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Research on Teaching Reform of "Software Development and Practice"

WANG Rui[a],*; YU Fangfei[a]; ZHANG Yuxin[a]; LI Hua[a]; ZHAO Jianping[a]

[a]Changchun University of Science and Technology, Changchun, China.
*Corresponding author.

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Abstract
Software development practice course unlike any experimental courses of high-level programming languages and software engineering, as an independent, practical, comprehensive software development practices and research training courses, training students' capabilities of software development, and other courses teaching content simultaneously, whose purpose is to enable students to understand the basic idea of software technology, to master methods, techniques and tools for software development, to master software development skills, to develop creative engineering design capability and ability to work together, to improve the ability of the comprehensive analysis and problem solving. In this paper, a new reform program in the teaching process has been put forward based on the software development and practice of curriculum reform.

Key words: Software development and practice; Teaching reform; Teaching method

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INTRODUCTION

Software development and practice of computer science and technology is an emerging comprehensive professional and practical core curriculum in recent years, the curriculum requires students to combine theoretical knowledge they learned with the actual project, which requires teachers organically combine the software development process together with related technologies in the teaching process to enable students to learn and use. Traditional teaching methods cannot be applied to the new discipline requirements and teaching methods, and cannot effectively improve and stimulate students' ability and creativity, thus it will be replaced by some new teaching methods gradually. The relevant teaching reform methods are set forth herein.

1. THE REFORM OF TEACHING CONTENT

In recent years, the demand for computer software engineers has been increasing and software engineers are required to master the latest software development and project management techniques, which requires us to reposition teaching content and practice of software development and training objectives. The paper performs reform of the curriculum of teaching content from two aspects:

(a) Traditional teaching methods is set fully in accordance with the syllabus for teaching content, all the creation of computer-related professional teaching contents are basically the same, and the computer major subdivides the professional directions, such as software engineering, network engineering, multimedia technology etc. (Zeng, Zhou, & Cai., et al., 2008). The teaching focus is also different among the majors, since the profession prerequisite basic course is different, and the research direction is also different, thus in this article, the choice of content is set based on the case studies and the teaching content of the course of the professional prerequisite teaching and research direction, for example, the network engineering major chooses related cases such as network development and construction of teaching, making teaching objectives more clearly, to overcome the shortcomings of the traditional teaching, for example,

the teaching contents are too loose and the research is not deep enough.

(b) Because software development is different from other professional disciplines, besides the rapid technological change, and computer science is subdivided, except part of the basic curriculum is relatively fixed, the other courses are constantly updated with the development of technology, so when setting the teaching content we first analyze the students' theoretical knowledge and prerequisite teaching, investigate the popular software development technology, and select the latest authoritative textbook, only briefly introduce the teaching content which is outdated , or rarely used in practical applications, for Prerequisite content, it should be added to the case to review and enhance the students' theoretical knowledge, in addition, appropriate selection of English teaching content, improve students' ability of understanding of the latest and most authoritative literature, making teaching plans for students at different levels, completely take the students as teaching subject.

