ISSN 2522-6398 Vol. 5, Issue 20: 91-96, DOI: 10.25236/FER.2022.052018

Exploration and Practice of Ideological and Political Teaching Reform in Probability Theory and Mathematical Statistics Course

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Abstract: *Probability theory and mathematical statistics are the core basic courses of science and engineering, agriculture and forestry. However, in recent years, the reform of ideological and political teaching in colleges and universities has become increasingly important in the curriculum education system of colleges and universities. Ideological and political education is the most urgent task of teaching reform, and it is also very necessary. In the actual process, the ideological and political teaching materials of probability and statistics courses are lacking, the ideological and political quality and ability of teachers are insufficient, the teaching methods are backward, and the assessment mode is single, making it difficult to carry out ideological and political work in the courses. In view of these problems, this paper analyzes the feasibility of ideological and political education in probability and statistics courses from the aspects of teaching resource development, teachers' ideological and political ability improvement, and the construction of offline and online hybrid teaching mode.*

Keywords: *online and offline hybrid teaching; probability theory and mathematical statistics; course ideology and politics; comprehensive assessment teaching reform*

1. Introduction

Teachers at colleges and ethnic colleges shoulder the responsibility of cultivating and supplying talents for the society and the country. Engineering and Science are very important disciplines in society as a whole. It is very necessary to train teachers of Engineering and Science, train talents of Engineering and Science, and cultivate comprehensive talents of Engineering and Science with the spirit of patriotism. Engineering and science use the subject knowledge of probability theory and mathematical statistics. In probability theory and mathematical statistics teaching, optimizing content, improving teaching methods, changing teaching concepts, and doing a good job in curriculum ideology are of great significance for cultivating qualified Engineering and Science talents.

2. Analysis of the curriculum ideology

What is curriculum ideology? In fact, there is no unified definition of ideological and political courses. Ideological and political courses should be taught in the course of ideology and politics, and ideological and political courses should also be taught in the course of specialization.[1] The cultivation of college students is not only to teach the knowledge of professional courses, but also to let college students establish correct ideological concepts.

The concept of curriculum ideology and politics has not been around for a long time, but many scholars have gained a deep understanding. Many people think that the ideological and political curriculum is a new course, but it is not. Gao Deyi and Zong Aidong believe that curriculum ideological and political education should integrate ideological and political education into all aspects and aspects of curriculum teaching and curriculum reform, so as to achieve the goal of morality and education.[2] Gong Weiming believes that traditional ideological and political courses should be used as the main channel of ideological and political education, and ideological and political courses should also be integrated into professional courses and other general education courses. The educational goal of educating people in the whole process.[3] Chen Daokun believes that ideological and political courses need to play the purpose of invisible ideological and political education, and unify with the ideological and political courses that

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play an explicit function to build a whole-process ideological and political education system with students as the main body.[4]

3. Characteristics of mathematical statistics and probability theory courses

Probability theory and mathematical statistics are mathematical disciplines, mainly to find the inevitable side in chance. They are the basic courses for introductory statistics. This course, like other mathematical disciplines, such as mathematical analysis, has a unique expression and many subject-specific symbols. The knowledge points in probability theory and mathematical statistics are closely related, and there is also a strong connection with other disciplines, such as mathematical analysis, advanced algebra, and mathematical modeling. Of course, although probability theory and mathematical statistics are derived from mathematics and are considered to be a mathematical discipline, they are very different from the teaching of other mathematical disciplines. Compared with other mathematical disciplines, the course is closely integrated with life, and many theories and applications are derived from actual cases in life, and there are not as many boring theories as other mathematical disciplines. Relatively speaking, this course is also more popular with students. Of course, as a mathematics subject, this course also has a certain degree of difficulty, and it is not very easy for students to learn well, and it is also very difficult to talk about ideological and political education in professional courses. The closeness of the course to life makes the course still have a high-quality soil for doing a good job in the ideology and politics of the course, but how to develop it is a problem that needs to be explored.

4. Ideological and Political Problems Facing the Course of Mathematical Statistics and Probability Theory

4.1. Lack of ideological and political textbook resources

Curriculum ideology is a concept of curriculum teaching reform proposed recently. Probability theory and mathematical statistics courses are very multidisciplinary learning courses, which have a wide range of applications in engineering, science, agriculture and forestry, and are often one of the basic courses of these disciplines and the teaching materials of Engineering and Science are relatively fixed due to the relatively fixed knowledge structure. Many updates are relatively slow, and it is normal for a textbook to be used for several years, or even more than ten years. One of the more commonly used textbooks in probability theory and mathematical statistics courses is the book by Mao Shisong[5] and others published by Higher Education Press in 2004. This book has been published for nearly 20 years, during which two The second edition adds some exercises and adjusts the order of explanation of some knowledge. The latest edition of the book is the third edition in 2016. As masters of statistics, Mao Shisong and others have written textbooks with a complete structure and prominent emphasis. However, due to the early writing and teaching, even if there is a reprint, the content of the new curriculum ideology cannot be reflected in the textbook.

