How to Grasp the Key Links of PBL Teaching Reform in iOS Curriculum System

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Abstract: The School of Software of Northeastern University actively promotes PBL classroom teaching reform, which requires that classroom teaching content can not only enable students to fully understand and master the mainstream cutting-edge science and technology in today's market, but also that the whole classroom teaching process can fully stimulate students' interest in learning and improve their active learning ability, better guide students to expand their knowledge outside the curriculum, and improve their overall professional comprehensive quality. Firstly, this paper analyzes the outstanding problems in the current classroom teaching that affect students' learning effect and can't improve students' hands-on ability, and thinks about the concrete practical thinking of implementing PBL teaching reform in the key links of iOS curriculum system. Combined with the actual situation of undergraduate teaching in Software College of Northeastern University, it puts forward ways and methods to solve many problems, including introducing massive open online course resources. Finally, the paper discusses the teaching reform and its effect of an undergraduate course-"iOS Development Technology", which the author has undertaken, proves that the proposed reform measures are effective, and makes some prospects for the future teaching improvement.

Keywords: Classroom teaching reform; Comprehensive professional quality; Students' practical ability; IOS development technology

Quote

With the rapid development of information technology, the demand for talents in the software market is constantly changing. Cultivating talents is the primary task of China's whole higher education system, and computer talents who meet the social needs should have solid computer technology knowledge synchronized with the times and be able to solve practical problems in social life and production independently. Therefore, the course education of computer major in colleges and universities should focus on cultivating students' comprehensive professional ability, practical ability and innovative ability. Cultivating students should be recognized by enterprises and markets, and can quickly create certain value [1]. However, due to many realistic and objective factors, students often only talk on paper, their professional basic ability is not high, their hands-on ability is poor, and many students have lost the motivation to continue their careers. Therefore, although there are a large number of fresh graduates of computer major in China every year, many enterprises are still eager for talents, which seriously affects the development of China's information industry, and the reform of computer major education is imperative.

1 . Computer professional courses teaching status

In recent 20 years, the computer-related major courses in Chinese universities have not changed greatly, and they are still composed of C language programming, data structure, operating system, computer network and other courses. Of course, with the continuous development of technology, there are some but few new major courses, such as android development technology, iOS development technology, big data and so on. Based on the need of undergraduate education and teaching reform undertaken by the author in the Software College of Northeastern University, we have made a full investigation of brother colleges in Beijing, Tianjin, Shenyang, Dalian, Jilin and other cities, and found that the following problems generally exist in the process of computer major education:

1.1 The problem of course content. In the teaching process of professional core courses, such problems are more prominent. Because most specialized courses belong to the category of classical theoretical knowledge, the curriculum content is too old to meet the needs of the current scientific and technological development, which directly affects the teaching effect. It is particularly important to continuously reform and develop the curriculum content to adapt to the new era.

1.2 The teaching method is rigid. According to the survey, in many professional core courses, many teachers teach in a single way, relying heavily on the content of slides, and the process is very boring. Almost all students can't accept this method, and the effect is extremely poor. As an engineering discipline, computer major not only needs a solid theoretical foundation, but also engineering experience is often more critical. Many theories are formed in a great deal of practice, so it is more necessary for teachers to use examples to help students understand in class. The rigid slide teaching method is undoubtedly a disaster for students.

1.3 The lack of students' comprehensive ability to use professional knowledge makes it difficult to improve students' comprehensive professional quality and innovative ability. In the process of leading professional courses teaching, a prominent problem is that the core professional knowledge is isolated and rigid, and it is often traditional theories. Even in some procedural practice courses, a lot of deduction and calculation processes will be explained. Therefore, most students forget what they have learned after the exam, and it is difficult to apply the theories learned in class to the process of solving practical problems in the future, and it is difficult to improve students' innovative ability and professional quality.

