Application of Micro Teaching Mode of Network Curriculum in Colleges Basic Courses Based on Cloud Computing Platform

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Abstract — With the continuous development of information technology, the continuous improvement of science and technology, modern educational technology, multimedia and network application as the core, has penetrated into all aspects of the education, has become a powerful thrust of teaching reform. The design and development of learning resources, especially the development of multimedia video learning resources, has been a hotspot in the field of educational technology. The existing teaching materials and textbooks with the learning resource is relatively backward, and the update speed of computer knowledge quickly, so students need to meet the actual needs of the added content, micro courses can better meet the needs of students. "Computer application foundation" as the basic content, design and development of computer application based curriculum system has been described. Reconstruction theory and by means of appropriate organizational structure based on the basis of application of design of computer video micro cluster, so as to assist teachers in teaching activities, but also can help students with autonomous learning. In order to demonstrate the scientificalness and feasibility of application of microcomputer based courses, with university students as the sample, study the utility of computer application foundation course of micro. Through the test of computer application basic micro course is helpful to improve the students' grades. This research results for micro courses in the design and development of teaching reference.

Keywords - micro network course; basic computer application; cloud computing platform

I. INTRODUCTION

In Higher Vocational Colleges in the course of computer application foundation is a public compulsory course. With the rapid development of information technology, learning theory and methods are undergoing profound changes, the popularity of multimedia technology and the Internet make people more convenient access to resources, network learning resources are more abundant, the online learning and mobile learning has become a new trend. In the current education mode, the school teaching time is limited; scheduling is limited, and students to demand more and more knowledge and skills. Micro courses can effectively solve the contradiction between the two [1]. The use of computer communication technology (ICT) to achieve specific objectives of small teaching materials generally based on a series of thematic or semi-independent units, the duration is generally 1-2 hours, teaching organization scale is relatively small [2]. Reversal of the teaching mode innovates in the traditional classroom teaching mode, to bring a new perspective to classroom teaching reform. The students make up for deficiencies in classroom teaching through the micro course [3]. Students can use the spare time to learn whenever and wherever possible, not by class arrangements. The existing teaching materials and textbooks with the learning resource is relatively backward, and the update speed of computer knowledge quickly, so students need to meet the actual needs of the added content, micro courses can better meet the needs of students [4]. The range of micro course learning content selected is very broad, is emerging, subject knowledge, also is not yet mature, development of new knowledge, and interdisciplinary knowledge or skills. This topic will be the guiding ideology of computer application based micro curriculum design, the actual development of computer application foundation design of micro courses and, provide the actual case to verify the actual effect of micro curriculum development, to provide reference for the reform of computer basic course.

II. STATE OF THE ART

A. The Guiding Ideology of the Curriculum Design of the Microcomputer Application Foundation

In the design and development process, to fully consider the location application course of higher vocational computer and the cultivation target of these comprehensive factors, on the other hand, will lose its value. Micro course is a new teaching resource, it is based on the actual teaching needs to be developed, micro courses targeted, can seize the organization and construction of the concrete teaching knowledge or the teaching subject and combined with specific teaching activities systematically. This means that no knowledge or the teaching content can be split and reconstruct the composition of micro courses, so it is easy to cause the students the curriculum content, the knowledge point is incomplete, do not correspond to the curriculum system, the whole of the two major characteristics[5]. Only the appropriate selection of micro courses, in order to
maximize the benefit of the play, it is a waste of manpower and material resources. Therefore, the core content of micro courses in selected time should not only consider the quantity but also to consider the matter, then the knowledge points are moderate and reasonable decomposition and selection. [6]

B. Micro Course Teaching Design

The general design of the teaching of the curriculum objectives, curriculum content, learning activities, learning evaluation etc. Design and development of the micro curriculum to the basic elements of the curriculum as a guide, follow the general process of system method. [7]

To determine the micro curriculum goal system: as a new teaching mode of micro course, provide new forms of teaching resources, according to the analysis of its characteristics, the design should follow the design and development of teaching resources and the characteristics of the program development process. Therefore, in determining the micro curriculum goal system, to carry out the preliminary analysis, includes the curriculum teaching present situation analysis, content analysis, analysis of learning objectives. On this basis, in order to micro course teaching content and teaching objectives. [8]

The contents of learning organization: the micro course in this study refers to a relatively complete curriculum content, is reflected by large numbers of related knowledge of micro video according to the knowledge points related rules and requirements of the organization, is a collection of micro video. So the correlation in the study of the contents we will ensure the integrity of the teaching content, learning content and objectives, effectiveness of the curriculum content itself, students' acceptance. [9]

