Classroom Teaching Mode of Computer Specialty in Higher Vocational Colleges Based on Knowledge Space Theory

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Abstract: In the information age, HVC(higher vocational colleges) education is facing opportunities and challenges, and the classroom teaching reform of HVC computer specialty is also imperative. When the integration of information technology and curriculum has become a hot spot, the resources in the resource pool have also begun to help students with their classroom learning. After years of development, the theoretical framework of knowledge space theory is becoming more and more mature and plays an increasingly important role in adaptive testing system. Therefore, knowledge space theory is often regarded as an educational measurement theory. This paper introduces the main content of knowledge space theory, and points out the problems existing in the classroom teaching of HVC computer specialty at present. In order to solve these problems, knowledge space theory guides the classroom teaching of computer majors. The application of this teaching method is conducive to cultivating students' ability to analyze and solve problems and the spirit of unity and cooperation, and has a positive effect on cultivating students' innovative ability.

1. Introduction

The traditional experimental teaching mode is teacher-centered knowledge imparting and instilling, and students learn passively, which is obviously not conducive to the mastery of students' operational skills based on the construction of knowledge meaning and can not meet the training requirements of high-end skilled talents[1]. When the integration of information technology and curriculum has become a hot spot, the resources in the resource pool have also begun to help students with their classroom learning. After years of development, the theoretical framework of knowledge space theory is becoming more and more mature and plays an increasingly important role in adaptive testing system. Therefore, knowledge space theory is often regarded as an educational measurement theory[2-3].

The teaching method of HVC(higher vocational colleges) computer courses based on knowledge space theory is different from the traditional teaching method of knowledge points. In the process of case gradual learning, students need to complete it in groups or groups. The discussion, experience sharing and evaluation of case teaching are important links to ensure the teaching effect.

2. Overview of Knowledge Space Theory

Knowledge space theory is a psychological theory to test students' knowledge level and knowledge structure. Its basic idea is that a subject's mastery level of knowledge in a certain field can be reflected by the subject's response to questions in the field, and the question can be done right or wrong by the subject. The core concepts of knowledge space theory are knowledge structure, knowledge space and guessing relationship[4].

Knowledge space refers to the set of all possible knowledge states that constitute knowledge in a certain field, which is closed to the union operation between knowledge states, that is, the union of two knowledge states is also an element of knowledge space. On the one hand, we should describe

the knowledge itself; On the other hand, we should describe the relationship between knowledge. In the knowledge structure model of hypertext domain based on knowledge space theory, we use hypertext model based on knowledge space theory to describe knowledge itself, and use double-layer knowledge space to describe the relationship between knowledge.

At present, the research subjects of knowledge space theory mainly focus on two aspects, one is the establishment of knowledge structure, and the other is the theoretical application based on adaptive evaluation. The following figure shows the relationship between various research topics and participating subjects as shown in Figure 1 below:
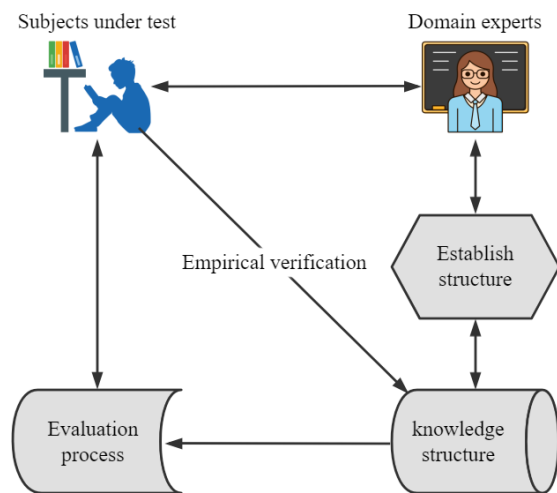

Fig.1 Topic Diagram of Knowledge Space Theory Research

In the classroom teaching of HVC computer specialty, the research on the representation of knowledge in the teaching field, especially the research on hypertext knowledge points, is more sufficient[5-6]. It is natural to discuss knowledge points in the classroom teaching of HVC computer specialty. The learning content provided to students is divided into five types: fact learning, concept learning, skill learning, principle learning and topic learning. Therefore, we can divide knowledge points into fact knowledge points, concept knowledge points, skill knowledge points, principle knowledge points and topic knowledge points. The knowledge space based on knowledge points is a collection of all possible knowledge states, which is closed to the union operation between knowledge states.

