

## Practical Research on Integrating Ideological and Political Education into Advanced Mathematics Curriculum

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### Abstract

Promoting the ideological and political construction of the curriculum is the implementation of the fundamental task of cultivating people with morality. There are abundant ideological and political materials in the advanced mathematics curriculum, through digging into the ideological and political elements contained in the teaching process of advanced mathematics, the ideological and political teaching cases are formed. By integrating the ideological and political education function of the advanced mathematics course into the classroom teaching, the advanced mathematics course and the ideological and political theory course are promoted to go with the same direction and educate students together.

### Keywords

Advanced mathematics; Ideological and political element; Teaching case.

## 1. THE NECESSITY OF INTEGRATING IDEOLOGICAL AND POLITICAL EDUCATION INTO ADVANCED MATHEMATICS CURRICULUM

General Secretary Xi Jinping pointed out that "we should make good use of classroom teaching as the main channel, so that all kinds of courses and ideological and political theory courses go together to form a synergistic effect". It is a new requirement for the reform and development of higher education in the new era that the course includes ideological and political education, teachers should educate people. The implementation of curriculum ideology is the moral education and bacon's responsibility of higher education [1].

《The guiding outline for the Curriculum ideological and political construction in Colleges and Universities》 which is issued by the Ministry of Education points out that the public foundation course should focus on building a batch of courses which can improve college students' ideological and moral cultivation, cultural quality, scientific spirit, consciousness of constitution and legal system, consciousness of national security and the cognitive ability, and strengthen students' ideal faith in imperceptible, cultivate patriotism, strengthen the moral cultivation, increase knowledge and insight, cultivate fighting spirit and improve students' comprehensive quality [2].

Advanced mathematics is a compulsory public basic course for freshmen. The content of advanced mathematics course is very logical, ideological and methodological. In the learning process, students find it boring and difficult to understand, lack of motivation and enthusiasm for learning, and lack of high participation in the class, which even becomes a burden for some students and affects their enthusiasm for learning, the final learning effect is not ideal [3]. In addition, for the students who just enter the university campus, while learning knowledge well, they must firmly grasp the correct political direction, establish a positive world outlook, outlook

on life and values, and so on. By digging into the scientific thought, scientific method, scientific spirit, dialectical materialism thought and humanistic feelings in the course of advanced mathematics, and putting them through all aspects of teaching, on the one hand, teachers can stimulate students' interest in learning and make the imparting of advanced mathematics knowledge high quality and efficient, on the other hand, it can realize value guidance for students.

## **2. THE PATH OF INTEGRATING IDEOLOGICAL AND POLITICAL EDUCATION INTO ADVANCED MATHEMATICS CURRICULUM**

### **2.1. Permeate the Ideological and Political Elements Into the Teaching Objectives**

We usually divide teaching goals into knowledge goals, ability goals and moral education goals. When making teaching objectives, teachers mainly focus on knowledge imparting and ability cultivation, but fail to put the cultivation of emotions, attitudes and values into practice. The teaching objectives of "curriculum thought and politics" of advanced mathematics mainly include the cultivation of the attitude of seeking truth from facts, the scientific spirit of active exploration and exploration, the sense of accomplishment of learning for application, the spirit of studying, the spirit of innovation, the spirit of patriotism, the way of being a man and doing things and so on.

### **2.2. Integrate Ideological and Political Functions Into the Teaching Process**

Ideological and political elements are there, we need to dig. Integrating ideological and political contents organically into classroom teaching of advanced mathematics can help students establish correct three views and positive moral quality, make the value guiding following knowledge imparting, and realize the "life-giving spring breeze and moisten things silently" of advanced mathematics course to students' ideological and political education. Thus, students' learning motivation can be stimulated, and the unification of knowledge transmission, ability cultivation and value shaping can be realized finally [4].

### **2.3. Strengthen Teacher's Ideological and Political Education Consciousness and Ability**

The emphasis of curriculum ideological and political construction lies in the teacher, teachers should take students as the main body, proficient in their subjects, have a noble vision and broad feelings, while imparting knowledge, teach the truth of life; Teachers should renew their educational concept, enhance their understanding, strengthen their sense of mission, and attach importance to the integration of ideology and politics into teaching practice. The consciousness and ability of teachers to develop curriculum ideological and political construction determines whether the curriculum ideological and political construction can achieve actual results. Teachers can improve their ideological level through studying political theories, teaching seminars, attending conferences and discussing with ideological and political course teachers, so as to improve their ability to expand curriculum ideological and political.

### **2.4. Guide Students to Deeply Participate and Think**

Classroom teaching must take students as the main body, and the teaching method of "full room filling" cannot let students have enough thinking space and strong interest in class. Teachers can adopt some active classroom teaching methods, such as cooperative learning, blended Learning and flipped classroom, etc., guide students to think, let students participate in discussion more, pass the ideological education to the students in the effective interaction, so that the students can feel education thoughts from the process of mathematical thinking, and the ideological education elements are integrated effectively [5].

