Research on Micro Course of Information Category Based on Ontology

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Keywords: Ontology, Micro Course, Curriculum Group.

Abstract. At present, the traditional teaching mode of troop’s distance network education, like TV University and Correspondence University, is unable to meet the noncommissioned officers’ job requirements that demand new skilled talent. In accordance with the development of new military combat units and the demand on the training of new military talents, efforts must be made in the development, integration and restructure of traditional subjects and specialties in military academies, while constructing those close to information based combat and exercise with the aim to keep perfecting the teaching mechanism of noncommissioned officers’ post-oriented education. Command and Control major in military colleges which chiefly cultivates noncommissioned officers focuses principally on single subject in distance network teaching and professional disciplines website, as a result that the shared resources is low, and it lacks similar knowledge and interdisciplinary relation with other discipline. In this thesis, the course ontology of Command and Control major was constructed to make the recourses shared in this academic domain by making use of the ontology technology. Also, the Micro Course group in Command and Control domain was established.

Introduction

Micro Course (Micro Course), the first proposed in the United States by David Penrose, the use of online learning replaced the traditional classroom teaching methods to learn teaching content. The features of the micro-curriculum include putting the core concept in less than 20 minutes, recording the content by recording and recording equipment, uploading the knowledge points and job evaluation tasks to the course management system on the network for the students' self-determination learning, can be used as a way to consolidate learning, but also for students with spare capacity to learn new knowledge points.

At present, mainly in the major colleges and universities in the use of basic teaching to the micro-curriculum, is a classroom teaching auxiliary teaching methods. The classroom can even be used directly micro-teaching, because the content is very strong, the teacher's lesson plans and teaching summary, comments and other content is very appropriate, which is a good teaching auxiliary information. Make up for the interaction between teachers and students in the classroom is not enough, so that students and teachers have more interaction between the more conducive to teaching a win-win goal. At present, the micro-course learning can be more context-based teaching, combined with textbook knowledge. The difficulty of different levels of knowledge points in tandem, learners can independently complete a variety of online learning resources online learning, and learning content can also be carried out download. More and more people will pay attention to and research on the reform of teaching methods of new forms and new trends. Micro-curriculum has its own unique advantages. China will further deepen the teaching concept of micro-curriculum, increase its model design, not only to the number of micro-courses, but also to high quality, need to further improve utilization, enhance the depth and breadth.

1. Ontology Overview

Ontology, also called entity, originated from the branch of philosophy. Over the years, we have
introduced from many areas of the concept of ontology, to solve the concept of knowledge, information extraction and other related issues. At present, most scholars recognize the ontology is defined as: ontology is on the concept of sharing agreement. Ontology generally consists of four parts: ontology class, ontology class relation, ontology class attribute and ontology class instance. Different classes have different data attributes that represent self-characteristics. Subclasses inherit the parent and parent class attributes, and different classes have different relationship properties. In addition, we build the ontology, and we should also follow the five principles of ontology construction: First, the clarity. The definition of ontology terminology is as complete and objective as possible. All definitions are described in natural language. Second, consistency. Ontology should support the reasoning consistent with its definition; Third, the scalability. Ontology should support the definition of new terms in the existing concept to meet the special needs, without having to modify the original definition of the concept of terminology; Fourth, the minimum degree of coding preferences. The description of ontology concept should not depend on a particular symbolic layer representation method. Fifth, the ontology convention is minimal. Define only the weakest axioms for constraint and vocabulary for communication.

2. Resources Construction of Micro Curriculum Group

Taking the command and control professional information course as an example, the course content is optimized and integrated. The information course group is constructed according to the basic general course, the specialized basic course and the specialized course, and the command and control professional information micro courses group is set up 1. In the computer system course group "computer application foundation" is a link between the course, "electrical and electronic technology", "digital logic", "computer composition principle" are based on general knowledge curriculum. "Basic Computer Application", "Oracle9i Database", "Visual Basic Programming", "Microcomputer Principle and Interface Technology" are the same basic courses; "Communication Technology", "Military Communication Technology"; For professional courses. Generally believed that information courses to 3-5 courses more appropriate.

