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# The Design and Application of "Flipped Classroom" Teaching Model based on Micro-lesson

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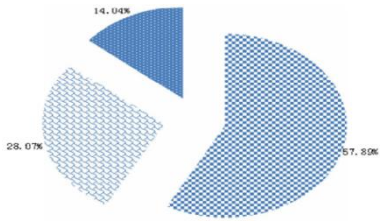
***Abstract:*** **"Flipped classroom" teaching model has become the focus of global education, but design and splice issues of activities before, during and after class in "Flipped classroom" are rarely reported. For the critical issue of the implementation of "Flipped Classroom Model", this article explores "Flipped Classroom Model" and verifies the effects of this teaching model in practice Moreover, this teaching model on the basis of the existing resources and activities of micro-lesson from home and abroad in the expanding through arranging pre-class paper achieves knowledge transferring, building, internalization, consolidating and clearance tasks, in class typical tasks and post-class expanded tasks.**



***Keywords:*** Micro lesson; Teaching model; Flipped classroom; Software application course

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## 1. Introduction

Recently, flipped classroom has become a focus in the teaching of food specialty. As a new type of teaching mode, micro course has promoting impact on the implementation of the flipped classroom.

With the new technology, new teaching ideas are constantly emerging, the integration of information technology and subject curriculum is deepened day by day, at the same time leading innovation teaching mode. In recent years, rising by USA flip classroom teaching mode provides new ideas and methods for teaching and learning research and development.

Flipped classroom teaching mode in China set off a huge boom. Information technology as both a theory and skills in the curriculum, is the main subject of technical ability cultivation of information, but the information technology curriculum now exist backward teaching content, lack of teaching resources, teaching the defects of low efficiency, information technology teaching can effectively promote the information technology education of the students. Turns the mode of classroom teaching reform for the course of information technology provides a new train of thought.

In the age of information, varies technologies continue to challenge and update our way of teaching and learning. Between which micro-lesson and flipped classroom are two typical cases which arouse people's attention a lot in recent years. But they don't affect our education a lot due to their limited use. So in this study we propose to reform the traditional classroom by adding the micro-lesson and flipped classroom elements to it and creating a new mode of teaching which is called "micro-flip course". And we also studied how to develop a micro-flip course by designing and developing one with the subject of information technology.

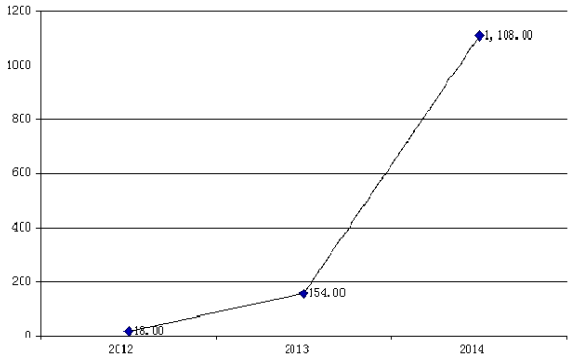


**Figure 1. Study on flipped classroom.**

## 2. Methods

### *2.1. Micro Lesson*

In support of information technology, the flip classroom teaching to teachers in producing micro-lesson for the carrier, within the next lesson in class knowledge transfer and knowledge of the process was reversed arrangement, students become self-paced learners, effectively reflects the Student-centered teaching structure. Flip the classroom to the success of the foundation is to have excellent micro lesson resources to enable students to successfully complete the task before class independent study to ensure knowledge within the classroom and expand smoothly. How to design and develop high-quality micro-class resources has become an issue of pressing concern the majority of classroom teachers in the flipped classroom teaching philosophy. Taking into account the reality of the need and feasibility, the author chose to junior IT courses as a research starting point,



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focusing on the concept of junior high school classroom-based flip IT design and development of micro-lesson.

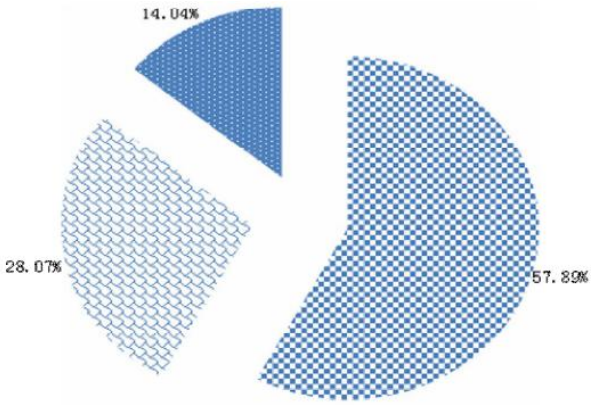


**Figure 2. Attitude to flipped classroom.**

Micro class as an important part of the flipped classroom, directly determine the effect of knowledge transfer before the classroom, the influence of the design of teaching activities in the classroom, so as to affect the final teaching effect. Used to flip the classroom micro class, should not be room for a complete classroom, but the service in the classroom a link or a collection of teaching activities, and through the network teaching platform display. Micro micro video lesson includes teacher's explanation, demonstration, and courseware, case, material resources and learning resources; micro homework exercises, supplemented by answering questions, online testing, online survey of autonomous learning activities and learning feedback.

