



Reform and Exploration of Curriculum Ideological and Political Teaching in the Higher Mathematics

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Abstract. This paper gives a reference reform strategy for the construction of ideology and politics in higher mathematics courses and aims at the problems that exist in ideological and political education, such as some mathematics teachers do not know enough about ideology and politics in courses, the teaching objectives of ideology and politics in courses are not implemented, there is a lack of scientific and reasonable teaching mode, the ideological and political elements in courses are not effectively explored, and the teaching evaluation mechanism does not highlight ideological and political elements. The above provides the basis for further implementing the ideological and political practice of higher mathematics curriculum.

Keywords: curriculum ideology and politics · higher mathematics · teaching reform

1 Introduction

Since the 18th People's Congress of the Communist Party of China, Secretary-General Xi Jinping has made a series of important instructions on ideological and political education in colleges and universities. In order to carry out Secretary-General Xi Jinping's important discussion on education, on May 28, 2020, the Ministry of Education issued the "Guideline of curriculum ideological and political Construction in Higher Education," which systematically explains the objectives, requirements, and contents of the new era of curriculum ideological and political construction around the fundamental issues of "what kind of people to cultivate, how to cultivate people and for whom to cultivate people" [1]. The above shows the direction of our education reform and development. Higher mathematics course is a compulsory public foundation course for all science and technology institutions majors. It is characteristic of the wide range of contents involved, complex knowledge structure, longer study time, and a larger audience for ideological and political education. Therefore, it has unique advantages in carrying out curriculum ideology and politics. However, in the present situation, although students pay attention to the course of higher mathematics, they generally think that the course is boring

and abstract, not to mention the connection with “curriculum thinking and politics”. So how to excavate the ideological and political elements contained in higher mathematics courses, integrate them with the knowledge points of higher mathematics organically, and give play to the synergistic role of ideological and political education in courses is a topic worth studying.

2 Problems of Ideological and Political Education

2.1 Some Mathematics Teachers Do Not Know Enough About Curriculum Ideology and Politics

To carry out curriculum ideological and political construction smoothly, mathematics teachers must deeply understand what curriculum ideological and political construction is, why to carry out curriculum ideological and political teaching reform, and so on. Only with the theoretical basis can we guide practice and consciously seek ideological and political elements in the teaching of higher mathematics courses so that the ideological and political content and professional knowledge can be seamlessly connected to complete the ideological and political objectives of the course. At present, some mathematics teachers do not have enough understanding of the curriculum ideology and politics, thinking that the ideological and political education of college students is only the work of ideological and political teachers and has nothing to do with mathematics teachers. The above leads to the low enthusiasm of some mathematics teachers to participate in excavating the elements of curriculum ideology and politics, which hinders the process of curriculum ideology and politics implementation.

2.2 Failure to Clarify Teaching Objectives of Ideological and Political

Although many colleges and universities have realized the importance of establishing curriculum ideology and politics, most of the concept exists only in slogans and has not been implemented. First, the teaching system still follows the traditional system, does not incorporate the curriculum ideology and politics into the personnel cultivation program, and lacks long-term planning for the overall teaching. Secondly, the teachers of higher mathematics still focus on the knowledge and theory of higher mathematics when they set the teaching objectives but ignore some emotional values contained in them. Therefore, it is difficult to find the shadow of curriculum ideology and politics in the teaching process, making it difficult for curriculum ideology and politics to play their role.

2.3 Lack of Scientific and Reasonable Teaching Mode

In order to integrate the ideological and political elements into higher mathematics, we should not make a long speech but look for the relevance of mathematical knowledge and ideological and political elements and gradually integrate the value shaping and ideological guidance so that students can be infected with the ideological and political ideas and knowledge in the teaching by subtle and layer-by-layer progress. However, mathematics

teachers lack effective teaching forms in practicing and exploring curriculum ideological and political construction. They usually combine mathematics with ideology and politics in the way of knowledge infusion and concept elaboration, which makes it impossible for students to achieve due results in value-building and thought-leading. In addition, the higher mathematics course capacity is large, the course content is abstract, and the course is difficult. If it integrates ideological and political elements, it will occupy some class time. In this way, it is easy to have insufficient teaching time and difficulty completing the teaching content, affecting the completeness of students' knowledge mastery.

2.4 Ideological and Political Elements Have not Been Effectively Explored

The subject of higher mathematics is special, which contains more objective and rigorous mathematical laws, and it is not easy to find the ideological and political elements in it directly. However, this does not mean the curriculum has no ideological and political elements. On the contrary, higher mathematics has rich elements of science and ethics. These can guide college students to establish a correct view of science and play an important role in their future development. However, the knowledge system in higher mathematics is relatively fixed, so it is not easy to find the entry point for ideological and political education. Based on this point, we can see a need further to explore the ideological and political elements in higher mathematics.

