Promoting Mixed Teaching Reform under the Information 2.0 Environment—Based on Time Series Analysis Course

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Abstract
The course of Time Series Analysis of Economic Statistics is an important major course that integrates advanced mathematics, R language programming and basic economic statistics. The traditional teaching mode mainly relies on offline teaching and after-class question-answering. The shortcomings of traditional teaching mode are students have little contact with teachers, and the way of communication is limited, so it is difficult to truly understand the obscure cross-knowledge. Driven by the information 2.0 environment, it adopts the mixed teaching reform mode combining online and offline, introduces the information teaching technology, enriches the means of multimedia teaching, expands the communication mode between teachers and students, and effectively breaks the traditional 1-to-N teaching mode, so as to achieve the teaching purpose of expanding students' learning horizon and grasping the frontier research direction of the subject. Moreover, it is helpful to stimulate students' interest in learning, promote students' mastery of learning dominance, and enhance students' penetration and application of knowledge.

Keywords
Time series analysis, informatization 2.0, blended teaching

1. Introduction
The course of time series analysis and analysis is a major course of the School of Economics of LD College for junior students in the autumn semester. According to the analysis of examination papers and scores in previous years, it is found that the average failure rate of the course for the first time is about 23%, which affects the effect of the normal distribution of scores. Through interviews with students over the years, the teaching team found that most of the students' problems focus on their incomprehension of the publicity of mathematical derivation (Deng Xin & Tian Chunyu, 2021). The inflexibility in the use of programming language and the ignorance of the past statistical knowledge led to the introduction of a new concept of mixed teaching by the teaching team in order to improve the high failure rate and solve the problems encountered by students in the learning process. In the first year of the implementation of the teaching reform, students reported that the learning effect was good, their interest in learning was greatly improved, and the failure rate was reduced to 13%, basically in line with the normal distribution of scores (Wang Chengwen, 2018).

Therefore, based on the questionnaire research method, this paper will explain the problems encountered in the teaching reform process and the specific measures to promote the mixed teaching reform with the help of the information 2.0 environment. Through in-depth analysis and reflection on the remaining problems in the curriculum education
reform of time series analysis, the main research purpose is to truly stimulate students' interest in independent learning, be willing to communicate with teachers through multiple channels, and complete the smooth infiltration of knowledge.

2. Design of questionnaire

The research object is the students of LD College who have studied the time series analysis course in the past three years. The purpose of the survey is to evaluate the effectiveness of the mixed teaching reform of the time series analysis course. This time, 93 questionnaires were issued, 86 valid test scores were recovered, and the recovery rate of the valid test papers reached 92.5%. The data displayed by the recovered test papers can be further analyzed.

The questionnaire mainly consists of three parts, with a total of 12 questions. In order to ensure the objectivity of the questionnaire, this questionnaire is distributed anonymously, which can ensure that students can freely make suggestions on the course. The first part is about curriculum preference, including how much you like the curriculum and how much you like the teaching team. First, you should enter the questionnaire subjectively and screen out some negative questionnaires subjectively saying no to the constructive reform; The second part is about the introduction methods of curriculum informatization, including students' acceptance of informatization reform, their preference for informatization education technology, and so on. It explores students' expectations for the reform of modern education means, and makes a unified analysis based on the existing reform system; The third part is the role of mixed teaching, including the students' understanding of the mixed teaching mode, whether it has the basic conditions for mixed teaching and learning, and so on. Learn how much mixed teaching can help the in-depth learning of the curriculum.

3. Analysis of questionnaire

According to the data processing of the first part of the preference questions, more than 85% of the students are satisfied with the current curriculum team configuration, and the degree of recognition of the practicality of the curriculum is as high as 70%. However, more than half of the students think that the time series analysis course is difficult, which shows that it is urgent to take diversified measures to reduce the difficulty of students' learning. With regard to the single degree problem of the curriculum, 45% of the students choose to agree with it or above, 55% of the students deny that the current curriculum is single, and the two basically show a balanced attitude. See Table 1 for details:

<table>
<thead>
<tr>
<th>Part I</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>25%</td>
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<td>40%</td>
<td>13%</td>
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<tr>
<td>Question 2</td>
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<td>22%</td>
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<td>Question 3</td>
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<td>Question 4</td>
<td>3%</td>
<td>22%</td>
<td>42%</td>
<td>15%</td>
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From the perspective of informatization, the second part of the question about whether to like the playback function of the course is mainly put forward for the online teaching screen recording link. For special reasons, all the students interviewed have experienced online platform lessons. Although online lessons have many advantages, they also reflect certain disadvantages in mobilizing the classroom atmosphere and controlling students' learning status in a timely manner, among the surveyed students, 22% of them prefer online screen recording online lessons with playback advantages, which is a low proportion. After an unexpected in-depth interview with individual students, it is found that students lack the willingness to actively watch playback, so the proportion of students with a positive attitude reaches 45%, nearly half of them.

It can be seen from Figure 1 that under the promotion of information education, students' demand for words in learning coursework is low, and the need for animation demonstration is higher than the need for video explanation, which more reflects that animation demonstration reveals the theme step by step andcatches students' attention. The introduction of video is subject to many time constraints. Therefore, the teaching team has also taken relevant issues into consideration when carrying out reform and added the short video teaching method. The introduction of audio can also play a role in dispelling the dull atmosphere in the classroom, so the demand is slightly higher than that of pictures.

