Exploration Of Computer Talents Training Under The New Economy

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Abatract: Through the integration of computer professional curriculum system for computer system ability training, in order to enhance practice. And innovation ability as the core, from the reconstruction and optimization of curriculum system, through the integration of knowledge structure and "multi-level + integration". Comprehensive practice platform construction three aspects of research and practice, will be related to the computer principle, computer System structure, computer operating system and data structure and other core professional courses are organically integrated. The knowledge structure is optimized to form a compound, systematic and comprehensive curriculum system. Practice has proved that. Since the implementation of the curriculum system, through effective research-based teaching reform, students' practice and innovation have been greatly improved. The new ability has important research and application significance to improve the quality and level of computer professional training.

Introduction

In recent years, the training mechanism with integration as the core is an important form of personnel training and specialty construction in Colleges and universities at home and abroad. In view of talent cultivation, Peking University has organically integrated professional education with quality education and put forward an innovative talent training system of "comprehensive quality, professional ability and innovative spirit". Wuhan University integrates "discipline construction and undergraduate teaching, general education and personalized training, broadens the foundation and strengthens the practice integration, and learns to learn and learn to be a person". It has constructed three stages of "major training", "professional training" and "diversified training" and three development paths of "professional academic", "cross compound" and "employment and entrepreneurship" System. Taking "integration" as the main line, the University of Electronic Science and technology has established a professional ability training system of "high integration of teaching and learning", "integration of curriculum content", "deep integration of teaching and research" and "seamless integration of theory and practice". In view of the construction of professional courses, Fudan University, Nanjing University and Nanjing University of Posts and telecommunications will cultivate the system ability of computer major students, organically integrate the interrelated computer professional courses into the courses of computer principle, computer system structure, computer operating system, etc., and optimize the knowledge structure as a whole to form a compound, systematic and comprehensive course And with the help of a large number of practice courses, further improve the practice and innovation ability training. For the training and improvement of computer professionals' practice and innovation ability, many American universities, such as Carnegie Mellon and UC Berkeley, have been engaged in the training and improvement of computer professionals' practice and innovation ability Colleges and universities have established "system ability training" as the core of the professional curriculum system, and rely on three "combination" education, that is, the combination of in class and extracurricular, the combination of science and humanities, teaching and research, and the implementation of the integration of personnel training mode, to improve students' computer system analysis, design, optimization, error detection ability. Many colleges and universities in India adopt

IS0900l quality standard system to control teaching quality Talent education and training as an industry, according to the needs of talents in the industry, in the process of curriculum system construction, we should pay attention to the cultivation of students' system ability, organically integrate the basic courses such as program language, algorithm design, architecture, compiler principle and other basic courses with professional courses, establish a solid concept of computer system, and improve the performance, program transplantation and robustness So as to become a "master" of the product. In recent years, China's modern higher engineering education reform has achieved good results in education standardization and knowledge systematization. The rationality of students' knowledge structure and overall ability have been greatly improved; However, there is a common phenomenon that students' practical innovation ability is insufficient and there is a big gap between them and the training goal. Especially, the computer major students' programming ability, scientific and technological innovation ability and system ability need to be further improved. In view of this situation, in the 13th five year development plan, the school of computer and communication engineering of our university clearly takes "cultivating compound senior engineering and technical talents with certain scientific literacy, innovative consciousness and strong practical ability" as the orientation and goal of professional personnel training. Looking at the current situation of innovative talents training in computer science at home and abroad, the research focus is "diversified penetration" and "multi-level integration". Therefore, in view of the cultivation of innovative talents, taking the cultivation of computer system ability as the goal, focusing on the improvement of College Students' practice and innovation ability as the core, a "through integration" professional curriculum system is proposed. According to the relationship between different courses, the existing relevant professional curriculum system is reconstructed, and the research-based teaching mode is used to teach through cross infiltration Learning methods: organically integrate the interrelated courses, optimize the knowledge structure on the whole, and form an integrated curriculum system [7-8].

1 Main research contents

"Computer composition principle", "data structure and algorithm", "computer network principle", "Database Principle", "computer operating system" and other courses are important core courses of computer specialty. These courses have different emphasis on professional theory teaching, practical skills training and discipline direction, which can provide important theory and Practice for improving students' practical ability and innovation consciousness Basics. This paper focuses on "reconstructing and optimizing the curriculum system", "connecting and integrating knowledge structure" and "building a comprehensive practice platform of" multi-level + integration ".

