Research on the Teaching Model of Database Foundation Course Based on Micro-lectures

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Keywords: Micro-lectures, Database Foundation, Teaching Model.

Abstract. The introduction of micro-lectures teaching in higher vocational education is a new measure to promote the education information. It is an effective way to deepen the reform of higher vocational education and improve the quality of teaching. Based on the perspective of the database foundation course in higher vocational colleges, this paper constructs the teaching model based on the micro-lectures combining the advantages of micro-lectures and in-depth understanding of the status quo of the course. This kind of teaching model has greatly aroused the students' learning interest, promoted the teachers' teaching ability and level, and has a great effect on the resources construction and teaching reform in higher vocational colleges.

Introduction

Database foundation is a professional basic course of computer science in vocational and technical education. It aims to familiarize students with the basic principles of relational database, the concepts, the using of SQL statements, and the knowledge of database security, and train students in database analysis, design, use, maintenance and management, and other aspects of the capabilities, for its future in database management, software development work to provide the necessary knowledge and skills foundation. However, the traditional classroom teaching ignores students' subjectivity. On the one hand, the teaching method is single, and the content of course is boring. On the other hand, the foundation of vocational students is weak, and the ability of understanding and accepting is poor, and the awareness of autonomous learning is lacking, which resulting in the learning effect is not good. As a new way of teaching, micro-lectures emphasize students are the subject of learning, which are typical of short time, outstanding teaching theme, contextualized and vivid teaching content, can easily stimulate students' learning interest and better make up the deficiency of traditional classroom teaching.

1. Analysis of the Current Situation of the Database Foundation Course

1.1 The Disadvantages of Traditional Teaching

Traditional teaching model is inclined to study the basic principle and theory of database first, and then through the application of examples to learn. It emphasizes on theoretical teaching, but practical teaching design is not reasonable. This kind of teaching model causes these problems: on the one hand, the students feel abstract and difficult to understand when they learn theoretical knowledge, which leads to the decrease of learning interest; on the other hand, the students find out of touch with theory in practice, and cannot connect learning content before and after smoothly. When designing and applying database, they cannot do the work for lack of ability.

1.2 Teaching Resources cannot Meet the Needs of Students' Learning

The rapid development of network technology and multimedia technology has brought great
changes in educational philosophy, curriculum system, personnel training, teaching and so on. Under this background, Database Foundation course has completed the development of network teaching platform and the construction of network teaching resources. However, the teaching content of the network course is updated slowly, and most of the video resources are developed in units of hours, continuing for about forty-five minutes or even longer, which present in the form of monotonous, resource themes and features are not prominent enough. Owing to the relatively weak foundation, poor understanding and acceptance of students, there is a big gap between the network course and the students' self-learning needs. As a result, the network course is less used in practical application.

1.3 Students Lack Learning Initiative, Practical Ability is not Strong

In teaching activities, the biggest problem of students is the lack of awareness of active participation. They rarely take the initiative to explore, accustom to "teachers say, we listen; teachers do, we learn". Passive acceptance of knowledge makes the students' learning initiative reduce, which is unable to stimulate students' autonomous learning interest. So, the practical ability of students has not been improved. In practical teaching, related to the database management and maintenance, database design, database connection, database development and other aspects, many students do not know how to customize the database in accordance with the data model. Therefore, their capacity to design and apply the database is obviously insufficient.

2. The Advantages of Micro-lectures

Using the video as a main carrier, micro-lectures record the brief and complete teaching activities around a point of knowledge or teaching links carried out by teachers [1]. They are produced beautifully and succinctly, which in the form of outstanding topics and fragmented knowledge, can be flexibly applied to many kinds of study situations.

2.1 Short Refining, can Improve the Students' Attention

The duration of the micro-lectures is generally less than 10 minutes. Compared to the more than 40 minutes of classroom teaching, short class hours are more consistent with the cognitive characteristics of the students, which can help them to keep their attention [2]. So, students can complete learning tasks in a short time efficiently without feeling tired and distracted.

2.2 Diversified Resources can Improve Teaching Effectiveness.

The development and production of micro-lectures is a summary and refinement. Using information technology to make text, images, audio and simulation animation into situational learning resources, micro-lectures make up for the single teaching mode of traditional teaching and enrich the teaching resources. They can help teachers organize classroom teaching, so that teachers have more opportunities to try a variety of teaching methods, and can pay attention to the characteristics and growth of each student, and can better do teaching.

2.3 Well-targeted, Helpful to Self-learning

Aiming at knowledge points, micro-lectures which have outstanding themes and various forms emphasize the fragmentation of knowledge, break through the key points and difficulties, and provide a new learning method for autonomous learning. Students can make study plans according to their learning characteristics and needs, take advantage of little time to learn, improve the learning initiative and strengthen their own weak links. They can focus attention in a short period of time and constantly upgrade themselves.