It can be seen from Figure 2 that students have a high voice for the time series analysis class to adopt case teaching and practical teaching. This course uses R language to program in the teaching process to demonstrate how to construct the models of stationary time series and non-stationary time series. It can be seen that students are interested in how to
apply the models in real life; In the process of teaching, with the help of the current domestic mature online learning platform, for example, the demand for famous teachers' teaching videos and materials for playing cutting-edge lectures for students is roughly equal, which is about half of the demand for case teaching. It can be seen that students are more receptive to teachers' absorption of knowledge and then transfer it.

Figure 1. What elements do students want to add to the teaching courseware.

Figure 2. External teaching materials expected to be added in the classroom.

Figure 3. Ranking of the Necessity of Informatization Teaching Technology.
According to Figure 3, the distribution of short videos of key and difficult points is most popular among students at present, mainly because it combines several major advantages of online teaching that can be played back, short time, and learning is not limited by time and space. When teaching online, teachers can still help students quickly recall the important and difficult points of this lesson by recording short videos, and publish them on WeChat or QQ, a common communication platform for students. So that students can consult at any time and recall; Secondly, students hope to combine teaching with fun, combine difficult and complicated professional knowledge with game animation, and enhance the interest of the course; Finally, students hope to open the final examination question bank at any time, and students can brush and consolidate the questions along with the course progress. This idea is mainly that students hope to achieve excellent results in the final examination, and whether it will help students control knowledge remains to be investigated in depth.

The third part, starting from the mixed teaching, sets question 10: Is there any online learning equipment? The reason is that the time series analysis course, as a course that requires repeated operation after class, has certain requirements for learning equipment. When offline teaching is conducted, students can complete computer operations in the laboratory, while online remote teaching undoubtedly improves students' learning difficulty, therefore, it is necessary for students to master the learning equipment.

It can be seen from Question 8 that even though the number of students who cannot use mobile devices to listen to lectures due to signal problems is relatively small, the number of seven students who can not follow the rhythm of the classroom online teaching is also limited, and there is no equipment to listen to online classes or no redundant equipment to carry out practical drills, which also reflects the disadvantage of online teaching, that is, it is easy to ignore the learning feelings of individual students; It can well keep up with the rhythm of the classroom. More than half of the students listen to the course and practice at the same time. They only use mobile phones to listen to the lesson. Up to 37% of the students can not achieve the exercise or are unwilling to train after class subjectively. This part of students needs the teaching team to use incentive measures to stimulate students to keep up with the pace of teaching.

In combination with Question 9, under the condition of limited equipment, 84% of the students still prefer online or mixed teaching for time series courses, while only 16% of the students choose traditional offline teaching. It can be seen that finding a reasonable way to retain the advantages of online teaching and offline education, and integrating them together can promote curriculum reform.

It can be seen from the data answer to question 10 that students hold a moderate opinion on the online communication channel suggested by teachers. The reason is that some students want to communicate with teachers at any time, while others fear that teachers will be watching them after establishing an online communication channel with teachers, and lack freedom. Therefore, 58% of students click the general option B, which is an inevitable online teaching environment, it is necessary to establish online communication channels. In order to prevent students from learning pressure, we can set up a special question answering group instead of assigning learning tasks to improve communication with students.

4. Problems found in curriculum reform and solutions

4.1 Problems

First of all, the problem of students' learning equipment needs to be solved urgently.

The time series analysis course is a course with strong practical application. Among the 48 class hours, 32 are theory class hours and 16 are practice class hours. Therefore, in the context of information technology, how to ensure the effective learning of students' practical courses in online teaching is an important issue facing us, which is also the premise for promoting the hybrid teaching mode;

Secondly, students have higher requirements for the interest of the course.

Under the impetus of informatization, students' daily entertainment life has also changed from gathering and making friends to short video platforms and team games. On the basis of not changing the overall environment, how to put education into play is also a problem that the teaching team should think about, and there is a driving force when there is demand. From the above analysis, students' more expected online and offline hybrid teaching is expected to add more interest in the teaching process. Instead of blindly copying the routine, students' needs can be met by enriching courseware topics. Therefore, with the promotion of educational information technology, enhancing classroom interest has become another major problem.

4.2 Solutions and conclusions

First of all, correctly establish online and offline communication channels between students and teachers. There are
many kinds of online channels. We can build online classes through the Pan Ya platform and Superstar Learning Link. On the online classes, we can push cutting-edge knowledge, and set up a clocking task for essential knowledge (Li Gan, 2021). That is, teachers can master students’ time in the background and complete the push work on time. No supervision function is set for additional knowledge, but students willing to learn will complete it. In this way, students with strong learning desire will not lose their learning energy, and students with poor initiative will also be urged to learn; Complete basic tasks such as submitting homework in online classes, and calling names and punching cards in class to save class time; In class, students can upload questions to the top of the screen at any time, and teachers can grasp the rhythm of the course to explain (Zou Qian, Ren Guohua, & Luo Fuyi, 2021).

Secondly, we will regularly release videos of important and difficult teaching points. Based on the incompleteness of students' learning equipment, the practice operation process can be recorded and distributed. When students' equipment conditions are good, they can practice repeatedly (He Jianhui & Zhang Yonghua, 2014). Because students have a high voice for practice drills and case teaching, they can also explain cases in the videos of key and difficult points, so that students can draw inferences from one example to another to find cases and data around them, and complete the practice drills by combining time series analysis of professional knowledge, Let students have a sense of learning in order to apply and then mobilize their enthusiasm for learning.

Finally, enhance the teaching interest. With the promotion of information technology 2.0, more dynamic elements can be added in the classroom, including teaching animation, video, etc. However, attention should be paid to the length of the video, which is usually less than 15 minutes. Long time video playing will also lead to students' distraction, which is not conducive to teaching.

References


