

# Innovation in the Teaching of Probability Theory and Mathematical Statistics under the Background of Ideological and Political Education

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**Abstract:** As an emerging educational concept, curriculum ideological and political education is not solely aimed at a certain discipline or curriculum, but rather at all disciplines and courses. By exploring the ideological and political elements in textbooks and teaching content, ideological and political teaching concepts are integrated into it, improving the quality and efficiency of classroom teaching. For the course “Probability Theory and Mathematical Statistics”, as a discipline that studies the statistical laws of random phenomena, it contains a variety of basic theoretical knowledge, achieving innovation in the teaching of “Probability Theory and Mathematical Statistics” and promoting the comprehensive development of students in this field. This article will analyze and discuss from four aspects: an overview of ideological and political education in the course, the problems in teaching the course “Probability Theory and Mathematical Statistics”, the importance of innovative teaching in the course “Probability Theory and Mathematical Statistics” under the background of ideological and political education, and strategies.

**Keywords:** Ideological and political; Course in Probability Theory and Mathematical Statistics; Teaching; Innovate

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The course “Probability Theory and Mathematical Statistics” is a compulsory course in science, engineering, and economics majors in higher education institutions. The teaching content involved in this course is relatively extensive, including computer knowledge, artificial intelligence knowledge, engineering technology, insurance actuarial science, and other content. This course is becoming increasingly important in higher education institutions. In the context of ideological and political education in the course “Probability Theory and Mathematical Statistics”, due to the rich teaching content, there are relatively rich and exploitable ideological and political elements in it. To achieve innovation in the teaching of this course, it means that while imparting the teaching content of this course, students’ dialectical thinking, scientific spirit, and national sentiment can also be cultivated, thereby cultivating them into high-quality professional talents, Complete the fundamental task of cultivating virtue and talent, and provide high-quality talents for society.

## 1. Overview of Course Ideological and Political Education

Compared with traditional educational concepts, the biggest difference between the concept of ideological and political education in the curriculum lies in the fact that the concept of ideological and political education in the curriculum places more emphasis on cultivating students’ ideological and moral qualities, comprehensive qualities, and other aspects. It does not solely focus on the study of textbook knowledge, but instead uses educational methods to help students establish correct worldviews, outlooks on life, and values, and to enable them in their daily lives, Being able to view everything with a positive and optimistic attitude, promoting the comprehensive development of students. For college students, they are in a stage where their physical and mental development tends to mature, and they also have their own ability to judge things. It is also a critical period for them to enter society. Realizing the ideological and political education reform of the course “Probability Theory and Mathematical Statistics” plays a crucial role in the comprehensive development of college students.

With the rapid development of our country’s society, people’s channels of obtaining information have become increasingly

diverse. In the complex information environment, although this provides certain convenience for people's lives, it may also have a negative impact on people's thoughts and behavior in a subtle way. After people acquire a large amount of mixed information, it will have a certain impact on their original thinking patterns and concepts. However, college students are in a state of partial understanding of social life and will be severely affected in the information age, forming a self-centered consciousness, making it difficult for them to integrate into social life, and even experiencing a series of extreme thoughts and behaviors. In response to the current ideological and moral problems and psychological problems of college students, universities should take effective measures to carry out moral education work, so as to build a correct ideological and moral system. Utilizing curriculum teaching to implement moral education work effectively has become the fundamental goal of curriculum teaching reform and innovation in the context of ideological and political education.

## **2. Problems in Teaching the Course of Probability Theory and Mathematical Statistics**

### **2.1 The course content is highly theoretical**

Due to the fact that the course "Probability Theory and Mathematical Statistics" is a mathematical science discipline, as a fundamental course in science and engineering majors, it revolves around mathematical teaching thinking in both teaching design and organization. Although it involves a variety of content, most of it is theoretical knowledge and is related to theorems, proofs, and other content, enhancing its abstract nature. This results in students having difficulty understanding the knowledge content and lacking the ability to flexibly apply the course knowledge during the learning process of the course, making it difficult for the teaching effect of the course "Probability Theory and Mathematical Statistics" to achieve ideal results.

### **2.2 Insufficient student initiative in learning**

Due to the strong theoretical and abstract nature of the course "Probability Theory and Mathematical Statistics", the purpose of students studying this course is not strong. Some students only consider it as a compulsory course, and the main purpose of studying this course is to obtain credits through exams, resulting in a serious lack of enthusiasm for students to study this course and difficulty in fully understanding the teaching content in the course. In addition, due to the high difficulty of learning this course, some students may gradually lose interest in learning after not understanding it for a long time, resulting in difficulty in fully realizing the educational value of this course.

