

# Evaluation Principles, Standards and Operating Strategies of Ideological and Political Teaching in Science and Engineering Courses

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**Abstract:** The reform of ideological and political education in science and engineering courses continues to deepen, and the establishment of a practical teaching evaluation system is the main goal. Combining the relevant requirements of the ideological and political education in science and engineering courses, establishing a teaching evaluation system needs to follow the corresponding principles to ensure that the teaching content is reasonable and the teaching objectives are clear. The selected teaching method is flexible and effective, which facilitates the improvement of teaching quality and feedback of teaching situation. In this regard, the paper mainly analyzes the principles and standards of ideological and political teaching evaluation for science and engineering courses, and chooses reasonable and operable measures in-line with actual requirements to apply them in practice, and strive to serve as a reference for subsequent related research.

**Keywords:** Teaching evaluation; Science and engineering courses; Evaluation standard; Ideological and political education

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Teaching evaluation has an important place in the professional teaching system. It is used for the

supervision and control of the whole teaching process, and the promotion of in-depth reform of teaching activities while providing feedbacks on teaching quality. In order to comply with the requirements of modern education reform, ideological and political teaching in professional courses has begun to reform and extend in depth, but judging from the actual situation, a systematic theory and operation method has not been established, which has become the main problem in the reform. Based on this, combining the relevant requirements of ideological and political education in science and engineering courses, reasonable principles and standards of teaching evaluation are proposed, and effective operating strategies are selected to improve teaching quality, break the closed-loop limitations of the traditional teaching process, and enhance the effectiveness of ideological and political education.

## 1 Evaluation Principles and Standards of Ideological and Political Teaching in Science and Engineering Courses

### 1.1 Evaluation Principles of Ideological and Political Teaching in Science and Engineering Courses

The construction of the evaluation system for ideological and political teaching in science and engineering courses requires comprehensive consideration of the characteristics of the ideological

and political education, including the diversification of teaching forms, the tacitization of teaching content, and the individualization of teaching methods, so as to deepen political identity and gradually establish one's identification, worldview and values, breaking the mechanical memorizing and understanding of ideological and political knowledge.

The ideological and political education in science and engineering courses is not a single theoretical statement, but a combination of theory and practice, so that what has been learned can be applied to facilitate getting the conclusion of the truth. Meanwhile, the ideological and political education in science and engineering courses has to realize the unity of opposites, strive for perfection, and cultivate a scientific spirit in learning. On the basis of combining the characteristics of ideological and political education in science and engineering courses, corresponding principles should be followed to construct a teaching evaluation system<sup>[1]</sup>.

The specific principles include: (1) Flexible and ingenious teaching: The essential goal of ideological and political education in science and engineering courses is to instil correct values and ideological qualities in students, and to promote the development of quality skills through benign influences. In the teaching of professional courses, ideological and political education is a tacit content, which exists in various aspects of professional course teaching in many forms. Meanwhile, the level of understanding of professional knowledge and teaching methods of different teachers are different. Even on the same knowledge point, the teaching design and teaching methods of different teachers are also very different. Therefore, to strengthen the evaluation of ideological and political teaching in science and engineering courses, we should avoid mechanical teaching methods, focus on innovation in teachers' thinking, and flexibly choose diversified teaching methods for ideological and political education in science and engineering courses. (2) Comprehensive teaching: In the ideological and political teaching in science and engineering courses, it has the characteristics of stereo, implicit and diversified. Each section in teaching is closely connected. The rationality of the teaching method selected has a large impact on the efficiency of ideological and political education in science and engineering courses. It should not be regarded as a paradigm of teaching format, but should

