

# Exploration and Application of micro-classroom "railway signal" Course Construction

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**Abstract.** With the advent of micro era, we tend to receive information fragmentation, tends to demand efficiency, hypertext links to information processing tends to habituation; how limited the classroom, so that students can more quickly large capacity to absorb knowledge, how will the "Railway signal" this basic course in a lot of theoretical knowledge vivid output to a student must change the teaching mode, the micro classroom introduced into the normal course of teaching, and actively explore the micro classroom construction, so that students learn on their own expertise in a more systematic and intuitive understanding.

## I. Introduction

Railway construction in the new period, reflecting the high-speed passenger and freight heavy load, equipment modernization, management, information technology and other features, along with a massive new rail lines and subway construction, railway construction field demand for highly skilled talent is more urgent, especially in the high-speed railway, suburban railway operation, maintenance, management personnel more scarce. In the context of the great development of the railway industry, railway signal for non-majors popularity railway signal expertise it is necessary.

### a. Overview "railway signal" Course

"Railway Signal" This course is oriented colleges and universities and non-urban rail traffic signal control undergraduate electives, it is a more integrated public basic course. The course content is the future in basic railway signaling aspects of the work. The course is open to adapt to the development of railway signaling technology, to meet the railway signal correlation signal Students learning the basics, which relates to "Development of Railway Signal" and "infrastructure - signal, switch machine, track Function and principle of the circuit, "" and the station interval signaling system principle "," train control system principle ", etc.

### b. Consideration "Railway Signal" Curriculum Reform

In recent years, the employer of the graduates visited the research and feedback organize information, training of railway signal graduates higher prevalence theoretical level, practical ability is weak, not strong ability to form a certain degree of theory and practice of disjointed, therefore, a considerable number of graduates takes a long time to adapt to new working environment, the actual internship period became virtually pull graduates, which both for himself or graduate employers will have a certain losses. In the "railway signal" of this profession we need to be based on the construction of a number of new exploration, innovative teaching mode, the micro curriculum well into teaching, to explore a "training for the industry, employment-oriented curriculum and teaching theory teaching and practice of combining application "as a new training model.

## 2. The development of micro classroom before analysis

"Micro Class" is the time in less than 10 minutes, with clear teaching objectives, content short, concentrates on a small course problems, seize the best prime-time students' attention, concise overview of knowledge, coaching difficulties, highlight and pay attention.

### a. Micro-classroom Situation Analysis

Timing and size of mini courses mainly for school education curriculum teaching for a long time, large-scale malpractice proposed are small, some small project-based curriculum module, so some

people call module courses. In fact, our country is in its infancy "micro-course" development of "micro-classroom" understanding understanding yet unified, resource construction has not yet formed, yet scattered applied research, evaluation model is not yet complete, "micro-classroom" organized, systematic standardized construction still has a long way to go.

Since 2012, the Ministry of Education, National Center for Teachers' Training College and the Ministry of Education Management Information Centre for the national lead in promoting micro-class universities and primary and secondary schools competition, now has become a micro-lesson basic education and higher education in the field of information technology education important . Lesson micro filming and production technology in hardware and software have made an important breakthrough, micro lesson resources become rich, increasing the degree of serialization, Practice, Application and pilot research increasingly rich, studies have also gradually revealed. Figure 1 is a domestic "micro-classroom" topic literature published in recent years the number of statistics.

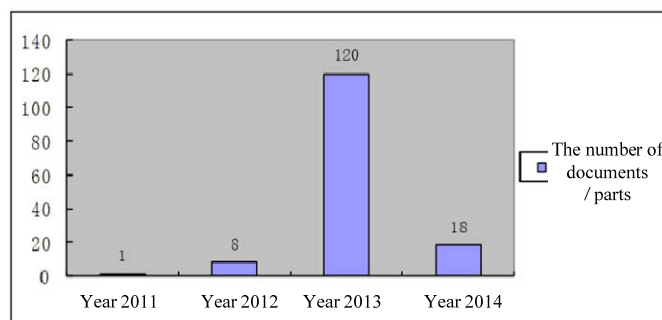


Figure 1. The number of domestic "micro-classroom" topic literature published in recent years.

