

Discussion on the Reform of Economics and Management Mathematics Curriculum in Higher Vocational Colleges

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Abstract: As a public basic course in higher vocational colleges, mathematics must closely follow the national policy. In order to achieve the goal of overall improvement of the quality of talent training and employment, it is urgent to carry out curriculum reform. This article takes “Economics and Management Mathematics” edited by Lei Tianli as an example to clarify the reasons, ideas, advantages and prospects of the curriculum reform. The content of this course is the first and second chapters of the first chapter, which are economic functions and limits, derivatives and their economic applications. The curriculum reform plan is guided by the mathematical context, and projects or tasks are used as the chapter division basis. Each chapter aims to solve a task, has a knowledge sub-module, and extracts some mathematics culture and related stories to explore the ideological and political elements in mathematics, Enriching the connotation and interest of the courses, as a result, students' learning interest can be mobilized, and their understanding of mathematics culture is gradually deepened.

1. Introduction

The notice of nine departments including the Ministry of Education on the issuance of the “Action Plan to Improve the Quality of Vocational Education (2020-2023)” mentioned the main objectives, including the overall improvement of the level of vocational schools, the quality of talent training and the overall improvement of the quality of employment, and the overall improvement of the quality of vocational education. The attractiveness and social recognition have been greatly improved, effectively supporting local economic and social development and major national strategies. As a public basic course in higher vocational colleges, mathematics must closely follow national policies. In order to achieve the goal of overall improvement of the quality of talent training and employment, it is urgent to carry out curriculum reform. Economics and Management Mathematics is a public basic course for students in the Department of Economics and Management. It is a part of the mathematics course. However, how to carry out curriculum reform and implement the fundamental task of Lide Shuren is a difficult point.

This article takes “Economics and Management Mathematics” edited by Lei Tianli as an example to clarify the ideas of curriculum reform. The content of this course is the first and second chapters of the first chapter, which are economic functions and limits, derivatives and their economic applications. Below, this article focuses on the reasons, ideas and directions, advantages

and prospects of curriculum reform.

2. Reasons for Curriculum Reform

(1) Academic reasons

At present, as far as the students of the Department of Economics and Management are concerned, there are more girls than boys. The students have a weak foundation in mathematics. A large part of the students do not pay attention to the study of advanced mathematics. They believe that mathematics has no value in practical work. Therefore, they are not proactive in the learning process. In addition, the single teaching method is also one of the reasons why the curriculum reform must be carried out. This monotonous way makes students only passively accept textbook knowledge, and students certainly cannot fully diverge their own thinking. As time goes by, students' interest in learning will become slower. Decrease, thereby affecting the quality of teachers' teaching and the effect of students' learning.^[1]

(2) Reasons for teaching materials

From the perspective of curriculum ideology, politics and morality, the existing teaching materials have the following two main problems:

There are few elements of moral education and mathematical culture in curriculum education. The vast majority of teachers only focus on the teaching of theoretical knowledge, incorporate few elements of moral education, lack the guidance of students' outlook on life, values, and world outlook, and do not involve mathematical cultural literacy other than mathematical knowledge.

There are two chapters in the selection of this textbook. Each chapter is divided by mathematics knowledge, not by projects or tasks. Students are not interested in learning enough. Due to the difficulty of economics and management mathematics courses, there are many knowledge points. If the project or module knowledge system framework cannot be constructed and the students' professional domain knowledge can not be constructed, the students' learning interest and learning effect will not be improved. Knowledge can't really apply what has been learned.

(3) Reasons for teachers

Curriculum reform is a difficult and lengthy task, and significant results cannot be seen overnight. It requires teachers to constantly explore and update the concept of curriculum reform. This requires teachers not only to master advanced information technology, mathematics software, etc., but also to understand the development history of mathematics and mathematics culture, and to be able to educate students silently while explaining knowledge. It can be said that in the context of curriculum reform, teachers are facing great opportunities and challenges.

So, how can we overcome these difficulties and make the curriculum reform achieve better results? First of all, we must help students discover the truth that mathematics comes from life and return to life. The setting of teaching situations that are closely related to actual life can stimulate students' learning initiative and guide them to actively discover problems and learn knowledge.^[2] Secondly, after students have established the cognition that mathematics is not out of life, combined with specific teaching content, the teaching content is integrated and combed, and diverse and reasonable teaching methods and teaching methods are used to add color to classroom teaching. Finally, it is necessary to evaluate the effect of classroom teaching in a timely manner so that problems can be found and solved quickly.

3. Ideas for Curriculum Reform

In view of the above reasons and the current students' learning and use of teaching materials, this article sorts out the direction of curriculum reform. Since the content of the selected chapters of this teaching material is not separated, but connected to each other, the direction of curriculum reform

should also be Analyze and integrate its content from the perspective of overall unity. The curriculum reform plan is guided by the mathematical context, and projects or tasks are used as the chapter division basis. Each chapter aims to solve a task, has a knowledge sub-module, and extracts some mathematics culture and related stories to explore the ideological and political elements in mathematics , Enriching the connotation and interest of the courses, as a result, students' learning interest can be mobilized, and their understanding of mathematics culture is gradually deepened.

