Research on Comprehensive Reform of Computer Embedded Curriculum Based on Pedagogy and Informatization

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Abstract. With the rapid development of technology, based on educational psychology and information teaching environment, the comprehensive reform of computer embedded course is carried out. This paper expounds the theory of educational psychology on which the teaching reform is based; the practice of teaching reform includes the establishment of embedded curriculum group, the reform of teaching content, the exploration of classroom interactive teaching mode, experimental links, information construction and the cultivation of innovative talents. Combining educational theory with practice, we can realize the integration of various teaching methods and means.

Keywords: Educational Psychology, Informatization, Computer Embedded, Teaching Reform

1. Introduction

With the rapid development of technology, embedded technology has been applied in all walks of life of social development, as shown in Figure 1. This has played a good role in promoting the development of society. In the field of education, higher requirements are put forward for the education, teaching and personnel training of university computer embedded direction: content needs to be updated, practical ability and comprehensive quality also have higher requirements. Information technology based on network is constantly applied to teaching. In such a situation and environment, the teaching reform of universities should face the social needs and be carried out systematically according to the law of education and teaching. Based on educational psychology and information-based teaching environment, teachers should deeply understand the principles and laws of education and teaching, combine with practice, and comprehensively use a variety of methods and technologies to improve the teaching effect [1]. Learning mode is diversified, so should teaching mode. According to Paul kosner, a professor of educational psychology, 'teachers' tools can be blackboard, computer, whiteboard and textbook; technology can be enlightening questions, group assistance and classroom lectures; materials and learning contents can be combined to achieve good teaching. Under the guidance of educational psychology, based on the modern information teaching environment, the reform of computer embedded curriculum in our college comprehensively uses a variety of methods and technologies, and carries out practice and exploration from the aspects of curriculum system, teaching content, classroom and experimental teaching mode, and innovative talent training [2].
2. Teaching reform of Embedded Course Group

2.1. Teaching content reform
With the development of Internet of things and the coming of digital age, embedded technology has been widely used. The society needs more and more talents for embedded system development. Based on the application-oriented curriculum system and the goal of cultivating application-oriented talents, the teaching content and key points are appropriately selected according to the actual application needs, and the application and development trend of technology are understood by keeping close contact with relevant technology enterprises. Design teaching methods, organize teaching content, and do a good job in classroom teaching design. The teaching content should be adjusted reasonably according to the logical relationship and knowledge relevance, so as to gradually sublimate from shallow knowledge to deeper knowledge, which is easy to understand and master [3].

2.2. Reform of classroom teaching mode
Based on the theory of constructivism, learning is an interactive process and a process of students' active construction. Heuristic teaching and interactive teaching are often used in teaching. Based on the immersion learning theory of modern positive psychology, we should take measures to enhance learning interest, experience learning achievement, correctly attribute failure and frustration, enhance internal learning driving force, and return to the essence of learning. The traditional teaching mode is that the classroom is full, students' classroom initiative is not enough, and the teaching effect is not good. There is a common phenomenon of plagiarism in exercises and assignments. Many students can't practice independently to master the required knowledge [4]. After the reform, the course adopts heuristic interactive teaching, which emphasizes both theoretical study and practice, and the teaching is carried out in the laboratory. Reform teaching methods, increase hands-on practice and practice, help students understand and build knowledge, improve practical ability. Update the teaching content, increase interest, stimulate interest in learning. Random questions and interactive questions and answers are added in class to carry out heuristic teaching. Maintain appropriate pressure in the classroom to promote concentration. Interactive teaching promotes every student to think, practice,
and exercise their expression ability, which can better mobilize students' initiative and maintain their attention.

2.3. Experimental teaching reform
In the laboratory teaching, each class has practical operation content. Guide students to operate, so as to enhance students' practical ability and research and innovation ability. Practice can help understand knowledge and improve learning interest. The experimental arrangement is adjusted according to the teaching schedule. The principle is to help students understand theoretical knowledge and improve their practical ability. For example, in the assembly instruction part, the original experimental arrangement was to arrange the experiment after all the instruction systems and pseudo instructions were explained. This arrangement makes the instruction learning process more boring and lack of practical debugging [5]. After the adjustment of the experimental arrangement, teaching synchronous experiment. In this way, students will have a practical understanding of the role of instruction. Familiar with the debugging environment and tools, learning while debugging, help to understand and learn instructions. Practice debugging can arouse learning interest and help understand knowledge content. Reform of experimental teaching mode. Experimental process: explain the principle, provide routine, students learn and master the routine, put forward the modification requirements, and students use their brains and hands to realize it. The experimental process is based on Vygotsky's teaching scaffolding theory, teachers build learning scaffolding to help students transition from the existing development area to the nearest development area; then remove the scaffolding to let students complete the use of knowledge independently. As shown in Figure 2, the teacher leads the students to study in the laboratory, so that the students have deeper memory and higher interest in learning.