focus on flexible selection of teaching methods based on educational needs, grasp multiple professional knowledge points, infiltrate ideological and political elements into the entire teaching process, and then be fully reflected in all aspects<sup>[2]</sup>. Therefore, the construction of an evaluation system for ideological and political teaching of teaching in engineering courses should fully conform to the characteristics of reasonable ideological and political content in engineering courses, advocate the selection of diversified teaching methods, develop teaching ideas, practice in all aspects of professional teaching, and establish a comprehensive ideological and political educational system<sup>[3]</sup>. (3) Enlightenment in Thinking: The ideological and political education in science and engineering courses emphasizes the integrity of students' personalities, not simply instillation of ideological and political knowledge in science and engineering courses. Combining teaching needs to optimize teaching design and choose appropriate methods, the goal is to try to gain the emotional resonance of students, to infiltrate ideological and political elements into teaching, and to play a role of nurturing and enlightening. Therefore, strengthening the evaluation ideological and political teaching in science and engineering courses, including teacher self-evaluation and external evaluation; having the barracks conform to the spirit of ideological and political education, and bringing deep emotional touch and realization to personnel so as to facilitate the improvement of the quality of ideological and political teaching in science and engineering courses<sup>[4]</sup>. In addition, the content of ideological and political education in science and engineering courses applied in professional courses is implicit content, but objective knowledge assessment may not provide effective evaluation. In the new era, the promotion of ideological and political education in science and engineering courses in an efficient and orderly manner will help guide students to establish correct values and ideology, enhance self-learning information, develop good occupational literacy, and promote the development of students' professional skills and occupational literacy.

## **1.2 Evaluation Standard of Ideological and Political Teaching in Science and Engineering Courses**

To evaluate whether the results meet the expectations, the key point is whether the evaluation standards

can be followed. To establish evaluation standards for ideological and political teaching in science and engineering courses, it is necessary to grasp the key points of teaching and establish overall evaluation standards to promote the efficient and orderly implementation of subsequent teaching activities. Teachers should be patient in communicating with students, bring the relationship between teachers and students closer, and promote more humane teaching methods; keep abreast of development trends at home and abroad, integrate hot topics of current affairs and the spirit of policy into professional teaching; combine different knowledge points to promote changes in ideological and political education; choose tacit edification methods to carry out ideological and political teaching activities in science and engineering courses; combine with the actual situation of social development, integrate organically with the ideological and political education in science and engineering; integration of ideological and political elements and professional knowledge in the science and engineering courses to enhance the professionalism of ideological and political teaching in science and engineering courses<sup>[5]</sup>. Meanwhile, bring the teachers and students closer during teaching, and adjust the content of teaching with the times; avoid the use of mechanical teaching methods or integrating the content of ideological and political education that are too ossified into science and engineering courses; imbalance in professional education and ideological and political education will affect the integrity of teaching. In general, the above-mentioned content can be used in the establishment of evaluation standards for ideological and political teaching in science and engineering courses as positive and negative standards for specific evaluation work. Endow a sense of hierarchy to the evaluation of ideological and political teaching in science and engineering courses, enrich teaching content and teaching methods, enhance the practicality of ideological and political education, and establish practical teaching evaluations.

Under normal circumstances, the standardization of ideological and political teaching in science and engineering courses should also pay attention to teaching content, teaching objectives, teaching methods, and teaching assessments in addition to respecting the dominant status of students, which are included in the scope of teaching evaluation. There

are some differences between science and engineering course teaching and ideological and political teaching, and the main content is even more different, but the teaching elements are relatively similar<sup>[6]</sup>. From the perspective of teaching evaluation, the evaluation criteria for teaching elements are determined, including flexible and ingenious teaching methods, clear and specific teaching goals, true and harmonious teaching situations, reasonable and accurate teaching content, and tacit and meticulous teaching assessment.

## **2 Effective Paths for Ideological and Political Education in Science and Engineering Courses**

### **2.1 Grasp the Main Points of Ideological and Political Teaching in Science and Engineering Courses**

Firstly, be flexible and ingenious in the teaching methods. In the pre-class preparation stage, optimize the ideological and political teaching methods of science and engineering courses according to the professional knowledge and ideological content of the course, optimize the teaching process, and select the best teaching format. The selected teaching method should be practical and reasonable to promote the full integration and expression of the ideological and political elements in the teaching, which will bring beneficial influence and enlightenment to the students tacitly, while avoiding the negative impacts on the quality of professional teaching<sup>[7]</sup>.