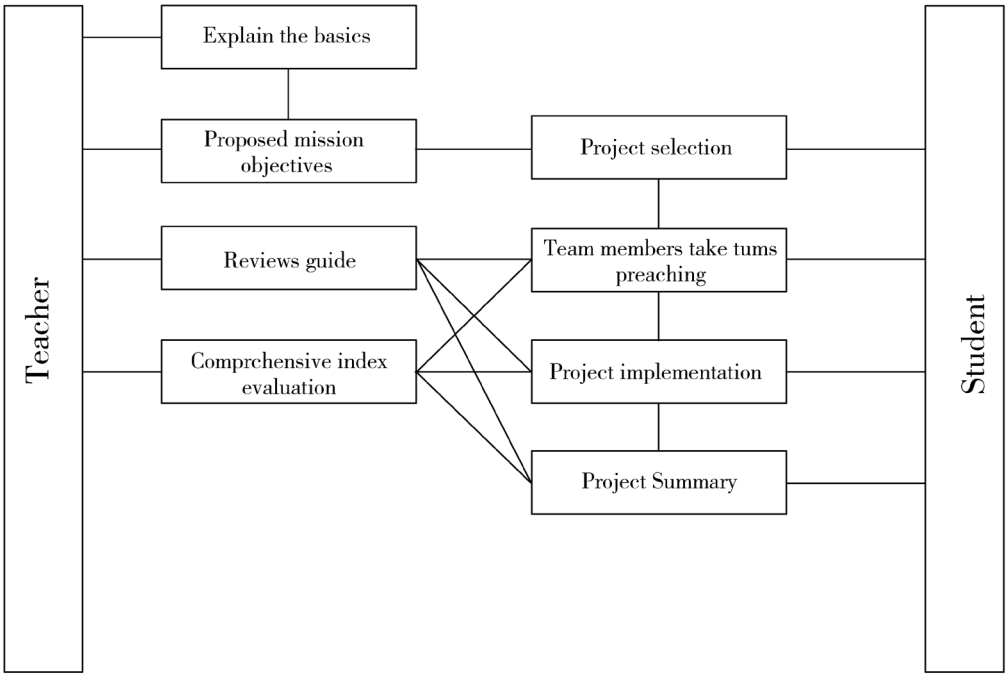

Figure 1
Teachers and Students Interactive

2. THE REFORM OF TEACHING METHODS

Abandon the traditional teaching methods which take teachers as the main subject, the time to explain the theoretical part is shortened, the teaching process is completely in the case, based on the theoretical part of the project into the case, according to course content , enable students to achieve the effect of review, practice, learning fused together (Xiao, Zhong, & Weng, 2015).

Case teaching is mainly on current case studies and analysis, research and analysis of the case is also an essential step in software development, case analysis is not going to prove some kind of point of view but to improve students' analytical and decision-making levels (Zeng, Zhou, Cai, Wang, Yan, & Huang, 2014). Therefore, the issue raised by the case, to show the contradiction or conflict, and problem-solving strategies, etc., should be independently thought by the learner, the actual situation and the relevant theoretical models and knowledge linked to make their own analysis and judgment. Spirit of innovation and capacity-building is the soul of the software engineering teaching and goals, and the case teaching method is the main way to achieve this goal. Software Engineering Case Teaching takes the actual project or the extracted simulation project in enterprises and institutions as the research center, to create a simulation environment for students, to make it be exposed to practical issues and the environment in the classroom, thus they can learn solve practical problems using the theory in complex conditions.

Teachers play a supporting role in the classroom teaching, classroom discussions were the main form, the teachers will put up the case, analysis is made by the students on their own, the analysis process is completed outside of class, in class they mainly discussed the main issues which have analyzed, training students to ask questions, analyze problems, and problem-solving skills. Teachers should grasp the main issues raised, to guide students to understand the real problems in the software development process often encountered.

