

## The Design and Making of The Micro-course of “The Nature of Circle”

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### Abstract

Today, with the rapid development of the information age, information technology has penetrated into all aspects of people's life and learning. As a new teaching method, micro class has the advantages of less time, less content and clear goal. Under the background of the new curriculum reform, micro class teaching resources can effectively promote the reform of traditional teaching method. This topic takes the related nature of circle in junior high school mathematics as the knowledge point, and gives full play to the characteristics of micro lesson, such as picture, text, sound and image, in order to assist junior high school students to understand this part of the content, stimulate students' interest in learning, and improve learning efficiency.

### Keywords

Junior high school mathematics, micro lesson, design, making.

### 1. Introduction

Nowadays, with the rapid development of society, Science and technology have made new discoveries and breakthroughs. With the popularization and application of mobile devices, micro-blog, micro-letter, short video, micro-film and so on gradually appear in people's life and study. At the same time, the promulgation of the Mathematics Curriculum Standards for compulsory education (2011 edition) has made it possible for modern educational technology to be widely applied and deeply integrated in mathematics classroom teaching in junior middle schools, and new teaching models such as micro-class, MOOC and flipped classroom have emerged, they deeply influence the development of mathematics classroom teaching mode in junior middle school, and also change the way of mathematics teaching, the form of organization, the evaluation and the teachers understanding of the modernization of teaching resources.<sup>[1]</sup>Micro-class is regarded as a new teaching method, for the abstract and boring mathematics curriculum, is a kind of abstract knowledge concrete optimization curriculum. In the classroom teaching, the application of micro-class to assist teaching, which not only changes the teacher-led classroom, teacher-centered traditional teaching methods, but also can save more time for students to consolidate knowledge, fill gaps, this allows knowledge to be refined over time. But in the junior middle school mathematics teaching, how follows the mathematics discipline and the student thinking ability development characteristic, strengthens to the student knowledge utilization ability and the creative thinking ability raise, is an important and the urgent topic.<sup>[2]</sup> Micro-class is a kind of teaching resources designed for specific concepts, ideas or methods with video as the carrier. Its main features are subject-prominent, short and easy to understand content, and so on, and in the actual teaching practice process have obtained the very good teaching effect.<sup>[3]</sup>In the information age, micro-lesson is introduced into

education, and the traditional education method is gradually introduced into the micro-education era.

## 2. Demand analysis

### 2.1. Object requirement analysis

The Micro lecture is aimed to the Junior high school students. At this stage, students have the ability to judge whether is true or false and can accept new things easily. At the same time, students have the curiosity for the unknown world and like exploring the new things, it is the best time to foster students' thinking ability and problem solving ability. But because students were influenced by environmental factors such as age growth. Students' attention span is not long, mathematics as an important and abstraction of boring courses, if things go on like this, students would lose curiosity, self-confidence in mathematics. In this Micro lecture, applying the courseware combining Chart, words, sound to present students in order to cause the students' attention and arouse the interesting in studying mathematics.

### 2.2. Content requirement analysis

According to the teaching characteristics of this course, six knowledge points are selected, namely, the concept of circle, the vertical diameter theorem, the central angle of circle, the deduction process of the arc length formula and the fan-shaped formula, the element perimeter angle theorem and the relationship between regular polygon and circle. The study of this chapter is not only a further understanding and exploration of the circle, but also can lay a good foundation for students to learn the knowledge about the circle in the future.

### 2.3. Feasibility Analysis

Compared with the traditional mode, the Micro lecture has many advantages. It mainly reflected in the short time, fine content, small capacity, modularization, convenient communication and so on. The process of the development of Micro course has feasibility. It mainly present following aspects: economy, it don't spend too much money, it only need to install the courseware making software Microsoft PowerPoint 2010, screen recording software Camtasia Studio9, Adobe Photoshop Image processing software and Adobe Audition CS6 audio processing software; equipment feasibility: The Micro course has low commands for the computer configuration, ordinary students' laptops could complete; recording environment: The recording environment should be quiet so that the recording wouldn't be disturbed and the recording effect is good; Production technology: As a student of educational technology and has studied some courses that is relate to the technology of Micro lesson production during school days. And students have studied the education teaching methods and have the corresponding ability in the course of teaching design.

## 3. Framework design

The design includes six instructional videos, each of which includes the beginning, the body, and the end. The idea of micro-course design is designed with the flow of introducing concept, proving, expanding application and summing up. In the part of scenario introduction, the context and content are connected to attract students' attention and curiosity, so that the micro-course design video has a clear knowledge point and illustrated explanation, to provide students with a variety of learning methods, not limited by time and place, students choose the course they need to study according to their own progress, in order to timely fill gaps in order to improve the efficiency of learning. The micro-course "Properties related to circles" is divided into six knowledge points to be explained, they are "The concept of a circle", "The diameter perpendicular to a chord", "The central angle of a circle", "The circumference angle", "The

relationship between a regular polygon and a circle”, “The length of an arc and the area of a sector”.

#### 4. Design and main development links

Preparation of teaching materials for multimedia courseware; Preparation of literary materials: In the early stage, the preparation of text material is mainly through the Microsoft PowerPoint 2010 and Microsoft Word to transfer in the document; The preparation of Sound material: Title Music and background music in the video mainly were downloaded through the Internet and use the Adobe Audition to edit. The voice of the teacher’s explanation is mainly obtained through recording tools. So the recording environment must be quiet; The preparation of photos material: Through the Internet to search and is basic of the content to use Microsoft PowerPoint 2010 shape tool to draw and use the Adobe Photoshop to handle; Development environment: The design mainly through to use Microsoft PowerPoint 2010 to making courseware. Using the Screen recording software 9 to record video and then to use its related operations to edit, transition, export and other operations. The sound part is edited by software.

#### 5. Evaluation of selection tools

Microsoft PowerPoint 2010 is to use simply. And it can make photos, sound, written words and video to interlock. Comparing to other Courseware making, the former is easier and faster. After the Camtasia Studio 9 recording software was been installed the software could be directly embedded in PPT software. During screen recording, the software could be opened in the PPT to record video. After the video was completed it can be edited later, background music, explanations process and other operations are added. It is convenient to use and combined. The Adobe Audition CS6 Audio processing software is an software that deals with audio. It could edit the recorder explanation process and eliminate some unnecessary noise, easy to use, it can edit according to one’s requirement. In summary, these software all meet the basic conditions of making a complete micro lesson.

#### 6. Summary

This micro class has the following characteristics: The content is concise and targeted, The content only has a knowledge point, when studying, targeted in learning, exercise explanation after class, consolidate knowledge, it difficult to cause confusion of knowledge points for students; Clear target, The micro class was used to provide for Sixth grade students to study the course content of “Propertied related to circles” and solve the key and difficult problems; Access convenience. The micro class can be broadcast in the multimedia classroom. Students could copy the video to watch on a mobile device and to make up for the deficiency in class; Repeatability. The video can be watched repeatedly without limitation of time and place. And it can embody abstract knowledge; Teaching is easy to understand. With the presentation of the courseware content, the teaching of language is carried out in an easy-to-understand way and the abstract knowledge is embodied; Deficiencies: First, there is no application test after the completion of the work, cannot grasp whether to meet the conditions for learners to learn, and second, because not professional mathematics teachers, in the teaching design of the consideration is not complete.

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