Now the content of the textbooks before and after the curriculum reform and sorting is made into a table for comparison.

Table 1 Contents Before The Curriculum Reform

Chapter 1 Economic Functions and Limits	1.1 Function Concepts and Elementary Functions
	1.2 Commonly used economic functions
	1.3 Limit and continuity
	1.4 MATLAB foundation and its application in limit calculation and continuity
Chapter 2 Derivatives and their economic applications	2.1 The concept of derivatives
	2.2 Differentiation of functions
	2.3 Application of Derivatives in Economics (1)-Marginal Analysis
	2.4 The application of derivatives in economics (2)-optimization problem
	2.5 Application of Derivatives in Economics (3)-Elasticity Analysis
	2.6 Application of MATLAB in Derivative
	2.7 Use MATLAB to calculate the differential of multivariate functions

Table 2 Contents after The Curriculum Reform

General task: simulate supermarket operations, conduct market research, and collect data such as the cost of goods, sales prices, sales volume, demand volume, etc.	Task 1: Simulate supermarket operations	Module 1: Calculate the supermarket income tax	1.1Tax rate table
			1.2Function concept and elementary function
			1.3Mathematics story, culture
	Module 2: Analyze survey data	2.1 Demand function	
		2.2 Supply function	
		2.3 Cost function	
		2.3 Income function	
		2.5 Profit function	
		2.6 Math story	
	Module 3: Calculate loan period and interest	3.1 Limit concept and calculation	
		3.2 Infinitely small, Infinitely large	
		3.3 Two important limits	
		3.4 Mathematics culture	
	Module 4: Mathematical Software: Fundamentals and Applications (training,	4.1 Getting started	
		4.2 Variables and management	

		1 week)	4.3 Function table
			4.4 Basic operator
			4.5 Command line basics
	Task 2: How to make decisions so that the supermarket can get the most profit?	Module 5: Calculate marginal cost, marginal revenue, and marginal profit	5.1 Derivative concept
			5.2 Derivative operation
			5.3 Marginal analysis
			5.4 Mathematics cultural story
		Module 6: Optimization problem	6.1 Monotonicity of function
			6.2 Function extremes
			6.3 Best value
	Module 7: Math software (practical training, 1 week)	6.4 Optimization analysis	
		6.5 Elasticity analysis	
		6.6 Mathematics culture	

Comparing Table 1 with Table 2, it can be found that the original textbook contains two chapters, the content is relatively boring, it is difficult to attract students' attention, and the characteristics are not obvious; after the curriculum reform, the content is divided into two tasks, seven Each module, with the teaching module as a unit, intersperses mathematics knowledge, mathematics culture, historical stories, and mathematics software, and appropriately adds ideological and political elements, with distinctive features, breaking the limitations of traditional teaching materials, and greatly increasing the interest.

4. Advantages of Curriculum Reform

(1) The “ideological and political” elements are obvious. This textbook closely follows the concept of “all kinds of courses and ideological and political theory courses in the same direction” advocated by the state, and combines the actual conditions of the students in the Department of Economics and Management of our school to refine and improve the original textbooks, aiming to help Based on the theoretical knowledge of mathematics, students can excavate a large amount of traditional culture and ancient wisdom related to mathematics and technology, and use them in mathematics classroom teaching to guide students to understand traditional Chinese culture, enhance their self-confidence and pride, and deepen their understanding of mathematics culture. Understand that students can cultivate and exercise their professional and mathematics literacy in the learning process.

(2) The context is clear, the key points are prominent, and the characteristics of the project modules are reflected. This textbook will be guided by tasks, with each task as a section. Different sub-modules will be set up below to disrupt the order of the original textbook content, add cases and mathematics cultural knowledge adapted to professional characteristics, and re-integrate them.

(3) Both pictures and texts are very interesting. This textbook introduces new knowledge in the form of task modules, and is accompanied by similar mathematics cultural cases and related stories. Compared with the original textbook, it is more interesting, with rich pictures and texts.

(4) Increase practical classrooms. Traditional mathematics teaching does not arrange practical classrooms. Students have been learning in the classroom with a single form. Especially when learning mathematics software, students only listen to the teacher, do not operate or practice by

themselves, and the learning effect is greatly reduced. Through the addition of practical classrooms, boring mathematics problems are interesting and sampling theory is visualized. Students not only learn knowledge, but also strengthen the practical ability of analyzing, discussing, solving and summarizing problems, laying a solid foundation for future study and work. ^[3]

5. Prospects of Curriculum Reform

The pace of curriculum reform can never stop. Compared with the traditional mathematics classroom teaching, the modular teaching model proposed in this article is very innovative. In addition to basic mathematics knowledge, it also adds mathematics culture, mathematics history, mathematics stories and Tasks, mathematics software and other content can help students improve their attention in the classroom to a certain extent. Students can expand their knowledge and interest in learning by learning mathematics culture and mathematics stories. However, reforms cannot be completed overnight. Educators are required to make persistent efforts and make continuous efforts to push the curriculum reform farther and farther, and to better implement the fundamental task of Lide Shuren.

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