1.1 Reconstruction and optimization of professional curriculum system based on Curriculum Group

According to the OBE output oriented concept, around the training objectives of practice and innovation ability improvement, the ability indicators and knowledge points are decomposed, and the related core theory and practice training are reconstructed and optimized by using the way of curriculum group, so as to realize the effective support for the training objectives. The course group includes three modules: compulsory course, elective course, course design and practice. The compulsory course is the theoretical basis for the completion of students' knowledge structure reserve: through the study of compulsory courses, students can fully understand the integrity of the basic theory, and cultivate the basic ability of the discipline, so as to lay a solid foundation for future development; The elective course focuses on the latest development technology of IT industry, and expands some contents, so that students can not only master the knowledge system of the whole course, but also explore new methods and new technologies according to their personal interests; Curriculum design and practice reflect the "unity of knowledge and practice", and integrate theory with practice, which can fully combine the basic knowledge of theory with practice, and further improve the applicability and creativity of their professional ability, so as to further enhance the ability of practice and innovation。

1.2 Knowledge structure reconstruction and optimization with the goal of integration and integration

There are a lot of connection and connection knowledge points in the professional courses of "computer composition principle", "data structure and algorithm", "computer network principle", "Database Principle" and "computer operating system", such as "mail sending" knowledge point, and TCP / IP in computer network Protocol stack, system call in computer operating system, data structure and mail data structure in algorithm have a lot of correlation.

For the relevant knowledge points, we can not carry out simple correlation, otherwise it will lead to repeated teaching, unable to achieve the knowledge of system view. Therefore, from the five aspects of "integrity, systematicness, scientificity, intersection and development", this paper studies the reconstruction and optimization of relevant knowledge points to determine the most effective form of content organization.

"Integrity" ensures that the reconstructed teaching system is complete and complete without the omission of subject content and knowledge points; "systematicness" emphasizes that each course can not only become a system, but also can penetrate and form a more perfect teaching content framework; "Scientificity" requires to ensure that students' knowledge reserve structure is clear and not disordered, and cultivate students' thinking ability; while "interdisciplinary" emphasizes the integration and interaction between different courses, so as to ensure that students can draw inferences from one another in the learning process and improve their practical ability; "Development" requires that we can absorb and absorb the latest research results and new views on the subject direction at any time, and pay close attention to the new trend of discipline development at any time, so as to cultivate students' innovative ability。

1.3 Construction of comprehensive practice platform of "multi level + integration"

Practice curriculum system is an important part of professional curriculum system, and it is an important support and guarantee to improve students' practice and innovation ability. Therefore, after reconstructing and optimizing the theoretical course according to the knowledge structure and relevance relationship, it is necessary to carefully sort out the cross and correlation relationship in the practice of computer, experiment, design and practice. On the basis of meeting the practical requirements of a certain course, combined with the relevant knowledge points between different courses, from the aspects of application development, system design, scientific and technological innovation, etc For overall consideration, it is necessary to research and realize the construction method of comprehensive practice integration platform needed to improve practice and innovation ability, and then provide the practice environment and support platform to meet the training requirements of students' practical ability training, innovative thinking guidance, practical ability strengthening and innovation ability promotion stage。

2 Key problems and Solutions

2.1 The method of determining the hierarchical relationship between different courses in the process of reconstruction

In the process of integrating curriculum system, the first problem to be solved is to clarify the relationship between courses. It is necessary to sort out the relationship between the courses. The research group intends to reconstruct the curriculum system through three kinds of relations, namely "up-down relationship", "serial relationship" and "parallel relationship", so as to realize the integration and penetration of courses effectively.

2.2 solutions for cross teaching and infiltration of curriculum contents

In the traditional teaching of professional courses, teachers only focus on teaching the knowledge content of this course, and seldom mention the relationship with other related courses. As a result, students can not produce macro concepts in the learning process, and do not understand the relationship between courses, which is not conducive to the cultivation of innovative talents;

The repeated explanation of the same knowledge point in different courses makes students lack of interest and low teaching efficiency. Therefore, according to the relationship between different courses, it is necessary to solve the problem of overlapping and infiltrating teaching in the way of "through integration", organically combine the interrelated courses, and optimize the knowledge structure as a whole.