3. Current Situation of Classroom Teaching of HVC Computer Specialty

3.1 Backward Teaching Mode

The traditional computer teaching mode is mainly a teacher-centered mode, and teachers explain each knowledge point one by one according to the inherent logical order of knowledge. This leads to abstract and boring teaching content in form, and monotonous and obsolete teaching methods. The unreasonable design of digital learning resources and the inconvenient use of related teaching resources lead to the reluctance of teachers and students to use related learning resources. Digital learning resources can not be updated in time, and the teaching content lags behind the latest technological development. Not only the interest in learning is not strong, but also the intellectual and practical activities are less, and the subjective initiative and creativity are often ignored, which leads to poor teaching effect and it is difficult to greatly improve the teaching quality.

3.2 Failure to Grasp the Core Knowledge Points

Due to the lack of practical exploration of cases, students can't acquire and grasp important core knowledge such as case generation and demand generation from extracurricular activities if project-based teaching is stiffly introduced into the classroom. The problem of students' lack of subjectivity[7]. At present, the teaching method of HVC computer is mainly "computer+big screen projection". Students must passively accept the project tasks assigned by teachers and write down

the theoretical knowledge taught by teachers. This teaching method makes students feel the loss of learning subjects, thus treating learning with a negative attitude.

Students can't exercise their core abilities such as creative thinking and master the essence of project teaching in classroom teaching of computer majors. Therefore, the full implementation of the complete project-based teaching in the limited time in the classroom is likely to lead to enthusiastic classroom teaching form and insufficient students' ability to master the core of project-based teaching, and the teaching effect produced by this simple introduction method is not obvious enough.

3.3 Pay More Attention to Be Paid to Theory Than Practice

HVC computer basic course is mainly to cultivate students' basic computer knowledge and related operation ability, and at the same time, it will also implement information literacy accordingly, and strive to enable students to apply what they have learned to real life to solve various problems[8]. Most HVC students come from all over the country, and there are differences in various aspects in these places, especially in cultural and life background habits. For various reasons, the level of students' mastery of basic computer knowledge is uneven. Naturally, we won't be too devoted to courses and teaching, and we can't achieve the effect of teaching students in accordance with their aptitude. Even a large number of students don't want to study hard, and schools and teachers don't pay attention to them. Those HVC students with weak foundation are not paid attention to in computer courses.

4. Construction of Classroom Teaching Mode of HVC Computer Specialty Based on Knowledge Space Theory

4.1 Application System Model of This Knowledge Structure

In the hypertext, the network is complicated and there are many branches. Students will get lost because they don't know their position and can't achieve their goals because of their ignorance of the knowledge they have learned. The application scope of knowledge structure model in this field will be limited to a book or a course. In this range, the number of knowledge points is limited, so the problem of getting lost can be avoided by using this learning navigation strategy. The application system model of this knowledge structure is shown in Figure 2.
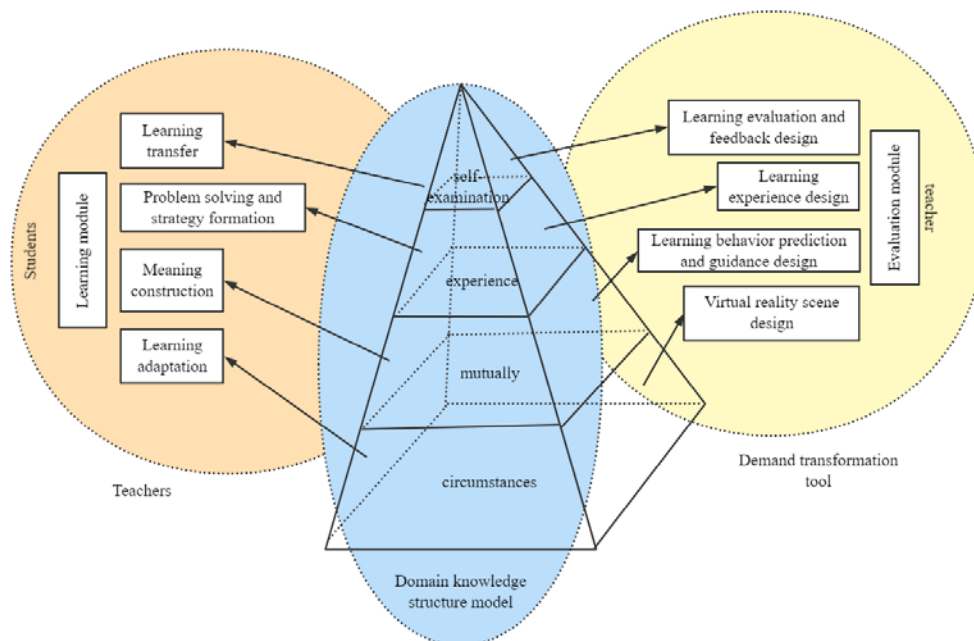

