Research on the Course of Software Engineering Mobile Internet under the Background of New Engineering

Ming Zhu*, **Jing Li, Xiaoyu Li**

College of Computer Science and Technology, Shandong University of Technology, Zibo, Shandong, China
*Corresponding author

Abstract: Since 2017, the Ministry of Education has actively promoted the construction of new engineering, stressed that universities with advantages in engineering should play an important role in engineering technological innovation and industrial innovation, and formulated a series of guiding policies and measures, such as the "Fudan Consensus", "Tianda Action" and "Beijing Guidelines". Facing the background of new engineering construction, the mobile Internet orientation of software engineering major in Shandong University of Technology closely focuses on national strategy, regional characteristics, personnel training and other contents, and vigorously promotes the teaching reform of the major. In view of the current situation and problems of professional teaching, the research direction of curriculum reform, the practical requirements of curriculum reform and other aspects, this paper combined with its own characteristics in-depth research and comprehensive exposition, through bilingual teaching, OBE, school-enterprise cooperation and other forms and means, to provide new ideas for the practical teaching reform of software engineering major in the direction of mobile Internet. It is committed to steadily improving the teaching quality by reforming the personnel training mechanism and teachers' teaching methods, so as to meet the demand for applied talents of software engineering in the economic and social development of China and Shandong for realizing the teaching reform and integrated development of production and education.

1. Introduction

In the face of profound changes unseen in a century, we need to speed up the building of national strategic talent and strengthen the support of talents for modernization. In 2017, the Ministry of Education proposed to carry out the construction of new engineering, and the new economy characterized by new technologies, new forms of business and new industries will develop vigorously. It requires engineering talents to have higher innovation and entrepreneurship ability and cross-border integration ability, accelerate the construction of new projects, promote economic transformation and upgrading, and help build a powerful country in higher education [1]. At the same time, starting from 2020, China is committed to speeding up the construction of 5G networks,

data centers and other new infrastructure. It can be said that new engineering and infrastructure provide new opportunities for the development of the Internet. As a higher education institution, we should comprehensively improve the quality of independent training of talents.

Software engineering not only provides technical support for the development of new engineering, but also lays a foundation for cultivating talents. In this context, the software engineering major of Shandong University of Technology is oriented to the national strategic needs, combined with the regional economic and social development, and cultivates high-quality compound engineering and technical personnel who are equipped with "excellent professional skills, good practical ability, international vision, social responsibility and critical thinking" in software engineering industry design, research and development, test operation and management and deployment. Guided by the new engineering requirements of the Ministry of Education and targeted at the national requirements and social needs, we will actively expand new talent training programs, to cultivate new talents for the new engineering.

2. The Problems and Status Quo of Software Engineering Specialty in Education

2.1. There are also Differences in Computer Skills among Students at Different Levels.

With the development of economy and the progress of people's living standard, computer is no longer a new thing, now undergraduates basically have one. However, different students have different degrees of understanding and application of computers. In the hands of many students, computers are only used as a tool for entertainment, and may be further used as a tool for consulting. A small number of students have strong interest in the professional aspects of computers. Besides entertainment and consulting, I dabbled in professional computer software and data processing. At the same time, different regions are very different in their familiarity with and mastery of computers. Computer courses and maker LABS set up by middle and high schools in some economically developed regions basically summarize the contents related to C language, which directly leads to the great difference in the computer level of students in different regions.

2.2. Students 'Theoretical Knowledge and Practical Skills cannot be Fully Combined in the Teaching Process

The program practice courses mainly study the grammar of high-level language programs, and the programming training is not enough, and the ability to understand algorithms and implement programs is insufficient, so there is no way to start when encountering practical problems. The insufficient combination of theoretical knowledge and practical skills is a typical short board in the teaching of computer science. For the software engineering specialty, theoretical knowledge and practical skills are interlinked, practical skills are the extension and improvement of theoretical knowledge, and need a lot of specific operation and practice. However, at present, the vast majority of schools in the classroom teaching teachers are still mainly to the theoretical teaching in class, and the control and guidance of practical teaching is far from enough. At the same time, due to the dull professional knowledge of computer science and the lack of teacher's supervision and guidance, students will largely "relax their guard" in the practice process, and will not be fully in accordance with the task requirements of the teacher to achieve[2]. As a result, students' practical skills and theoretical knowledge cannot be organically combined in the teaching process.

2.3. Textbooks cannot Keep Pace with the Times and Adapt to the Development of Science and Technology in Time

In the context of the development of the current era, the update and upgrade of computer technology is very rapid, especially in the development of computer hardware, systems and the Internet. There is a certain lag in the current teaching materials, which may lead to the fact that what students learn cannot be integrated with the actual business operation. The old teaching content limits students' learning to a greater extent, and the learning efficiency will also decline. The multimedia equipment software used at ordinary times has not been synchronized with the new curriculum reform, which has a great impact on students' practical operation. At the same time, the old teaching content lacks innovation consciousness, and is not updated timely and effectively according to the needs of curriculum teaching. To a certain extent, it affects the ability of students to think independently, and indirectly has a great impact on the quality and efficiency of teaching.

