Research on the Quality Evaluation System and Improvement Path of Ideological and Political Education in College Students' National Security Education Courses Based on Multimodal Sentiment Analysis

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Abstract: *With the continuous change of the national security situation, the importance of national security education in higher education is becoming more and more prominent. The purpose of this paper is to explore the evaluation system of the quality of civic teaching and its improvement path of national security education courses for college students based on multimodal sentiment analysis. The study first collects students' affective feedback in the national security education course through questionnaires and classroom observation, and analyses the data using affective analysis techniques to reveal the relationship between students' affective states and learning effects. The results showed that most students had a positive attitude towards the course content, but rated the sense of engagement and interactivity of the teaching methods as relatively low. In addition, there was a significant correlation between affective fluctuations and classroom engagement, indicating the importance of affective factors in the teaching and learning process. Based on these findings, this paper proposes the construction of a teaching quality evaluation system and corresponding suggestions for improvement, including the enhancement of classroom interaction, the use of modern technological means to promote emotional communication, and the establishment of a dynamic feedback mechanism. Through these measures, it aims to improve the teaching quality of national security education and enhance students' national security awareness and ideological and political literacy. Finally, this paper hopes to provide a reference for future related research and a practical guide for national security education curriculum reform in higher education.*

Keywords: *multimodal sentiment analysis; national security education; civics teaching; teaching quality evaluation; improvement paths*

1. Introduction

National security is the cornerstone of national development, involving many aspects of the country's politics, economy, culture and society. Under the background of globalisation and informatisation, the concept of national security is gradually expanding from traditional military security to a wider range of areas including network security, economic security, cultural security and so on[1]. As the future builders and successors of the country, college students must have solid national security awareness and related knowledge. Therefore, it is particularly important to integrate national security education into the curriculum system of colleges and universities, especially in the ideological education[2].

In recent years, China's higher education has gradually strengthened its attention to national security education. The Guideline for National Security Education in Colleges and Universities issued by the Ministry of Education clearly points out that colleges and universities should cultivate students' awareness of national security while improving their comprehensive quality and innovation ability[3]. This guideline not only provides policy support for national security education in colleges and universities, but also points out the direction for the innovation and development of the Civics programme. However, the current national security education programme still has some problems in the actual teaching process, such as single teaching content and lack of interaction in the teaching

method. These problems directly affect students' learning enthusiasm and understanding of national security[4].

At the same time, traditional teaching quality evaluation methods often focus on the degree of students' knowledge mastery, while ignoring the changes in students' emotional attitudes. Research in educational psychology shows that affective states have a significant impact on learning outcomes. Students' motivation, classroom engagement and learning outcomes are often driven by emotional factors[5]. Therefore, the introduction of sentiment analysis techniques in assessing the quality of teaching and learning will contribute to a more comprehensive understanding of students' learning experiences and psychological states[6].

Multimodal sentiment analysis, a technique that combines multiple data sources (e.g., text, audio, video, etc.) for sentiment recognition, has seen a gradual increase in applications in the education field in recent years[7]. It has been found that multimodal sentiment analysis can effectively capture students' emotional changes during the learning process, thus providing a basis for the improvement of teaching methods. By analysing students' emotional responses in the classroom, teachers can make timely adjustments to teaching strategies to meet students' learning and emotional needs[8].