Table 1. Course of Command and Control Professional Information Micro Curriculum Group.

<table>
<thead>
<tr>
<th>Electrotechnical Application</th>
<th>Computer Application Foundation</th>
<th>Communication Technology Fundamentals</th>
</tr>
</thead>
<tbody>
<tr>
<td>digital logic</td>
<td>Visual basic programming</td>
<td>Military General Technology</td>
</tr>
<tr>
<td>Computer composition principle</td>
<td>Microcomputer Principle and Interface Technology</td>
<td>Introduction to Weapons Communication System</td>
</tr>
<tr>
<td>Basic General Studies</td>
<td>Professional basic course</td>
<td>Specialized courses</td>
</tr>
</tbody>
</table>

All levels of practical teaching links to set the principle function as follows:

1) The practical operation in the classroom is a confirmatory experiment. In this session, one or a few knowledge points of the demonstration, verification, combination of verification wins and other experiments to do with the theory, so that students can further consolidate the knowledge, and improve hands-on ability. But also all-round training students the basic design ideas, design methods, experimental skills and design capabilities.

2) Integrated design, also known as comprehensive exercise, is a comprehensive
knowledge-oriented course for the assessment link, through the realization of a large-scale case, requires students to use knowledge, analysis and problem-solving practical ability.

3) To participate in the "four small" and other scientific research and racing, mainly to provide students with knowledge, ability to play one. Combination of small inventions, small creation of the project, the students can exercise the innovation.

2.1 Micro-curriculum Design Content

Course selection to teach the main knowledge, a wide range of content, is suitable for online self-learning courses. Micro-curriculum is mainly to solve a classroom teaching knowledge points, or reflect a classroom teaching and learning activities of the subject, mainly for students pre-class preview, after-school review. With the traditional classroom needs to complete many complex teaching objectives, the learning objectives more clearly, more prominent theme, the content is more concise. The main resources of micro-curriculum video teaching clips, is the general control of 8 to 10 minutes. Compared with the traditional 45-minute classroom, resource capacity is small. Time is compact, short and pithy. Courses should be clear the scope of study to support the registration unit, IP address and other conditions within the control of the elective courses and learning. Courses should be allowed to register to study the scope of public announcement. The following details are provided in electronic format two weeks prior to the start of the course. The course will be used to introduce the basic features and the main content of the course. It takes about 2 minutes, and the video parameters refer to the second part. The course picture is used to display the course in the course selection interface, providing a picture that can accurately express the characteristics of this course, resolution 600 × 338, jpg format. Introduction This course introduces the basic contents of the course and attracts students to enroll in the study. The text is easy to understand within 500 Chinese characters. Course Learners should have a basic knowledge of the course, 200 Chinese characters or less. Course Outline: The courses in the course - to - section - the structure of knowledge points to organize, which can be seen as a large unit of knowledge, is generally composed of a series of relatively complete knowledge of the theme. The section can be seen into the traditional classroom teaching in a class (45 minutes). The corresponding point of knowledge is the micro-video. The knowledge of each video point recommendations are relatively independent and complete.

2.2 Micro-video Production Rules

2.2.1 Selection of Shooting Environment

Course groups can choose the following shooting environment according to the characteristics of their courses:

(1) Interactive Studio: Located in the information center of the teaching building information center, the lighting and photography effect is good. There are projection, reminder, TV, blackboard and e-writing screen, suitable for all kinds of courses.

(2) Simple Studio: located in the teaching building information center on the second floor of the Ministry of Resources studio, there are reminders, electronic writing screen and other necessary equipment, short production cycle, flexible, suitable for courses without writing on the blackboard.

(3) Classroom: Choose the classroom for shooting, interactive activities with students, suitable for the need for blackboard courses.

(4) DIY self-shooting: You can choose to shoot in the office and other places, video production requirements refer to the relevant requirements of this document.