1.4 Change the curriculum function. Traditional professional courses are boring and difficult to understand, and software engineering courses in many colleges and universities are generally taught in large classes (100-person scale). Boring slides and knowledge explanations reduce the learning efficiency of most students. What is even more fatal is that students are "tired of learning" or "fed up with learning", and students basically lose the motivation and ability of active learning, which is quite unfavorable to students' learning and career development of computer science. Therefore, it is imperative to change the function of the courses, so that students can acquire knowledge.

1.5 The problem of curriculum structure. In the process of core curriculum construction, the old-fashioned and rigid curriculum structure is a common problem. The course structure is always the same, and the experimental courses of theoretical courses are often rudely stacked together, without being organically combined with the actual situation according to the course content. In addition, some novel curriculum structure adjustments will stimulate students' learning enthusiasm and achieve better teaching effect.

2. PBL teaching reform in the iOS curriculum system to grasp the key links

Talent cultivation is the top priority of colleges and universities, which is related to the progress of the country and the nation and is very important. Facing the serious shortage of software talents in China at present, we must reform the higher education of computer major. We should not only solve the problems mentioned above, but also attach importance to education forever. It can be said that the reform of computer major education in colleges and universities is always on the way.

In recent five years, the author has been undertaking the teaching task of "iOS Development Technology" course in the School of Software, Northeastern University. "iOS Development Technology" is a very important professional elective course set up by our college to adapt to the current rapid wave of entrepreneurship in internet plus. The course focuses on improving students' comprehensive professional quality, practical ability and problem-solving ability. If students achieve the expected results, it will be of great help to their employment and future career development. In order to achieve the expected effect, the author analyzes the key links in the curriculum system in combination with the practice process of PBL teaching reform, makes a detailed analysis of the previous research problems combined with the actual situation of our college, and puts forward some effective concrete measures, which have achieved good results.

2.1 Curriculum content reform

Today, with the rapid development of computer technology, the curriculum contents of both traditional and emerging courses are quietly changing. In the course of iOS development technology, we have experienced the transformation from Objective-c to Swift, and from Swift 1.0 to Swift 3.0. Although every change is very painful, it means that we have to re-prepare the syllabus, handouts, examples and all the materials, but what we bring to the students is the new technology with the highest market recognition and the most needed, so the students are very satisfied with the teaching effect after the end of the lecture, and at the same time, it stimulates the students' enthusiasm for independent and continuous learning, achieves very good results and improves their future career prospects.

It is imperative to reform the content of traditional professional courses. Many people think that the content of traditional classic courses such as C language is unchangeable and there is no need to revise and update them. Actually, although the development of C language technology doesn't have the feeling that emerging technologies make people shine at the moment, it is also undergoing great changes silently, and new technical forms and cases emerge one after another, giving it more powerful vitality. Therefore, we should also introduce these new technical forms and cases into the traditional course teaching, which will increase the depth of the course and broaden the students' horizons. All these will fundamentally improve the students' professional basic technical ability, and more importantly, make students interested in continuing to study in the professional field, which will benefit them a lot.

2.2 Reform of teaching methods

In the course of iOS development technology, we abandoned the boring slide teaching method. In the course of teaching, we designed a lot of interesting demonstration examples for each knowledge point. We hope to tell students boring and incomprehensible basic theories through codes and demonstrations. In the classroom, we hope that students can code and test together with the instructor on the computer, because an interesting program and example can greatly stimulate students' enthusiasm for continuous learning, and solving learning difficulties in hands-on practice can make students master it more firmly, and the effect is particularly prominent [2].

In fact, a large number of practical links can also be introduced into traditional non-coding courses, such as operating system, computer composition principle, computer network and so on. These courses seem to require a lot of boring conceptual explanations, but in fact, they can be programmed with the help of third-party tool platforms or already complete basic code packages. These courses no longer need a large number of multiple-choice questions and calculation questions to investigate students' mastery. After all, they have nothing to do with production and social needs. Instead, they should be coded and practiced so as to truly understand the core of technology and truly inspire students to create value [3].