Through the research on the application of multimodal affective analysis in the Civics teaching of national security education courses, it provides new perspectives and methods for national security education in colleges and universities, and promotes the innovation and development of Civics teaching[9]. By constructing a scientific teaching quality evaluation system, the effectiveness and pertinence of national security education can be further improved, contributing to the cultivation of outstanding talents with a high degree of national security awareness[10]. Evaluation system and improvement path of the quality of the teaching of the national security education programme for college students in the field of ideology and politics is shown in Figure 1.
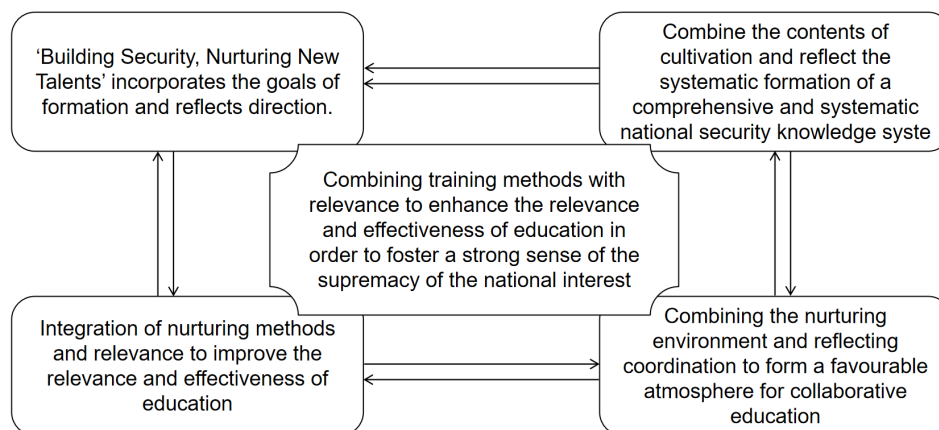

Figure 1: Evaluation system and improvement path of the quality of the teaching of the national security education programme for college students in the field of ideology and politics

2. The current situation and problems of the current national security education curriculum

2.1 Current situation of national security education curriculum

National security education programmes have gradually gained importance and development in China's higher education system. With the complex and changing national security situation, the Ministry of Education and other relevant departments have issued a series of policy documents, which clearly require colleges and universities to strengthen national security education. These documents not only provide policy support for the curriculum, but also provide guidance for teachers' teaching content and methods.

At present, the curriculum of national security education is mainly reflected in the following aspects:

(1) Gradual improvement of the curriculum system: many colleges and universities have already added national security education content to their Civics and Political Science courses, forming a

relatively complete curriculum system. These courses cover the basic concepts of national security, importance, relevant laws and regulations, real-life case studies, etc., aiming to enhance students' national security awareness.

(2) Rich teaching content: the content of the courses not only includes traditional military security, but also extends to a variety of fields such as economic security, cultural security, network security, etc., so that students can comprehensively understand the multi-dimensional characteristics of national security.

(3) Diversified teaching forms: some universities try to adopt a variety of teaching forms, including case discussions, simulation exercises, scenario dramas, etc., to enhance the interactivity and interest of the classroom. This change in form helps to increase students' motivation and participation in learning.

(4) Combination of scientific research and practice: some colleges and universities have carried out scientific research projects and social practice activities in conjunction with the reality of national security, so that students can learn and apply relevant knowledge in real situations.

2.2 Problems

Although the national security education programme has gradually been promoted in colleges and universities, there are still some problems in the actual implementation process, which are specifically manifested in the following aspects:

(1) Lagging update of teaching content: the content of national security education courses in some colleges and universities is relatively outdated, failing to reflect the changes and latest developments in the current national security situation in a timely manner. This lagging behind leads to a disconnect between the course content and the actual needs, and fails to stimulate students' interest in learning.

(2) Single teaching method: Although some colleges and universities try to diversify their teaching forms, most of the courses are still dominated by traditional lectures, lacking interaction and participation, and students' learning experience is relatively monotonous. This teaching method cannot effectively mobilise students' enthusiasm, leading to a decline in students' attention to the course.

(3) Lack of emotional education: current national security education courses tend to focus on the transmission of knowledge and neglect the cultivation of emotional attitudes. Studies have shown that emotional factors have an important impact on learning effects, and the lack of attention to the emotional state of students in the evaluation of teaching quality has led to a less than comprehensive assessment of teaching effects.

(4) The evaluation system is not sound: the existing teaching quality evaluation system is mostly based on examination results and lacks a comprehensive assessment of students' emotion, participation and thinking ability. This single evaluation method cannot truly reflect students' learning in national security education.

(5) Teachers' professionalism is insufficient: Teachers of national security education courses in some colleges and universities have deficiencies in professionalism and teaching ability, and are unable to effectively guide students to in-depth thinking and discussion. In addition, there are differences in teachers' understanding and awareness of national security education, which affects the consistency and effectiveness of teaching.

