

# The Application of Pad Class in the Teaching of Macroeconomics: A Reform Experiment Based on Three Teaching Classes

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**Abstract.** Due to the difficulty of studying macroeconomics, many students are not interested in learning. In terms of the "teaching difficulty" problem, many teachers have tried to reform, but the effect is not obvious. Based on the pad class theory proposed by Prof. Zhang Xuexin, this work designed a pad class experiment in the macroeconomics class, and tested the teaching effect from dimensions of classroom response, homework situation, questionnaire survey, and thesis situation. It was concluded that macroeconomics is suitable for pad class teaching, yet the class time and the teachers' guidance of the discussion will affect the discussion effect. In addition, the pad mode should be adjusted according to the characteristics of the teaching class.

## 1. Introduction

### 1.1. Research background

Thus far, in the undergraduate teaching of economics in China's universities, macroeconomics is a difficult course to teach. First, its knowledge system is difficult and theoretical, and its previous course "microeconomics" belongs to a different school of economics, which is opposed to macroeconomics, so students usually feel confused at the beginning of studying macroeconomics. Second, there are many schools of macroeconomics, making it difficult for beginners to distinguish and be at a loss. Third, students who study macroeconomics have a weak mathematical foundation. At present, the economics and management majors in ordinary colleges and universities enroll both science and arts students. However, arts students have a relatively poor mathematical foundation, and they feel difficult to learn a large number of mathematical models to derive macroeconomics. The most direct result caused by this situation is that students are not interested in the curriculum and the teaching effect is poor.

### 1.2. Review of related literature

In terms of the "teaching difficulty" problem, many teachers have tried to improve this situation through teaching reforms. Peng Xiantang believes that it is possible to improve students' interest in learning by organizing hot topic discussions, guiding students in data analysis, and teaching with cases, and improve their enthusiasm for learning by asking questions [1]. Zeng Xiangyan pays attention to the cultivation of students' economic thinking and believes that the thinking process design in a series of teaching processes such as the introduction of situational thinking can be used to solve the problem of students' stagnation in teaching [2]. Gu Yanhui et al. research on the method selection and skill application of case teaching in economics teaching [3]. Li Ying et al. advocate strengthening the function of teaching evaluation and attaching importance to formative evaluation, such as using mid-term exams and daily question tests to understand the situation of students and improve teaching [4]. In terms of the teaching reform of macroeconomics, the common drawback of the existing research is that it focuses on the reform of the classroom link but ignores the process of students' absorption of knowledge, so the effect is not good.

In 2014, Professor Zhang Xuexin of the School of Social Development and Public Policy of Fudan University proposed the teaching method of "pad classroom", which is based on western discussion-based teaching methods. It absorbs the discussion of "assimilation" in the Mazur peer instruction and establishes a new localized teaching method suitable for Chinese students. Its basic characteristics include dividing the entire teaching process into Presentation, Assimilation, and

Discussion in chronological order. (PAD for short), which pays attention to the process of "assimilation" and gives students a week to personalize learning and absorption [5].

The course of macroeconomics is very suitable for the teaching method of pad classroom. First, a very important feature of macroeconomics theory studying is the multi-level nature. Even though students have a shallow understanding of economics theory, they still grasp the overall framework of economics. However, with the in-depth exploration of the links among knowledge details, theoretical foundations, and knowledge points, students can master economics knowledge at a higher level. Introducing thinking and discussion links in the pad classroom can help students dig deeper thoughts, which is not only conducive to the mastery of knowledge, but also strengthens students' thinking ability. Plus, it is difficult to master macroeconomics concepts and theories by tens of minutes of lectures. If students want to truly understand and master macroeconomics knowledge, they have to experience a process of assimilation. The introduction of discussion sessions in the pad classrooms forces students to read teaching materials in advance. In view of this, the author conducted a pad class experiment based on the macroeconomics courses of three classes.

## **2. Experimental Design and Effect Test of Macroeconomics Pad Classroom Teaching Reform**

### **2.1. Basic information of the course**

This macroeconomics teaching has two objectives: first, let students systematically master the theoretical framework and knowledge of macroeconomics; second, train students to improve their thinking and analysis skills. The teaching will last 16 weeks, one lesson per week (2 class hours, 90 minutes), and a total of 32 hours; the small-sized class with 37-40 people.

### **2.2. Course design ideas**

#### **2.2.1. Class schedule**

Each chapter is taught in one and a half lessons (3 hours) and discussed in one and a half lessons (1 hour). Teachers will teach each chapter first, and leave a week for students to read teaching materials and do notes in class. Class discussions will take place in the next class one week later.

#### **2.2.2. Class content design**

The teaching is mainly guided heuristic teaching, leaving space for students to think. For concepts, teachers only have to focus on the logical nature instead of detail; for theory, teachers should focus on the background, problem-solving, and basic framework, but do not have to talk about details and theoretical paths; for the model, teachers will only focus on its framework and conclusions without explaining derivation process; for cases, teachers will mainly talk about the theory of the cases and the actual background, but will not explain the theory's interpretation of the cases. Homework is mainly reading notes, which allow students to focus on digging into the details of the concept, the way of thinking in economic theory, the derivation process of the model, the internal and external relationship, and the explanation of the case by economic theory.