It must be based on the analysis and extraction of teaching objectives, teaching objects and teaching content, which needs to make teaching video and network teaching resources. In addition, also need to set up according to the needs of exercise and online answering learning feedback, provide an information learning environment, timely understanding of the students' learning status and problems, and then can make more targeted counseling. Micro class learning time and difficulty should be based on the specific classroom teaching content, it should not be longer than 15 minutes, and the completion of the whole micro class learning time should be controlled in about 30 minutes.

### *2.2. Flipped Classroom*

To develop a micro-flip course, the cooperation of a team composed of all teachers who teaches this subjects needed. And all the actions should strictly follow the principles of constructivism and instructional systems design. Besides, all the teaching resource should be standardized and iteratively upgraded to ensure its reuse. Through literature research method, research status and micro flipped classroom lessons were studied to determine the subject of value and significance of the study.

On the basis of relevant theories flipped classroom courses and micro-systems research related theories

Through questionnaires and interviews, the status of the micro-teaching Mountain Division II High School Grade Two IT investigation, according to the findings of analysis of the problem and the reason for flipping the classroom under the concept of micro junior IT courses designed to provide guidance.

Design principles flipped classroom concept under study micro junior IT courses, instructional design, script design and development process of micro lesson, and for detailed analysis.

Flip the classroom is not only teaching the simple structure of the flip, is a subversion of the traditional classroom, after the turnover of classroom teachers is not only teaching, more to guide and facilitator of the learning process, students from the podium passive audience into active participants in teaching activities. According to the different stages and different disciplines, different types of classroom teachers, flip the classroom way could be different, but the basic idea is the same, flipping the classroom effectively has the following important features: students from passive audience into active learners need to realize the classroom by turning; information technology; classroom activities implementation the students' knowledge construction and internalization; classroom time to help students master more challenging concepts, cultivate the ability to solve practical problems.

During the design of the teaching mode, the relevant theories should be followed, and the following principles should be followed. Pay attention to construction of learning theory holds that knowledge is not taught by teachers, but the students through the construction of meaning, flipped classroom to the traditional knowledge transfer is put in the classroom before the class is added in the interaction of teachers and students to collaborative activities. The teacher to the classroom in the stage to let the students become the coordinator and guidance, so as to mobilize the initiative of students, to stimulate students' learning activities, to better reflect the dominant position of students, so that students can better finish and internalization of knowledge construction. According to the cognitive load theory, the traditional classroom teaching content selection of the same, take unified teaching organization, the students' cognitive load low foundation, which causes teaching a waste of time, and the basis of poor students' cognitive load is too high, the way of learning. So in the flipped classroom process, to provide enough micro video and related resources for students, students can choose according to their own foundation, flexible learning resources, arrange the learning time, do not worry about whether the impact on others; can be repeated several times to watch video, do not have to worry about the omission



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of knowledge points, so as to realize the hierarchical education, individualized learning. American psychologist Bloom put forward to grasp the learning theory that as long as the best teaching and give sufficient time, most learners can get excellent results. In the flipped classroom process, to create a comfortable learning environment for students to create a relaxed learning atmosphere, the students do not like listening in class that feel nervous, get rid of the progress of teaching group in the teaching mode of problem, learning is no longer limited by time, so that students can learn at their own pace.

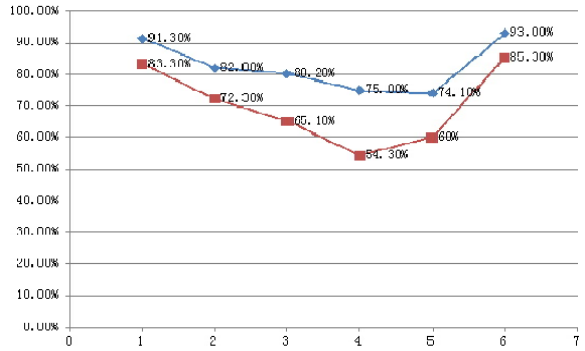


**Figure 3. Compare flipped classroom and traditional classroom.**

The practice of research, according to flip the classroom under the concept of design principles and the design and development process of micro class, as a teaching content, design and development of the micro class of cases "filters and color."

Summarizes the present research, summarize thesis results, innovation points and aspects need to be improved, put forward the prospects of the follow-up study direction.

## 3. Results and Discussion

In this section, the micro-flip course should be designed from three levels, namely the curriculum level, the class level, and the micro-class level. Curriculum design is the overall plan of the course, including determining the curriculum objectives and arranging the teaching schedule. Class design refers to making a specific design of each class, including setting teaching objectives, planning teaching flow and preparing guiding instructions to associate students learn this class. Micro-class design is to design and develop the teaching resource for each micro-lesson paragraph of a class.