Fig.2 Application System Model Diagram

The learning environment is a platform for students to study and evaluate. It communicates with the learning module and the evaluation module, extracts knowledge points or topics from the

database according to the requirements of the learning module and the evaluation module, presents them to students, collects information about students' learning and evaluation, and feeds back the information to the learning module and the evaluation module[9].

In this system, the communication between the learning module, the evaluation module and the learning environment is very simple. The learning module and the evaluation module only need to pass the knowledge point number or topic number to the learning environment, and conversely, the learning environment only needs to feed back the information of whether the students have mastered the knowledge point or whether the answer to the topic is correct to the learning module or the evaluation module.

4.2 Application of Educational Resources Platform Based on Knowledge Space Theory

Computer courses are abstract, extensive in content and fast in updating. It is difficult for teachers to explain every computer knowledge systematically and in detail in a limited time. Computer teachers can discuss the content of teaching with students and highlight the teaching principle of taking students as the main body. Teachers' application of the brand-new teaching mode of computer professional courses can enable students to actively search for learning resources after class and complete theoretical knowledge learning. Guide students to discuss this problem together in class, and guide students to think about the ways to optimize the speed of web links. Through the guidance of teachers and students' discussion, students realize that they can speed up the speed of website access from various channels such as web page picture design, inner page optimization and web page layout.

With the deepening of educational informatization, people's expectations of educational resource database are increasing, and the educational resource platform must be reformed accordingly to meet people's expectations, including serving teachers, students and educational software manufacturers. The new generation educational resource base based on knowledge space theory consists of three parts, including question base for detecting the subject's skill level, skill base for representing the subject's skill level and learning object base for improving the subject's skill level[10]. The resource platform is based on the underlying database and communication platform. The platform is mainly established to meet the needs of distributed resource construction in the future, and all kinds of end-user-oriented applications are realized through the standard interface provided by the platform.

The resources in this platform are mainly learning objects, and the characteristics of learning objects are that it is a meaningful learning material, that is, it can be associated with skill sets. Of course, the resource platform still needs to meet the needs of standardization construction, that is to say, the description of test question resources and learning object resources must conform to the corresponding national standards, and gradually standardize the skill structure of different disciplines.

4.3 Well-Structured Skill Structure and Learning Path

The classroom teaching of HVC computer specialty should focus on cultivating computer application skilled talents, and cultivate computer professional technical skills talents who can quickly adapt to social needs. With the rapid development of computer technology and the limitation of school education, students' knowledge in class can't keep up with the ever-changing development of computers. The fundamental way to solve this contradiction is to make students have their own hematopoietic function, constantly acquire valuable knowledge for themselves, and transform it into their own comprehensive ability with self-learning ability as the core.

In traditional teaching, in order to grasp the students' situation, teachers often arrange an entrance examination at the beginning of the semester. Through such an examination, teachers can master students' knowledge and arrange the teaching process according to these conditions. In the teaching process based on this knowledge structure model, we also arrange an entrance examination to comprehensively evaluate students' knowledge composition and cognitive defects. Through this evaluation, the system can understand students' learning status and cognitive defects, and carry out targeted teaching suitable for students' own situation according to these conditions, so as to truly

teach students in accordance with their aptitude.

5. Conclusions

The traditional computer teaching mode is mainly a teacher-centered mode, and teachers explain each knowledge point one by one according to the inherent logical order of knowledge. This leads to abstract and boring teaching content in form, and monotonous and obsolete teaching methods. When the integration of information technology and curriculum has become a hot spot, the resources in the resource pool have also begun to help students with their classroom learning. The teaching method based on knowledge space theory is different from the traditional teaching method of knowledge points. In the process of case gradual learning, students need to complete it in the form of groups or groups. The discussion, experience sharing and evaluation of case teaching are important links to ensure the teaching effect. In the classroom teaching mode of HVC computer specialty based on knowledge space theory, the system can understand students' learning status and cognitive defects, and carry out targeted teaching according to these conditions, so as to ensure the students' own situation.

Acknowledgement

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