Received: 11 April 2022 | Revised: 20 April 2022 | Accepted: 30 May 2022 | Published online: 17 June 2022

RESEARCH ARTICLE

Research on Mixed Teaching Mode of *Discrete Mathematics* under Epidemic Situation

Contemporary Education and Teaching Research
2022,Vol.3(2)39-40
DOI: 10.47852/bonviewCETR2022030204

BON VIEW PUBLISHING

Min Huang[1,*] and Yongle Yu[2]
[1]*Information science institute, Guangzhou Xinhua University, China*
[2]*Software institute, Shenzhen Institute of Information Technology, China*

Abstract: *Discrete Mathematics* is a required course for students majoring in computer and its related majors. This course is the theoretical basis of students' learning algorithm research and plays a key role in professional learning. However, the learning content of this course is complicated and difficult, which requires students' theoretical basis and practical skills. Influenced by the epidemic situation, many colleges and universities adopt online teaching mode. Under the background of the epidemic situation, discrete mathematics is taught by mixed teaching mode, which has achieved good results. This paper will study the mixed teaching mode of discrete mathematics under the background of epidemic situation, in order to provide more beneficial reference for the teaching of discrete mathematics.
Keywords: epidemic situation; discrete mathematics; blended teaching

1.Introduction

Discrete mathematics mainly studies the structure of discrete quantities and their relationships, and it also plays an important role in computer science and technology. It is a required course for computer majors, and it is also the basis of learning contents such as artificial intelligence and data structure(Lu et al., 2020). Discrete mathematics has a high degree of abstraction, which can effectively train students' reasoning ability and logical thinking. Moreover, this course has high requirements for students' theoretical basis and practical ability. Teachers should innovate the teaching mode according to the course attributes and improve the teaching efficiency. The mixed teaching mode breaks the single offline teaching mode, gives full play to the advantages of information technology in the teaching field, and can effectively improve the teaching quality.

1. The necessity of mixed teaching mode of discrete mathematics

In recent years, affected by the epidemic situation, offline teaching of many college courses was interrupted, and online teaching was adopted instead. In fact, the flipped classroom has been constructed and implemented in many colleges and universities in recent years, and achieved good teaching results. With the support of modern science and technology, the teaching mode has also changed, from a single offline teaching mode to an online and offline mixed teaching mode, which can give full play to the advantages of information technology. Teachers can directly synchronize information to students, so that students can preview independently in advance and improve teaching efficiency. There are many definitions and concepts of discrete mathematics, and their contents are generally abstract, which is not conducive to students' learning. If a single offline teaching mode is adopted, students will easily lose interest in learning, resulting in resistance, which is not conducive to classroom teaching(Zhai, 2021).

In the teaching of discrete mathematics, teachers can innovate the teaching mode and adopt the strategy of online and offline mixed teaching to help students learn the course content more deeply and improve their interest in learning. The combination of online and offline teaching methods requires teachers to select the teaching content, and some contents related to the understanding of concepts and definitions require teachers to adopt traditional offline teaching methods, so that teachers can adjust the teaching progress in time according to students' classroom responses. For example, in the teaching of mathematical logic, concepts and definitions need to be taught in traditional ways. While some easy-to-understand teaching contents, such as relevant knowledge collected, students have already learned relevant contents in advanced mathematics, so it is easier to learn. Teachers can distribute this part of the network materials to students, so that students can preview independently, directly teach the important and difficult points in the classroom, optimize the allocation of teaching resources, and create an efficient classroom.

2. The strategy of discrete mathematics mixed teaching

3.1 Self-preparation before class

Discrete mathematics is generally offered to freshmen and sophomores in colleges and universities. College students are adults and have certain autonomous learning ability. Therefore, teachers can send some classroom-related videos or online resources to students in advance, so that students can preview independently before class, and have a general understanding of the teaching content first. In addition, with some simple and easy-to-understand contents, students can absorb and digest them in advance through self-preview, saving time in class. Affected by the epidemic situation in COVID-19, many colleges and universities have experienced offline suspension of classes. In response to the policy call of suspension of classes and non-stop learning, Discrete Mathematics has also begun to innovate and reform the teaching mode, making full use of the mixed teaching mode to implement the teaching during

Corresponding Author: Min Huang
Information science institute, Guangzhou Xinhua University, China.
Email: 635297362@qq.com

the epidemic prevention and control period. Discrete mathematics content is abstract, which requires students' logical thinking ability. If students can preview independently in advance, the efficiency of classroom teaching will be greatly improved. Discrete mathematics includes set theory, graph theory, algebraic structure, mathematical logic and so on. The loose system among these chapters puts forward higher requirements for teachers. Taking the teaching of set in discrete mathematics as an example, teachers can distribute teaching videos to students before class through software such as massive open online course, Rain Classroom or Superstar Learning. This part of the content has a certain foundation for students, so the difficulty coefficient of learning is not large. Moreover, the online video teaching method can meet the individual needs of students with different foundations, and it is also conducive to students' repeated review, thus improving their autonomous learning ability. Online teaching video has vivid and rich characteristics, which is a good choice for college students with strong self-control ability, and also plays an important role in the teaching of discrete mathematics.