![Figure 2. Students study in the laboratory](image)

3. Deep integration of information technology and Curriculum
Make full use of the school network education platform, share educational resources, and carry out network interaction (in the form of question and answer forum, questionnaire survey, etc.). In order to realize the deep integration of traditional classroom and network education, blended learning integrates the advantages of traditional learning methods and digital learning methods, that is, to play
the role of teachers in guiding, inspiring, supervising and process oriented education. Fully reflect the enthusiasm, enthusiasm and creativity of students as the main body of the learning process [6]! At present, the consensus of international educational technology circles is that the combination of the two can complement each other and achieve the maximum learning effect. There are three aspects of specific implementation: first, the improvement of teaching platform, teaching platform and teaching platform; second, the provision of rich online E-education resources related to quality courses; what is conducive to students' independent development of knowledge research. In addition, it also includes teaching contents, experimental teaching, extracurricular learning materials, daily materials, etc. Use the Internet forum to organize topics and discussions, organize online teaching work and modification (set the submission deadline of online tasks, which can guide students to modify and master the required content in time), and use the network platform to conduct questionnaire survey on students' learning styles, personal plans and education suggestions, so as to improve the form of education and provide reference for students through data collection, statistics and analysis. Students provide precise guidance [7].

4. Educational Exploration on the cultivation of students' talents

4.1. Reform and exploration of improving students' practical and innovative ability

Enterprises need embedded engineering personnel, not only have a solid theoretical foundation, but also have rich practical experience. Based on extensive reference materials and gradual exploration, the teaching team has formed a three-dimensional and multi-level practical teaching system in the form of teaching experiments, curriculum design, comprehensive training, graduation design, college students' innovative projects, embedded competitions, etc., which adapts to the employment oriented and ability oriented talent training needs, and highlights the cultivation of "skilled, applied and practical" talents [8].

Organize students to participate in the embedded competition every year, and open the embedded laboratory, so that students have an innovative design environment. Technological innovation competition is an important way of teaching supplement and test for the exchange of advanced technology and the cultivation and employment of innovative talents in Colleges and universities. This kind of technology innovation competition has greatly promoted the development of embedded system design, software technology development and Internet of things practice teaching, and inspired many students to come forth with innovative achievements in this field. The competition and demonstration also strengthen the academic exchanges and cooperation between colleges and universities, and form a wonderful stage for high-tech enterprises to select excellent scientific and technological talents and solve students' employment [9].

4.2. Improving learning motivation and implementing inspirational measures

In the process of education and teaching, we should use a variety of psychological principles, especially the law of positive psychology, stimulate students' interest in learning through psychological technical means, guide and enhance the internal driving force of learning, and improve learning motivation. When encountering difficulties, pressures and setbacks, we should strengthen guidance and correct attribution to enhance psychological resilience. For example: using the hard work and perseverance of the participants in the embedded competition and electronic competition to encourage students to work hard and forge ahead; recommending Harvard's "happiness class" open class and relevant materials and websites on positive psychology to students, understanding and using positive psychology to guide students to study happily and enjoy the flow experience and learning process; organizing excellent Show graduates and embedded team members give students personal growth and professional reports, guide students to choose the appropriate professional direction; through the network and QQ group, recommend and share information, interactive communication. 

Modern psychology believes that individual cognition, motivation, emotion and teacher-student
relationship are closely related to learning, which should not be ignored in education and teaching [10].

5. Conclusion
At present, there are still many problems in the teaching of computer courses in Colleges and universities, which to a great extent inhibit the development of computer teaching, hinder the improvement of students' computer ability, and ultimately reduce their comprehensive competitiveness in the future development. Therefore, colleges and universities should pay full attention to the computer curriculum reform, take the information teaching as the basic point of the computer curriculum reform, and realize the reform goal through scientific and effective measures. This paper analyzes the goal of computer curriculum reform in Colleges and universities, teaching status, and explores the computer curriculum reform strategy based on information teaching. However, there are still some limitations in this paper. It is hoped that college teachers can strengthen the research on computer curriculum reform, take effective measures to promote the development of computer teaching in Colleges and universities, and finally achieve the goal of talent training in Colleges and universities.

References
[1] Li Haiyan, Ma Chao. Review of educational psychology [J]. Journal of Inner Mongolia Normal University (EDUCATION SCIENCE EDITION), 2011, 24 (4), 66-68.
[2] Zhou Jian, Shi Guoxing. Introduction to positive psychology [J]. Chinese Journal of mental health, 2006, 20 (2): 129 – 132.
[3] Jeanne Ellis ornmrod. Essentials of educational psychology [M]. China Renmin University Press, 2013.
[4] Zhang Jing, Yang Wenzheng. Case analysis and Strategy Research on Informatization Teaching for deep learning [J]. Teaching and management, 2014, 5:147-149.
[5] Du Yuxia, Kong Weihong. Modern educational technology [M]. Tsinghua University Press, 2013.
[6] Yang Ligong, Wang Xiaohua. Application of open and interactive experimental teaching in innovation ability training [J]. Experimental technology and management, 2013, 30 (8), 132-134.
[7] Niu Jiahui. Research on Information Teaching Design of College Computer Basic Course Based on Task Cooperative Learning Mode [J]. Computer Products and Circulation,2018:214.
[8] Yang Guizen. Research on Computer Basic Curriculum Reform Based on Informational Thinking [J]. Curriculum Education Research: Research on Learning and Teaching Methods,2018:121-121.
[9] XU Xinxin. Teaching Reform of Computer Basic Course Based on Mixed Model [J]. Journal of Yan 'an Vocational and Technical College,2017.
[10] XIAO Shuai. On the Practice of Information Teaching Reform of Computer Basic Education Course [J]. Computer Knowledge and Technology,2018:131-132.