### **2.3 The means of course teaching are single**

In the information age, some teachers still use a single teaching method to teach knowledge in the course "Probability Theory and Mathematical Statistics", and usually derive relevant theorems, definitions, formulas, etc. through blackboard writing. In this single teaching mode, the classroom teaching atmosphere is also relatively dull, and students naturally find it difficult to efficiently learn knowledge.

## **3. Strategies for Teaching Innovation in the Course of Probability Theory and Mathematical Statistics under the Background of Ideological and Political Education**

Although the course "Probability Theory and Mathematical Statistics" is a science course, there is a close connection between the knowledge content involved and actual life, and it also contains many ideological and political elements. Therefore, in the context of ideological and political education in the curriculum, teachers should explore the ideological and political elements in the course of Probability Theory and Mathematical Statistics, and use this to provide moral education to students, so as to form correct ideological values and moral awareness, and cultivate their comprehensive literacy.

### **3.1 Using knowledge of species evolution to guide students to appreciate the beauty of life**

In the course of Probability Theory and Mathematical Statistics, the teacher will explain the origin, development, and practical application of probability to students in the first class. In the process of explaining the history of development, the teacher can use the probability of human evolution as the center, integrate relevant knowledge of species evolution, and guide students to form a sense of respecting, cherishing, and respecting life. By calculating the probability of meeting two people, make students aware of the difficulty level of meeting two people, and then make them cherish their time together more. Once conflicts arise in life, they should actively face and resolve them, guide students to have friendly relationships with others, cherish the fate of meeting, and build good interpersonal relationships in college life, avoiding conflicts between classmates as much as possible.

### **3.2 Utilize life knowledge to stimulate students' interest in course learning**

In the course "Probability Theory and Mathematical Statistics", many of the teaching content is closely related to daily life. During the teaching process of this course, teachers should use the knowledge of life knowledge or life-related cases. While explaining

the professional knowledge of probability and statistics courses, they can also use life knowledge to stimulate students' interest in learning, thereby enabling students to maintain a good learning attitude, Take knowledge seriously and explore it. For example, when explaining the nature of the probability sum of opposing events being 1, teachers can use the probability of a person who cannot play basketball shooting as a teaching case to explain the conclusion that the probability of continuously shooting 400 times and hitting at least 2 times is almost close to 1. This encourages students to maintain a spirit of perseverance and not to give up easily when completing a task, Guide them to continuously research and explore unknown knowledge or fields, and cultivate students' craftsmanship spirit.

### **3.3 Integrate patriotic thinking and establish correct ideological values**

In the context of ideological and political education in the curriculum, teachers can focus on introducing Mr. Xu Baolu, the founder of China's probability and statistics industry, when teaching the "Hypothesis Testing and Parameter Estimation" section of the course "Probability Theory and Mathematical Statistics" The achievements in multiple statistical analysis, as well as his patriotic determination to return to China after completing his studies abroad, as well as his spiritual qualities of dedicating himself to the scientific cause of his country, are presented to students, in order to stimulate their patriotic emotions and form their lofty ideals and aspirations to serve their country. They also strive towards this direction and contribute their own strength to the development of the statistical industry.

### **3.4 Integrate relevant statistical regulations to enhance students' moral and legal literacy**

In the context of ideological and political education in the curriculum, when teachers teach the "Sample and Sampling Distribution" section of the "Probability Theory and Mathematical Statistics" course, it involves a lot of knowledge in data sampling, data organization, data compilation, and other aspects. Teachers should incorporate relevant regulations into it, reminding students to comply with relevant laws and regulations, abide by social ethics, and conscientiously fulfill their job responsibilities when carrying out data statistics work, Ensuring the authenticity and fairness of data processing, avoiding behaviors such as concealing data and falsifying, while enabling students to acquire knowledge of data statistics, can also establish legal awareness and ensure the effective implementation of ideological and political education.

## **5. Conclusion**

In summary, in the context of the concept of ideological and political education in the curriculum, it is necessary to promote the integration of ideological and political education with the teaching of "Probability Theory and Mathematical Statistics", achieve innovation in the teaching of "Probability Theory and Mathematical Statistics", and enable students to form correct ideological concepts, moral literacy, and legal awareness while learning basic professional knowledge, and promote their comprehensive development.

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