2.3 teaching system construction method of "theory teaching + practice teaching + second classroom"

Theory teaching, practice teaching and the second classroom complement each other and constitute an important part of professional ability training. Therefore, the CDIO (conceptual, design, implementation and operate) concept is used for reference, and "it" is followed The guiding principle of "engineering theory comes from practice, and is restored in practice". The textbook knowledge is integrated into the project development process. In the process, the theoretical system is introduced and the practice is guided. This avoids the empty preaching divorced from the project environment in the past, which makes it easier for students to master the theory and lay a foundation for improving students' practice and innovation ability.

3 reconstruction and optimization implementation scheme

3.1 reconstruct and optimize the curriculum system in the form of three-dimensional professional curriculum group

In the realization of "through integration" curriculum system, the three-dimensional mode is used to construct. Compulsory course modules include: computer composition principle, data structure and algorithm, computer operating system, computer network principle, database principle; elective courses include calculation method, operating system kernel analysis, routing and switching technology, information security, Oracle database management and maintenance, etc; The course design and practice include computer composition principle course design, data structure and algorithm practice, operating system course design, network comprehensive practice, etc.

The curriculum system runs through the "up-down relationship", "serial relationship" and "parallel relationship". Among them, up-down relationship refers to the relationship between courses and practice, such as "computer operating system" and "operating system curriculum design", "data structure and algorithm" and "data structure and algorithm practice", "Database Principle" and "Oracle database management and maintenance"+ Database curriculum design "and so on, the relationship between the upper and lower is to improve students' practice and development ability through team cooperation after learning relevant courses. Serial relationship refers to the relationship between the pre course and the follow-up course. Students' learning situation of the pre course will directly affect the teaching effect of the follow-up course. For example, "data structure and algorithm", "calculation method", "Database Principle" and "computer operating system" have serial relationship. Parallelism refers to the fact that there is no close direct connection between courses in terms of content, but they are all important parts of cultivating students' practical application ability. For example, "Database Principle" and "computer network principle" are very important tools and means in computer application, forming parallel relationship.

Through the reconstruction of the curriculum group, while improving the practical ability, and combined with the second classroom to further cultivate the sense of innovation and team spirit. For example, actively guide college students to participate in science and technology competitions, participate in professional training and certification, further deepen students' in-depth understanding of the training objectives of "thinking ability, practical ability and innovation ability", and increase their professional practical value and employment competitiveness.

3. 2The knowledge structure of the course is integrated

Select the relevant theoretical knowledge, practical cases and innovative topics of the

breakthrough knowledge points, systematize and integrate the teaching content structure, and pay attention to the organic integration of the course content. In order to improve the systematization of theoretical knowledge, and pay attention to the effective connection with the practical innovation and upgrading [10], the knowledge point integration system is established. At the same time, we should fully consider the needs of different students for each course content and personality development needs, grasp the depth and breadth of theory and knowledge, and adopt the teaching mode of students' actual participation to improve the systematicness and integrity of students' mastery of theoretical knowledge from the following aspects:

(1)the dependence between knowledge points.

For example, some knowledge points in the prerequisite course are the basis of the teaching content of the follow-up course. Because these knowledge points have been learned in the pre course, they do not need to appear in the syllabus of the follow-up courses, and there is no need to repeat the explanation in the teaching process

Students should be guided to review these knowledge points.

(2) similarity between knowledge points. Similarities in multiple courses

Knowledge points, they are related, but also different, should be included in the syllabus of each course, and compared in the teaching process, to deepen the impression of students.

(3) the same knowledge points in multiple courses.

If all the courses are explained in detail, it will not only waste the classroom time, but also reduce the students' interest in learning. Therefore, we should arrange the most suitable course to explain according to the importance of knowledge points in each course and the class hours.

(4) integration of experimental contents. In the arrangement of experiment content,

The experiments of each course are advanced step by step according to the basic knowledge experiment, design experiment, comprehensive design experiment and innovative experiment, so as to consolidate and improve the knowledge of this course. In the process of experiment integration, there are both connections and differences between the experiments of each course, which can not only meet the practical application of a certain course knowledge, but also realize the mutual echo and supplement with other courses in the curriculum system.