(6) Lack of practice and application: although some colleges and universities try to combine theory and practice, the practical aspects are still relatively small overall. Students lack real practice opportunities after theoretical learning and are unable to apply what they have learnt to practical problems, which affects the cultivation of their national security awareness and coping ability.

3. Construction of Civic Teaching Quality Evaluation System for National Security Education Curriculum for College Students Based on Multimodal Sentiment Analysis

3.1 Development and application of emotion analysis tools

In modern education, affective factors are increasingly recognised as important variables affecting learning outcomes. Therefore, this study aims to develop a multimodal affective analysis tool to assess the affective state of college students in national security education courses in real time. The development process of the tool will include several key steps covering technology selection, data

integration, algorithm design, and application testing.

First, technology selection is the basis for tool development. This study will use a combination of computer vision technology and natural language processing (NLP) technology. Computer vision technology will capture students' non-verbal behaviours, such as facial expressions and postures, through the camera to analyse their emotional states. Natural Language Processing (NLP) technology, on the other hand, is responsible for analysing students' verbal emotions, including speeches made during class discussions, written feedback, etc. Combining these two technologies, we will be able to obtain a comprehensive emotional portrait.

Second, data integration is another important part of tool development. The integration of multimodal data requires the design of an effective data collection system to collect video, audio and text data in real time during classroom teaching. The system needs not only efficient data storage and processing capabilities, but also a good user interface so that it can be easily used by teachers and students. The key to data integration is how to effectively fuse data from different sources to achieve multimodal analysis.

In terms of algorithm design, the research will adopt deep learning and machine learning techniques to develop emotion recognition models. Through training on large-scale emotion datasets, the model will be able to automatically recognise students' emotional states, such as pleasure, tension, confusion, etc. This process needs to take into account the diversity and complexity of emotional expressions; therefore, we will design multi-layer neural networks to improve the accuracy of emotion recognition. At the same time, the optimisation of the algorithms is crucial to ensure the real-time performance of the tool, which needs to strike a balance between accuracy and computational speed.

In the application testing phase, we will select a certain number of classrooms for pilot experiments. By collecting students' sentiment data during the course, we will analyse the relationship between their sentiment changes and learning outcomes. The test results will be used to continuously optimise the sentiment analysis tool to ensure its validity and reliability in actual teaching. In addition, in order to increase the acceptance and usage of the tool, teachers and students will be invited to participate in the design and feedback of the tool to ensure that it meets the actual needs.

Ultimately, the sentiment analysis tool will provide teachers with a real-time feedback mechanism to help them understand their students' affective states and learning motivation, and then adjust their teaching strategies. By dynamically monitoring students' emotions, teachers can identify and respond to emotional fluctuations in the classroom in a timely manner, such as taking positive interventions to enhance classroom interactivity and student engagement when students show confusion or anxiety.

3.2 Construction of Teaching Quality Evaluation Index System

In order to effectively assess the teaching quality of national security education courses, it is crucial to construct a set of scientific evaluation index system. This study will design a set of teaching quality evaluation index system covering multiple dimensions based on the results of multimodal sentiment analysis. This system will not only focus on students' knowledge mastery, but also explore students' affective attitudes, classroom participation and self-efficacy in depth.

First, knowledge mastery is one of the basic dimensions of teaching quality evaluation. This study will assess students' understanding and mastery of national security-related knowledge through tests, assignments and classroom performance. Specific indicators include students' scores on tests, the quality of homework completion, and their ability to apply relevant knowledge in class discussions. These data will provide a quantitative basis for evaluating students' knowledge level.

Second, affective attitudes are an important part of evaluating teaching quality. The study will collect students' affective feedback in the classroom by means of an affective analysis tool, with specific indicators including the proportion of positive affect (e.g., interest, pleasure) and negative affect (e.g., boredom, anxiety). By quantitatively analysing the affective data, teachers can get a clear picture of students' attitudes and identification with the course content, so that they can adjust their teaching strategies to enhance students' emotional engagement.