2.3 Improve students' comprehensive ability to use professional knowledge

The curriculum arrangement of iOS development technology is closely connected with the core curriculum of software engineering. The curriculum content and the required homework content of students involve almost all the core professional courses such as programming design, database, operation coordination, computer network, software engineering, etc. The knowledge points of all disciplines are fully combined, and the problems are practical, which exercises students' practical ability and improves their

professional comprehensive factors and innovative ability.

2.4 Stimulate students' enthusiasm for active learning

The teaching content of traditional specialized courses is boring, the phenomenon of "cramming" is serious, and the teaching effect is average. Change the curriculum function, so that the classroom can not only transfer knowledge, but also teach students good learning methods and learning enthusiasm. The curriculum reform of iOS development technology focuses on this point. In class, it focuses on guiding students to find and solve problems by themselves, and cultivating students' learning ability. In addition, through some activities, such as helping students choose topics to make apps and upload them to Apple Store, good works will get considerable profits and dividends, etc., students' enthusiasm for learning this course will be improved, thus achieving good teaching effect.

2.5 Adjust the curriculum structure

In order to solve the problem of unreasonable curriculum structure, new teaching ideas are introduced. IOS is a practical programming course, which requires students to meet problems, discuss and solve problems and learn knowledge in practical engineering. The computer course structure of famous foreign universities is a good reference. Firstly, it introduces the three-tier curriculum architecture of theory class, discussion class and experiment class. In the theory class, the instructor will not only complete the theoretical explanation, but also guide the students to find problems in the classroom and try to solve them. In addition, after class, the teacher will provide a large number of classic massive open online course materials for students to refer to and learn, and will establish a complete and practical assignment system. The topic comes from real life, which not only reviews what is said in class but also involves new knowledge outside class, which improves students' interest and broadens their knowledge, and benefits students a lot.

3. Effectiveness of reform implementation

The iOS development technology course is taught in the second half of the third semester, because most students choose employment or further studies in the summer vacation after the third year, so the feedback from students is of great reference value to the effect of the course. In this paper, the author used several methods to conduct research during and after the class of Grade 13 students in our college. The results are as follows:

3.1 Questionnaire

After the middle stage of teaching, a questionnaire survey was conducted on each student to understand the students' actual learning situation and their opinions on the course. The questionnaire focuses on some questions such as the satisfaction of the course, the opinions of the improvement methods and some subjective evaluations. The results show that all the students in the class are very satisfied with the teaching effect, recognize the new teaching method, and mention that it really provides great help for their future employment and further studies, and suggest that the college should open this course earlier.

3.2 After-class homework effect

The final score of the iOS development technology course is given according to the final students' display of their independently produced mobile phone application effect based on iOS platform and their usual performance. Most students are able to independently develop mobile phone applications with certain creativity at the end of class. According to the final effect, many students give full play to the knowledge they have learned in class, and most students also combine the knowledge of other professional courses they have learned before into their own works. Many applications are very creative and unique, and the results are gratifying. Finally, some students uploaded their apps to Apple Store, and even earned a certain amount of income.

3.3 Through the evaluation of students' employment level

At the end of the course, about 20% of students immediately went to different scale software companies to study and be responsible for the development of iOS platform products during the summer vacation. In October, a survey was conducted among the students who participated in the lectures. 70% of the students emphatically mentioned that the knowledge learned in iOS course was mentioned or used during the interview process of enterprises or the internship process of enterprises. This course was of great help when they faced the first career challenge in their lives, and had advantages that others didn't have.

4. Conclusion

To sum up, this paper has seriously considered the key link of implementing PBL teaching reform in the iOS curriculum system. The PBL teaching reform of the iOS development technology course has really played a very obvious role. Students can generally accept the new teaching mode and benefit from it, which provides great help for their study and future professional development. We believe that the essential purpose of teaching reform is to help students grow and progress effectively, which is the direction of our efforts. In the future teaching work, we will continue to take the road of reform, constantly improve the details of teaching forms and contents, strive to benefit students more, and cultivate more practical, compound and innovative talents.

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