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The Exploration of Curriculum Ideology and Politics in Advanced Mathematics from the Perspective of the Three-Wide Education

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Abstract

For advanced mathematics courses for science and engineering students, the course guided by three-wide education (TWE) explores the ideological and political teaching in the curriculum, analyzes the relationship between TWE and curriculum ideology and politics (CIP), and determines the course objectives. The course is related to the ideological and political elements of the curriculum, establishes the feelings of home and country, integrates into educational activities, creates a collaborative education classroom, and formulate assessment and evaluation standards. Finally, through the questionnaire survey and feedback on the implementation effect, it is concluded that integrating ideology and politics into advanced mathematics can stimulate learning motivation, realizes all-round education throughout the process, and well implement the task of building morality and cultivating people.

Keywords: three-wide education, curriculum ideology and politics, advanced mathematics

1. Introduction

Colleges and universities should implement the fundamental task of establishing morality and cultivating talents in the new era, promote precise curriculum thinking and government, and implement the project of improving the quality of thinking and government work to ensure the transmission of the great cause of socialism. Colleges and universities adhere to the original intention of nurturing people, bearing in mind the mission and responsibility of the Chinese nation's centennial revival of the Chinese dream. In 2016, General Secretary Xi Jinping pointed out that all kinds of courses and ideological and political courses go in the same direction to form a synergistic effect, which points out the direction and puts forward new requirements for teachers' teaching process to realize the full range of all-round education of people.

In recent years, many scholars have continued to research on TWE and CIP. For example, Zheng Yong' an et al. (2018) make every effort to build a TWE system with moral education and educated

tenet. Guo Changhua et al. (2020) propose the path to realize TWE in universities. Yuan Yingke (2020) et al. built a trinity model of large-scale of collaboration, big sir and college students for education; Wu Xianchao (2019) et al. used the organization system of multiple collaborations, the practice system of whole area monitoring and the method of all-round integration to build an innovative model of mental health education for college students in the new era; Su Wei et al. (2020) explored multidimensional professional CIP in the context of new engineering. Qin Hourong et al. (2019) explored the construction of contact points and teaching system of university mathematics CIP to promote the integration of mathematics and curriculum construction. Xie Youru et al. (2019) proposed the design theory and method of CIP in universities in the age of intelligence. Ming, Pingfang et al. (2021) studied the value and realization path of the construction of the thought politics of university physical education curriculum; For construction of CIP, Li, Xinping et al. (2021) promoted theoretical basis, key issues and strategic options. Zhou Qin et al. (2021) explored and practiced blended teaching in linear algebra. The study aims to explore the relationship between TWE and CIP, determine the objectives of the course, establish the national sentiment, integrate the activities of education, create a collaborative education classroom, and develop assessment and evaluation criteria. The conclusion is that the integration of CIP in higher mathematics can stimulate learning motivation, realize the whole process of all-round education, and can well implement the task of establishing moral education.

2. Exploration on the Ideology of Advanced Mathematics Course Based on TWE

2.1 Participants

Advanced mathematics is a fundamental subject for science and engineering students, containing calculus, algebra and geometry, and is the basic subject for the graduate entrance exam. The subject is a compulsory mathematics course for non-mathematics majors in science and technology, and is also a compulsory course for some other majors, mainly studying limits, calculus, space analytic geometry and vector algebra, series, ordinary differential equations, etc. It has the following characteristics:

(1) It is highly abstract and needs to be taught with relevant software to make students understand it deeply.

(2) It has a strict logic, such as the proof and derivation process of many theorems and properties, which are cleverly conceived.

(3) It has a wide range of applications, and is a basic subject for engineering, science, finance and other disciplines.

(4) It is computationally difficult, such as the proof of limits, the calculation of double and triple integrals, and so on.

This course has many elements of CIP, so it is convenient to explore CIP under the perspective of TWE.

