

Research on the Necessity and Practical Path of ideological and political Reform of higher Mathematics Curriculum

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ABSTRACT

Curriculum ideological and political reform is the focus of teaching reform in colleges and universities in recent years. The curriculum ideological and political reform can not only improve the students' learning efficiency of each course, but also cultivate the students' ideological and moral quality. Cultivate students into excellent successors of socialism. Based on the necessity of reform and practical path, this paper first analyzes the necessity of ideological and political reform of higher mathematics curriculum; secondly, from the three angles of establishing curriculum ideological and political database, training teachers and creating "pre-class-class-after-class" trinity ideological and political content system of higher mathematics curriculum, the practical path of ideological and political reform of higher mathematics curriculum is determined.

Keywords: *advanced mathematics, ideological and political studies, reform, practice path*

1. INTRODUCTION

Curriculum ideological and political [1] refers to the construction of the whole staff, the whole course, the whole curriculum education pattern of all kinds of courses and ideological and political theory courses in the same direction, forming a synergistic effect, "Li de Shuren" as the fundamental task of education as a comprehensive educational concept. As the focus of teaching reform in colleges and universities, curriculum ideological and political research began in 2014. At first, it took the ideological and political course as the core and set up the elective course of the ideological and political course. Later, with the deepening of the research and the embodiment of the importance of the ideological and political course, it was gradually used in the teaching reform of various university courses. In 2018, at the National Conference on Undergraduate Education in Colleges and Universities in the New era, Minister Chen Baosheng pointed out: "Colleges and universities should clarify the educational elements and responsibilities of all courses, and promote each professional teacher to formulate and carry out curriculum ideological and political teaching design." [2] Further pointed out the importance of ideological and political reform of university curriculum. As a general education course in colleges and universities, higher mathematics is a compulsory basic course for most college students. Therefore, the ideological and political reform of higher mathematics curriculum is imperative.

2. THE NEED OF IDEOLOGICAL AND POLITICAL REFORM IN HIGHER MATHEMATICS CURRICULUM

2.1. Activate classroom atmosphere and enhance students' interest in learning

Advanced mathematics is a compulsory basic course for science and engineering students. It plays an important role in the study of follow-up courses of science and engineering and the work after graduation from university. But for most students, the learning process of higher mathematics is rather boring in the face of some mathematical formulas and theorems. Therefore, most students have great difficulty in learning higher mathematics curriculum and low interest in higher mathematics. Adding the course thought and politics to the higher mathematics course can improve this situation. There are many ideological and political elements in the course of higher mathematics, and many theorems and formulas in the course have been formed hundreds of years ago. The process of inventing these theorems, formulas, and the story of mathematicians can be added as ideological and political elements to the study of higher mathematics courses. Such as calculus in advanced mathematics, First, we can tell the students about the process of the formation of calculus, which was first put forward by Newton, the great scientist of British science, in his paper "A brief Theory of flow numbers" in 1666, In this paper, the concept of flow number (i.e. derivative) is introduced in the form of velocity and used to find the

tangent of curve etc; In 1672, the German mathematician Leibniz, another founder of calculus, recognized the problem of "tangent is only difference" by imagining the vertical coordinate of the curve into a set of infinite series, thus pointing out the important branch of calculus[3]. If we add these interesting mathematical stories to the boring advanced mathematics curriculum, we will effectively attract students' attention, not only can enliven the learning atmosphere in the classroom and enhance students' interest in higher mathematics. It can also enable students to master the source of knowledge, vivid mathematical theorems and formulas, more conducive to students' mastery of knowledge.

2.2. To cultivate excellent successors of socialism

Through four years of study in college, college students are not only to become a professional with rich knowledge, but also to become a comprehensive person, a patriot, person of high moral character. General Secretary Xi Jinping[4]has repeatedly pointed out that "the ideological and political curriculum is a comprehensive educational concept that embodies the fundamental task of establishing morality and building people,It is also an important measure to construct the pattern of full-staff education, whole-course education and all-round education. It is necessary to combine all kinds of courses with ideological and political courses to form a synergistic effect ." It can be seen that the reform of ideological and political courses

in colleges and universities can not only enhance students' interest in curriculum learning, enable students to better master what they have learned, but also, more importantly, it can improve students' moral quality and cultural and artistic literacy. Cultivate students into ideal, responsible, all-round development of socialist excellent successors.

3. PRACTICAL PATH OF IDEOLOGICAL AND POLITICAL REFORM IN HIGHER MATHEMATICS CURRICULUM

3.1. Study the teaching material, excavate the ideological and political elements

Ideological and political curriculum is integrated into the curriculum, through the study of the curriculum to achieve. Therefore, in order to realize the ideological and political reform of the curriculum and truly integrate the ideological and political elements into the classroom, we must concentrate on preparing lessons and studying teaching materials. And the whole teaching process is designed to add the ideological and political elements to the course learning.