**Table 1 The students' core**

| Type | 2013 | 2014 | 2015 |
|---|---|---|---|
| Core | 77.273 | 83.570 | 88.976 |

A micro-flip class is usually executed in a process like this: Firstly, teacher distributes the guiding instruction material to students. Then students learn with learning recourses micro-lesson by micro-lesson as the instruction material told them until all the micro-lessons of this class are finished.

According to the classroom teaching structure, it is not difficult to find that the key is: how to use information technology to achieve knowledge transfer. How to design activities in the classroom to realize the internalization of knowledge? The characteristics and design principles of the flipped classroom are the basis for the construction of the flipped classroom teaching mode based on the micro lesson.

According to the characteristics and design principles of the flipped classroom, both at home and abroad flipped classroom practical application case, application mode design of continuous improvement and perfection based on flipped classroom application model is proposed based on the micro class for the software courses classroom needs. The model through the class before the clearance task, the any class and after class to achieve the expansion of the task of knowledge transfer, knowledge construction and internalization, the consolidation and expansion of knowledge. The software courses refers to the specific application of the teaching content of the course requires students to master the software function of theoretical knowledge, but also requires students to have software practice skills, the former can be obtained through the teaching of teachers, which need to be cultured in the actual operation.

he preparation stage before class: teachers should first according to the needs of the teaching arrangement, teaching content review unit, the contents taught by the teachers, the demonstration of isolated, determine the purpose and content of micro teaching courses, learning resources collection, complete the teaching design of micro lesson. Then, the fabrication of micro video, taking account of the characteristics of the software courses, should pay attention to the fabrication of micro video: micro video can be used to record screen and voice form, to process as much as possible to restore the mouse and keyboard; should the occasional teachers teach in the video camera in order to increase the teaching sense of reality and the sense of the scene; video should be appropriate to add operation key points, points that information to facilitate students to grasp the difficulty; considering the students' cognitive load, the length of the video should be controlled within 15 minutes. Finally, the micro video and other learning resources uploaded to the network teaching platform, and set the task for the micro class, to build online Q & A, online discussion and other information learning environment.

Before class transfer stage of teacher collected is first class link, depending on the type of problem can organize classroom inquiry or classroom discussions; in questions, teachers set the typical tasks according to task difficulty or student self inquiry or collaborative



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learning, teachers or students to observe the operation or the Student Seminar beside, teachers individual counseling or collective appropriate explanation; finally complete the task form learning works, construction and internalization of the knowledge and skills.

The teacher comments on completion of the student, the excellent learning works on network teaching platform; teachers can also collect relevant teaching contents to develop learning resources to expand the task set, there is spare capacity of students to challenge the developing task, realize students to consolidate knowledge and expand.

In order to test the operation and matters need to pay attention to the micro course of flipping the classroom teaching mode based on the "Flash animation" in the "button" teaching content as an example, based on the development of micro course "flipped classroom" empirical research. To further explore the effectiveness of software application courses of micro course of flipping the classroom teaching mode based on the selection of the experimental class teaching practice of "button", to collect data in practice is analyzed, and using the method of questionnaire and interview to understand the acceptance of learning of the new model, compared with the traditional changes in the mode of students' interest in learning.

The class consists of 40 people, the class has been completed before the Flash continued to study the content of courses, built a complete network course, previous attempts have been made to assist teaching in the network course, students with online learning conditions, also has the ability to use self-regulated learning ability.

Teaching content analysis: in the "button making" teaching unit, we put the "button components to create the method", "the role of the button four frames" and other knowledge and skills through the completion of the micro class;

Micro class design and production: recorded a 13 minute micro video, mainly on the "button component creation method" and "button four frame role", and set up the "three common" button pass the task, in addition to micro class difficulty whether appropriate, the use of the number of time to complete the task to collect feedback information such as online discussion;

Class activities: according to the students' feedback is further discussed in the "click" button frame function, and then to "know computer" as a typical task, making students are required to complete tasks by independent inquiry form;

After-school activities of the design: the selection of excellent "understanding of the computer" works in the online course on display, and the layout of the "six in one teaching" to expand the task, upload the task of material for students to expand their learning.

## 4. Conclusion

The design and interface for after-school activities in the implementation of flipping the classroom before class, in class, and put forward based on the micro course of flipping the classroom teaching mode, combined with the specific teaching content to carry out the research and practice, verified the validity of the model. The model through the pre-class clearance tasks, the typical tasks within the class and after class to achieve the expansion of the task of knowledge (skills) transfer, knowledge (skills) construction and internalization, knowledge (skills) to consolidate and expand. The advantage of the flipped classroom is proved by the application of the results of the investigation, which verifies the operability of the model.

This paper puts forward three major tasks of the teaching mode based on the teaching practice based on construction of the software courses, is applicable to other teaching contents have yet to be further verified; in addition to the teaching mode to promote students' learning effectiveness of performance still need further practice to verify.

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