

## The Application of Microlearning in Elementary School Information Technology Teaching

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### Abstract

With the rapid development of technology, information technology education has received more and more attention, and micro-lessons are soon applied to school classroom teaching with many features such as short time and small capacity, targeted content and rich performance. Although there are many micro-lesson resources, specific application models are rare. This study defines the concept, characteristics, and analyzes the advantages of micro-lessons in elementary school IT teaching. Micro-lessons can improve teaching effectiveness, make students and teachers more interactive, develop students' self-learning ability, and realize students' stratified teaching. Through interviews with some elementary school IT teachers in Liao Cheng City, the specific application of micro-classes in elementary school IT is discussed, and the application of micro-classes is analyzed from three aspects: before, during and after the class with specific cases. Finally, the matters that should be paid attention to when applying micro-classes in elementary school IT teaching are elaborated.

### Keywords

Elementary school information technology; Micro-course; Teaching.

### 1. Introduction

With the current rapid development of technology and network technology, mobile terminals are becoming more and more common in life and our society is now becoming an information-based society. In the field of teaching, it has become common for teachers to use a lot of energy to teach. At this time, a simple yet effective teaching tool and method will greatly improve their teaching quality, and the emergence of micro-lessons can make teachers detach from this repetitive teaching situation. With its targeted content, highlighting important and difficult points, and lively and interesting features, micro-lessons are applied in school teaching, and its impact on teaching is very obvious.

Through the analysis of the characteristics and advantages of micro-lessons, it is concluded that micro-lessons can promote students' meaningful learning and help teachers to teach effectively, as the traditional IT classroom is based on theoretical knowledge, teachers' demonstration and students' practice, which may have some problems. There are some new contents waiting for students to discover. Secondly, elementary school IT subject has less class time, and students will forget the last class content when they do not go through the review, and releasing micro-lessons to students in the class can make them review in time. Through this study, the characteristics of micro-lessons are described, the advantages of micro-lessons in elementary information technology are clarified, and some specific applications of micro-lessons in elementary information technology teaching are further elaborated, so that we hope to further develop micro-lessons in elementary information technology teaching and accelerate the pace of teaching reform.

The earliest foreign proposal for micro-lessons was David Penrose, who proposed five aspects of micro-lesson construction: first, list the key points to be delivered during classroom teaching; second, make a summary introduction to provide a background for the core concepts; third, record the key content with some devices, which should be less than 3 minutes; fourth, students do the learning and assign the post-lesson tasks; fifth transfer the tasks with video to the course platform. After that, Salman Khan established Khan Academy, which has many online courses, and as long as there is a network, students can study anytime and anywhere. Soon, teachers changed the way they teach, allowing students to watch videos in advance, understand the teaching priorities, and communicate in class to achieve the purpose of problem solving, this kind is also called flipped classroom, and there are some problems in flipped classroom, such as effective integration of curriculum and resources, teachers' There are some problems in the flipped classroom, such as the effective integration of curriculum and resources, the teacher's role cannot be effectively played, and the existence of micro-classes can solve the problems of the flipped classroom to a certain extent because of their relevance and thematic content.

The earliest research on microcourses in China was the microcourse collection and selection activity of Foshan Education Bureau in Guangdong in 2011, and the research on microcourses in China started to heat up in 2013 and started to get on track in 2014. In 2012, the first globally released microlearning website, Phoenix Microlearning, was released, in which the courses are free and can be further improved as long as you want to learn. 2014, Xiong Kaiwu elaborated on both the design and application of primary IT microlearning. 2016, Zhou Ying analyzed the application of microlearning in primary IT teaching by to come up with a summary. in 2020, Guo Fangming categorized the content design of elementary school IT microlearning resource library and explained the principles of application in the process of supporting teaching in stages respectively. Overall, the above-mentioned studies have done some research on the mode and principles of microlearning application in elementary school IT teaching, but microlearning in elementary school IT teaching and learning needs more in-depth research.

## **2. Characteristics of Micro-class**

### **2.1. Short Time and Small Capacity**

The duration of micro lessons is relatively short. The storage capacity occupied by micro-lessons is generally very small, using mp4 format, avi format, flv format, which takes up less memory, the video is not easy to lag, and easy to spread and share.