The design of learning resources: the main form of the micro course learning resource is micro video. Design of micro video should have the following points: one is the need to pay attention to the relevance of micro courses in this paper is a relatively complete curriculum content. So the micro video should have certain relevance, the overall logic clear, complete the teaching content. The two is a rich amount of information, the first micro video should be rich, form second micro video to diversity, can cover pictures, audio and video, documents, web, database. In order to meet the requirements of micro video students learning resources for the diversity, three is the processing of the material. Micro video is not only a disseminator of knowledge, but also play the role of guidance, so time to collect the raw material fully taking into account various factors, the teaching content should be developed to highlight the key points and difficulties of the. Four is the organization. The micro video type according to the thinking of teaching and learning of the clues, focusing on modularity, to facilitate learners to quickly find useful resources. [10]

The design of learning activities: according to the micro curriculum system to identify and design and implementation of teaching form. This course is a major feature of micro semi independence, according to this characteristic, teachers can choose for classroom teaching or students' autonomous learning based on the actual situation of teaching. Therefore, in consideration of the maximum utility play micro course itself, teachers can choose for classroom teaching and students' autonomous learning teaching according to the actual situation. [11]

C. Design of Micro Video

Micro video is micro course presentation, is the main teaching resource of micro course learning activities. Micro video is a short video, showing a point of knowledge content. [12]

The design criteria establishment: first to determine the design style of micro video, the overall style to be consistent. Color tone, picture layout, voice has to be considered. In order to avoid color jump too large in the process of micro video playback, voice and incoherence problems.

Media content choice: rich material is an integral part of the design of micro video, high-quality material can make the micro video showing effect is more outstanding. But we can get the material very much, quality is uneven, and the material is directly related to the final presentation of the micro video effect, influence the effect of learning. The selection associated with micro video content material is an important link in the fabrication of micro video design.

The integration of media content: the literal meaning is to understand, mining and refining further to meet the material requirements.

Modular division: Although micro video only 5 minutes, but it is just a reflection of teaching content teaching knowledge points. In five minutes, the designers of knowledge points, introduced deeply, also need to carefully consider sublimation. Therefore, the micro video to present the knowledge point subdivision in this link, and the number of segments of the knowledge point. Modular are divided into several modules according to the specific content, to ensure the integrity of the micro video content, content to ensure smooth convergence. The micro video content modules for the script design and lay good foundation.

Script design: making script is a micro video development planning before, to write scripts according to the teaching process and teaching. Script is knowledge representations, such as composition, order of appearance, appear way of making specific arrangements, provide the most direct basis for the production of micro course.

Micro video creation design: first is the content presented to accurately meet the scientific knowledge, logical, reasonable structure, meet the learning needs of students and can reach the level to help students learn the function. Secondly, micro video to facilitate students' learning and knowledge storage, the main line should be clear, the screen should be beautiful, meet the students' aesthetic, to arouse the interest of students, to stimulate students' learning enthusiasm. Finally, the design of micro video is to reflect the designer's creativity, to attract the attention of students.

In the completion of the micro video works, according to the feedback of learners, from the media content integration, modular division, script design, micro video creation and design aspects of reflection, modification, and the micro video can be improved, in order to achieve better results. [13]
D. The Design of Teaching Evaluation

Levene test and T test were used in this paper. [14] Levene test, variance analysis of single factor data conversion:

\[ W = \frac{1}{MSe} \sum_{i=1}^{r} n_i \left( Z_i - \bar{Z} \right)^2 \]

(1)

Where each group of data conversion data of the same time, N=rn. The original formula can be simplified to

\[ W = \frac{1}{MSe} N \left( \bar{Z} - \bar{Z}_t \right)^2 \]

(2)

Where, \( \bar{Z} \) is the average value of the overall data conversion, \( \bar{Z}_t \) is the average conversion of data values for the I group.

MSe is a data conversion of mean square error is the average conversion of data values for the I group.

Statistics W F distribution

\[ W \sim F \left( r - 1, N - r \right) \]

(3)

The original assumption that each conversion data obey the normal distribution, while the group errors \( S_e \) follow chi square distribution, degree of freedom N-r. This is because each group of \( S_e \) is obtained with the sample variance, will lose a degree of freedom; R group lost r degrees of freedom.

T test: Based on the statistics used in the analysis of variance test.

The total score and the students

\[ \sum X = x_1 + x_2 + \cdots + x_m \]

(4)

Where, m is the number of students; \( x_i \) (i = 1, 2, ..., m) is the student achievement.

