm$ 5.66	Satisfied
8	Teacher8	19.65	28.61	28.41	19.55	96.21 $\pm$ 4.48	Satisfied
9	Teacher9	18.39	27.39	27.17	18.68	91.61 $\pm$ 13.85	Satisfied
10	Teacher10	17.95	26.54	26.96	18.48	89.91 $\pm$ 13.84	Quite satisfied
11	Teacher11	18.65	27.56	27.58	19.14	92.91 $\pm$ 11.55	Satisfied
12	Teacher12	18.82	27.64	27.72	19	93.15 $\pm$ 14.81	Satisfied
13	Teacher13	19.26	28.32	28.02	19.32	94.88 $\pm$ 12.15	Satisfied
14	Teacher14	18.75	26.69	27.19	18.12	90.73 $\pm$ 17.86	Satisfied
15	Teacher15	18.49	27.03	27.19	18.63	91.32 $\pm$ 14.87	Satisfied
16	Teacher16	19.45	29.03	29.12	19.75	97.33 $\pm$ 13.77	Satisfied
17	Teacher17	19.72	28.96	28.76	19.53	95.95 $\pm$ 4.56	Satisfied
18	Teacher18	17.37	25.78	26.64	18.36	88.11 $\pm$ 3.48	Quite satisfied
19	Teacher19	19.62	27.81	27.65	19.43	94.47 $\pm$ 16.01	Satisfied
20	Teacher20	19.25	27.98	27.77	19.43	94.38 $\pm$ 9.91	satisfied
21	Teacher21	18.75	28.22	27.89	18.98	93.81 $\pm$ 8.17	Satisfied
22	Teacher22	17.98	25.37	25.39	17.52	86.22 $\pm$ 10.63	Quite satisfied
23	Teacher23	19.38	28.51	27.69	19.26	94.81 $\pm$ 15.58	Satisfied
24	Teacher24	18.94	28.3	27.84	19.31	94.24 $\pm$ 9.05	Satisfied
							
							
111	Teacher111	18.53	26.65	26.26	18.75	90.17 $\pm$ 12.3	Satisfied
112	Teacher112	18.95	28.18	28.27	19.23	94.61 $\pm$ 11.37	Satisfied
113	Teacher113	18.19	26.82	26.76	18.31	90.04 $\pm$ 17.36	satisfied

Table 7. Data processing results of ideological and political classroom teaching evaluation

Serial No	Teacher Name	title	Gender	Teaching attitude	In teaching	Teaching party	teaching effectiveness	Evaluation grade
1	Teacher1	Lecturer level	male	A	A	B	A	satisfied
2	Teacher2	Lecturer level	male	A	B	A	B	satisfied
3	Teacher3	Professor level	male	A	A	B	A	satisfied
4	Teacher4	Professor level	female	B	B	A	A	satisfied
5	Teacher5	Professor level	male	A	B	A	A	satisfied
6	Teacher6	associate professor	female	B	B	C	B	satisfied
7	Teacher7	associate professor	male	A	A	B	A	satisfied
8	Teacher8	associate professor	male	A	A	B	A	Quite satisfied
9	Teacher9	associate professor	female	B	A	B	C	satisfied
10	Teacher10	Lecturer level	male	A	A	B	A	Quite satisfied
11	Teacher11	Lecturer level	female	A	B	A	A	satisfied
12	Teacher12	Lecturer level	female	B	B	A	A	satisfied
13	Teacher13	associate professor	male	A	A	B	A	satisfied
14	Teacher14	associate professor	female	C	A	C	C	satisfied
15	Teacher15	Professor level	male	A	A	B	A	satisfied
16	Teacher16	associate professor	female	A	B	A	A	Quite satisfied
17	Teacher17	associate professor	male	A	A	A	A	satisfied
18	Teacher18	Professor level	male	A	B	A	A	satisfied
19	Teacher19	Lecturer level	female	A	A	B	A	satisfied
20	Teacher20	Professor level	male	A	A	A	B	satisfied
21	Teacher21	Lecturer level	male	A	A	A	A	Quite satisfied
								
111	Teacher111	Lecturer level	female	A	A	B	A	satisfied
112	Teacher112	Professor level	male	A	A	A	B	satisfied
113	Teacher113	Lecturer level	male	A	A	A	A	Quite satisfied

Therefore, for the teaching management department, first of all, so as to strengthen teachers' love for work and strong sense of responsibility, and secondly, for teachers who undertake professional courses with strong professionalism, actively encourage them to further study, training, and strive to progress, in the professional level to be improved to the level of high professional titles.

5. Conclusion

Education and evaluation demonstration is the most important evaluation system in the quality management system of college ideological and political education. Therefore, this document analyzes the problem of building university education knowledge and policy evaluation system based on wireless network and artificial intelligence. Then, according to the detailed analysis of the requirements, there is a unit, all courses and presentation units of courses on the home page. We mainly calculated four functional units: wireless network, ideological and political college, artificial intelligence based on university education system, and evaluation based on professional requirements. The empirical results show that teachers' attitude is the most important factor affecting the quality of education, and secondly, teaching methods are very important.

Data availability

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

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