### **3. THE TEACHING CASES OF INTEGRATING IDEOLOGICAL AND POLITICAL EDUCATION INTO ADVANCED MATHEMATICS COURSE**

Through the exploration of relevant moral education resources in advanced mathematics curriculum and the integration of ideological and political education into the teaching objectives, teaching design, teaching resources, teaching process and teaching methods, the ideological and political teaching cases of advanced mathematics curriculum are formed. While teachers help students to understand the knowledge points, the education effect of moistening things silent are achieved.

#### **3.1. Take Cultivating Innovative Ability as A Starting Point to Enhance Students' Innovative Consciousness and Spirit**

When teaching the abnormal integral of infinite limit, the paper introduces the problem of "the area of the open curved trapezoid surrounded by curve  $y = 1/x^2$  and X-axis", so as to make students understand that the area of the unbounded area is not necessarily infinite. Guide students: the abnormal integrals do not only exist in the field of mathematics. In fact, many things we encounter in our daily study and daily life can be regarded as abnormal integrals. It seems impossible to complete, but actually converges. We must treat and think dialectically with scientific and rational thinking, and have the courage to innovate and break through in the way of solving problems.

#### **3.2. Take Practicing Socialist Core Values as A Starting Point to Enhance Students' Patriotic Feelings**

When explaining the knowledge point of rotatory surface, I can introduce to students that academician Nan Rendong resolutely gave up the superior life abroad and entered the deep mountains in order that China could not be restricted in astronomical observation and did not lag behind other countries. After 23 years' construction, the surface of FAST is the rotatory surface--the rotational paraboloid. Guide students: we must Learn Nan Rendong's patriotism and craftsman spirit, learn knowledge well, integrate personal ideal into the cause of the country, and make contributions to the development of the motherland within one's power.

#### **3.3. Take Improving the Scientific Quality as A Starting Point to Cultivate Students' Scientific Attitude and Spirit**

Green entered school at the age of eight, dropped out of school at nine, taught himself by working in his father's mill with a passion for mathematics and a tremendous determination, and entered Cambridge University at the age of 40, where he received his bachelor's degree four years later. Guide students: We should learn the scientific spirit of assiduous and never tired and diligent exploration from Green, cherish the learning time, grasp the netter, learn knowledge and long ability, and become a useful talent for our country and society in the future.

#### **3.4. Take Training Students to Form Correct Three Views as A Starting Point, Guide Students to Behave and Do Things Correctly**

When solving the area of a plane figure, take the area of a plane figure enclosed by a parabola  $y^2 = 2x$  and a straight line  $y = x - 4$  as an example. It can be seen that when the area of a plane figure is represented by a definite integral, sometimes  $x$  can be chosen as the integral variable, and sometimes  $y$  can be chosen as the integral variable. It needs to be determined according to the shape of the figure, and proper selection of the integral variable can get twice the result with half the effort. Guide students: in daily life, we do things should also pay attention to the ways and methods, correct method will get twice the result with half the effort, clever work is better than reckless work.

### 3.5. Take Solving Practical Problems as A Starting Point, Cultivate Students' Ability to Put What They Have Learned Into Practice

Differential equations are widely used in physics, chemistry, biology, medicine, aerospace and other fields. When teaching the degradable high-order differential equation, it can be introduced by solving the catenary equation and the rocket launch problem, the mathematical model can be established through the differential equation to finally solve the practical problem. Guide students: Mathematical modeling originates from reality and is applied to reality. Students should pay more attention to practical problems in the society, such as the COVID-19 epidemic. They should analyze and solve problems with mathematical modeling, showing the contemporary college students' due responsibility for The Times.

## 4. CONCLUSION

There are a lot of materials for ideological and political education in advanced mathematics curriculum, so teachers should base on the characteristics of the school and the discipline, dig deep the ideological and political resources, and integrate them naturally with knowledge points in class. Only by making good use of classroom teaching as the main channel and carrying out flexible and diversified ideological and political education, we can achieve the silent teaching effect [6]. By integrating teaching material, teachers, teaching methods with the ideological elements, and permeating ideological and political education in the process of teaching knowledge, teachers can help students to shape the right three views, cultivate the students' patriotism, craftsmanship spirit, moral accomplishment and humanistic quality, etc. finally teachers promote advanced mathematics course and ideological and ideological and political theory course to go with the same direction, and become a good guider for students to grow up healthily.

## ACKNOWLEDGEMENTS

This research is supported by Key Project in the 13th Five-Year Plan of Education Science in Heilongjiang Province "Practical study on integrating ideological and political education into college mathematics curriculum from the perspective of collaborative education" (GJB1320231).

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