

# Teaching Reform of Economics and Management Mathematics under the Background of Artificial Intelligence——Discussion on Project Driven Teaching Mode

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**Abstract:** The development of artificial intelligence puts forward new requirements for mathematics teaching in higher vocational colleges. Based on the existing teaching reform and project driven teaching mode, this paper reconstructs the teaching content of economics and management mathematics. From the overall reform idea, teaching content design, project design, teaching implementation process and other aspects, this paper puts forward a set of economic and management mathematics teaching reform plan with the integration of teaching, learning and doing with students as the main body, project as the carrier and ability training as the core, hoping to effectively improve the effect of higher vocational mathematics teaching.

**Keywords:** Economics and Management Mathematics; Project Driven; Artificial Intelligence

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## 1. Introduction

According to the overall deployment of the Ministry of education's "action plan for the innovation of artificial intelligence in colleges and universities", the key task is to speed up the construction of majors, teaching materials and personnel training relying on artificial intelligence. Artificial intelligence big data and mathematics have an inseparable relationship. At the same time, mathematics, as a basic course in higher vocational colleges, has a wide range of audiences, so the integration of artificial intelligence and mathematics teaching is more important.

This paper explores the significance, feasibility, mode and operability of AI integrating into mathematics education through big data, so as to contribute to mathematics education in theory. Find problems in practice, solve problems, try to promote the use of artificial intelligence big data related projects and cases in mathematics teaching in higher vocational colleges, lay the foundation for future research, improve students' data analysis ability and artificial intelligence thinking.

## 2. Basis of reform

Before the reform of artificial intelligence background, the course of economics and management mathematics has done a lot of preparatory work related to the curriculum reform, mainly in the following aspects.

First, the construction of curriculum resource database. Aiming at the content of artificial intelligence big data, customized PPT and video are produced to explain in detail the content of data acquisition, data visualization, data cleaning, function fitting, etc., for students to learn relevant knowledge points in advance or at any time and the detailed operation steps in software.

Second, the construction of training conditions. The construction of on campus training base of mathematics

course, including the data analysis content related to artificial intelligence and the application of mathematics software into the course content, and reconstruct the on Campus Training Room integrating teaching, training and social service around the reform of curriculum system.

### **3. Overall reform ideas**

The reform of this course relies on Python, through the proficient application of python, improve students' computer level and artificial intelligence literacy. Consider reconstructing the classical limit, derivative and integral in the original calculus, adding the content of data analysis, through the form of project, emphasizing the ability of software application and analysis, weakening the original theoretical calculation requirements. The course is divided into the following topics after reconstruction.

#### **3.1 Economic data acquisition**

The course introduces the explosive growth of data and the value of data. At the same time, it introduces the common ways to obtain economic and financial data and the detailed operation mode, so that students can obtain the corresponding data for different cases when project-based teaching is convenient.

#### **3.2 Data visualization**

Data visualization is to use graphical means to clearly and effectively convey and communicate information, which can help people better analyze data. On the one hand, data gives value to visualization. On the other hand, visualization increases the intelligence of data, and the two complement each other, helping to extract knowledge from information and gain value from knowledge.

#### **3.3 Function fitting**

Function fitting is a very important part of this curriculum reform. Function and commonly used economic function are the basis of this course. With function, we can study the limit, derivative and integral of function. According to the previous data, fitting function to obtain the relationship between the two variables. Function fitting mainly focuses on the fitting of linear function of one variable, and the function fitting which can be linearized. Because the basic elementary functions are mainly divided into five categories, we will select the common functions in economic life to carry out the project.

#### **3.4 Limits of functions**

After fitting the function, we can calculate the limit of function in different situations, but after the curriculum reform, we will weaken the requirements of calculation, and pay attention to how to use software to solve the limit related problems of function.

#### **3.5 Derivative: rate of change of function**

As long as there is a functional relationship, there must be the concept of rate of change, instantaneous rate of change and derivative. Through the calculation of function derivative, we can find the relationship between the two variables, that is, how the change of independent variable causes the change of dependent variable, which can be used to analyze the law of economic life.

#### **3.6 Integration of functions**

Integral is mainly divided into indefinite integral and definite integral. The basic formula of calculus connects indefinite integral and definite integral. Through python software for integral operation, using the software from multiple angles, it has a positive effect on students to skillfully use the software, focusing on the analysis.

### **4. Teaching reform of economics and management mathematics driven by projects**

Project driven teaching is based on the course content. Teachers construct project tasks close to the real application scene, so that students can complete the teaching tasks according to the project.

#### **4.1 Project design**

The design of this course project mainly selects the common variables, functions and economic laws in the field of economy and management, runs through some or all of the above topics in the process of case

explanation, and integrates knowledge points into the project. Some selected items are shown in Table 1.

**Table 1.** Project design table

Serial number	project
1	The relationship between GDP growth rate and unemployment rate
2	The relationship between consumption and income
3	The relationship between RMB exchange rate and total import and export
4	The relationship between RMB exchange rate and foreign exchange reserve
5	The relationship between total energy consumption and GDP
6	The relationship between house price and loan interest rate
7	The relationship between M2 growth rate and consumer price index

The above selected items are basically related to two variables, and the corresponding data can be obtained from the website of the National Bureau of statistics. In this process, students can learn how to obtain data by themselves, and find the relationship between them through visualization, function fitting and other processes. By calculating the limit, derivative and integral of the function, they can obtain the ability to comprehensively analyze and solve problems.

## 4.2 Teaching implementation process

The implementation of project—based teaching runs through the whole process, which is mainly divided into two parts: one is the teachers’ explanation of knowledge points and operation steps, the other is the students’ operation and display.

The teachers explain the key knowledge points first and then lead the students to operate it with Python software in class. Then divide the class into several groups, release tasks to each group, select different projects from the project design table to different groups, let them complete the content, form their own report, and show it in the next class, show the data, visual graphics, the fitting function expression, the evaluation of the model and calculator results of the limit, derivative and integral of the function they fit out. The teacher will comment on the presentation of each group and focus on the difficult points.

The above process, through repeated training of multiple projects, in order to achieve the purpose of getting familiar with knowledge points. This project—based teaching mode, through the real case, pays more attention to students’ autonomous participation and learning.

## 5. Conclusion

As a basic course in higher vocational education, the curriculum reform of economics and management mathematics is imminent under the background of artificial intelligence. Through the integration of project—based teaching, the teaching content of economics and management mathematics is reconstructed, and a new teaching reform mode of economics and management mathematics, which takes students as the main body, projects as the carrier and ability training as the core, is realized.

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