Classroom engagement is likewise an important dimension in the evaluation of teaching quality. This study will assess students' participation in classroom discussions and interactive activities through observation records and self-assessment questionnaires. Specific indicators include the frequency of students' speeches, the number of questions asked, and their performance in participating in group discussions. A high level of classroom participation usually implies students' recognition of and interest

in the course content, and thus assessment in this dimension can provide strong support for improving teaching quality.

Finally, self-efficacy is also an important evaluation index. Self-efficacy refers to an individual's confidence in his or her ability to complete a specific task. In national security education courses, students' self-efficacy will affect their motivation and learning effects. This study will design relevant questionnaires to assess students' self-efficacy in the learning process, including confidence in their knowledge mastery, problem-solving ability, and self-efficacy in participating in class discussions. These data will provide teachers with important feedback to help them understand students' psychological state during the learning process.

By combining quantitative and qualitative methods and comprehensively assessing the above multiple dimensions, the study will construct a complete set of teaching quality evaluation index system. The system can not only provide a scientific basis for decision-making for educational administrators, but also provide a reference for teachers' teaching improvement. In addition, the establishment of such an evaluation system will also promote exchanges and cooperation among teachers, share their respective teaching experiences and strategies, and further enhance the overall quality of national security education programmes.

4. Research on the Implementation Path of Civic Teaching of National Security Education Course for College Students Based on Multimodal Sentiment Analysis

4.1 Clarification and Positioning of Teaching Objectives

Before implementing the national security education course based on multimodal sentiment analysis, it is first necessary to clarify the teaching objectives and positioning of the course. The setting of this goal should be centred on students' comprehensive understanding of national security, emotional identity and the cultivation of practical ability, especially in the integration of ideological and political education and national security education. The curriculum objectives should not only emphasise the transmission of knowledge, but also pay more attention to the shaping of students' emotional attitudes and values to ensure that they develop positive emotional resonance in their learning.

4.1.1 Clarify the Teaching Objectives

First of all, the course objectives should include the knowledge mastery level. Students should be able to understand the basic concepts of national security, its main contents and its importance, and be able to analyse the characteristics and response strategies of national security issues in different contexts. Through systematic knowledge learning, students can form a comprehensive understanding of the multi-dimensional features of national security.

Secondly, emotional identity is also a key component of the curriculum objectives. National security education is not only the instillation of knowledge, but also the cultivation of emotion. Students need to build a sense of identity and responsibility for the country in the course. Teaching objectives should include cultivating students' awareness of national security so that they can emotionally identify with the importance of national security and enhance their sense of responsibility and mission towards the country and society.

Finally, the cultivation of practical ability is also an indispensable part of the course objectives. Students should gain a certain amount of practical experience in the course, and enhance their practical skills and problem-solving abilities by participating in actual case analyses, simulation exercises and other activities. This will not only help students achieve academic success, but also lay the foundation for their future social engagement and career development.

4.1.2 Design of Course Content

In order to achieve the above objectives, the design of the course content needs to be closely aligned with the teaching and learning objectives. The course should include the following main modules:

(1) Explaining the basic concepts of national security, its historical evolution and the current international and domestic security situation to help students establish a systematic theoretical knowledge framework.

(2) Stimulate students' emotional resonance through case analyses and emotional guidance to help

them understand the relationship between national security and personal interests and social responsibility.

(3) Design a series of practical activities, such as Model United Nations meetings, security drills, debates, etc., so that students can enhance their understanding and recognition of national security in practice.

(4) Combine multimodal emotion analysis tools to encourage students to reflect on their emotional responses, understand the importance of emotion in the learning process, and promote their self-regulation and growth.

4.1.3 Assessment and Feedback Mechanism

In order to ensure the realisation of the course objectives, it is crucial to establish an effective assessment and feedback mechanism. Teachers can comprehensively assess students' performance in knowledge mastery, emotional identity and practical ability through a variety of assessment methods, such as mid-term and final exams, classroom performance evaluation and learning feedback questionnaires. At the same time, feedback from students is regularly collected to understand their feelings and needs in the course, which provides a basis for subsequent curriculum adjustment.