The average score of the students

\[ \bar{X} = \frac{1}{m} \left( \sum X \right) \]

(5)

Deviation from the mean square and the variation between groups

\[ SS_d = \left( \frac{\sum X^2}{m_1} + \frac{\sum Y^2}{m_2} \right) - \left( \frac{\sum X + \sum Y}{m_1 + m_2} \right)^2 \]

(6)

Where, \( \sum X \) and \( \sum Y \) are the total score of two groups of students respectively.

Sum of square variation within groups

\[ SS_{2m} = \left( \sum X^2 - \left( \sum X \right)^2 \right) + \left( \sum Y^2 - \left( \sum Y \right)^2 \right) \]

(7)

F-measure

\[ F = \frac{SS_d}{df_d} / \left( \frac{SS_{2m}}{df_{2m}} \right) \]

(8)

Where, \( df_d \) is a group of variation between the degrees of freedom, \( df_{2m} \) is within group variation degree of freedom.

III. METHODOLOGY

A. Micro Computer Application Foundation Curriculum Development Environment

Micro curriculum development environment includes two parts, one is the micro video development environment, two micro video course group consisting of the development environment. In this paper, the author uses the PPT link function of micro video links to each knowledge organically, to complete the course of micro organization, planning and development[15].

B. Production of Computer Application Based Micro Video

From the micro video we can see that the development process is divided into 6 steps.

Topic: making micro video first to have reasonable choice, this is the first step, the key steps of micro video production. It determines the main content of micro video.

Design: the design is the most important step in the process of micro video, it is the general idea of the formation process of micro video. Teaching design: teaching design is the system method, design of teaching objectives, teaching content, teaching strategies, teaching evaluation and other aspects, create a conducive to the teaching and learning process. Structure design of micro video is a continuation of the teaching design and concrete reflection. According to the teaching content and teaching objectives, in accordance with the specific teaching ideas, learning theory and organization of teaching contents and teaching order control strategy, is the micro video structure design, finally presented in tabular form. Interface design: the 3 basic principles of interface design: first, the interest principle; second, concise principle; third, the principle of unified style. The so-called interest refers to the principle of the learning content is boring and complicated with artistic and entertaining. It refers to the principle in just a few minutes, the interface is concise presentation, not too many independent modification; unified style interface design principles, requirements should let a person see the consistency of the overall feeling, such as all text text, caption text should be consistent, etc.

Production: production of the script script is a programming micro video before development, to write scripts according to the teaching process and teaching. Script is a knowledge representation, such as composition, order of appearance, appear way of making specific arrangements, to provide the most direct basis for the fabrication of micro video. In the script design, should be fully combined with the requirements of the characteristics of discipline and teaching, in the teaching syllabus as the basis, give full consideration to the needs of the students, in the content, picture, voice music should join the creative, cater to students’ interest, stimulate students’ interest in learning.
Teaching preparation is mainly prepared to shoot micro video resources with packages, including quizzes, courseware etc. In the course of need, but also need to prepare models, props, experimental equipment etc. Micro video is a complete explanation of the knowledge points so that the preparatory work is very necessary.

Video recording: micro video recording, there are two main methods, one is the screen recording, there is a shooting.

The late editor: editing includes titles making, content editing, with commentary words, making the tail and insert pictures or audio prompts. The necessary tips pictures or audio can give students proper guidance.

In short, the design of micro video to the following basic principles: the first is based on the content presented to accurately meet the scientific knowledge, logical, reasonable structure, meet the learning needs of students and can reach the level to help students learn the function. Secondly, micro video to facilitate students' learning and knowledge storage, the main line should be clear, the screen should be beautiful, meet the students' aesthetic, to arouse the interest of students, to stimulate students' learning enthusiasm. Finally, the design of micro video to reflect the designer's creativity, to attract the attention of students.

C. Micro Computer Application Foundation Curriculum Organization Planning

After the micro video production, which we can micro courses. Because the micro curriculum refers to a relatively complete curriculum content, is reflected by large numbers of related knowledge of micro video according to the knowledge points related rules and requirements of the organization, is a collection of micro video. So we have to carry out organizational planning of micro video, in order to complete the development of micro course.

At present the micro course design, design completed only word and PowerPoint, the organization chart as follows:

![Figure 2 Basic computer application course of PowerPoint micro module content organization chart](image2)

The author use the hyperlink function of PPT, the combination of various knowledge points. Through the directory, users can quickly find the resources needed. The following diagram:

![Figure 3 Directory links the knowledge point](image3)

In Figure 3 the four button each knowledge link button, respectively link to the micro video of various points.