### **2.2. Stimulate Students' Interest in Learning**

Excellent micro-lessons integrate images, text and sound, sometimes incorporating contemporary popular elements to attract students' interest and lively knowledge, so that students can be entertained while learning knowledge without being bored. Microlearning combines different senses to arouse students' interest in learning. It will also make students impressed.

### **2.3. Less Content, But Rich in Expression**

Micro-lessons generally focus on a certain point of knowledge, targeted explanation, such as knowledge-based micro-lessons it is a separate micro-lesson to explain a point of knowledge, and other micro-lessons are not necessarily related to each other, this kind of general teaching for the majority of the heavy and difficult points, heavy and difficult points because it is not easy to understand, will let the teacher teaching a certain obstacle, sometimes there will be this lesson the teacher has spoken students remember, to the next lesson students forget the situation, the student learning effect is not good. Sometimes, the teacher may remember this lesson, but the students forget it in the next lesson, so the students' learning effect is not good, but by using micro-class, the students can watch the video repeatedly, so it is easy to achieve

the breakthrough of the important and difficult points, and the teacher will not always be stuck in the explanation of the important and difficult points, which is a waste of class time and is conducive to the improvement of the teacher's teaching efficiency. It can effectively help students to clarify and master the important and difficult points.

### **3. The Advantages of Micro-class Applied to Elementary School Information Technology Teaching**

#### **3.1. It Is Conducive to Reflecting the Main Position of Students**

In the traditional teaching activities, teachers explain and operate the lessons according to the textbook, and students practice, which distracts students and may lose their interest in learning in the classroom. In elementary school IT teaching through micro-lessons, students can follow their own learning style and habits, and choose what they are interested in or what they are not proficient in to watch and learn again and again. The teacher will distribute the micro-lessons to students in the classroom, and students can choose whether to learn this aspect by themselves, ignore the knowledge they have already mastered, and repeatedly watch and learn the knowledge that is difficult to understand, which is conducive to reflecting the main position of students.

#### **3.2. Help Develop Students' Self-learning Ability**

Elementary school information technology is a subject that attaches more importance to practice, with the continuous development of contemporary technology, students need to have the ability to find problems and solve them, sometimes the teacher's explanation is not comprehensive, for some students, may not be deep enough, for others, may be too deep, elementary school students are generally younger, roughly at the stage of concrete operation and evolution, can not yet form abstract logical thinking. The application of micro-lessons to elementary school IT teaching, students are more likely to choose the appropriate micro-lessons independently for learning, in addition to completing the tasks assigned by the teacher. For students, there is the ability to choose independently, and through this way, it makes students have a clear understanding of themselves and the knowledge they have mastered. If the learning is not solid enough, they can make up for the deficiencies in their own learning by repeatedly learning through micro-lessons.

#### **3.3. It Is Conducive to Achieving Students' Stratified Learning**

Each student has a different learning style, and the social and family environment will also bring certain influence, each primary school student's information technology foundation also exists differences, in the traditional teaching some students may not be able to understand one aspect of knowledge, will lag behind the progress of other students, the use of micro-lessons, students according to the needs of learning to choose the appropriate learning content, can achieve layered teaching, teachers can design different The teacher can design different interactive games, so that students of different levels can get the joy of success through the learning of micro-lessons, so that they can keep making progress, realizing "teaching according to their ability", making students interested in learning, improving their self-confidence, and narrowing the gap of students step by step.

## 4. The Application of Micro-class in Elementary School Information Technology Teaching

### 4.1. Pre-learning Before Class Using Micro-lessons to Lay the Foundation for Student Learning

Elementary school information technology attaches importance to basic teaching, but the computer subject itself has a certain abstraction, elementary school students can carry out simple abstract thinking, but there are still certain problems, the use of micro-classes before class, can guide students to effective pre-study, before class, the teacher according to the next lesson to be taught, the students are not easy to understand, too abstract knowledge points made into micro-classes, will itself may be boring The lessons are displayed through animations, so that students can understand the key contents of the lesson, and it is easy for students to keep questions about the knowledge points they are not clear about during the lesson, and to find the answers to their questions with curiosity, laying the foundation for their next learning. Using the micro-lesson as a pre-course prep video, in the video, tasks can also be set so that learners can watch the video and complete the tasks. They may encounter problems when carrying out the tasks, so that they can overcome them by consulting the information, and if they cannot overcome them, they can let the students carry out the lesson with questions and curiosity, which is more relevant.

