

Practice Research of Online Course of Linear Algebra Based on Chaoxing Fanya Platform

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Abstract: Based on the course information, classroom teaching, homework exercises, online testing and other teaching modules of the Chaoxing Fanya Learning platform, this paper constructs teaching resources such as courseware, micro-class videos and self-examination question banks such as homework exercises and online tests, which promotes the diversification and practicability of linear algebra teaching. Students can preview, practice and review through the platform; Teachers can track and understand students' learning through the platform, so as to better teach. Through the analysis of students' learning effect, it is found that this kind of online and offline blended teaching mode has improved students' learning performance, and has been recognized by students.

Keywords: Chaoxing Fanya platform; Linear algebra; Curriculum practice; Online course

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1. Introduction

During the epidemic period from 2019 to 2022, due to the inability to carry out traditional teaching, in response to the requirements of the Ministry of Education and the requirement of "suspend classes, but learning, suspend classes, but teaching" of schools, and in response to the special situation of only online teaching, the linear algebra teaching team formulated teaching plans, course resources, assessment methods, and curriculum frameworks that meet the characteristics of online teaching. The online course of linear algebra is established by using the of "Chaoxing Fanya Learning platform". The aim is to build a high-quality linear algebra online course through the joint efforts and struggles of team teachers, to provide students with a better learning and service platform, so that students can learn efficiently.

2. Problems Existing in the Construction of Linear Algebra Online Course in Our School

At present, there are still many problems in the construction of linear algebra online courses. Firstly, there is no systematic and comprehensive online learning platform; Secondly, students lack energy and effort in their spare time, resulting in fewer exercises; Thirdly, there are fewer test questions in the section on linear algebra, which does not fully grasp the students' mastery of the knowledge they have learned; Fourthly, informatization of teaching methods need to be further improved, and the construction of linear algebra test question banks needs to be carried out.

In order to solve the above problem, this paper deepens the reform based on the existing teaching methods and practices of linear algebra courses. According to the characteristics of post-90s college students who are adept at accepting new things, learning new things, and using new platforms from the internet, utilizing Chaoxing Fanya platform and fully tapping into platform modules and building modules such as course information, classroom teaching, homework exercises, online testing, and online Q&A, we aim to promote the diversity and fun of linear algebra classroom teaching, enhance the depth and breadth of classroom teaching, and enable students to easily learn from multiple dimensions, and improve their learning efficiency and academic performance.

3.Organization and Construction of Online Courses

3.1 Overall design of online courses

Compared with traditional offline courses,linear algebra online courses take different ways in terms of learning methods and homework.According to the teaching arrangement,the traditional offline linear algebra course has 4 class hours per week;However,for online teaching,students'learning time is relatively flexible,so with the help of Chaoxing Fanya learning platform to upload course resources in advance for students to preview,study,review,no matter when and where students can want to learn to learn,want to practice to practice.These course resources mainly include:electronic textbook content,teaching PPT,teaching video,homework,teaching syllabus,teaching calendar and so on.Through independent learning before class,students can have a certain basic understanding of what they have learned,so that they can find which knowledge point they do not understand thoroughly and which knowledge point is easier to understand.They can carry out targeted learning according to their own situation in the later study of online live teaching courses.

3.2 Online teaching tests and assignments

In order to enable students to self-test the learning effect and accurately recognize their shortcomings,corresponding homework,chapter tests and mock exams are designed.

Homework is released after students have learned the knowledge points of each class.Homework is mainly divided into four types:multiple-choice questions,fill in the blank questions,comprehensive questions,and calculation questions.The number of questions will vary from 4 to 10 depending on the content of the chapter.The difficulty of the question type matches the content of the knowledge point,and also adapts to the learning characteristics of the students in our school.Different from the traditional offline homework,students can see the problem analysis after finishing their homework,students can correct their mistakes in time according to their own problems,and students can do the problems many times to consolidate the knowledge they have learned.

Chapter tests are published after learning the content of each chapter.The purpose of chapter test is to check students'grasp of the key contents of the chapter.The type of question is the same as the usual homework,and the difficulty level is moderate.In order to ensure students'enthusiasm and initiative in learning,and also ensure that students can check their mastery of knowledge points,students can choose the appropriate time to test according to their actual situation.At the same time,students can repeat test exercises on different knowledge points according to their mastery of knowledge points,so as to deepen their understanding of what they have learned.