IV. RESULT ANALYSIS AND DISCUSSION

In order to understand and grasp the feasibility of micro computer application foundation curriculum design and practical application effect, the author use the method of questionnaire survey and field study method. Select a class as the experiment object. Firstly, experimental study was made on the selection of the same class, according to the number of single and double tail number to divide the students into two groups, one group using micro teaching courses, another group using traditional methods of teaching. After teaching, test on the two groups of students, and the two group test scores were compared. Through the experiment to accurately grasp the feasibility of the study of micro course design and development.
A. The Use of Animation in PPT Micro Curriculum Implementation Process

According to the arrangement of the teaching of computer application course arrangement on Monday and Tuesday, the two day course arrangement is compact, easy to control the progress of experiments. Monday study is the picture text inserted before the class was over, the students were grouped according to the number of single and double tail number, number of mantissa is singular is the experimental group A, according to the micro learning teaching form; learn to double the number of mantissa is group B, for learning in the traditional teaching form. In the grouping of students, were arranged in two groups of students after class learning tasks. Arrange the A group of students for the next class after class using the PPT in the use of animation "micro video preview, requires the use of micro video and introduces the method of learning; arrangement of experimental group B students to preview the content according to the textbook. In order to urge the students to complete the task of understanding the preview, preview, to two groups of students were given the learning quality tracking table.

Tuesday before class, tracking table to collect the quality of student learning, to understand the situation of students, especially the experimental group A micro video learning situation. The first lesson, teaching time for the normal class, using a PPT animation as the case introduction, arouse students' interest in learning and teaching. 20 minutes before the second class, complete the classwork time for students. The students completed the classwork time, experimental group A students can be repeated learning by micro video assisted them to finish the homework. The experimental group B students can ask the teacher questions. Among the same group of students can discuss with each other. The students completed the quiz, submitted works, use the projector in the classroom, showing the works of students, encourage students to learn from each other. Finally, after the test of the level of knowledge of all students.

B. Analysis of Test Results

The students' knowledge of students after the test, the author according to the micro content and to complete the teaching goal, and the expected effect. The students completed choice test, statistical analysis was performed using SPSS statistical software. Test the design of a total of 8 related test, according to answer every question, specific analysis of the two groups were compared with the total.

The use of SPSS statistical data were analyzed by descriptive statistics, from table 1 we can see that the average scores of the experimental group A was 85.156 points, the highest score out of 100 points, the lowest score was 75 points, the standard deviation is 9.375. The average scores of the experimental group B was 65.625 points, the highest score is 87.5 points, the lowest score was 50 points, the standard deviation is 11.6369. The results of the statistics we can see that the experimental group A students' learning effect than the experimental group B students.

In Table 2, performance variables and some obtained by different groups after descriptive statistics: sample N, sample mean, sample standard deviation and standard error of the sample mean. The mean and standard difference of two sample data, the variance difference is relatively large, while the mean difference is not too big. The micro course experimental group A score difference degree is high,
indicating that the micro course is suitable for some students, such as learning a good foundation, strong self-learning ability of students, and for the poor foundation, self-learning ability is not strong students, micro courses should not be collected.

### Table III Independent Samples Test

<table>
<thead>
<tr>
<th></th>
<th>Levene test</th>
<th>T test</th>
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<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>5.228</td>
<td>30</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.2370.275</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 is the t test, Levene test and variance equation of the mean equation. Levene test results of variance equation, F statistics is 1.237, its concomitant probability is p=0.275. 0.05. Therefore, that the variance is equal to the results of two groups. Should choose the equal variances assumed a line of data as the result of T test data in the mean equation under the t test data. T statistics is 5.228 degrees of freedom, df=30, its concomitant probability is p=0<0.05, so we conclude that the two modes of study learning make significant conclusions.

From the above analysis of the data confirmed the micro teaching effect, in this test, the design and development of micro courses is more scientific and effective, but also can be reflected in teaching achievements.

### V. Conclusion

In the information and digital era, micro course provides a way of teaching resources and form the major changes in teaching mode and learning. Micro course applied in in the field is a new research field, but also have demonstrated more complete system. In this paper, through the method of theory, data and examples such as research, design and development of computer application based micro curriculum, and the practical application in the classroom, is an innovative micro case curriculum. Reconstruction theory and by means of appropriate organizational structure based on the basis of application of design of computer video micro cluster, so as to assist teachers in teaching activities, but also can help students with autonomous learning. In order to demonstrate the scientificity and feasibility of application of micro computer based courses, to a university students as the sample, study the utility of computer application foundation course of micro. Through the test of computer application basic micro course is helpful to improve the students' grades. This research results for micro courses in the design and development of teaching reference.

### Reference