The theme is limited, but the content is free to talk. Firstly, there is a 20-minute student discussion, which is divided into groups of four to discuss their learning experiences and questions. After that, there is a 20-minute sharing time, and students can speak freely within the topic frame of the chapter, share different ideas or ask their own questions. For students' questions, teachers should encourage other groups of students to answer. If students can't answer, the teacher will answer them. The last 10 minutes will be summarized by the teacher to answer common questions.

#### **2.2.3. Design of assessment**

Final assessment score equals to discussion grade multiplies 25% plus assignment grade multiplies 25% plus final essay multiplies 50%. The assessment of students should pay attention to both the results of learning and the process of learning, so each accounts for 50%. The assessment of learning results abandons the traditional examination and switches to using the thesis, that is because the teaching objectives of this course include both the mastery of the macroeconomic knowledge system and the improvement of thinking analysis ability.

### **2.3. Experimental effect test**

After one semester of teaching practice, the introduction of the pad classroom teaching method

in the macroeconomics classroom has achieved good results. According to the initial experimental design, it mainly tests the effect from four dimensions: classroom response, homework situation, questionnaire survey, and thesis situation.

(1) The classroom response is tested from several sub-items such as attitudes towards the pad classroom, classroom discussions, active questions after class, and the rate of raising head during the lectures. The results are shown in Table 1.

Table 1. Class response

Class	Attitudes towards the pad class		Class discussion situation		Ask questions positively after classes	Rate of raising head in the class
	Before the class	Ten weeks later	Initiative	Depth of questions		
Class One	Indifferent	Like very much	Very positive	Average	Frequently	Almost 80%
Class Two	Indifferent	Like	Passive to positive	Average to deep	Frequently	Almost 80%
Class Three	Indifferent	Like	Passive	Deep	Occasionally	Almost 90%

(2) Homework situation. All students in each class can submit homework on time. The homework will be rated as "excellent, good, and average". On the whole, most students (approximately 53.3%) are able to use the assimilation time for a week to study and think, and then dig for knowledge points, thus getting the result of "excellent"; a small number of students (about 36.7%) can think deeper and the results are "good"; only a small number of students (about 10%) do not think and score "average".

(3) Questionnaire survey. A total of 117 questionnaires were recovered, of which 104 are valid. (a) Preference for pad and full-teaching classes: of the 104 valid questionnaires, a total of 81 people choose "like pad class very much" or "like pad class", accounting for 78%; 23 people choose "indifferent" or "like full-teaching class", accounting for 22% (see Figure 1). For macroeconomics on the score of the pad class: the average score of 104 questionnaires is 8.69, and the most selected score is 10 (See Figure 2). From the results of these two questionnaires, it can be seen that most students acknowledge the use of pad classes in this course. (b) The study time after pad class and the estimated study time after class if the full-teaching method is adopted: as shown in Figure 3 and Figure 4, the distribution of the two has a significant difference. The average value of "study time after class" is 11.43 hours, and the estimated study time after class "if the full-teaching method is adopted" is 9.01 hours. (c) Macroeconomics pad class exercises the thinking ability of students: whether the pad class exercises the thinking ability, 42 people agree very much; 54 people agree; only 8 people disagree. It can be seen that most students think that the use of pad classes of macroeconomics has played a significant role in training thinking.

