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Teaching Reform of Probability Theory and Mathematical Statistics in Applied Universities

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Abstract: "Probability Theory and Mathematical Statistics" as the refinement branch of mathematics courses, has a very wide application in daily production and life practice, so the education sector also incorporates this discipline into the compulsory course of the management and its related disciplines.The main principle of this course is to take some random phenomena in nature as the research object, study the occurrence probability of some random events, and work out certain statistical rules based on the probability.

Keywords: Applied University; Probability Theory and Mathematical Statistics; the Teaching Reform

Introduction

Applied education is proposed by the Ministry of Education in order to speed up the process of technical education. With the advancement of higher education from elitism to popularization, a new teaching mode emerges at the right moment."Probability theory and Mathematical Statistics" is one of the courses, mainly based on "Calculus", "linear algebra" and other courses teaching, after mastering the basic theory of some probability problems calculation.The teaching purpose of this course is to cultivate students' ability to solve practical problems with their professional knowledge.However, in this course, the partial emphasis of probability theory and mathematical statistics is also different. Probability theory is more inclined for students to establish mathematical model first, then use it to carry out theoretical derivation, and finally summarize the corresponding laws. Mathematical statistics, on the other hand, is more inclined to the processing of basic data, analyze the collected data and draw conclusions, and then apply the conclusions to reality.

1. Problems encountered in teaching

1.1 Too much emphasis on theoretical teaching

When many colleges and universities open this course, there are no relevant talents and materials for reference, so they can only learn from the experience and teaching methods of other schools when opening this major, most of which are the teaching ideas and teaching methods of science and engineering colleges and universities.The core of probability theory and Mathematical Statistics is that both theory and practice are indispensable. On the one hand, students should be able to master relevant theorems and formulas, and on the other hand, they should apply them to practical problems.In the previous teaching of this subject, due to too much emphasis on theoretical knowledge, only let students master relevant knowledge and theorems, and then familiar with some common case analysis, but in the long-term practice, the effect is not optimistic. If we want to explore the reasons, the first reason is that students' poor foundation leads to the weakness of mathematics-related theories, so the ability of calculation and modeling is not enough to match the learning of the course, and the second reason is that the teaching methods and models do not adapt to the subject.The course of Probability theory and Mathematical Statistics is very practical, but as far as the current situation is concerned, colleges and universities attach too much importance to the teaching of theoretical knowledge, but violate the fundamental principle of application, which is the fundamental reason for the unsatisfactory course effect.

1.2 The teaching form and content are too single

At present, the general textbook of probability theory and Mathematical Statistics is very strong in theory, and the starting point is relatively high, which leads to some students with low scores when they enter the school unable to adapt to the situation of the textbook. There is also the problem of teaching hours set up by some colleges and universities, leading to some content in the textbook is not involved at all, so the teaching content is not optimistic.

The course probability theory and Mathematical Statistics includes two parts of probability and statistics. The knowledge is very complicated, but in actual teaching, the teaching content of this part of knowledge is too monotonous. Not only that, in the process of teaching, teachers also pass on all knowledge points to students by means of lecturing. Therefore, students have been passively accepting knowledge in the process of learning, and there is no real internalization of knowledge. In the process of practical application, they lack the ability of independent thinking and cannot solve practical problems at all. In the long run, students will naturally have disgust or even resistance to the course.

1.3 Unsound assessment

The way to take the assessment is to take the previous tradition. The test questions out of the teacher are also issued on topic templates given by the Academic Affairs Office. The proportion in the topic is also Subjective Questions, and Objective Questions is less.However, the application of hypothesis testing and variance analysis is very strong in the process of practical application, and a large amount of data processing will also be involved in the topic. Obviously, it is very difficult to process these data in closed-book examination.And in the process of actual teaching, the school does not set up corresponding experimental courses, but simply let students understand the meaning of experiments, and students' ability to solve practical problems by using theories can not be improved naturally. Therefore, the core of this course assessment should be moved to practical operation ability.