Application principle: Micro-lessons will generally focus on a certain point of knowledge. To refine the content of a chapter in the textbook to multiple sections, and then to multiple knowledge points, a knowledge point makes up a micro-lesson, so the complex content should be streamlined. As a pre-course preview video, it should be more innovative and allow students to carry out the lesson with questions.



Figure 1. Introduction



Figure 2. Mission

### 4.2. Classroom Teaching Using Micro-lessons to Improve Students' Learning Efficiency

The first part of classroom teaching is the introduction of the class. A good introduction can arouse students' interest and motivate them, and it also helps teaching activities. It has the role of a prior organizer, and it is a kind of guiding material that makes clear the connection between the original concept learned and the new concept to be learned. The form of language introduction is too monotonous and students are not interested in it. Often, while the teacher is talking above, the students are dull or doing something else below, while it is different through micro-lesson introduction. Before the teaching starts, the micro-lesson video related to the lesson is played to introduce the new lesson, which will stimulate students' interest in learning and keep their minds on the class.

Application principle: the content of the introduction video should be in line with life reality and teaching objectives, and not spend a lot of time on the introduction link. For primary school students, it should meet the cognitive characteristics and psychological development of primary school students. The video of introducing micro-lesson needs to pay attention to the

choice of pictures or sounds to meet the age characteristics of elementary school students, and choose some things that elementary school students like and are interested in. It should be closely related to our real life, and the time of the video should not be too long, which will easily make elementary school students feel bored.



Figure 3. Introduction



Figure 4. Show

### 4.3. Post-class Review Using Micro-lessons to Consolidate Students' Learning Content

For elementary school students, what they remember in the classroom may be quickly forgotten, and information technology courses in elementary school usually for a week, there will often be students master the knowledge of this lesson, not to review the summary of the next class, the next class, the knowledge learned in the previous lesson to forget the situation, so it is very important to review in class, review in class, students will not know where to review because of the memory is not deep, and do not know where to review Therefore, micro-lessons can be integrated into the review session, and the content of the micro-lessons is the important and difficult points of the lesson. In this way, students can find their own shortcomings and improve themselves so that they can form a complete knowledge system at the end of the semester.

Application Principle: In the process of micro-lesson design, interactive elements can be added so that it will not be a one-way output, but can have interactive elements that will help students learn knowledge and improve learning efficiency. The design and production of micro-lessons should focus on the relationship between the whole and the parts. Although a micro-lesson may only reflect a knowledge point, the knowledge points are both relatively independent and interconnected, which will form a complete knowledge structure system on the whole. This is especially important in the review of the class, in connection with the previously learned knowledge points, if necessary, can be reviewed again, to achieve the effect of twice the effort with half the effort.



Figure 5. Interactive

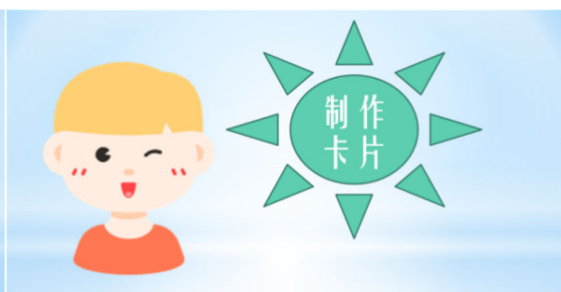


Figure 6. Challenge

#### 4.4. Analysis of the Application Effect of Micro-class in Elementary School Information Technology Teaching

Through interviews with three IT teachers (X, Z, Y) who often use microcourses in Xinghua Road Primary School, Zhenxing Road Primary School, and Construction Road Primary School, we found that the use of microcourse teaching resources is very helpful to teachers in their usual teaching, and it also plays a good role in driving teachers to learn and develop IT. The main summary is as follows.