2.4 Flexible Application, Strong Operability

The widespread popularity of smart phones has provided a broader space for the development of micro-lectures teaching. At present, mobile learning has become the main way of network learning. Students can study online or through mobile learning using scattered time anytime and anywhere. It
breaks the limits of time and space, and it's easy to arouse students' learning interest, and it can better make up for the deficiency of traditional classroom teaching. The flexibility of the application of the micro-lectures makes the learning convenient and efficient.

3. Construction Teaching Model of Micro-lectures

The present situation of the Database Foundation course is that the course information is large, and the teaching resources are single, and the individual differences of students are large. In order to arouse the students' learning enthusiasm and initiative, to improve the teaching effect, we make full use of modern educational technology and adopt diversified teaching methods. As a new type of teaching resources, micro-lectures emerge as the times require. This paper puts forward the following micro-lectures teaching model: micro-lectures design and development, autonomous learning before class, interactive learning in class and summary and reflection after class, as shown in Fig. 1. Take creating student information table for example, the following will show the teaching model of micro-lectures.

Figure 1. The Teaching Model of Micro-lectures.

3.1 Micro-lectures Design and Development

As a new teaching mode, micro-lectures provide new teaching resources. According to its characteristic analysis, it is clear that the design and development process should follow the characteristics and procedures of teaching resource design and development [3]. In order to design micro-lectures for a course, first of all, we should analysis the course's current situation, teaching content and learning objectives, determine the overall teaching tasks and objectives. Secondly, set up the contents framework of micro-lectures, split course content, and find suitable chapters to form micro-lectures. Then fill the teaching design, after the teaching design is completed, carry out the detailed script design. Finally, develop and produce the micro-lectures resources according to the script design, and use them in the actual teaching, then adjust the micro-lectures resources according to the use and evaluation of students. The overall process of the design and development of the micro-lectures is shown in Fig. 2 below.
3.2 Autonomous Learning before Class

Teachers use the network to spread the micro-lecture about creating a student information table online in advance, which contains the knowledge points of data types and constraints. Students use their spare time to learn and watch micro-lecture, PPT and other materials uploaded by teachers. Therefore, they know the process of creating a table, the classification of data types, and the use of constraints. At the same time, according to the knowledge points of creating a table, teachers design some questions and also make them into micro-lecture, allow students to complete the relevant pre-class practice tasks, so as to test the students' learning effect. In the process of self-learning, students can use the network platform to communicate and exchange the difficult problems encountered with other students or teachers to complete their knowledge construction.

3.3 Interactive Learning in Class

Classroom learning stage is mainly to carry out in-depth study of core knowledge and the basic understanding of expanding knowledge. Before the class, teachers should do a good job in teaching design, and grasp the status of students' self-learning in time. In the class, teachers answer the common questions and give students feedback on the evaluation of pre-class practice. Therefore, in the course of classroom teaching about creating a student information table, according to these problems that what the difference is between char and varchar in the string data type, how to ensure that the specific field of each record is not null and different from each other, and how to make a specific field value in a table refer to a specific field value in the other table, teachers put forward some problems, and allow students to discuss and carry out cooperative learning based on their previous self-learning state. During this process, teachers are no longer the imparting of knowledge, but the instructors of learning and organizers of teaching activities; students are no longer passive recipients of knowledge, but the active constructors of knowledge. Through interactive learning, in the process of asking questions and solving problems, students can further understand and digest the relevant teaching contents, thereby improving the learning effect.
3.4 Summary and Reflection after Class

After class, through summarizing and reflecting on the application of the micro-lectures and the learning situation of the students, the teachers can further optimize the teaching design and teaching methods based on the micro-lectures, and accumulate the experience. Through the completion of the different degrees of difficulty of the homework, students review and consolidate what they have learned. They can deepen and expand their knowledge and skills, and enhance their interest in learning by discovering problems, analyzing problems, looking up materials themselves or discussing and solving problems with each other. For example, when arranging homework on creating student information table, the teachers ask all the students to finish the homework as following: creating student information table, teacher information table and curriculum information table, customizing the data type of each field and setting the primary key, foreign key, not null and other constraints. In addition, the teachers also arrange the expansive job to create a library management database which contains the reader information table, book information table and borrowing records table. When creating table, students need to think about a series of questions, such as how to distinguish the borrower from the same name? How to record the number of books borrowed by the students? Are there extra fields in the table design? What is the relationship between the tables? ... These issues can deepen students' understanding and mastery of knowledge, and further improve their ability to apply.

Conclusions

As a new type of teaching resource, micro-lectures have changed the traditional teaching modes and learning methods, promoted students' self-learning and teachers' network teaching ability, improved the quality of higher vocational education and realized effective learning. It is necessary to further develop and research how to design micro-lectures according to teaching contents, teaching objectives and teaching objects so as to make them better apply to the teaching of information courses.

References