In this process, the roles and responsibilities of teachers also need to be clarified. Teachers are not only the transmitters of knowledge, but also the guides of students' emotions and the supporters of learning. Teachers should have strong emotional sensitivity and be able to recognise students' emotional changes in the classroom in a timely manner and make adjustments through appropriate teaching strategies. Teachers should also actively create an open and inclusive classroom atmosphere, so that students can freely express their emotions and opinions in a relaxed and pleasant environment.

4.2 Real-time emotion monitoring and feedback mechanism

In the national security education course based on multimodal sentiment analysis, the establishment of a real-time sentiment monitoring and feedback mechanism is an important measure to improve the teaching effect. The mechanism can not only help teachers understand students' emotional changes in a timely manner, but also provide students with immediate emotional feedback to promote their emotional engagement and learning motivation.

4.2.1 The necessity of real-time emotion monitoring

In classroom teaching, students' emotional state fluctuates with changes in teaching content. Real-time affective monitoring enables teachers to identify students' affective changes in a timely manner and understand their motivation, engagement and identification with the course content. This monitoring mechanism can help teachers in the following ways:

(1) By monitoring students' affective states in real time, teachers can make timely adjustments to their interaction strategies in the classroom. For example, when it is monitored that most students show confusion or anxiety, teachers can take more guidance and questions to encourage students to participate in the discussion in order to enhance the interactivity and activity of the classroom.

(2) Real-time affective monitoring can help teachers assess students' acceptance of course content, so as to decide whether adjustments need to be made to the teaching content. When it is found that students' affective feedback is low for a certain knowledge point, teachers can increase the explanation of the knowledge point or help students understand it through case studies.

(3) Based on the results of real-time affective monitoring, teachers can make timely interventions for students who show negative affect or low engagement. For example, if it is monitored that certain students appear to be distracted or restless in class, teachers can provide the necessary support and assistance by paying individual attention, enquiring about their understanding, or even arranging for after-class tutorials. This timely emotional intervention not only helps to enhance students' learning, but also strengthens their sense of belonging and engagement.

4.2.2 Design and implementation of feedback mechanism

The design of the feedback mechanism needs to be combined with the results of multimodal sentiment analysis to ensure its effectiveness and practicality. This can be achieved in the following ways:

(1) Using multimodal sentiment analysis tools, teachers can view the charts of students' emotional

state in real time in the classroom. For example, sentiment analysis software is used in the classroom to show the emotional changes of students in different teaching sessions so that teachers can react immediately and adjust their teaching strategies.

(2) In addition to immediate feedback, regular sentiment analysis reports can also provide students with in-depth reflection and self-assessment. Teachers can send students a comprehensive analysis report on their affective state at the end of the course to help them understand the affective changes during the learning process and reflect on their own learning state. Such reports can contain information such as affective scores, class participation, and feedback on course content.

(3) At the end of each lesson, the teacher can organise a short classroom summary, asking students how they feel about the course content and discussing it in relation to the results of the sentiment analysis. Through open-ended questions, students are encouraged to share their emotional experiences and learning experiences, so as to create a favourable classroom atmosphere and promote students' emotional communication and understanding.

(4) The study should establish a variety of feedback channels to ensure that students are able to express their emotions and ideas freely. For example, anonymous questionnaires, online feedback platforms, and classroom discussions can be used to allow students to provide feedback in different contexts, increasing the diversity and richness of feedback.

4.2.3 Emotional guidance and support from teachers

The role of the teacher is crucial when implementing real-time affective monitoring and feedback mechanisms. Teachers not only need to have good emotional sensitivity, but also need to be able to respond positively to students' emotional feedback. Specific measures include:

(1) Teachers should guide students to correctly recognise and express their emotions. In the classroom, students are encouraged to actively share their emotional states to help them understand the diversity and complexity of emotions. This not only promotes students' self-knowledge, but also helps to improve their ability to express their emotions.

(2) Teachers should endeavour to create a safe environment in which students can express their emotions without fear. Such an environment needs to be established through positive interactions, positive feedback and a respectful attitude so that students feel valued and understood in the classroom.

