

# Research on Application of Teaching Method Based on Micro-class in Engineering Structure Course

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**Abstract:** With the advent of the “Internet +” era, the traditional teaching mode of colleges and universities has undergone tremendous changes. The use of new media such as Wechat, Weibo, news application, Douyin, and live broadcast platforms has broken through the limitations of traditional classroom teaching time and space, and has achieved remarkable results. The micro-course teaching method based on the network teaching platform plays an important role in the teaching of various majors in colleges and universities. This article focuses on the application of engineering structure courses based on the micro-course teaching method.

**Keywords:** Engineering Structure Course; Micro-Class Teaching Method; Applied Research

The use of micro-class teaching methods in the teaching of engineering structure courses can optimize traditional curriculum design to a large extent, create a good classroom teaching atmosphere, break through key and difficult knowledge, and guide students to establish good learning attitudes and habits, and improve self-learning ability. Build a real-time communication platform for teachers and students to effectively improve the quality and level of teaching. Next, take the engineering structure course as an example to talk about some thoughts on the application of the micro-teaching method in the course teaching.

## 1. The application value of micro-course teaching development in engineering structure course teaching

### 1.1 Conducive to stimulating students' interest and enthusiasm for learning

In the use of the micro-class teaching mode, teachers should combine the teaching content to make vivid and interesting micro-class teaching plans to fully stimulate students' interest and enthusiasm in learning, and pictures, videos, animations and other media are conducive to focusing students' attention in class. As we all know, the engineering structure course knowledge involves a wide range, abstract theories, obscure and difficult to understand, and has a small class schedule. Teachers are required to explain multiple knowledge points in the limited classroom time. Under the traditional “indoctrination” theoretical teaching model, students passively accept knowledge, easy to lose interest and confidence in learning. Through the micro-class video teaching, the abstract and obscure theoretical knowledge is vividly and vividly displayed in front of students, which is conducive to stimulating students' interest and enthusiasm in learning.

### 1.2 Conducive to cultivating students' autonomous learning ability

Through the video teaching of micro-classes, teachers can make videos explaining the important and difficult points of the course and share them with students, allowing students to break through the limitations of traditional time and space, check

deficiencies and fill in gaps, consolidate learning according to their needs anytime, anywhere, and deepen their understanding of knowledge points, This is conducive to cultivating students' good self-study ability.

### **1.3 Conducive to cultivating students' practical engineering application ability**

Teachers can combine specific engineering cases and engineering experiments to make micro-course teaching courseware, allowing students to form perceptual knowledge of engineering structure theory through specific cases. Engineering structure courses involve a lot of practical and professional knowledge. The traditional "indoctrination" theoretical explanation mode makes it impossible for students to understand and master theoretical knowledge. Through micro-class videos and matching voice explanations, students can form a good perceptual understanding of these knowledge points, understand the specific application of these theoretical knowledge in engineering, and cultivate students' practical application ability of knowledge points.

### **1.4 Conducive to improving the professionalism of teachers**

The teaching and research group of engineering structure majors in colleges and universities collaborate to produce micro-class teaching plans, which can give full play to the strengths of teachers and provide a platform for teachers to exchange teaching methods and experiences. Teachers can also use micro-classes to accumulate teaching resources, share teaching experience, and continuously improve teachers the quality and level of teaching to improve the professionalism of teachers.

## **2. Specific countermeasures based on the application of the micro-class teaching method in the engineering structure course**

### **2.1 Establish a perfect micro-course teaching platform**

The construction of a micro-course teaching platform requires a certain amount of energy, time and expenses for universities, and education authorities at all levels should provide certain support. In the current rapid development of information technology, colleges and universities should focus on building digital teaching platforms, building MOOCs, micro-classes and other online course libraries. Teachers use these digital platforms to establish online classes and authorize students to allow students to participate in micro-courses after logging in. Lesson learning, and interact with teachers and students. Teachers use the micro-class teaching platform to carry out homework correction, supervise students, answer questions for students, interact with students, and check students' learning progress, teaching feedback information, establish an assessment and evaluation mechanism, and then adjust and optimize teaching content according to the actual situation, Teaching progress, and achieve good teaching results.