Teacher X uses micro-lessons in pre-class prep, posting videos through the school's platform for students to prep and watch, so that students can find weak points in advance and listen to the lectures in a targeted way. Teachers can analyze students' situation and identify problems in learning based on their self-study so that they can teach in a tiered way. Through the interview, Mr. X said that students had a fresh feeling about the microlearning during the pre-class preview, and most of them could learn the knowledge during the preview and ask their own questions in the class. Through self-study before class, there are some knowledge points that students mastered before class, which reduces the time spent by the teacher to repeat a knowledge point and allows time for students to practice independently or work in groups to solve problems together. This sets a good tone at the beginning of the class, students know what to learn in the lesson, mental energy is focused, and the teacher maintains a high level of enthusiasm for the work.

By using micro-lessons in class and sending videos to students' mainframes in class, Ms. Z has more time to focus on teaching students about information literacy and the classroom atmosphere becomes more harmonious. Through the interview, Mr. Z said that the use of micro-lessons is usually used for theoretical content, and the videos can make students focus on the knowledge point and leave a deep impression on students' mind through animation and sound, which helps students to understand rather than memorize. In addition, micro-lessons can also be used to rekindle students' interest in learning when they express boredom with the class content and go off on a tangent, which is easier for students to understand than mere verbal descriptions. But she also suggested that at the school level, schools should pay more attention to micro-lessons, guide teachers to use them more often in their teaching, and keep promoting them.

Ms. Y's use of micro-lessons after school and posting of videos through the school's platform relieves teachers of heavy repetitive teaching, gives them enthusiasm for their work as teachers, energy to reflect and evaluate their teaching, and plenty of time to attend to students with learning differences. It helps teachers to improve their teaching skills. The efficiency of students' learning was greatly improved by sending the video to students after class for them to watch, as compared to the previous effect of not using microlearning and simply reminding students to review after class. I will give some extension exercises to some students with good foundation, and I will also give individual tutorials to some students with poor foundation, so that they will not fall behind and will not have a sense of lagging behind.

#### 5. The Considerations of Micro-classes Applied to Elementary School Information Technology Teaching

In elementary school IT teaching, micro-lessons can be a good aid for teachers to carry out teaching, but not every part of teaching is suitable for using micro-lessons. Teachers should consider the teaching objectives and contents of each lesson, analyze students' learning conditions, reasonably use micro-lessons in the classroom, and combine micro-lessons with our teaching plan of the lesson. For example, in explaining the knowledge point of "drawing graphs", as the important and difficult point of this lesson, we can teach through micro-lessons, but the end of micro-lessons does not mean the end of learning this knowledge point, in order to make

students understand this knowledge point more, we should let students do actual operation. Although there are many micro-lesson resources, the composition is relatively single and no system is formed. Sometimes micro-lessons may not have corresponding supporting resources, which will make the teacher's teaching incoherent and unfavorable to the learning of teachers and students, so micro-lessons should be used reasonably in teaching, not abused and not used in general, teachers should choose and use them reasonably.

At present, many schools and teachers attach importance to micro-lessons, which can largely improve the quality of elementary school teaching and help transform teaching. Micro-lessons are one of the teaching forms of the flipped classroom, and as a new teaching resource, they complement the lecture-centered traditional classroom in practical application. The use of micro-lessons in the pre-class session can help students build a solid foundation for learning; the use of micro-lessons in the classroom session can improve students' learning efficiency; the use of micro-lessons in the post-class session can help students review and consolidate their learning content, and also help with tiered teaching. However, at present, micro-lessons are limited to the introduction of micro-lesson resources, and although changes in teaching methods are made, they lack attention to students' ways of thinking and cannot be applied to teaching with micro-lesson innovation. Therefore, in the process of teaching changes, it is necessary to make changes to the teaching contents and the proportion of them, especially to make a reasonable design of micro-lessons for pre-lesson and micro-lessons for post-lesson review, and the teaching rhythm is appropriately Changes are made to enhance the teaching effect, and innovations are made to micro-lessons to suit students of different levels. Students can be organized for self-study, which can speed up the pace of teaching changes in elementary school.

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