2.2 The Relationship Between TWE and CIP

General Secretary Xi Jinping emphasized in the National Conference on Ideological and Political Work in Colleges and Universities that ideological and political work should be carried out throughout the whole process of education and teaching, so as to achieve full education and all-round education (referred to as three-wide education). The teaching is integrated into social practice, cultural knowledge and moral education. The ideological and political work is integrated into students' daily life, student management, knowledge of subject materials and knowledge system, so that students can establish good ideals and beliefs and realize the ultimate goal of establishing moral education.

CIP was issued in 2004. After years of development, CIP has always adhered to the goal of cultivating virtue and nurturing people in the teaching process, promoting college students to have a correct understanding of national development and national rejuvenation through various methods, striving to learn the excellent traditional culture of the Chinese nation, and possessing a correct outlook on life, worldview, and values. The deep implement is necessary for the multi-channel approach of preaching, imparting knowledge, resolving doubts, and cultivating talents in the same direction, forming a synergistic effect.

In the process of educating people through TWE and implementing CIP, the fundamental principle of cultivating morality and talents is always adhered. Efforts should be made to integrate teaching and ideological education activities, fully utilize educational carriers such as professional courses and general history courses, and deeply explore the educational

elements in the curriculum. The teaching process should be comprehensive, complete, and aimed at educating all students. Therefore, CIP in the curriculum is a vital way to achieve the TWE. At the same time, the process of CIP should also consider the value connotation contained in professional knowledge, such as how to make students understand the reason for learning the course, the specific content of the course and the significance of learning the course, how to make the implicit elements of thinking politics education in the course explicit, and to implement the whole staff, the whole process, and the all-round specific process in TWE. That is to say CIP should follow TWE.

2.3 Determining the Objectives of Higher Mathematics Courses Under TWE

The objective of higher mathematics courses under TWE also serve as a new type of classroom implementation and evaluation standard, and place the most important position in the construction of TWE, so that CIP can penetrate into the whole process and all aspects of education and teaching, and promote the overall development of moral, intellectual, physical, social and aesthetic development. The fundamental principle is to promote the all-round development of moral, intellectual, physical, aesthetic and social development of students, and to integrate the teaching objectives of higher mathematics with the knowledge system, social needs and physical and mental rules of students, so as to establish good conditions for the implementation of TWE. The specific objectives are as follows:

Table 1.

Dimensions of the objective	Specific descriptions
Value objectives	(1) Create a high-quality teaching team, and require teachers to improve their practice with the standard of "four teachers".
	(2) Cultivate students to be responsible and responsible socialist builders and successors of the new era, with love of country, family and society, and promote the all-round development of students' moral, intellectual, physical and aesthetic development.
Knowledge objectives	(1) The study of advanced mathematics will help in the study of professional courses and further study for the examination.
	(2) Develop thinking ability, solve real-world problems, and enhance understanding and interest in knowledge through advanced mathematics.
	(3) Master the content of each chapter of advanced mathematics; master the system of research methods, tasks and roles of each chapter of advanced mathematics.
	(4) Tap elements of CIP for the higher mathematics course and promote the education of the whole process of all students by all-round education.
Competency Objectives	(1) Through the study of advanced mathematics, students will be able to acquire a solid foundation in mathematics, have the idea of modeling, and have the ability to carry this idea through the whole process of teaching.
	(2) Through the study of each chapter of advanced mathematics, students will be able to study further for the examination and deepen professional learning ability.
	(3) Through advanced mathematics and hot issues to explore, students will be able to combine with the discipline of classroom thinking, have the fight for life, values, worldview, with the ability to analyze problems and solve them in conjunction with practical problems.

2.4 Create a Collaborative Education Class Around CIP

2.4.1 Establish the Love of Country and School and Family, Remember the Mission, and Strive

for the Realization of the Centennial Revival of the Chinese Dream

We will incorporate the history of higher mathematics, such as the mathematician Yau Shing-tung, who won the Phil Prize in mathematics for differential geometry, the mathematician Hua Luogeng, who taught himself and returned to China, the mathematician Chen Jingrun, who conquered the world's mathematical problems in a difficult environment, Su Buqing, the founder of the Chinese school of differential geometry, and Chen Jiankong, the pioneer of function theory research in China, etc. We will combine the contributions of mathematicians and the spirit of self-improvement to realize the whole process of education for the whole class and educate students to be patriotic and understand that the best way to be patriotic is to study hard, conquer scientific problems in many fields and realize the dream of a strong country.