### **2.2 Application process based on the micro-class teaching method in the engineering structure course**

First, the teaching design stage. First of all, teachers should prepare for teaching before class, arrange the teaching schedule in combination with the syllabus and teaching plan, filter out the important and difficult knowledge of each chapter, adopt the micro-class teaching model, and make the micro-class teaching design and make the micro-class teaching video. It is worth mentioning that the video content of the micro-class should be closely related to the content of the classroom explanation, but should not be repeated. Teachers should also focus on stimulating students' interest and enthusiasm for in-depth learning through micro-videos. The duration of each micro-class video should be kept at 10~15 minutes. After the production is completed, it will be shared with students through the online teaching platform in time, and exercises and test questions should be designed based on the micro-class video, and online exercises and online Q&A teaching activities should be carried out. Second, pay attention to classroom explanations. Teachers should pay attention to explaining the core knowledge points of the chapters when carrying out classroom teaching activities. For those difficult and need to be expanded and extended, students should be taught according to the micro-class video. In addition, pay attention to micro-class learning. After the classroom teaching is over, students should first consolidate the knowledge points explained in the classroom, and then learn the micro-class video, aiming to consolidate understanding and master the classroom teaching content, and participate in online exercises and online Q&A sessions as required to continuously consolidate what they have learned Knowledge points. As a teacher, you should check the students' exercises and test questions in time, analyze the students' comprehensive learning effects, and combine existing problems to conduct targeted teaching. Finally, consolidate and improve. Before each class, teachers should use about 10 minutes before class to comment on the completion of students' micro-class teaching platform homework, and targeted

expansion and improvement, so as to effectively consolidate knowledge points and improve students' knowledge mastery.

Second, specific case analysis. Take the knowledge point of "calculation of the bearing capacity of the normal section of a bending member" as an example to conduct a specific teaching case analysis. First of all, before teaching, the teacher carefully divides the content of the knowledge points in this chapter, extracting one or two difficult points and knowledge that need to be deepened in each small unit to carry out micro-class teaching. In the development of the micro-class teaching design work, taking "how to ensure the yield of the steel bar in the compression zone" and "the design and review process of the double-reinforced rectangular section" as examples, when making the micro-class video, it is clear that the micro-class teaching goal is to make students fully grasp the conditions to ensure the yield of the compressed steel bar, deeply understand and master the stress value of the compressed steel bar in the limit state. When designing the micro-class video, you should first review the four basic assumptions about the bearing capacity of the normal section, so as to introduce the problem that the compression steel bar will not yield; then combine the flat section assumption to derive the ultimate state compression steel stress; Find the conditions for the yield of the compressed steel bar and find the calculation method for the unyielding of the compressed steel bar; then guide the students to think more deeply, such as, "What should I do if the compressed steel bar does not yield?" The video is kept for 10~15 minutes. Secondly, lecture in class. For the knowledge points in this chapter, the teacher should focus on the calculation of the normal section bearing capacity, the use conditions of the double-reinforced rectangular section, the design and review method of the double-reinforced rectangular section, etc. After the explanation, students are required to watch the relevant micro-class video by themselves. And then consolidate and improve the knowledge learned in the classroom. Furthermore, micro-class learning. Teachers should supervise students to learn knowledge through micro-class videos, and guide and encourage students to ask questions on the network platform. Teachers should provide targeted answers and select and record common problems among students. After the end, students will take photos of their completed homework to the online platform and answer the questions assigned in the micro-class. The teacher corrects the students' homework and builds the results into a file to be included in the final assessment. Finally, consolidate and improve. Before the knowledge of the new chapter is in class, the teacher uses the time about 10 minutes before class to explain the difficult problems, common problems, and problems in the homework that the students in the previous chapter raised on the online platform, so as to consolidate the knowledge points learned, but also Able to raise students to a certain extent and continuously improve the quality and level of course teaching.

### 3. Conclusion

To sum up, with the rapid development of network information technology, the use of teaching methods such as micro-classes and MOOCs has changed the drawbacks of the traditional exam-oriented education model, which is conducive to stimulating students' interest and enthusiasm in learning, while focusing students' attention in class It can also improve the level of knowledge understanding and mastery, and cultivate students' good self-study ability. As a teacher, when using the micro-class teaching model in the teaching of engineering structure courses, he should pay attention to using the existing network teaching platform, make preparations for pre-class teaching, carefully make micro-class videos, pay attention to classroom explanations and micro-class learning links, and also Pay attention to the consolidation and improvement after class, and then maximize the role of micro-class teaching, improve the quality and level of curriculum teaching, but also guide students to establish good learning attitudes and habits, cultivate core literacy of the subject, and achieve comprehensive development.

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