

Discussion on Online Teaching Mode in the Information Age—Taking "Probability Theory and Mathematical Statistics" as an Example

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Abstract: The study of basic courses is an important part of cultivating innovative talents in colleges and universities, and probability theory and mathematical statistics is one of the contents of basic courses. It is mainly to conduct a large number of observations on various random phenomena to obtain corresponding knowledge, and can form certain laws from a quantitative perspective. It is a required course for engineering majors that combines theory and practice. This paper discusses the problems existing in online teaching, the analysis of online teaching mode and the online teaching mode in the information age, hoping to improve the effect of probability theory and mathematical statistics teaching, so as to promote the all-round development of students.

1. Introduction

With the continuous development and progress of modern information technology, online teaching has gradually become the main form for teachers to carry out teaching activities. Probability theory and mathematical statistics are important contents of teaching activities in colleges and universities. There are still some problems and obstacles in the implementation of online teaching mode, and the course content is difficult, resulting in many students unable to learn and understand the content in depth. In the information age, colleges and universities can fully integrate and utilize various data resources, analyze according to the practical characteristics of probability theory and mathematical statistics, and constantly seek and explore more teaching forms, so as to promote the development of probability theory and mathematical statistics teaching in colleges and universities.

2. Problems in online teaching

2.1. Lack of conditions for online teaching platform

The development of online teaching activities is mainly based on electronic equipment, and also depends on the quality of the Internet and network. A small number of students in some schools do not have computers, and some students in rural areas have poor network signals, especially in the teaching peak, which is relatively serious, and the effect of online teaching has been directly affected. The logic of courses such as probability theory and mathematical statistics is relatively strong, and

the links between each chapter are relatively close. If some students fall behind the content of classroom teaching due to network problems, this will also have a great impact on the following courses.[1] Therefore, the relevant facilities required by the online teaching platform can directly affect the effect and efficiency of students' learning of course content.

2.2. Lack of online teaching experience

Many teachers and students have access to online teaching platforms only during the epidemic, so they are not skilled in using relevant facilities. Courses such as probability theory and mathematical statistics are carried out through online teaching platform, which is relatively special. Moreover, many reasoning processes cannot be demonstrated in front of students. This process of online teaching requires constant run-in and adaptation between teachers and students. There are also some students who lack autonomy in online learning and can't deeply participate in classroom teaching activities for learning, so they are prone to drift away when learning, and will unconsciously use classroom teaching time to do other things, thus reducing the effect of online teaching[2].

2.3. Formalism is obvious

When preparing for online teaching, some teachers tend to have a negative and coping mentality because of their hasty preparation and lack of experience in online teaching. Moreover, the enthusiasm and efficiency of students' active participation in learning are low. Although most students can actively participate in online learning, some students are not interested in and enthusiastic about this abstract course, which leads to some problems in later learning and understanding, and even give up this course with a negative attitude. The teaching form used by teachers in teaching is relatively simple, and students can only passively listen to the knowledge points that are difficult to understand by teachers, resulting in some students having a bad attitude to cope with the exam.

3. Analysis of online teaching mode

3.1. Preparation stage

Teachers need to make pre-class preparations in advance when teaching activities are suitable, analyze the teaching progress and outline, and understand the teaching platform. They also need to select the most suitable teaching software for teaching, use the form of QQ groups to give feedback on students' learning, and understand students' suggestions for online teaching activities. Teachers need to publish the links of learning, the methods of participating in classroom learning and the specific time of class in advance. The teacher modifies the content of the courseware according to the teaching content and characteristics of this class, and arranges the teaching steps and methods. It also requires careful design and formulation of homework to enable students to participate in classroom learning more efficiently.[3]

3.2. Arrangement of curriculum resources

Although there are very rich curriculum teaching resources on the network, the fragmentation phenomenon is relatively serious. Therefore, when carrying out online teaching activities, teachers should analyze the curriculum settings and the actual situation of students, so as to sort out the curriculum resources suitable for students. When arranging the resources related to the course, teachers include the courseware, syllabus, calendar, etc., which should be consistent with the content of this course. In addition, teachers need to make the content of classroom exercises and tests, prepare

the topics and topics to be discussed in class in advance, and properly introduce the resources on the network into classroom teaching activities, so as to broaden the teaching content and improve the effect and efficiency of classroom teaching.

3.3. Implementation phase

When carrying out online teaching, teachers need to make systematic design according to the actual situation of students and the characteristics of courses. Online teaching is a relatively special form of teaching. Teachers and students cannot communicate and discuss face to face, nor can they directly manage and supervise students. Some students with low self-discipline are easily affected. They need to analyze according to the characteristics of online teaching and probability theory and mathematical statistics, and explain the key content through case analysis, so as to help students build their own knowledge structure and system. Students can arrange their learning time according to their own conditions, in order to achieve the layered effect and goal.

3.4. Development after class

On the basis of arranging traditional after-class exercises, teachers should also collect relevant examples according to the teaching content, let students analyze and discuss relevant cases in the form of groups, and encourage more students to actively find out the problems themselves, as well as actively participate in the study, so as to guide students to summarize and summarize the contents learned, and improve students' ability to summarize. The question bank can be established according to each unit. After learning the knowledge of the unit online, students can test by themselves, so that they can more directly understand their learning about the knowledge points. Comprehensive assessment of students through multiple forms of assessment can promote students' more comprehensive and long-term development.