(3) Based on the results of real-time emotion monitoring, teachers can provide personalised support to students with different emotional states. For example, for students with positive emotional responses, teachers can provide more challenging tasks; while for students with negative emotional responses, teachers need to provide more support and encouragement to help them rebuild their confidence in learning.

Through effective real-time affective monitoring and feedback mechanisms, a national security education curriculum based on multimodal affective analysis will be able to achieve significant results in enhancing students' affective engagement, increasing classroom interactivity, and supporting students' individual development. This mechanism not only provides strong support for teachers, but also creates good conditions for students' overall development.

4.3 Flexible Adjustment of Teaching Strategies

In the process of implementing the national security education curriculum based on multimodal sentiment analysis, the flexible adjustment of teaching strategies is an important means to enhance teaching effectiveness and students' emotional engagement. According to the real-time monitoring of emotional data, teachers should timely adjust the teaching strategy to adapt to the emotional needs and learning state of students, so as to achieve better educational effects.

4.3.1 Implementation of interactive teaching strategies

The interactive teaching strategy emphasises the positive interaction between teachers and students, which can effectively enhance students' sense of classroom engagement and learning motivation. Based on the results of sentiment analysis, teachers can adjust the interactive strategy in the following aspects:

(1) For students with low affective feedback, teachers can organise group discussions, allowing students to share their views and feelings within the group to enhance interaction with each other. In group discussions, students can express their opinions more easily, thus enhancing their sense of participation and emotional engagement.

(2) By introducing real national security cases, students can participate in discussions in contextual simulations. Such a strategy can not only stimulate students' interest, but also prompt them to emotionally connect with national security issues and enhance the effectiveness of learning.

(3) Teachers should give students positive feedback in class in a timely manner and encourage them to participate in discussions and express their emotions. Through praise and encouragement, students' self-confidence is enhanced, making them more active in the classroom.

4.3.2 Emotional guidance and regulation strategies

In the teaching process, teachers should use emotional guidance and regulation strategies to help students adjust their emotional state, so as to enhance learning. Specific measures include:

(1) Teachers can design some emotion-guided activities, such as the opening emotional exchange session, which encourages students to share their views and feelings about national security. Such activities can help students relax and enhance emotional engagement.

(2) During the course, teachers can teach students some emotional regulation techniques, such as deep breathing and positive self-talk, to help them better manage their emotional state when facing learning pressure.

(3) Teachers should try to create a positive classroom atmosphere, attracting students' attention through humour and stories to enhance their emotional resonance. In such an atmosphere, students are more likely to be engaged in learning and have positive emotional responses.

4.3.3 Development of personalised teaching strategies

Personalised teaching strategies are adapted to the emotional needs and learning characteristics of different students to achieve more effective teaching. Teachers can develop personalised strategies in the following ways:

(1) Teachers should personalise the results of the affective analysis of different students to understand how each student's affect changes in the classroom. Such analyses can help teachers identify students who need special attention and target support.

(2) Based on students' affective feedback, teachers can adjust teaching content and methods. For example, more in-depth learning materials can be provided to students who show higher motivation to learn, while students with lower affective feedback should be provided with more guidance and support to help them overcome their learning difficulties.

(3) Teachers can develop a personalised learning plan for each student, taking into account their affective state and learning needs and designing teaching activities that match their learning styles. This personalised support will help to enhance students' learning effectiveness and emotional engagement.

By flexibly adjusting the teaching strategies, the national security education curriculum based on multimodal sentiment analysis will be able to better adapt to the emotional needs of students, enhance the interactivity and engagement of the classroom, and thus create good conditions for the overall development of students.

4.4 Evaluation and reflection of teaching effect

During the implementation of the national security education curriculum based on multimodal sentiment analysis, the evaluation and reflection of the teaching effect is an important link to ensure the continuous improvement and optimisation of the curriculum. Through systematic evaluation and in-depth reflection, teachers are able to discover problems in teaching in time and take corresponding measures to make adjustments.

4.4.1 Construction and implementation of evaluation system

Constructing a scientific and reasonable evaluation system of teaching effectiveness is the basis of evaluation and reflection. The system should include the following dimensions:

(1) Assess students' understanding and mastery of national security knowledge through quizzes, assignments and classroom performance. This assessment should cover all knowledge points of the course to ensure that students have a solid foundation in theory.