The same is true for other mathematical statistics and probability theory textbooks. As a result, many of the current probability theory and statistics textbooks fail to highlight the characteristics of the times, and it is difficult to implement the teaching reform of political courses. [6] In fact, it is not only the courses of probability and statistics, but there are basically very few textbooks that can reflect the ideology and politics of the courses in the entire Engineering and Science field.

4.2. The ideological and political quality of teachers' courses is weak

Course ideology have put forward higher requirements for all teachers, not only to master the professional knowledge of relevant subjects, but also to have a certain political literacy, but also to organically combine ideological and professional course content to improve Things are silent, so that students can also get political education in the study of professional courses. For college teachers in mathematical statistics and probability theory, they are basically from statistics-related majors or statistics in mathematics. Professional knowledge and There are no problems with the education of this course. But they only have a little understanding of the content, concept and form of political education. In teaching, it is often difficult to reflect ideological and content in professional classroom teaching such as mathematical statistics and probability theory.

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4.3. Constraints of traditional teaching methods

In the teaching of the new era, the main body of students is emphasized, and students are required to be the main body of teaching and classrooms. However, in traditional teaching, mathematical statistics and probability theory courses are still dominated by the teaching method of full teachers, lacking Teacher-student interaction, teachers teach knowledge, students learn knowledge, students lack reflection, and classroom participation is low. [7] In classroom teaching, it is not centered on the learning of students, but on the teaching mode of the teacher.

Mathematical statistics and Probability theory courses are inherently difficult to learn. In classroom teaching, many teachers have difficulty integrating the ideological content of the course into their teaching. Without paying attention to the emotional experience of students, it is difficult for students to deeply grasp the ideological content of the course. It is difficult to absorb valuable political content from probability theory and mathematical statistics classrooms. It makes it difficult for the ideology and politics of knowledge inheritance and educating people to exert its value of collaborative education.

4.4. The course assessment method is single

Course assessment is a common method to evaluate the teaching effect of a course, which has an important impact on teachers' teaching and students' learning. However, the assessment methods of traditional mathematical statistics and probability theory courses are relatively simple. Basically, students' final exam scores are used to explain problems, which are all professional knowledge assessments. There is a lack of assessment methods for the ideological content of the course. This also causes teachers to not pay attention to the reflection of curriculum politics in teaching, and students often neglect the study of curriculum politics and the content of humanistic feelings. Students focus only on formulas and theorems. The singleness of this assessment method also makes it difficult to carry out the political teaching reform of probability theory and mathematical statistics courses.

5. Reform strategies of ideological and political teaching in the course of probability and statistics

5.1 Construction of textbook resources

Textbooks are the basis for teaching, but the teaching of courses cannot rely solely on textbooks. For mathematical statistics and probability theory, some newly published textbooks have been combined with curriculum ideology and politics to launch integrated textbooks. However, these emerging textbooks are mixed, those that can be used and those that cannot be used, and need to be carefully identified.

On the basis of teaching materials, lecture notes and lesson plans should be formed, and a teaching resource library of probability theory and mathematical statistics should be constructed. Integrate traditional Chinese culture into each chapter module, improve students' cultural self-confidence, and deepen their understanding and recognition of the Chinese spirit. Only by integrating traditional Chinese culture, professional quality, and Embody socialist core values in teaching resource base, and combining mathematical statistics and probability theory knowledge with ideological and political education, can good teaching resources be made. Therefore, good mathematical statistics and probability theory ideological and political teaching materials are not just waiting for others to write and use them directly. You should use good mathematical statistics and probability theory teaching materials to generate ideological and political teaching resources suitable for your own knowledge reserve, in order to do a good job in political courses.

5.2. Cultivate the ideological literacy of teachers of mathematical statistics and probability theory

The teaching of ideology and politics requires that teachers of mathematical statistics and probability theory should not only be familiar with the professional course knowledge of mathematical statistics and probability theory, but also have the literacy of ideological and political education. It takes ten years to cultivate trees and a hundred years to cultivate people. It is not only students who need to continuously learn knowledge, but also teachers. Especially, many teachers of Engineering and Science lack humanistic literacy. Therefore, to create a professional teacher with political ability in the curriculum is imminent, it can mainly improve the political ability of teachers through training, learning, communication and other channels.

Sending training here means that teachers of Engineering and Science can be sent to participate in

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some training or conferences on political education of humanistic feelings. Through systematic training, teachers can master political ability of the course and do a good job in the political course. Some colleges and universities lack teachers and may not be able to send personnel for training. Then, they can continue to study through the mode of network resources to acquire the subject quality of political courses. Confucius said that if three people walk, there must be my teacher. The best political teacher in the course of ideology and politics is the best. The ancients said that people who study alone have no friends, and they are lonely and ignorant. Therefore, teachers of professional courses should communicate more with political teachers. Only by gradually understanding the meaning of curriculum politics in the communication can we gradually do a good job in curriculum ideology and politics.