2 Analysis of teaching reform methods

2.1 Optimize the classroom teaching form

Optimization of classroom teaching form, the first is to stimulate students' interest in learning, especially some liberal arts students to overcome the fear of learning mathematics psychology. Teachers should create a relaxed and pleasant teaching atmosphere, combine the explanation of concepts with their backgrounds, step by step, and stimulate students' learning motivation. In addition to the theoretical explanation, teachers can also organize students to have group discussions within the class, and members of the team can explain to each other, so as to truly internalize knowledge. For some simple theoretical knowledge learned in high school, teachers can encourage students to step onto the platform bravely, express their understanding and share their experience with others, so that every student can become the teacher of others.

2.2 Improve classroom teaching content

The knowledge of probability theory and Mathematical Statistics is very large and complicated, which requires teachers to sort out the knowledge and help students to establish clear learning goals. Because the teaching hours of each semester are very limited, and so much knowledge needs to be taught, it is difficult for many teachers to explain the knowledge thoroughly at present, and students are also in a state of half-understanding. Combined with the past teaching experience, most teachers pay too much attention to the teaching of theorems and formulas, but there are few practical applications, and even some theoretical knowledge is beyond the scope of acceptance of students at the present stage.So if we want to change this situation, the first thing we need to reform is what we teach. Under the general trend of the promotion of application-oriented thinking, colleges and universities should appropriately delete some theoretical knowledge that does not conform to the current law of students' acceptance, add more examples, and put some contents in the current teaching materials in the elective part. Additionally be in the arrangement of school hours, want to take out a part to give actual operation. In the final assessment, we should also change the current situation of objective questions, and increase part of the subjective questions,

especially the content related to calculation.

2.3 Introducing example teaching

The ultimate goal of applied subject is application, "Probability theory and Mathematical Statistics" is such, so example teaching is very important.Practical teaching, as its name implies, takes practical examples as teaching means and strengthens students' understanding and mastery of theoretical knowledge by guiding students to analyze practical problems.The study of this course is to better serve life, so it is not advisable to separate teaching from practical problems. In the selection of examples, teachers can choose some content that students are interested in as far as possible, so as to cultivate students' interest in learning to the greatest extent.In a word, the introduction of example teaching can make students' thinking closer to solving problems, improve their learning efficiency, and avoid the passive status of students in the learning process, so that students can really integrate into the classroom and learn knowledge.

2.4 Give full play to the advantages of network resources and enrich teaching methods

Now is in the era of big data, so teaching should also make full use of this tool, give play to its advantages and create convenience for teaching. The development of technology has become the driving force for the reform of traditional teaching methods. Teachers can use videos or dynamic diagrams to present problems that previously needed to be solved by drawing.At the same time, MOOC and micro-courses and other resources have quietly emerged on the Internet, enriching students' access to knowledge, but it is also a big impact on traditional teaching. Some students find it difficult to distinguish good teaching from bad, so the teaching resources on the Internet bring some negative effects. Despite the impact on the traditional classroom, teachers should not reject these resources. On the contrary, they should supplement the in-class knowledge. Teachers can focus on the focus of knowledge in class, and let students choose the other part of the content as extracurricular resources according to their own ability.

3. Conclusion

The study of probability theory and Mathematical Statistics is not only a theoretical course, but also a practical course, so the teaching quality has a very important impact on the solution of practical problems. The above paper puts forward the current problems on the current teaching situation, and puts forward corresponding solutions according to these, to improve students' ability to solve practical problems based on reality.

References

[1] Hu, J.L., Teaching Material Reform and Application of Mathematical Model in Probability Theory and Mathematical Statistics under the Background of combination of work and Study [J]. Journal of Higher Education, 2019 (10).

[2] Ding, G.Y., Liu, H., He, X.Q., et al. Thoughts on the teaching reform of Probability theory and Mathematical statistics [J]. Contemporary Education Practice and Teaching Research, 2017 (5).

[3] Yang, W.X., He, L., Liu, Y., Reform and Practice of Engineering Mathematics Curriculum Group Teaching under the Background of new Engineering: A Case study of Wuhan University of Technology [J]. College Education, 2020 (1).

[4] Hao, R.L., Wang, X.S., Discussion on teaching Reform of Economics and Management course Probability Theory and Mathematical Statistics[J]. Education Reform And Innovation, 2012:55 -56.

[5] Li, Q.Y., Thinking on constructing Integrated Ecological Chain of Higher Mathematics Curriculum Construction [J]. Journal of Chongqing University of Science and Technology (Social Science Edition), 2019 (1).