Incorporating the results of advanced mathematics research and current contributions in the field of mathematics, such as the mathematical model of tidal sediment in the Hong Kong-Zhuhai-Macao Bridge, we will talk about the great achievements, enhance the sense of mission and responsibility, and guide students to enhance the four self-confidences.

Incorporating resources such as the university's master teachers, outstanding teachers, and outstanding teacher teams (artificial intelligence team, cryptography team, optimization team, differential equations team, etc.) to enrich teaching content, broaden the teaching field, use smart classrooms and Internet platforms, combine online and offline hybrid teaching, realize the exchange between students and school masters, etc., and explore a new pattern of innovative classrooms. Improve undergraduate university innovation and provide a good environment for in-depth education.

2.4.2 Integration of Higher Mathematics Chapters with Ideology and Politics Education

Table 2.

Content	Ideology and politics education
Introduction of definite integral concept (area of islands in South and East China Sea, and area of country)	Enhance the sense of national mission, make it emotionally resonant and enhance the sense of social mission.
Four steps in the concept of indefinite and definite integrals: splitting approximation and taking limits.	The many big problems in learning life are divided into infinitely small problems as much as possible, and the whole is turned into zero. Each small problem is analyzed intelligently and creatively, and the big problems are explored comprehensively for solutions.
The partition integral solves the definite integral requiring the rule of conjugate differentiation.	Prepare well in advance and choose the right method. If the method is not right, it will become increasingly difficult, the right method, and the efficiency greatly improved.
Theorem of convergence of positive series: if the large series converge, the small series must converge; if the small series diverge, the large series must diverge.	Carry out education activities of love for family and love for country. The small streams rise when the main stream is high. The country is rich and strong and stable, and each small family is happy and harmonious. If the personal character and style of misconduct, it means that there are problems in his family environment; if there is corruption in the public cadres, it may give the country exists collapse disaster.
The study of limits introduces the idea: a hammer of one foot is taken halfway through the day and will never be exhausted.	It is about the spirit of national craftsmanship of rigorous and conscientiousness, excellence and innovation, and contains the idea of dialectical materialism from quantitative change to qualitative change.
Applications of partial derivatives,	Integrate the knowledge of each chapter into the

vectors, gradients, scatter, etc. in artificial intelligence, differential equations, extrema, etc. in various frontiers such as neural networks and flight simulation.	corresponding cutting-edge knowledge, present research results from various fields in multiple dimensions, stimulate the desire for knowledge, allow students to enhance the depth of various types of knowledge, meeting global challenges, tackle stuck problems, and broadening their worldview.
The nature of infinitesimal: the sum of finite infinitesimal is infinitesimal, infinite infinitesimal is not necessarily infinitesimal.	The accumulation of quantity in order to have a qualitative leap Avenue, and the accumulation of knowledge also needs to accumulate day by day, in order to have the magical power to attack the problem of card neck. The country's strength also needs to accumulate more and more, in order to achieve a century of rejuvenation, to achieve a moderately prosperous society, to achieve a strong country and a strong army.
Continuity of functions (small changes in the independent variable and small changes in the response variable), monotonicity (increase or decrease), extremes (stationary points, inflection points), and most-valued problems (stationary points, boundary points)	The continuous function graph is like the ancient Silk Road, through the rolling hills, with peaks and valleys, life is the same, every day you need to move forward in a sequential manner, the troughs and peaks are just inflection points in life, to learn to face all kinds of difficulties correctly, motivated to move forward and establish a correct outlook on life.

2.4.3 Integration of Distinctive Educational Activities

Establishment of distinctive educational resources for human development:

(1) In view of the global epidemic situation, especially the seriousness of the epidemic in neighboring countries, although our country has achieved remarkable results in epidemic prevention and control, we still have to strengthen the spirit of epidemic resistance and curriculum integration, educate students' family and national spirit through the spirit of Wuhan epidemic resistance, and educate students to do a good job in epidemic prevention and control and vaccination.