(5) expand teaching contents and reflect the advanced nature of knowledge structure. stay

In the elective link, the new knowledge and new achievements related to the development of disciplines will be incorporated into the teaching content, so that the theoretical teaching can keep pace with the times, and appropriately guide the senior students to carry out academic discussion, so as to establish a connection with relevant disciplines, so as to lay a solid foundation for improving students' innovation ability and future research work。

3.3 relying on the scientific and technological innovation mode of "three self and three integration", provide strong support for the cultivation of high-quality innovative talents

With the help of College Students' science and Technology Association and open professional laboratory resource construction [11-13], the "Cisco network technology competition", "Bochuang cup embedded design competition", "ACM program design competition", "Freescale intelligent car competition", "Shandong information security competition" and "SDN" The practice and innovation of "three self and three integration" have been established by using innovation competition and other innovation competitions as carriers

Ability training mode. Under the premise of teachers' conscious guidance, the college students' Association for science and technology organizes their own scientific and technological practice activities, and college students participate in the scientific and technological innovation competition spontaneously; The core of the model is the "Three Integrations" related to theoretical teaching: "innovation and competition", "extracurricular and in class" and "freedom and guidance". At the same time, we should pay attention to the individualized education of top students in scientific and technological activities, track and guide their theoretical learning and practical ability, and strive to provide them with better innovation environment and conditions, and provide strong support for the cultivation of high-quality innovative talents.

3.4 adopt research teaching and implement the student-centered learning mode

The implementation of research-based teaching reform and the adoption of "case method", "Participatory" and "universal teaching" are important ways to implement the "through integration" training system.

(1) "case method" teaching.

In the actual teaching process, the case models designed by the research group include confirmatory experiments, innovative cases, comprehensive cases and team level project development, so that students can integrate theory with practice and quickly integrate theoretical knowledge into practical development on the basis of a large number of sense of achievement.

(2) participatory teaching.

The students are divided into groups. Each group uses the spare time to find the relevant information of the designated problem, and selects representatives to explain in class. The teacher only makes supplementary and corrective explanation in time, so as to effectively exercise the students' team cooperation ability, self-study ability, summary ability and problem expression ability.

(3) universal teaching.

Through the course system network resources, the classroom teaching content and modern teaching methods are effectively combined. In addition to the traditional mode of "preview before class, listen to lectures in class and review after class", we have developed and established a multimedia teaching website to ensure that students can enter the "classroom" anytime and anywhere, enrich their learning content and learning efficiency, strengthen the communication between teachers and students, provide a channel to contact at any time, and improve the integration and interaction between teaching and learning.

4. Implementation effect of "through integration" professional curriculum system

In order to ensure the effective implementation of practice and innovation in the curriculum system, in view of the environmental resources of professional laboratories, schools and colleges have vigorously supported the establishment and improvement of seven innovation laboratories and three professional qualification certification institutions, which are open all day long under the self-management of students, and established a new SDN Joint Laboratory for the realization of students

The improvement of practice and innovation ability provides sufficient material guarantee. In the specific implementation process, it is oriented to computer science and Technology Specialty in 2014 and 2015 According to the concept of integration, and supporting the comprehensive practice of the system, we have carried out Curriculum Optimization and adjustment, teaching content organization and research-oriented teaching reform

Fruitful practice.

Practice has proved that students' practical and innovative ability has been greatly improved under the "through integration" professional curriculum training system. At present, more than 40% of the students have the experience of winning prizes in provincial or above scientific and technological competitions. Since 2014, computer major students have won more than 30 national awards, including ACM program design competition, National College Students' smart car competition, Bochuang cup embedded design competition, Cisco network technology competition, and more than 40 provincial awards, with more than 300 awards. The number of students / total number of students who have been recognized as science and technology innovation credits has ranked first in the University.

Conclusion

The construction scheme of "through integration" computer professional curriculum system focuses on it In order to meet the needs of innovative talents in the industry, a series of "cross and

penetration" teaching content organization methods oriented to multi courses have been established around the professional training objectives, which can effectively connect the relevant knowledge points, improve the students' learning initiative and enthusiasm, and further improve the students' practice and innovation ability. Innovative talents need special training and growth channels. The establishment of "through integration" professional curriculum system provides an effective way to explore the establishment of innovative IT talents training mechanism, and also provides a reference for the cultivation of innovative talents in Colleges and universities.

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