#### b. Micro-classroom trends analysis

Future Development Trend Micro program will be the focus of attention by the micro-course "micro" to "class" Conversion, pay more attention to quality, "class", trying to achieve the best integration of the "micro" and "class", the research focus gradually to how the design, production and evaluation of micro curriculum "class"; online learning (E-learning) and mobile learning (M-learning) course to become the mainstream of the micro-learning, mobile learning and online learning scenarios provide convenient, interactive, personalized of learning as "micro classroom" informal learning form provided the conditions of mobile learning and online learning media tools also become carriers of micro curriculum released so anytime efficient learning possible; gradually make micro curriculum content knowledge the "fragmentation", "fragmentation" to "organization", "special" of change, the role of great importance to teamwork "micro-classroom" in the development process, and research to improve the overall level of the team, organized, disciplined team can design high-quality work; micro flipped classroom curriculum with each other, to promote the development of the wave of education reform, reconstruction of the flipped classroom teaching structure, increasing learner autonomy, increasing the teacher-student interaction; and micro-programs for the flipped classroom reduce the burden on teachers teaching, the flipped classroom so students are more self-learning can reduce student class under the burden and improve learning efficiency.

### 3. The micro classroom in "Railway Signal" Course Construction Exploration

Through the "Railway Signal" courses of study, so that students understand the important role in directing traffic in the railway signal, the master and the role of basic principles of signal equipment; clear interlocking occlusion concept; initial grasp of the relevant ministerial standards, regulations, rules, norms and graphic symbol; for the future development of the railway signal to understand.

Now teaching and learning methods and the traditional sense is very different, the former is more diversified, in the process, great changes occurred in the role of teachers, personalized learning resources building more and more attention, more learners' autonomy stressed, micro lesson building is to promote learner autonomy in learning services, mainly for students preview, review

after class.

a. Diversified teaching

With the progress of science and technology, the emergence of new media, new technologies in the field of education gradually penetrate. The course on the use of teaching slides, projectors, etc., using video image data on a planar perspective books will be presented in front of students, students' enthusiasm significantly improved.

b. The construction of micro-video, build micro classroom

The past two years, in the Web2.0 environment, "micro-letters", "micro-blog", "micro-film" and "micro" pattern emerging, a lot of changes in people's lifestyles, and can be said to have entered a "micro" era. Micro-lesson in the trend of "micro" era came into being; it has not only become an important teaching and learning resources, but also to build a learning society possible. The "Railway Signal" teaching focus of this course gathered in the "micro" word, it is desired by "micro" in the form of changes in our education, teaching content modular, unitized decomposition according to knowledge, according to the teaching curriculum key, difficult and doubtful, error-prone points, the establishment of curriculum mapping knowledge, in the form of micro-curriculum, design, production micro-video and associated support resources.

c. Building an interactive platform

Teacher's personal space and personal space of students. Teachers create curriculum materials in the fields of personal space, granted curriculum course descriptions, curriculum standards, teaching courseware, electronic lesson plans, case base, instructional videos and other information posted online; students can see the teacher's teaching materials, teacher-initiated learning added club, and through comment interact with the teacher. Under the guidance of teachers, the use of interactive learning platform to support independent learning by teaching after the first change to first post-teaching. Immediately after learning platform to learn to do the test, for each micro course, immediately after school arrangements test can not score, you can not see the next lesson. And arrangements online questions, each student has any problems can be linked to the Internet to the platform to give the wrong answer, the answer is not a teacher, but at the same time learning courses to students of this micro.

#### **4. The development of micro-class principles and process**

Railway signal technology is to ensure traffic safety, improve transport efficiency and improve working conditions for the purpose of technical system; graduates properly understand and master some railway signaling technology is very necessary. The railway signaling important points, such as: "the role of infrastructure and principle", "stop and interval signal systems principle", "Train Control System Principle" and made 10 to 15 minutes short video teaching resources, and this new types of resources and mobile devices (such as tablets, smart phones, etc.) combined to promote in the school, so that the majority of students interested in railways can fully understand the basis from classroom teaching and independent study on railway signaling knowledge, their future work to provide valuable services.

a. The theoretical basis of the micro-classroom building

In building the micro lesson resources, the knowledge points to sort out the course, and the difficulties in the course of the division focus, knowledge modules into the design of these micro-lesson about 10 minutes.