4. Online teaching mode in the information age

4.1. Diversified teaching methods, giving full play to the advantages of online teaching

Different teaching platforms have their own advantages and advantages. When online teaching is conducted through Tencent classroom, video teaching has a good effect. When online teaching is conducted through Learning Pass, screen recording and online and offline communication have a good effect, and the information provided is also very rich. Therefore, when carrying out online teaching activities, we can combine various teaching platforms with the actual situation of students and the characteristics of probability theory and mathematical statistics, so as to give full play to the strengths and advantages of various teaching platforms.

For example, when carrying out the online teaching of "probability theory and mathematical statistics" course, online and offline teaching can be combined to carry out the course teaching in a mixed teaching form. Blue Ink Cloud Class is a software that can interact freely. It incorporates artificial intelligence and other technologies, and is also a very intelligent and convenient teaching tool. This software is formed under the environment of the Internet. It can enable teachers and students to interact in real time, push relevant learning materials and assignments, so that more students can learn on this platform, and the records of students' learning on the platform will also be presented in time, so that students can assess the whole learning process, which is extremely beneficial to the teaching of probability theory and mathematical statistics. Through the adjustment of online teaching mode, the teaching effect of probability theory and mathematical statistics course can be improved, and students can participate in classroom learning more actively.

4.2. Giving full play to the main role of students and improving the ability of online learning

The final effect of online teaching is closely related to students' autonomous learning. Students have always been the main body of their own learning. Therefore, when conducting online teaching, teachers can strengthen and guide students' thinking, thus mobilizing students' enthusiasm and interest in in-depth learning. In the process of carrying out online teaching, it is necessary to improve the effect of online teaching by strengthening students' independent learning mentality. For probability theory and mathematical statistics, which are more abstract and logical, we should not adopt indoctrination.

For example, we can take the first chapter of "probability theory and mathematical statistics" as the main object for research, and focus on the teaching of "total probability formula and Bayesian formula". In combination with the syllabus and requirements of the course teaching, we can constantly refine each link of the teaching, consolidate and review the nature of probability, conditional probability and multiplication formula when carrying out teaching activities, and quickly learn these formulas. In this teaching mode, when the first class begins to carry out the experiment, each test link can find some students who have not done the experiment, and the answers obtained are not too different, which can also well explain that students cannot understand these formulas in depth, so teachers need to understand the reasons why students cannot understand them in depth. We should find out the problems through continuous understanding, and explain the contents in detail in the subsequent classroom teaching to improve students' mastery of the formula.

4.3. Building a professional teaching team and carrying out practical teaching in combination with the curriculum

There is a great difference between online teaching and traditional teaching forms, so the requirements for teachers are also higher and higher. In order to carry out teaching activities more efficiently and smoothly, colleges and universities can regularly carry out professional training for teachers, so that teachers can use various teaching software more skillfully, so as to continuously improve teachers' ability to use the Internet to carry out teaching activities, and form a professional teaching team. When online teaching, it is necessary to take improving students' ability as the main goal and direction, and the students can continuously improve their practical ability.

For example, when carrying out online teaching activities, teachers need to have relatively professional teaching ability and technology. Probability theory and mathematical statistics are relatively abstract and difficult to understand. Teachers need to fully understand and master the actual learning situation of each student, and should also solve and adjust various problems in the process in a timely manner. At the beginning of the online teaching mode, one of the main problems was that it was stuck, because there were more students online and watching at the same time, and some students might be difficult to open it, or could not refresh it normally, resulting in students unable to watch it normally. When these problems occurred, we can transfer the teaching to other teaching platforms, and ensure the normal operation of online teaching through screen sharing and voice. Probability theory and mathematical statistics contain knowledge points with high difficulty, which leads to some students' fear and abandonment of the course content. Teachers can appropriately add some simple topics to improve students' enthusiasm for in-depth study and exploration.

4.4. Reform of teaching methods to meet new needs

When teaching probability theory and mathematical statistics courses through online teaching mode, teachers should abandon the previous theory-based concepts and models, make good use of modern information technology means, and apply various technologies and resources on the network

to teaching, in order to actively learn and explore teaching methods and means suitable for students, optimize and reform teaching means. In order to meet the needs of the society and every student in the information age, the teaching of probability theory and mathematical statistics can be continuously developed and improved.

For example, we can build some web pages related to the course of probability theory and mathematical statistics, and design some links to relevant knowledge and reference materials. On this web page, teachers can regularly publish information and content related to the course. We can also extend the knowledge points taught by teachers in the classroom to extra-curricular learning through the home page and mailbox of the course, and assign some related assignments to expand the face-to-face teaching form of teachers and students into the field of network. Not only that, teachers can also continue to strengthen the teaching software, combine the classroom with the network, and use Excel, R, MATLAB, SPSS and other software for online teaching. We can also publish the videos and links related to the course to the web page, and arrange some post-class case analysis questions, so that students can consciously lead the exploration, solve various problems with the help of teaching software, or let students participate in the data collection process, so that students can more deeply understand and understand the content and importance of probability theory and mathematical statistics.

5. Conclusion

In a word, online teaching mode is a new form of education, which is formed on the basis of traditional teaching and conforms to the development of the times. The quality and efficiency of course teaching can be improved through the use of modern information technology. The discussion of online teaching mode is very helpful to the development of probability theory and mathematical statistics in colleges and universities. It needs colleges and universities to continuously adjust and optimize the online teaching mode, so that it can play an important role in teaching activities. It is necessary to give full play to the advantages of online teaching mode according to the actual situation of students, so as to improve the learning effect of probability theory and mathematical statistics.

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