2.4. Professional Curriculum Simplification, and too Few Auxiliary Means

The core curriculum content of the major has been greatly simplified, mainly focusing on the most basic theoretical knowledge, lack of understanding of deep and extended theories, unclear concept of theoretical logical relationship and knowledge connection, and strong blindness in learning. Teaching materials, PPT courseware and case reference procedures are the main teaching materials, which involve limited teaching time and scope. The relationship between teachers and students is one-to-many, and there is a lack of assistant teachers, insufficient teaching cooperation, insufficient interaction and weak pertinence.

3. Research Direction of Mobile Internet Course Reform for Software Engineering Major

3.1. Actively Promote the Bilingual Construction of Software Engineering

With the general improvement of students' English level and the increase of English demand, software engineering majors are actively exploring a new mode of "bilingual construction". "Bilingual construction" adopts foreign textbooks, which has strong practicability and can largely break the barriers of domestic textbooks for many years. "Bilingual construction" has stricter requirements on teachers, requiring teachers to be very familiar with the content of the textbook, teach in English and Chinese, actively use English to explain knowledge on the basis of ensuring the fluency of students' thinking, and use English for test questions[3]. The professional teaching language is used to promote the development of students' foreign language ability. At the same time, the "original taste" in the course promotes the standardization and internationalization of teaching. This model has been applied in the Chinese-foreign cooperative class of the College of Computer Science and Technology, and the effect is obvious.

3.2. The Outcome-Based Education (OBE) Model was Introduced

Traditional engineering education follows the principle of division of majors according to disciplines, while "Outcome-based Education (OBE)" engineering education is results-oriented. Training objectives are determined according to industry needs based on the principle of reverse design, and then graduation requirements are determined by training objectives, and then the curriculum system is determined by graduation requirements. Taking students' future as the starting point, strategic design is made based on students' expected results. Curriculum planning, teaching methods, evaluation and assessment, planning and allocation of learning resources should be carried

out with students' learning effectiveness as the core concept. The new characteristics of teaching reform are mainly based on expected results, students' active learning and continuous improvement [4]. Under the guidance of engineering education certification, the graduation requirements of software engineering major can be judged by the indicators of the implementation of teaching content and teaching activities. Teachers can use independent inquiry active learning, problem context driven, project context driven design and other new teaching methods, with teachers, teaching equipment and other teaching resources to ensure that students achieve learning objectives. Guide and encourage students to actively explore and learn, optimize the evaluation standards of course teaching quality, and adopt diversified assessment methods to innovate and improve the evaluation of results.

Through the introduction of Outcome-based Education (OBE) model, a series of problems such as what kind of Internet talents to cultivate, how to cultivate Internet talents and how to improve the evaluation standards of cultivating Internet talents are solved [5].

3.3. School-Enterprise Cooperation Creates a New Platform for Students to Practice

Under the influence of the era of big data, the demand for talents in the field of software engineering has also changed to some extent. It is necessary to break the classroom constraints, boldly try new teaching methods, realize curriculum coordination, and adapt to enterprise needs. At the same time, in terms of teaching evaluation of school-enterprise collaborative education, it is necessary to establish a diversified evaluation mechanism. First, it is necessary to establish and perfect the talent evaluation mechanism, which is constantly improved in recruitment and employment, training program formulation, skill assessment, classroom teaching, practice assessment and other links. Second, establish a scientific quality control system for talent training, arrange special personnel to take charge of quality control of talent training, check and coordinate feedback of all kinds of information of talent training, and actively correct the deficiencies in talent training; The third is to carry out long-term tracking of talent training. Graduates and employers will be included in the evaluation subject, and the evaluation of students' employment literacy before employment and long-term effect after employment will be done well[6]. Through school-enterprise cooperation, the college builds a new platform for collaborative education practice teaching, cooperates with enterprises to jointly complete course teaching, carries out project training relying on enterprise environment, and constantly adapts to changes in social needs. Improve the pertinence of students' practice and training, and realize the smooth transition from graduation to employment[7]. The final realization of school-enterprise cooperation in running schools, collaborative education, employment protection, common development.

3.4. Relying on Subject Competitions, Encourage Students to "Learn by Doing"

Software engineering subject competition is to build a platform that is conducive to giving full play to the creative thinking of students, reflecting the sense of innovation and competition of college students, and showing the practical practice and innovative thinking ability of college students. Relying on the subject competition, students are encouraged to "learn by doing", not only actively participate in the subject competition activities, but also integrate the competition activities into the process of teaching mode reform, such as combining part of the practical training courses with the subject competition activities. On the one hand, most students can participate in the competition activities, cultivate students' professional skills, and have a deeper understanding and application of the knowledge they have learned. On the other hand, teachers can broaden their horizons in the competition, understand the types of talents required by enterprises, and explore new teaching methods and teaching models. Encourage students to strengthen practice, bold innovation,

dare to trial and error on the basis of in-depth study of theoretical knowledge, and cultivate students' ability to learn independently and solve problems creatively [8].