Secondly, be clear and specific with the teaching objectives. During the lesson preparation stage, fully consider the professional teaching content of the course, determine a reasonable teaching goal, and further refine the overall goal, realize the optimization design of each section, and guide the subsequent ideological and political teaching activities in science and engineering courses in an orderly manner.

Thirdly, be real and harmonious with the teaching situation. The creation of the ideological and political teaching environment for science and engineering courses greatly affects students' enthusiasm for learning. There are various situations, requiring teachers to analyze the actual situation, select laboratory, classroom, field or workshop site, pre-judge the teaching content, analyze the pros and cons on the ideological and political teaching in science and engineering courses, and dynamically combine with the changes in the objective environment to

create the ideological and political teaching situation in science and engineering courses to bring good emotional influence to the students.

Finally, be reasonable and accurate with the teaching content. It is emphasized that teachers should fully consider the teaching knowledge and related content in the preliminary lesson preparation, and introduce multiple teaching cases. Regarding the proportion of content involving ideological and political education in major courses, do not overemphasize ideological and political education to the extent of impacting the quality of professional teaching<sup>[8]</sup>. The selection of evaluation methods for ideological and political teaching in science and engineering courses further enriches the evaluation formats compared with previous evaluations. For example, through classroom discussions, classroom reports and other formats, assess students' understanding of knowledge and infiltrate ideological and political elements in the final exam to check students' acceptance.

## 2.2 Implement Professional Learning Evaluation

Ideological and political education in science and engineering courses belongs to implicit education. First of all, we need to focus on stimulating students' enthusiasm for professional learning, and have a stronger sense of professional accountability and responsibility. Based on professional learning, it integrates internal and external evaluations of teachers, collects students' classroom performance and test results, judges the impact of ideological and political education on students' professional learning outcomes, and ensures that ideological and political education plays a positive role. Specifically, we must first establish an evaluation system for basic teaching elements. Follow the evaluation standards for ideological and political teaching in science and engineering courses, combine actual teaching needs to qualitatively or quantitatively assess and evaluate, and check the syllabus, teaching methods and classroom teaching according to their aptitude, and gradually build a well-established evaluation system for ideological and political teaching in science and engineering courses. Secondly, follow the requirements of different teaching management departments and further refine the indicators of the evaluation system to cover the entire teaching process. Ideological and political education teaching

assessment, which integrates professional assessment, to check whether students agree with and understand the ideological and political elements delivered by the teachers, is the main content of ideological and political teaching evaluation. Targeted assessment tests can be implemented, and this assessment method is also implicit and easily accepted by students, such as implementing process assessments on teaching discussions in professional courses, classroom reports and post-lecture homework etc., as well as assessments on final exam scores. Actively incorporate ideological and political elements into it, design the topics between professional assessment and ideological and political assessment, and improve the effectiveness of evaluation of ideological and political teaching in science and engineering courses. For example, in the microbiology examination, carry out subjective descriptive feedback evaluation at the end. The essential goal of the reform of ideological and political teaching in science and engineering courses is to cultivate students' ideological quality, but there are huge differences in the individual cognitive level and ideological awareness in different students, so the teaching effects are different. Implement subjective descriptive feedback evaluation and collect students' descriptive evaluation of courses to understand the advantages and disadvantages of ideological and political teaching in science and engineering courses. Through the information platform, the students' evaluation records are collected, and the completion status of the teaching goals can be learned from a certain number of feedback samples, which directly reflects the results of ideological and political teaching in science and engineering courses.

## 3 Conclusion

In conclusion, the evaluation of ideological and political teaching in science and engineering courses should respect individual differences in students, pay attention to changes in students' learning attitudes, infiltrate the content of ideological and political education into professional teaching, and feedback on students' acknowledgment of teaching in order to build a well-established evaluation system for ideological and political teaching in science and engineering courses, and gradually improve the effectiveness of ideological and political education in science and engineering courses.

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