2.5 Difficulty in Teaching Evaluation

Currently, the evaluation mechanism of higher mathematics teaching in some colleges and universities does not highlight the elements of ideology and politics. From teachers' perspective, colleges and universities focus on evaluating teachers' teaching skills and pay less attention to whether teachers fully integrate the ideological and political elements in their teaching. For example, some colleges and universities focus on whether teachers can highlight the important and difficult points in teaching and whether the PPT design is easy to understand. However, they seldom pay attention to whether teachers can fully explore and flexibly integrate higher mathematics's ideological and political elements. From the students' perspective, the evaluation of higher mathematics learning effectiveness of college students focuses on the mastery of mathematics ability. However, it neglects the assessment of their ideological and moral realm. For example, most colleges and universities take written tests to evaluate students' mastery of higher mathematics and set various questions, such as practical application cases, to test students' comprehensive mathematical ability.

3 Strategies for the Construction of Higher Mathematics Curriculum Ideology and Politics

To ensure the effective implementation of the curriculum ideology and politics, we have developed the following construction strategies aimed at the current problems of ideological and political education in higher mathematics courses.

3.1 Clarify the Objectives of Curriculum Ideology and Politics

When teaching ideology and politics in higher mathematics courses, we should look for rich elements of curriculum ideology and politics around the three main lines of the history of mathematics, the beauty of mathematics, the thoughts of mathematics, the uses of mathematics, and the core socialist values and materialist dialectics. Focus on the subject's content and inject new teaching theories and methods while focusing on training problem-solving skills and cultivating students' mathematical spirit, craftsmanship, and patriotic enthusiasm. Students are required to master basic concepts and theorems, be proficient in using theorems and properties to carry out basic operations, understand mathematical thoughts and methods, understand the dynamics of the mathematical frontier, and construct a mathematical knowledge system. In learning, students should enhance their aesthetic taste, cultivate their rigorous scientific attitude, exploration consciousness, collaborative innovation, feelings of home and country, and social responsibility. Pay attention to improving students' observation and analysis abilities, communication and expression abilities, and logical thinking abilities. The program is designed to achieve the teaching goal of the trinity of knowledge transfer, value shaping, and ability cultivation.

3.2 Established the Curriculum Ideological and Political Teachers Group

In response to the problem that some mathematics teachers do not know enough about the curriculum ideology and politics, a group of teachers of ideology and politics of higher mathematics course can be established. Teachers regularly organize and carry out teaching seminars and actively explore the ideological and political elements in the curriculum of higher mathematics. To sort out the connection point of the course and ideological and political education, naturally combine the higher mathematics course with the ideological and political course. The teachers summarized the experience of integrating the ideology and politics of the course in the teaching process and exchanged their experiences to integrate the university's ideological and political education into all aspects of the course teaching and reform. In addition, the teachers' ideological and political teacher skills training [2] should improve their ideological and political awareness to lay a solid foundation for integrating ideological and political elements in the subsequent courses.

3.3 Deeply Explore the Ideological and Political Elements

The exploration and application of ideological and political elements are the key to constructing higher mathematics curriculum ideology and politics, which is an important guarantee for mathematics teachers to improve the quality of curriculum ideology and politics. Mathematics teachers should not only fully explore and utilize resources such as mathematical culture, mathematical spirit, and mathematical figures to penetrate the content of ideological and political education but also combine ideological and political elements with daily teaching activities in combination with professional teaching practice [3].

First, consolidate and deepen the traditional ideological and political elements. The traditional ideological and political elements in higher mathematics include ancient mathematical achievements, contemporary mathematical theoretical research and practical achievements, outstanding mathematicians, and mathematical culture. The content and resources related to higher mathematics have distinctive humanistic attributes. Mathematics teachers can integrate the content of ideological and political education from the level of social institutions, cultural concepts, and moral ethics embodied in them. For example, in teaching mathematical persons, teachers can explore the rigorous work style, high moral cultivation, and touching deeds of mathematicians to lay the foundation for students to feel better and appreciate the ideological charm of ideological and political education. However, in exploring ideological and political elements, teachers must also clarify the channels of penetration of mathematical personas and research history. For example, when teaching definite integral and derivative, teachers should infiltrate the process of Newton's study of physical problems and Leibniz's study of geometric problems in the content explanation. Subsequently, the moral, ideological, and value concepts contained in the mathematical characters are integrated so that the ideological and political elements are integrated more naturally. Then, the dialectical method is infused into the teaching of mathematics. Higher mathematics is the practice and application of philosophy in mathematics. Calculus explores the contradiction between integration and differentiation. When teaching the theorem of calculus, teachers should elaborate on the law of both unity and opposition of integration and differentiation; when explaining the theory of series, students should realize that human beings know the world from the perspective of finite to infinite. Teachers can better cultivate students' philosophical spirit and thinking by infiltrating dialectical thought into mathematics teaching. At the same time, they can organically combine ideological elements with professional teaching. In future exploration, teachers need to make the knowledge of ideology and politics more subliminally presented to students by combining methodology and dialectics in ideological and political education and mathematics teaching process.