It is also the key work of computer science and technology major to cultivate students' comprehensive practical ability, make students seek innovation in practice and explore, and constantly improve their teamwork ability. For complex engineering problems, the teaching is carried out in project task-driven and problem-driven modes, and the research is carried out in accordance with the idea of "research, design, implementation and induction". In the learning process, students need to build models according to actual problems, design experiment schemes, collect data information, and obtain reasonable and effective conclusions through information synthesis, so as to improve the ability to solve complex engineering problems.

3.5. Take Advantage of New Education Models such as MOOCs and Flipped Classrooms

MOOC refers to online courses with a certain scale, which has the characteristics of sharing, openness and flexible management. It can form a complementary relationship with offline teaching in colleges and universities to make up for the defects of limited offline teaching and education resources. As soon as MOOC appeared, it was widely recognized in the field of higher education. Colleges and universities began to explore the new education mode of integrating MOOC into traditional teaching, and constantly improved the credit mutual recognition system related to MOOC, and strive to play the advantages of MOOC, integrate online and offline teaching deeply, and reflect the new characteristics of higher education in the information age[9].

The use of MOOC, flipped classroom and other new education models provides a new way for the reform practice of traditional classroom teaching. The traditional classroom has some defects, such as low student participation in the classroom, less interaction between teachers and students, difficult to achieve personalization, and single assessment and evaluation mode. The new model of MOOC and flipped classroom can be combined to make corresponding changes

Teaching reform practice, in order to obtain better teaching quality and effect.

3.6. Pay Attention to Curriculum Ideological and Political Construction

In 2020, the Guideline for Ideological and Political Construction in Higher Education Curriculum issued by the Ministry of Education emphasized that ideological and political construction in higher education curriculum should be comprehensively promoted. At the same time, the teaching of specialized courses also provides knowledge and skills background and professional discipline foundation for the development of ideological and political education[10]. The major focuses on ideological and political construction of the curriculum, combines professional education with the current development status of the discipline and national needs, and constantly deepens students' understanding of the history, orientation and development of the discipline. Curriculum ideology and politics play a key role in the process of "three-in-one education". The whole teaching process and each link of professional courses should strengthen curriculum ideology and politics consciously, form a joint force for education, and carry out the fundamental task of cultivating virtues and cultivating people. It will equip students with the spirit of striving for excellence, and enhance their patriotism and sense of mission to serve the country through science and technology. These measures well combine ideological and political elements with curriculum teaching, give students positive value guidance, stimulate students' motivation for independent learning, make students shift from passive learning to active learning, enhance students' sense of academic mission, let students shift from "I want to learn" to "I want to learn", and finally achieve better learning results.

4. The Practical Requirements of Software Engineering Reform

1) Cultivate bilingual teachers with excellent professional quality and promote "bilingual construction". Teachers should actively choose practical and time-effective teaching materials in the teaching process.

2) Build a team of experts, take students' future development as the orientation, improve the evaluation mechanism of students, and promote the scientific and standardized cultivation of talents

3) Relying on school-enterprise cooperation, build a new learning and practice platform, and strive to realize the integrated development of industry feeding teaching.

4) Actively promote the construction of "mass entrepreneurship mentor" to provide strong escort for students to participate in discipline competitions, innovation and entrepreneurship competitions.

5) Learn advanced teaching concepts from domestic and foreign universities and introduce excellent MOOC resources, and gradually realize the synchronization of curriculum resources with the world frontier[11].

6) The major attaches importance to the ideological and political construction of the curriculum, combines the professional education with the current development status of the discipline and the national needs, and constantly deepenstudents' understanding of the history, orientation and development of the discipline. In the course of learning, develop students' scientific thinking and outlook on development, and integrate the education of core values of socialism with Chinese characteristics.

5. Conclusions

With the arrival of the fourth industrial revolution with the deep integration of networking, informatization and intelligence as the core, and based on the background of new engineering and the current national and regional strategies, the traditional classroom teaching method is no longer suitable for the teaching objectives and methods of today's software modeling technology course, and the Internet direction education of software engineering should also keep pace with The Times. How to cultivate talents with comprehensive quality and innovative ability to adapt to the requirements of new engineering has put forward new challenges for teachers in colleges and universities. Through the active application of undergraduate education and aiming at the frontier of the world, promoting the high integration of scientific research, production and education, and industry feedback of basic teaching practice, this paper provides an important guarantee for the teaching work and practical education of software engineering. Relying on national needs, region-oriented development and curriculum teaching reform, cultivate high-quality multi-level high-quality and compound engineering and technical personnel. At present, the teaching reform of software engineering course is still in the exploratory stage. From the aspects of teaching content, problem design, process organization and teaching evaluation, further experience accumulation is needed to fully mobilize students 'subjective initiative in learning and achieve better teaching effect.

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