2.2.2 Instructors to Pay Attention to Matters

Instructors should show their personal style, and make full use of gestures, facial expressions and other body language intuitive delivery of course content and course-related information. Teachers should be taught in the classroom teaching methods should be similar to the traditional methods of attention, including: Instructors themselves should appear in the video; Should not read the manuscript lecture mode; Teaching eyes naturally as the front of the head, try to avoid low head readings, may be appropriate to speed up the language, coherence, reduce the pause, post-production methods by editing the wrong statement; Need instructions, emphasis on
courseware content, the teacher should remember the style and time nodes marked, and in the latter part of the video synthesis increased; Teachers during the teaching process, the body's posture should be maintained relatively stable (Figure 2), and the body of the hand gesture, if no special needs, it is recommended that teachers do not move around a large range or frequent turn.

2.2.3 The Requirements of Courseware

The courseware should meet the following requirements:

1. Courseware in accordance with the ratio of 16:9;
2. Courseware should ensure that the font, pictures clearly distinguishable. It is recommended to use a solid color of light-colored, dark words, do not recommend the use of color-rich courseware, do not recommend the use of gradient;
3. Courseware on a page of text should not be too much, it is recommended not to exceed 8 lines, the font size of not less than 24 pixels;
4. Courseware should be appropriate blank, leaving enough to explain the picture and courseware teachers at the same time space;
5. Video or animation material in the courseware is not recommended directly in the courseware, but in the form of material interspersed in the course video, the proportion of 16:9, video production requirements refer to the relevant requirements of this document.

2.2.4 Video Product Parameters Requirements

The video requirements are as follows:

1. The format is mp4, flv;
2. Resolution: 720P standard definition (1280 × 720, 16:9);
3. Compression rate > 512kb, <1024kb;
4. Each video time control in 5-15 minutes, a single file size of 500m or less;
5. To provide subtitle files in courses taught in the second language.

2.3 Micro-curriculum Organization Rules

Courses in addition to the instructors, each course should have not less than 5 people in the teaching assistants' team. Its main responsibility is to answer the discussion area, participate in subjective assignment correction, and students to conduct extensive interaction. Course teachers and teaching assistants must ensure that the Internet time and answer the number of times a week.

In addition, the requirements for practice test questions include:

1) Type of requirements

Video quizzes are mainly used to help students to consolidate the previous section of micro-video taught by the knowledge content. In principle, the general 5-15 minutes behind the video content should be the appropriate test topic, the test subject to no manual correction objective test questions based. The system supports the following three types of questions:

To determine the title: the answer is "yes" or "no" subject;
Single choice: the answer is the only multiple choice;
Multiple choices: the answer is not the only multiple-choice questions, the general correct answer is greater than or equal to two.

2) Precautions

Questions should be noted: a problem is only one set of answers, do not appear a problem stem two or more questions and answers; try not to use the computer system that can not automatically identify the characters. If you really need, please convert the image format; each question to provide the correct answer in advance and scores.

3) Graduation examination design requirements

The examination should be completed completely online. The examination results do not need to manually modify or audit. The basic considerations include: completion of the examination should be randomly selected from the question bank to form a final exam papers, in principle, 50 questions, 2 points for each question, a total of 100. Part of the examination questions by the quizzes composition, in part by the additional topics, the proportion of questions posed by the teacher to determine the title of the number of questions should be greater than 200 questions; Completion of
the examination questions should be standardized objective test questions; The examination duration of the final examinations should be specified.

Conclusions
In this paper, based on the traditional cognitive ability and teaching characteristics of non-commissioned officers, this paper makes use of relevant theories and new technologies of ontology, micro-curriculum and MOOC, and studies the subject of command and control and the specialty of command and control. The construction and maintenance of the ontology is a cumbersome project. The latter will rely solely on manual completion of time-consuming and laborious. Ontology evolution can be considered in an automatic or semi-automatic way to expand the ontology, using machine learning to explore the ontology concept.

References