(2) In the face of recent years, our country's national enterprises, high-tech enterprises, high-tech talent, etc. in the international community by the suppression and exclusion of the situation. Higher mathematics is a basic discipline, combined with artificial intelligence, big data processing and other advanced results, education students well students, for many card-neck problems, while constantly attacking, to stimulate students' patriotic feelings, the sense of national crisis, for a century of rejuvenation of a strong country and struggle.

(3) Adopt a pre-course-in-class-post-course teaching model, make full use of school curriculum resources, such as the Wisdom Tree platform and the Course Center platform, incorporate the history of mathematics recording micro-video before class, and complete tasks before class, and teachers participate in discussions online. Students' interest is stimulated and professionalism is improved. During class, we use the Rain Classroom software to take roll call, ask random questions, vote, and record the class to keep track of student dynamics and make the class more efficient. After class, students can watch back the recording and upload the assignments to the platform in time and discuss the doubtful questions.

(4) Combine with the Chinese university MOOC platform quality courses Civics MU resources teaching and learning through the platform to strengthen the interaction between teachers and students.

(5) In conjunction with the 100th anniversary of the founding of the Party, it is necessary to tap knowledge related to higher mathematics and hold an online knowledge contest or knowledge competition.

2.5 The Assessment and Evaluation of Higher Mathematics Courses in CIP Under the Perspective

of TWE

The evaluation of higher mathematics course philosophy is the basis to test whether the higher mathematics course philosophy is achieved. Classes 1-2 of Computer Science College and classes 6-8 of Business College were selected as the research subjects, and the weighting system was formulated based on platform data, relevant theories and classroom performance, as follows:

Table 3.

Professional teaching situation (70%)				**CIP in the context of TWE (30%)**			
Before Class Study	MOOC Platform	Classroom Performance	After Class Assignments	Native land emotion	Professionalism	Career aspirations	Innovation ability
Grades in Course Center Platform	Grades in MOOC Platform	Rain classroom interaction, problem discussion	discussions of assignment and problem	Love of country, love of family, love of society, sense of social responsi-bility	Basic qualities of the academic profession	Career aspirations, career attitudes, career abilities, etc.	Ability to apply subject knowledge
15%	15%	50%	20%	20%	40%	20%	20%

3. Questionnaire and Result

The questionnaire is conducted to survey on the subject of advanced mathematics in our classes to implement TWE in the field of CIP, to establish moral education as the fundamental task of education, to carry out ideological and political education for all students in the whole process and in all aspects, and to grasp the ideological dynamics of students in time. A total of 205 questionnaires were distributed and 190 were received, with a response rate of 92.3%, as follows:

Table 4.

Items in the questionnaire	Strongly agree (%)	Agree (%)	Accept (%)	Disagree (%)
Highlights the idea of TWE in the course	30	45	20	5
Inspire patriotic feelings with global anti-epidemic spirit	34	43	18	1
Record micro-video on the history of mathematics to stimulate students' interest	44	50	5	1
Enhance student-teacher interaction by rain classroom software	48	41	7	4
Be conducive to independent learning by online quality learning resources	51	40	8	1
The course is conducive to improving professionalism.	37	40	22	1
It is reasonable to integrate into the CIP.	46	40	10	4

The results of the above questionnaire show that: 95% of students think that the knowledge of

each chapter of advanced mathematics highlights the idea of three-wide education; 99% of students add global anti-epidemic deeds in the course, objectively evaluate the achievements of our country's anti-epidemic and stimulate patriotic feelings; 97% of students think that recording micro lessons before class can improve independent learning; 99% of students use Rain Classroom software in class, which can enhance interaction and provide timely feedback Ninety-nine percent of the students believe that the teacher-student interaction enhances the effect of online learning; 96% of the students believe that the online platform's high-quality learning resources are conducive to independent learning; 96% of the students believe that the course integrates the elements of curriculum thinking and politics, which can realize the whole process of teaching and education. This paper is based on the TWE perspective under the curriculum of teaching exploration, which can be recognized by students, to achieve the whole process of all-round education, and can well implement the task of moral education.

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