(2) Combine the results of multimodal sentiment analysis to assess students' emotional attitudes. Analyse students' emotional changes in the classroom to understand their identification with the course

content and their motivation to learn. This assessment not only focuses on the positivity of emotion, but also considers the stability and changing trend of emotion.

(3) Assess students' classroom engagement by observing their participation in classroom discussions and interactive activities. The assessment should take into account the students' performance in different teaching sessions, including the number of speeches made, the motivation to participate in group discussions and so on.

4.4.2 Implementation of Feedback and Reflection

In the evaluation process, teachers should pay attention to students' feedback and take it as an important basis for teaching improvement. Specific implementation steps include:

(1) Regularly collect students' feedback on the course through questionnaires and class discussions. These feedbacks should cover a variety of aspects such as course content, teaching methods, emotional involvement, etc. in order to have a comprehensive understanding of the students

(2) At the end of each lesson, teachers should conduct classroom reflection and summaries, analyse the gains and losses of classroom teaching, and think about which teaching strategies are effective and which need to be improved. This kind of reflection not only helps teachers' own growth, but also provides valuable experience for subsequent teaching practice.

(3) Teachers should take into account the results of evaluation and reflection to formulate a personal professional development plan to improve their teaching ability and emotional guidance. This plan may include attending professional training, communicating with peers, and learning advanced teaching concepts and methods.

5. Conclusion

(1) By developing and applying a multimodal sentiment analysis tool, this study reveals the important influence of affective states on the learning effects of national security education courses for college students. Sentiment not only affects students' motivation and engagement, but also directly relates to their understanding and identification with the course content. By integrating video, audio and text data, we are able to monitor students' emotional changes in real time, thus providing rich data support for teaching quality evaluation. This evaluation system based on sentiment analysis can reflect students' learning status more comprehensively and provide teachers with targeted suggestions for improvement, thus enhancing teaching effectiveness.

(2) In the process of constructing the teaching quality evaluation index system, this study specifies multiple dimensions such as knowledge mastery, emotional attitude, classroom participation and self-efficacy. By quantifying these indicators, we are able to make a comprehensive assessment of students' learning effects and provide educational administrators and teachers with a scientific basis for decision-making. At the same time, the combination of quantitative and qualitative assessment methods makes the evaluation process more objective and accurate. The implementation of this system will promote the standardisation and scientification of teaching management and lay a solid foundation for improving the overall teaching quality of national security education courses.

(3) Based on the results of multimodal sentiment analysis and teaching quality evaluation, we propose a series of targeted teaching improvement paths. These paths include enhancing classroom interaction, optimising teaching strategies, and implementing personalised learning support. By adjusting teaching methods in real time, teachers are able to respond to students' emotional needs in a timely manner and enhance classroom engagement and interactivity. In addition, the study also emphasises the important role of teachers in emotional guidance and support, and calls for teachers to pay more attention to students' emotional experiences in teaching, so as to stimulate students' learning motivation and emotional engagement more effectively. In conclusion, the teaching improvement pathway incorporating multimodal affective analysis will provide a practical solution for the quality improvement of the national security education curriculum and promote the overall development and growth of students.

Acknowledgement

Teaching Reform Research Project:

(1) 2024 Key Research Project of Philosophy and Social Sciences Planning in Yantai City: Research on the Innovative Mechanism and Development Path of Grassroots Social Science Theory Propaganda and Popularization from the Perspective of Rural Cultural Revitalization - Taking Yantai City as an Example.

(2) 2022 Shandong Province Undergraduate Teaching Reform Research Project (M2022099): Research on the Construction, Evaluation, and Quality Improvement Path of Online and Offline Hybrid Teaching System in Universities.

(3) 2023 Shandong Province Higher Education Curriculum Ideological and Political Education Reform Research Project (SZ2023074): Digital Empowerment Integration Innovation - Research on the Ideological and Political Education Model, Evaluation Mechanism, and Improvement Path of Higher Education Curriculum under the Background of Education Information.

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