

The Reform of Linear Algebra Course in Agricultural Colleges Under the Background of New Agricultural Science

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Abstract: Taking Xinjiang Agricultural University as an example, based on Rain Classroom and Dingding platform, the linear algebra course changes the current situation of "emphasizing theory and ignoring application" in traditional mathematics classrooms, adding applied teaching cases with the background of industry and agriculture, using online and offline The blended teaching mode, through inquiry-based and case-based teaching methods and students' autonomous learning and discussion methods, develops from a teaching mode focusing on "teaching" to focusing on "learning". The teaching mode has been comprehensively reformed, and satisfactory results have been achieved.

Keywords: Linear Algebra; Blended Teaching Model; Reform

Introduction

Taking Xinjiang Agricultural University as an example, in order to fully implement the educational and teaching goals of national higher education institutions, adhere to the fundamental task of building morality and cultivating people, and take the construction concept of "new engineering and new agricultural science" as the guide ^[1], strengthen the central position of talent training and undergraduate education. The basic status of teaching, the linear algebra course has carried out teaching innovation reform. On the one hand: this course changes the status quo of the traditional mathematics classroom of "emphasizing theory and ignoring application"; through heuristic and case-based teaching methods and students' autonomous learning and discussion methods, it changes from "teaching" to "student"-centered teaching On the other hand: adopting the online and offline mixed teaching mode, with the help of multimedia teaching methods and modern information technology, innovating modern teaching methods; by implementing diversified process assessment methods, comprehensive evaluation of students' comprehensive ability to study this course.

1. Curriculum innovation and reform content

This course is based on the requirements of disciplines and courses, and through teaching innovation and reform, it embodies the idea of cultivating people with morality and the "student-centered" education and teaching philosophy. Specifically, the teaching innovation reform is carried out from the following five aspects:

1.1 Based on the teaching content, integrate into the red gene of Agricultural University

Based on the educational and teaching goals, this course studies the teaching content, excavates teaching cases, designs teaching methods, and integrates the concept of educating people into the teaching process of the whole course in an all-round way. "Red Gene", carry forward the "Agricultural University" spirit of "self-reliance and hard work", cultivate students' objective and rigorous scientific spirit, learn to use philosophical thinking methods to analyze and solve problems, so as to achieve all-round and whole-process education.

1.2 Explore the teaching model of "teacher-led, student-led"

From "teaching" to "learning"-based teaching mode, reflecting the "student-centered" teaching philosophy. In 2020, this course adopts an online and offline hybrid teaching mode. With the help of multimedia teaching methods and modern information technology [2], case-based and heuristic teaching methods are used, and online teaching methods such as Rain Classroom and Dingding are used to conduct teaching. The interactive methods such as answering questions in class, submitting papers, and barrage are convenient for students to participate in the class immediately, present the discussion process at any time, mobilize the thinking ability of students to explore independently, analyze and solve problems, and innovate the student-centered teaching mode [3].

1.3 Frontier knowledge of applied disciplines into the classroom

Change the status quo of "emphasizing theory and ignoring application" in traditional mathematics classrooms, increase application-oriented teaching cases with industrial and agricultural backgrounds, reflect the frontiers of the subject, and gradually make the teaching content a "golden class" level of "gender degree" [1]. The idea of mathematical modeling will be integrated into the teaching process to cultivate students' ability to transform practical problems into mathematical problems, so as to apply mathematical knowledge to solve practical problems.

1.4 Innovative and diversified teaching methods and means

Change the single teaching method of "textbook + blackboard + chalk" in the traditional classroom, and innovate diversified teaching methods. This course adopts the online and offline mixed teaching mode, adopts Rain Classroom and Wisdom Tree learning platform online, and introduces high-quality courses from China University of Petroleum. Offline, a modern information technology teaching method combined with multimedia technology is adopted [4]. On the one hand, it improves the efficiency of education and expands the time and space of education; on the other hand, it enriches the sensory experience of students in the teaching process, makes the combination of audio-visual and vivid presentation of teaching content, and improves the quality of education and teaching.

1.5 Implement the whole process assessment and evaluation

Through the implementation of diversified process assessment methods and final assessment methods, emphasis is placed on inspecting students' usual learning effects, and comprehensively inspecting students' comprehensive ability level in learning this course. In the course assessment method, the proportion of the usual grades has been increased. The course assessment method is reformed to account for 50% of the usual grades and 50% of the final exam. Among them, the usual grades include assessment methods such as attendance rate, module test, homework, classroom interaction, and course learning experience.

2. Curriculum reform results

Through the implementation of the teaching innovation reform of the "Linear Algebra" course, the "pain point" problem in the "Linear Algebra" course has been solved, and a relatively satisfactory teaching effect has been achieved, and has been well received by leaders, peers and students.

2.1 The satisfaction of teaching evaluation is high, and the teaching effect is improved.

Through the school supervision group teachers, leaders, peers listening to the class, and students' evaluation results, the students' satisfaction with the "Linear Algebra" course is relatively high. In the past five years, the comprehensive average score of students' teaching evaluation and peer-leader's lecture evaluation is above 90. Judging from the results of teaching evaluation, this course has a large scope of reform and innovation, rich teaching methods, students understand the frontiers of the subject through learning this course, have a greater personal gain, improve the level of application of modern information technology, and are more satisfied with the teaching evaluation of teachers and courses. high.

2.2 reflects the student-centered teaching philosophy.

By reforming teaching content, applying case-based teaching and inquiry-based teaching mode, and introducing modern information technology teaching methods, the current situation of "emphasizing theory and ignoring application" in traditional

mathematics classrooms has been changed, and the depth and breadth of teaching content has been expanded, so that students' The classroom attendance rate and the enthusiasm of students to participate in learning in the classroom have improved, the students' performance in the classroom has been significantly more active, and the classroom atmosphere has been greatly improved, reflecting the student-centered teaching concept [5].

2.3 Improve the comprehensive quality ability of students.

From the results of students' evaluation of teaching, it can be seen that because the focus of learning has shifted from mechanical calculation to the cultivation of application ability, it has stimulated students' interest in learning, cultivated students' practical ability to analyze and solve problems, and enhanced students' overall cognition and learning of the course. It expands students' knowledge horizons and the level of application of modern information technology, and improves students' comprehensive quality ability.

2.4 The passing rate and average examination score of the "Linear Algebra" course have been improved.

By comparing the assessment data of various types of students in the past five years, it is found that after the implementation of teaching innovation and reform, the average score and pass rate of students have been greatly improved, especially the average score and pass rate of students in ethnic classes and bilingual classes with relatively weak foundations. , from 72.11/92.20% and 69.52/87.14% in the 2019-2020 school year to 72.48/92.86% and 70.72/92.20% in the 2020-2021 school year, which has been greatly improved and the effect is remarkable.

3. Conclusion

Through the implementation of the curriculum reform, the students not only improved their interest and drive in learning the linear algebra course, but also improved the average score and passing rate of the course, and also cultivated their mathematical thinking ability, logical analysis ability, and ability to solve practical problems. Practical ability. At the same time, in the study of course application cases, the classical mathematical thinking method is refined, which provides a powerful thinking method for solving other problems in the future. Further, by organically integrating into the curriculum education content, it actively leads students to form the correct three views, thus realizing all-round and whole-process education. In the future course teaching reform, on the premise of laying a good foundation for students' basic knowledge, we will also summarize the knowledge system, form a mind map of knowledge points, further expand the knowledge structure, create online teaching resources, and try to use flipping Classrooms, group discussions, etc., and innovative teaching modes, so that the course further reaches the golden class standard of one gender [1].

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