Of course, teachers of Engineering and Science courses such as mathematical statistics and probability theory need to do a good job in course ideology and politics, not only the above three methods. Some colleges and universities have tried to let professional course teachers be part-time counselors, set an example, feel the political education work, and then feed back in the professional course classrooms, so that they can not only teach professional courses, but also do a good job in curriculum ideology and politics. That's a good try. In order to do a good job in political courses, we can continue to explore more ways for teachers of professional courses to improve their political abilities.

5.3. Construction of online and offline mixed teaching mode of mathematical statistics and probability theory

For mathematical statistics and probability theory, it is a basic core course of Engineering and Science. The traditional teaching mode of mathematical statistics and probability theory courses is traditional offline course teaching. In order to do a good job in the political education of this course, this course can build a hybrid teaching mode of online and offline.[8] The combination of modern educational technology and traditional teaching methods can broaden the teaching path of mathematical statistics and probability theory.

Mathematical statistics and Probability theory courses, there are many electronic resources in Chinese college students MOOCs, Chaoxing Learning Platform, Xueyin Online and other online platforms. However, these resources on the Internet not match the offline teaching resources of teachers themselves. Many of the resources on the Internet are almost all about professional knowledge of courses, and few of them involve the ideological and political content of this course. Online electronic resources can be used as a reference, but it is often difficult to use them directly. Therefore, the teaching resources in the online and offline teaching mode all need to be developed by teachers themselves. Blended teaching models also require teachers to integrate themselves. Specifically, offline teaching should generally be used as the main teaching mode of mathematical statistics and probability theory. The overall knowledge structure also needs offline courses to be taught. Some course ideology and politics should also be done in the offline classroom. However, due to the limited duration of the course, it is difficult to open up some issues. And for the overall teaching effect, online teaching is needed as an auxiliary means. Some professional knowledge points and course ideological and political points that are not fully developed in the classroom can be made into online teaching resources. It can allow students to chew repeatedly in advance preview, after-class review, and breakthrough of knowledge points. It forms an organic closed loop with offline courses. In this way, the online-offline hybrid teaching mode broadens the teaching platform for teachers. It can have a more effective effect and can better adapt to the promotion of the political teaching reform of the curriculum.

5.4. Improve the assessment methods of mathematical statistics and probability theory courses

As a professional course, mathematical statistics and probability theory are traditionally assessed by closed-book examination as the assessment result of the course. This method only examines the students' mastery of the professional knowledge of mathematical statistics and probability theory, and lacks a comprehensive assessment of the course learning, as well as the assessment of the political content of the course.

The assessment of the course plays a very important guiding role in the classroom teaching. Therefore, in order to do a good job in the ideological and political reform of mathematical statistics and probability theory courses, it is not enough to start with teaching material resources, teacher quality, teaching methods and other means. Of course, mathematical statistics and probability theory are professional courses, and closed-book examination results are still essential to the assessment of knowledge. In addition, it is also possible to design a comprehensive evaluation of the usual and roll surface according

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to a certain proportion. The assessment of university courses must focus on procedural assessment. Therefore, in the process of course study, students' emotions can be tracked by writing their learning experiences, and the content of course political assessment can be reflected in the students' learning gains. Based on the characteristics of mathematical statistics and probability theory courses, students can also complete experimental operations before the end of the term. Form a test report, complete the test by yourself, deepen the sense of knowledge acquisition, and also allow students to write a short paper on mathematical statistics and probability theory before the end of the semester. The subject essay is an exploration and sublimation of the course study. In order to write a good subject essay, students must consult a lot of professional knowledge reference papers and course ideological and political articles in the discipline. By writing a subject essay, they can also evaluate the effect of classroom teaching and the effect of course politics. As long as the assessment of the course pays attention to the usual process assessment. The final course assessment is a matter of course. In the comprehensive assessment, both the procedural evaluation and the conclusive evaluation are emphasized. The combination of the two achieves the dual effect of knowledge assessment and curriculum ideological and political assessment.

6. Conclusion

Curriculum ideology and politics is an important direction of the current teaching reform in universities. Not only teachers of mathematical statistics and probability theory, but also teachers of other disciplines should change their concepts in time and actively participate in the reform of curriculum political teaching. Ideological and political education is very important in both specialized and non-specialized courses, and all courses should do a good job in curriculum ideological and political education, so that the effect of interaction will be more obvious.

In the teaching of mathematical statistics and probability theory, high-quality course political teaching resources must be constructed, the course political quality of professional course teachers should be improved, an online and offline mixed teaching model should be constructed, and a comprehensive assessment and evaluation mechanism should be established.

Of course, curriculum politics is also a long-term task, and it cannot be accomplished overnight. The teaching reform must be carried out step by step. Let schools also attach importance to curriculum politics from the institutional level, and build an institutional guarantee for curriculum political teaching reform. Students are changing, their learning conditions are changing, and only continuous teaching reform in curriculum politics can achieve good teaching results.

Acknowledgements

This work was financially supported by Sichuan Minzu College 2021-2023 Higher Education Talent Training Quality and Teaching Reform Project "Probability Theory and Mathematical Statistics Online and Offline Course Construction and Application", project number JG202147.

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