3.4 Innovative Teaching Mode

Given the lack of scientific and reasonable teaching modes in teaching higher mathematics, the teaching mode can be innovated. Firstly, through changing the traditional boring and stereotypical teaching mode of higher mathematics, building a student-centered teaching concept, increasing the fun and practicality of teaching contents, organically merging ideological and political elements with the content of higher mathematics courses by creating teaching situations, making students feel the importance of mathematics and guiding them to apply it, so as to stimulate students' interest in learning and make them change from passive learning to active participation and even independent learning. Secondly, set up curriculum ideological and political modules and topics through online learning resources such as flipped classrooms, micro classes, and catechism, and build ideological and political contents with depth, height, width, and temperature. Pre-learning before class, class exercises, knowledge extension, content supplement, post-class review, post-class homework, application cases, etc., are done with the help of the Super Star Learning Platform. The ideological and political elements,

such as mathematicians, mathematical history, mathematical culture, mathematical models, and mathematical allusions, are integrated with philosophy, aesthetics, architecture, astronomy, and aerospace to naturally integrate ideological and political elements into the teaching of higher mathematics courses. We promote students' personalized development and guide students to establish the correct outlook on life and values. Finally, effective communication with students is enhanced through teacher-student interaction, after-school question-and-answer sessions, online communication, academic guidance, career planning, etc. Teachers set an example by combining teaching and nurturing and teaching by word and example. Teachers should integrate emotional factors into the teaching process to mobilize students' enthusiasm and initiative in learning.

3.5 Improve the Teaching Evaluation and Highlight Ideology and Politics

Colleges and universities need to make whether teachers of higher mathematics course effectively integrate curriculum ideology and politics in higher mathematics teaching as the focus of teacher evaluation. In order to ensure the organic integration of higher mathematics and curriculum ideology effectively, universities need to improve the teaching evaluation and highlight the orientation of curriculum ideology and politics [4]. First, colleges and universities should put professional ethics and other ideological and moral assessment in an important position and focus on the curriculum ideology and politics integration behavior shown in teachers' lesson preparation and teaching links. It takes the form of student and teacher mutual evaluation to evaluate whether teachers integrate ideological and political elements, such as value guidance, into teaching organically. Whether the integration of related links is reasonable and scientific, and whether it conforms to the actual ideological development and law of students in school. In this regard, colleges and universities should focus on the teachers' ability to integrate curriculum ideology and politics in higher mathematics teaching organically. When evaluating the backbone of higher mathematics teaching, value leadership, ideological and political education, and effectiveness of education should be used to measure the effectiveness of integrating curriculum ideology and politics. The initiative and consciousness of teachers of higher mathematics courses to actively integrate curriculum ideology and politics should be mobilized to the maximum extent. Second, colleges and universities should use written tests and questionnaires at the beginning of the semester to understand college students' mastery of higher mathematics and moral cultivation. At the end of the semester, colleges and universities should still adopt these two forms to test students' mathematical level and moral status and compare the results of the two tests in detail to facilitate the higher mathematics teachers to adjust the teaching methods timely basis.

4 Conclusion

To integrate ideological and political education into the teaching of higher mathematics courses, we should strengthen the top-level design and planning of the courses. It is necessary to clarify the goal of ideological and political construction in the higher mathematics curriculum, set up a group of ideological and political teachers in the higher mathematics curriculum, and explore the ideological and political elements contained

in the higher mathematics curriculum. The ideological and political elements naturally integrate with the knowledge points of higher mathematics, innovate the teaching mode, improve the teaching evaluation, and highlight the ideological and political orientation of the curriculum. In the teaching process to achieve value leadership, play the role of curriculum ideology and politics and government to co-education, enhance the course of interest, knowledge, cutting-edge, and education. At the same time, it helps students to integrate scientific research ideas, establish a complete knowledge system, set up a correct outlook on life and values, stimulate students' curiosity and desire for knowledge, and cultivate the spirit of active learning, diligent thinking, and innovation.

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