3.2 Answering questions in class

The mixed teaching mode can make the classroom teaching of discrete mathematics more efficient. Teachers can make targeted teaching according to the doubts and difficulties of students' preview before class. Moreover, after students preview independently, they have a general understanding of the teaching content, can actively participate in classroom interaction, give full play to students' subjectivity, and build a new type of efficient classroom. In the traditional single-line and offline teaching mode, in order to save the course time, teachers often use the way of teachers' lectures and students' lectures. This kind of teaching ignores students' thinking and expression in class, which is not conducive to cultivating students' core literacy. Because the content of discrete mathematics is scattered and abstract, only relying on classroom teaching can not make students master the teaching content in depth. However, if students use online resources to preview in advance, the classroom effect can be improved, and students can be encouraged to ask questions and solve problems actively in class. In the question-and-answer session in class, teachers can arrange several discussion questions in the self-study stage, so that students can answer them in class or have group discussions. For example, when teaching the content of graph representation, teachers can create situations for students in the self-study session, let students draw adjacency matrices, and let students judge whether it is a directed matrix or an undirected matrix, so as to deepen their knowledge and understanding of concepts, and encourage students to actively express themselves in class, and supplement their answers to dispel doubts, effectively use classroom time, improve teaching efficiency, and train students' logical expression ability.

3.3 Consolidation and promotion after class

Discrete mathematics has many teaching contents and high difficulty coefficient, so it is very important to consolidate and upgrade after class. In the traditional teaching mode, teachers usually assign homework after class to help students consolidate and review. In the single offline teaching mode, the homework assigned by teachers is often after-class exercises or other paper homework, and students' practical ability cannot be improved. Discrete mathematics requires students' practical ability, and the mixed teaching mode can make up for this defect. In the blended teaching mode, teachers can arrange some exercises after class, including practical exercises such as computer operation, so that students can submit their homework in online software such as Superstar Learning or Rain Classroom, which is also beneficial for teachers to correct and consult(Lu et al., 2020). In addition, teachers should assign different types of homework according to the class content, one is to consolidate the theoretical knowledge in class, and the other is to apply the knowledge in practice. For example, when teachers are teaching set theory, equivalence relation and division are important teaching contents, so that students should not only learn to use equivalence relation to classify sets, but also exercise their ability to apply knowledge. The teaching goal of paying equal attention to knowledge and practical skills requires teachers to arrange homework by category. One kind can review the basic knowledge of the concept and definition of equivalence relation, and the other kind requires teachers to train students' practical ability of knowledge application. For example, teachers can let students collect and sort out the application of equivalence relation in daily life or computer science(Zhang et al., 2021), help students achieve consolidation and promotion after class, and strengthen their ability to understand and apply knowledge.

3. Conclusion

To sum up, under the background of epidemic situation, blended teaching has become a necessary teaching mode for discrete mathematics, which is conducive to targeted teaching for teachers, improving students' autonomous learning ability, creating efficient classrooms and improving teaching efficiency. In order to effectively promote the implementation of the mixed teaching mode of discrete mathematics, teachers can optimize the mixed teaching of discrete mathematics through the following ways: distributing teaching videos before class, so that students can preview independently; Students are encouraged to express themselves actively and answer questions pertinently in class; Assign homework after class to help students consolidate and improve.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

References

Lu, Q., Li, J., & Guo, T. (2020). Research on the blended teaching mode of “discrete mathematics” oriented by ability training. Computer Knowledge and Technology, 2020(06), 123–125. https://doi.org/CNKI:SUN:DNZS.0.2020-06-055

Zhai, L. (2021). Exploration of “Discrete Mathematics” course teaching under mixed teaching mode. Wireless Internet Technology, 2021(12), 140–141.

Lu, Q., Li, J., & Guo, T. (2020). Research on the blended teaching mode of “discrete mathematics” oriented by ability training. Computer Knowledge and Technology, 2020(06), 123–125. https://doi.org/CNKI:SUN:DNZS.0.2020-06-055

Zhang, S., Niu, L., & Yang, D. (2021). Exploration of Blended Teaching Method of Discrete Mathematics Course in General Engineering Colleges. Heilongjiang Education (Higher Education Research and Evaluation), 2021(02), 18–20