Through studying advanced mathematics textbooks and consulting relevant materials, the ideological and political elements of higher mathematics curriculum are as follows[5]:

Table 1 Course ideological and political database

Chapter	Teaching content	Ideological and political elements	Example
Functions and Limits	Mapping and Functions	Adhere to the scientific spirit of pursuing truth	The story of the German mathematician Dreykere
	Limit of series	National pride	Liu Hui's circular cutting
Derivative and differential	Higher order derivative	Keep your feet on the ground and don't rush to success	Three days fishing, two days netting
Application of Differential Mean Value Theorem and Derivative	Differential Mean Value Theorem	Keep an optimistic attitude and work hard	The story of the mathematician Lagrange
indefinite integral	Concepts and properties of indefinite integral	Focus on comprehensive development	The story of the mathematician Leibniz
	Division integral method	Focus on the development of logical thinking	Decomposition Process of Partial Integral Method
Fixed integral	Application of definite integral in geometry	Enhance self-confidence and action	The story of the scientist Archimedes
Differential equation	Basic concepts of differential equations	Do not forget the original ideals and aspirations, single-minded	General Secretary Xi Jinping's speech

Vector Algebra and Spatial Analytic Geometry	Vector and Linear Operations	Do things with goals and plans	Ji Liang persuaded Wei to give up Zhao
Differential Method of Multivariate Function and Its Application	The derivation formula of implicit function	Adhere to the scientific spirit of pursuing truth	The story of the mathematician Jacobi
	Ext Value of Multivariate Function and Its Method	Open-minded and objective	Su Shi's Poems
multiple integral	Application of Reintegral	Craftsman spirit	Establishment of Zhaozhou Bridge
Curve integral and surface integral	Convergence Method for Series of Constant Terms	Believe in yourself and stick to the foolish spirit of not giving up	Snail climbing rope
	Power series	Adhere to the scientific spirit of pursuing truth	The story of the mathematician Abel

3.2. To train teachers and improve teachers' ability of moral education

The primary influence factor on college students' thinking, words and growth is teachers. As a teacher, it is not only to teach students knowledge, but also to teach students how to be a person of high moral character. It is particularly important for teachers to teach and what to teach in class, and how to cultivate students' moral and behavioral qualities. Therefore, if we want to improve students' own accomplishment through curriculum thinking and politics, and train students into a socialist successor with all-round development, we must improve teachers' own ability to cultivate morality and master enough elements of curriculum thinking and politics. Teachers' mastery of curriculum ideology and politics can not only improve their own ideological awareness, but more importantly, educate students and enhance their ideological and moral awareness. In order to understand the actual situation of college teachers' understanding of curriculum ideology and politics, we conducted a questionnaire survey on some college teachers. The survey results show that most teachers do not have a good understanding of curriculum ideology and politics reform (the results are as follows)

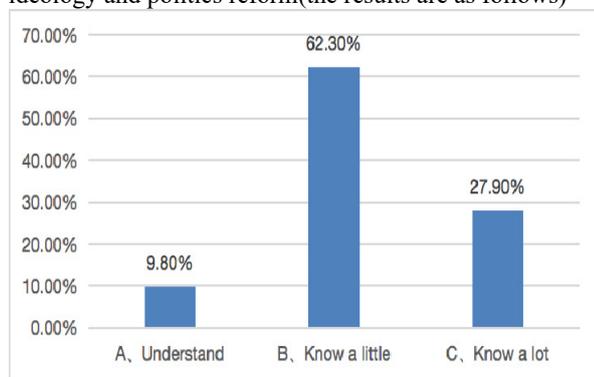


Figure 1 Questionnaire on teachers' Actual situation

According to the survey, 9.8% of the teachers do not know what is curriculum thought and politics, 62.3% know something about curriculum thought and politics, and only 27.9% understand curriculum thought and politics. Therefore, in order to promote the ideological and political reform of curriculum, firstly, we must train teachers and improve teachers' ideological and political ability. To this end, colleges and universities can organize teachers to participate in the curriculum ideological and political reform lectures, training and so on. Secondly, we should plan the curriculum ideological and political reform of each course, and organize the teachers of each subject to carry out the curriculum ideological and political reform in order to improve the teachers' own moral ability.

3.3. Create "pre-class—class—after-class" trinity of higher mathematics curriculum ideological and political content system

In order to cultivate students' ideological and moral literacy, so that students can really develop into a comprehensive person through the course of ideological and political development, the most important thing is how to effectively add the course of ideological and political into the higher mathematics classroom. Combined with the characteristics of higher mathematics curriculum and the learning software, this paper creates a trinity of "pre-class-class-after-class" ideological and political content system of higher mathematics curriculum. Firstly, before class, students can feel the charm of mathematics in advance and arouse students' interest in learning mathematics by learning to push videos and documents related to various mathematics cultures and the history of mathematics development, etc. Secondly, in the course, according to the course ideological and political database summarized above in this paper, compared with the chapters taught, in the course of explaining cases, definition theorems and examples, the corresponding curriculum ideological and political elements can not only help students better understand what they have learned, but also improve their

interest in learning and cultivate their related qualities. Finally, after class, we can share with the students the knowledge of mathematics culture, mathematics development and so on by holding thematic seminars, and so on. At the same time, we can understand whether students have been promoted in ideological and moral character through curriculum ideological and political reform through communication with students.

4. CONCLUSION

Curriculum ideological and political is a key point of teaching reform in colleges and universities, and higher mathematics is an important basic course in colleges and universities. The ideological and political reform of higher mathematics curriculum can not only improve students' interest in learning higher mathematics, but also help students master higher mathematics knowledge better. Most importantly, it can improve students' moral quality and cultural and artistic literacy. Cultivate students into ideal, responsible, all-round development of socialist excellent successors.

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