4. Online Assessment for Online Courses

The assessment is mainly based on the students'usual grades and the situation of the final exam,according to the ratio of 3:7.The final exam is conducted through the super star learning platform,and the question type of the paper is the same as the usual homework test,which is also divided into fill-in-the-blank questions,multiple choice questions,comprehensive questions,and calculation questions.These four question types are extracted from the established question bank in the early stage,in which the fill-in-the-blank questions,multiple choice questions and calculation questions are similar to the previous question types,and the comprehensive question is a newly established question type.

5. Evaluation of the Effectiveness of Online Courses of Linear Algebra

5.1 Student evaluation of online courses

Through the whole semester of online course learning,we can roughly see that good results have been achieved from the aspects of students'class activity,homework completion,homework accuracy and so on.In order to have a clearer understanding of students'use and satisfaction with online courses,questionnaires are set up from the aspects of students'learning situation and overall evaluation.Questionnaires are used to understand students'feedback on online courses.The respondents were students of the class of 2021.An anonymous questionnaire survey was carried out.A total of 400 questionnaires were sent out and 395 were collected,with a recovery rate of 98.75%.From the survey results,it can be seen that the use of online course teaching that combines Xuexitong has been recognized by students in terms of assigning homework and unit tests on the Chaoxing Fanya platform,helping with learning,promoting understanding of knowledge points,and automatic online assessment methods.

5.2 Teacher evaluation for online courses

Other teachers in the course group carried out the course teaching by using the online platform based on Chaoxing Fanya platform.The teachers all agreed that most students could complete the homework well,which enhanced the consolidation and understanding of students on each knowledge point,and at the same time,they could track the learning situation of students well,so as to better

supervise students' learning. It is conducive to the construction of good learning atmosphere and learning environment. Through class listening and teaching inspection, the school's supervisors believe that the linear algebra online course construction based on Chaoxing Fanya Learning Platform is relatively perfect, the course content is rich, and students can obtain convenient learning materials conveniently, which provides a good learning platform for students to learn whenever they want and practice whenever they want.

5.3 Score analysis of online courses

According to the assessment of the teachers of the course group, the knowledge and difficulty of the final exam of this semester are at the same level as the final exam of the previous year. At the same time, the scoring criteria of the final exam paper is consistent, and the way of Flowing grading paper is used to ensure the objectivity of the students' results. Compared with the previous year's student performance, it has credibility. Therefore, in order to compare and analyze the learning effect of students, we compare the final grades of students who did not use online teaching courses with the final grades of students who used online teaching. Through comparative analysis of test scores, it is found that the average score of the last year's final exam is 69.1 points, and the average score of the current year's students is 75.8 points. By analyzing grades at different stages, it was found that in particular, the number of students with scores of 80 and above has almost doubled compared to last year, while the number of students with scores of 60 and below has almost halved. In general, the number of people in the upper segment has increased, while the number of people in the lower segment has decreased. At the same time, the chi-square test of the data obtained the chi-square value $10.38 > 5.99$, indicating that the teaching effect of using online courses has a significant impact on students' achievement.

6. Conclusions and Recommendations

This paper constructs a teaching model of linear algebra online course based on the Xuexitong platform, integrates micro-class teaching and case teaching in the concrete implementation process, and preliminarily validates the feasibility and effectiveness of this model. The rich functions of the Xuexitong platform provide good technical support for the effective development of the classroom. The online course constructed by the Xuexitong platform improves students' learning enthusiasm and learning effect to a certain extent, but there are still some problems that need to be further improved. In general, the linear algebra course construction based on the Chaoxing Fanya learning platform is rich in content, convenient and fast, and fully combines the means of digitalization and informatization of education, which is conducive to students' better grasp and consolidate the knowledge points they have learned. However, the teaching evaluation is relatively simple, the evaluation method needs to be further improved, and the construction of the question bank needs to be perfected and updated.

References:

- [1] Ran An, Liping An, Wei Wang, Yu Liu, Zhuo Pan & Yunfeng Li. Exploration and Application of the Construction of Biochemistry Online Courses[J]. Chemistry of Life, 2021, 41(02): 387-393.
- [2] Yujin Xu, Mingyu Jin, Zhenyu Liu & Genpei Li. Research on Blended Teaching Mode of Basic Theory of Traditional Chinese Medical Science Based on the Integration of BOPPPS and Chaoxing Fanya Learning Platform[J]. Lishizhen Medicine and Materia Medica Research, 2019, 30(06): 1481-1482.
- [3] Dian Gao, Chunchao Zhu, Linbo Shi, Jiexin Zou, Xiaoyan Zhang, Yinnan Wang, Xianmin Zhou & Qiongfang Yu. Teaching Design and Practice of Flipped Classroom Based on Chaoxing Fanya Learning Platform: A Case Study of Human Parasitology Course[J]. Journal of Biology, 2021, 38(02): 116-119.

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