From the micro curriculum topics, creativity, design, content presentation, analysis and other technical aspects of production, from the knowledge of the course starting, select one of the major and difficult, error-prone points, design and production of micro-course series closely. Each micro-course series is relatively independent, and a chain. First, the creation of learning environment, following prior knowledge, prior experience wake; then heavy and difficult to solve; and finally leads to the subsequent knowledge points. Prior knowledge and knowledge will follow the series, set up links from the learner in the past, present and future of the bridge. Cleverly designed range of issues to guide layers, triggering deep thinking learners.

b. Micro-classroom building teacher training

For micro-lesson, to let teachers have a micro lesson clearer understanding, and micro-lesson on how to advocate ideas can be realized in the teaching process thinking, have their own ideas; secondly, also technical guidance for teachers on how to make a micro-lesson training. There are teaching how to record video, how post-editing, and how then PPT insert multimedia files. Teachers are required in the production of micro-lesson course, the use of standardized academic language; languages express a clear, coherent and easy to understand students; rational distribution screen, clear image, no quality defects. And the appropriate use of information technology for different themes, select the appropriate one or more technical methods to stimulate student interest in learning, to help students study independently smooth smoothly. While teachers' educational philosophy of innovation, teaching mode innovation, use of technology innovation, teaching strategies, students create a enjoyable, beneficial micro-learning courses.

#### c. The production of micro-classroom

Micro-class production neither excessively visualization, dynamic and interesting, to the actual situation, static and dynamic binding, specific binding abstract, in the right situation, mood and rhythm which enable learners to focus on watch, experience and thinking presented content develop good thinking habits, enhance higher-order thinking skills; they do not modeling, blindly demand perfection, always prominent teaching first, the effect of the first and the effective transmission of principles, not technology first, "advanced" concept first principle .

Many micro-class production methods, flexible and diverse. Mobile phones, digital cameras, DV, tablet, pen recorder lessons, interactive video system, screen recording software (such as screen recording software --Camtasia Studio v6.0.3) so you can make as a micro-class tools.

Here are the more common production of micro lesson three methods. First, "Khan Details": Khan Academy's production methods, namely the electronic blackboard system (including tablet, drawing software) combined screen recording software. Teachers in electronic touchpad to select various color brush, like on a real classroom, while explaining, while presentation on the electronic blackboard screen recording software through, about 10 minutes made into micro lesson. Second, the "software-based": the use of some micro lesson authoring software. For applications such as the production of micro-class software IPAD Show me, Explain Everything ASK3 and the like. IPAD screen is an electronic black board; teachers can explain the side while doing writing on the blackboard, the teacher's voice and the content of the electronic board at the same time it is recorded, without having to learn any technology can create micro lessons for teachers to save time. Third, the "record class style": Record real courses, post-production editing about 10 minutes into the micro lesson. Use camera or taped classroom, teachers teaching the whole recording process, then the number of clips into one or more micro-lesson based on knowledge. At the same lesson plans, courseware, questions are also accordingly "micro" treatment.

#### 5. The educational value of the micro classroom

Future technological development of education three trends: mobile, without moving die; open, not open to die; interactive participation, does not participate die! The microspheres used in the classroom before class, learning can be combined to achieve a single task Guidance function, which helps students to preview key, difficult and requires prior learning. For example, recalls its previous knowledge, Wake existing experience, introduce background knowledge, stimulate interest in learning and so on. The micro-lesson in classroom use, can help students solve key, difficult and doubtful, error-prone points and confounding points, complete internalization of knowledge, maintain and strengthen interest in learning. Micro classroom use in class, help students sort out knowledge, to: review, consolidate key, difficult and doubtful, error-prone points, extended learning, application migration, learning content leads to follow.

Micro courses will adapt to the new trends in the Internet age has become "teaching, learning and research, professional development," one of the four new technologies and educational resources construction. Lessons in the application of micro-information programs to help teachers enhance the core instructional design capability; in the commentary course applications, micro curriculum evaluation capacity can enhance teaching and teaching reflection ability. Micro-course abandoned the image of teachers, students and the classroom environment and other image

information, leaving only through miniaturization, after contextualizing and visualizing treated essence of the content; enables teachers and students to focus on teaching key, difficult and doubtful, error-prone points, confusing point, without worrying about interference irrelevant information. Deliver high quality in a short time the essence of the content; initiator depth of thinking learners, from a question / answer can lead to another problem extends students think / answer. Excellent micro curriculum is "wisdom, beauty and technology" is compatible with the body.

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