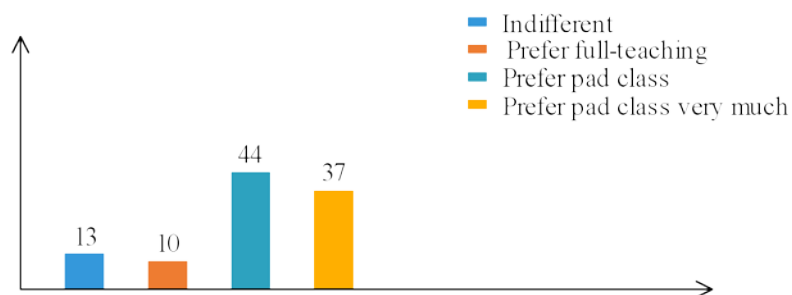


Figure 1. Preference for the macroeconomics pad class

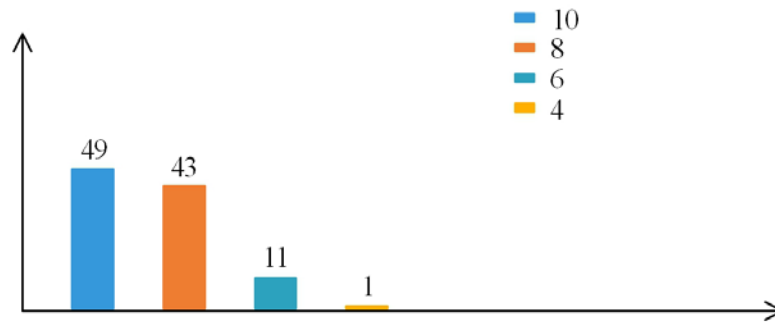


Figure 2. Grades on the macroeconomics pad class

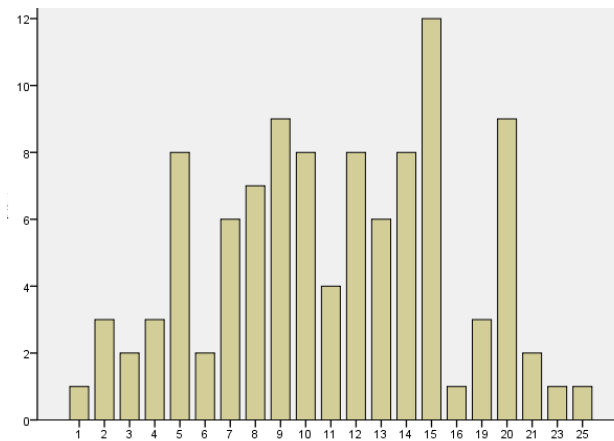


Figure 3. Study time after class

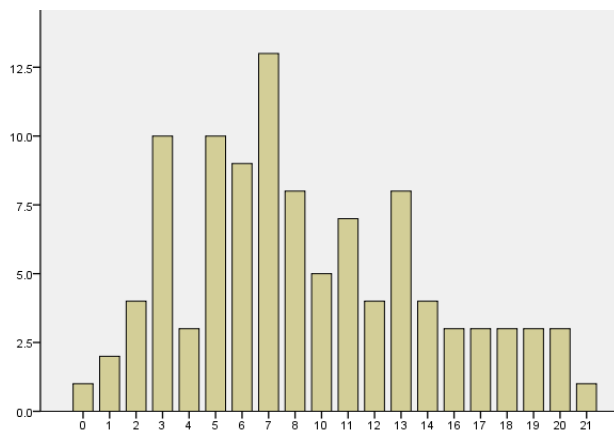


Figure 4. The estimated study time after class if full-teaching method is adopted

#### 2.4. Thesis situation

Most students understand the requirements of the thesis, and the structure and logic of the thesis are very clear, which can not only accurately explain the theoretical knowledge, but also accurately analyze the macroeconomic facts. It is a precious opportunity for freshmen who have not experienced systematic scientific research training. This also further shows that the teaching experiment of the pad classroom has trained the students' thinking ability well.

### 3. Experiment Experience Summary of Macroeconomics Pad Classroom

#### 3.1. Macroeconomics is suitable for the teaching method of pad classroom

After a semester of experiment, the teaching method of pad class has proved to be very effective for macroeconomics. Summarizing the discussion and homework situation of students can verify the significant effect of pad class on the improvement of teaching quality no matter which dimension is tested.

### 3.2. Discussion time has an impact on the pad effect

The Class Two in the pad teaching experiment started class at 2:00 pm at the beginning of the semester. At that time, the students' response was poor, and the enthusiasm and depth of discussion were far behind the other two classes. Later, for an accidental reason, the class time was adjusted to 8:00 am, and the discussion situation was obviously improved, and its enthusiasm gradually improved and even exceeded the status of another class. This may be related to the students' drowsiness during the period afternoon, which is not suitable for active thinking. Morning is more suitable for discussion than the afternoon, and the time after 4:00 in the afternoon is more suitable for discussion than the time from 2:00 to 4:00.

### 3.3. Teachers' guidance on the discussion will directly affect the effect of the discussion

As a result of the adjustment of the class time, the class order of the three classes also changed once. However, there is an obvious phenomenon before and after the change, that is, the discussion depth of the second class is better than that of the first class, and the third one is better than the second one. It is probably because teachers have a clearer understanding and grasp of teaching knowledge and students' thinking focus with the increase in the number of lessons. Therefore, both the explanation in lecture and the guidance before discussion are more accurate, which affects the students' thinking and the effect of thinking.

### 3.4. The pad mode should be adjusted according to the characteristics of the teaching class

In the Class Three of the teaching experiment, students are generally shy, like to think, but do not like to show, which is an obvious contrast to the enthusiasm and activity in the other two classes. However, the author later observed that the Class Three always shared the most accurate and insightful questions in discussions and assignments. And their final thesis is also the most innovative among the students in three classes. Therefore, such a class should not be given too much pressure. Since students like to be appointed by the teacher passively, then the teacher might as well cooperate with them. The results obtained are also satisfactory.

## 4. Summary

Through this experiment of using pad class mode in macroeconomics teaching, it has been proved that the application of the pad class in macroeconomics is very feasible and the effect is very good. Inevitably, there are many problems in this experiment, for example, the setting of many details is not very reasonable, and the initiative of one is not strong. These problems still need to be further studied and improved later.

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