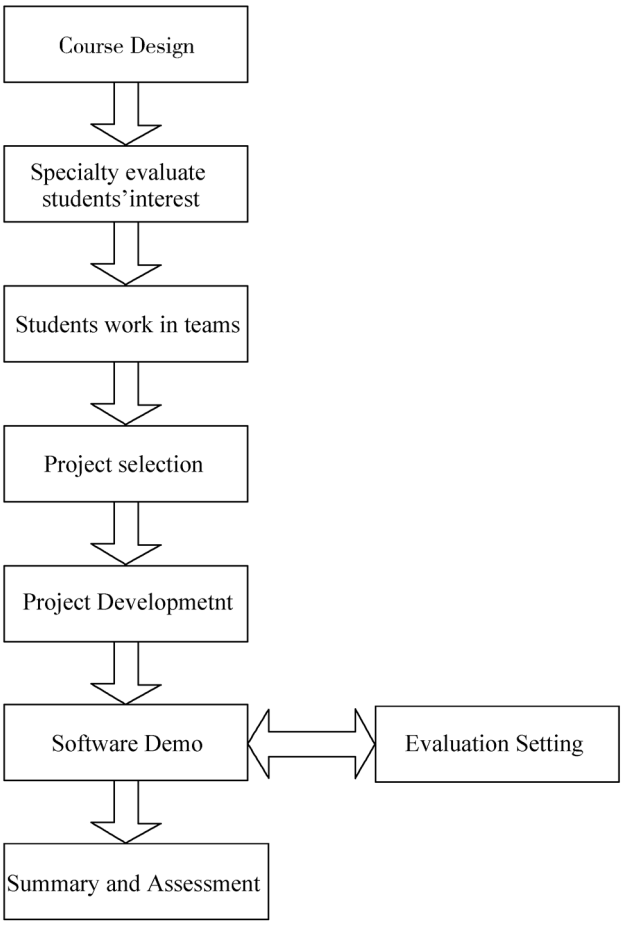

Figure 2
Teaching Implementation Process Diagram

3. THE REFORM OF MULTIMEDIA TEACHING

Innovation is the soul of a nation. Implementation of innovative education will also be the subject which will never change. In today's information glut, multimedia applications and advantages will make it an important means of effective innovative education. Therefore, in the classroom teaching practice, to take advantage of multimedia technology, combined with the characteristics of students, proper incentives to introduce some competition, set some frustration scenes, enable students to learn not only to feel when there is a certain degree of difficulty, there is a certain attraction force, but also to have a choice, so that students do their talent. In this way, students get frustration and a sense of accomplishment, and at the same time, they also get the opportunity to explore and training with creativity, which further enhance the power to pursue and explore.

Traditional multimedia teaching mainly carried out by "teacher talk, students listen," the main approach to teaching, according to the characteristics of software development course and practice, scene changing and more classroom interaction requires to change the traditional courseware, courseware structure conduct change requires students will interact with the scene, which must be added to multimedia presentations courseware, and the vivid courseware can be modified not only to provide teachers presentation, which can also become instant play one student speech reference materials. Student-centered teaching methods also require the fusion of demonstration and related development, the integration of multimedia environment and development environment, organic combination of students and multimedia presentation, the fusion of teachers and multimedia, thereby effectively improve teaching effectiveness in the classroom.

4. THE REFORM OF EXPERIMENTAL TEACHING

Practice part is mainly based on some simulation of the actual project, selecting areas which students are more familiar with, progressive approach to project practice, the software development process is a complex process, except few small software can be developed by individuals, large Part of the software is developed by the team, in the form of cooperative learning and teaching strategies currently in one of the world widely used teaching organization that can fully reflect the dominance of the main role of teachers and students, in order to better simulate the real project, training students teamwork, we use cooperative learning, based on the performance of students in different areas will have different abilities to differentiate student group (Xu, Guo, & Zhou, 2009), the difference grouping can effectively avoid the students' ability randomized brought similar character with to the unequal distribution of the phenomenon of team structure, so that students can effectively complement each other, learn from each other, emphasizing teamwork. In order to play a specialty training students in the group better, to understand others, we carry out effective group discussions and team incentives. In the late practice, we will arrange for students to enter China Software, Northeast Software and other large software companies for internship, take the actual project as the basis, to enable students to participate in real projects, in strict accordance with the software company's management system for project management, and in accordance with the company's document template as a document specification of the project, learning to develop experience of front-line software development engineer, feel the corporate culture, effectively improve the students' practical abilities.

5. THE REFORM OF EXAMINATION

The ultimate goal of the assessment should be a true reflection of the students' practical abilities, professional knowledge and development capabilities, the quality of the organic unity. As a new curriculum, assessment

methods are also essentially different from the traditional way, the traditional assessment methods generally include two parts, attendance and examination papers. According to the special nature of the course of software development and practice, the way we carried out the assessment makes innovative adjustment. Final grade comes from the classroom performance, which accounted for 20%; project documentation, which accounted for 40%, and defense, accounting for 40%. And mandatory attendance at the project less than 50% of the members as unqualified examination results, this effectively avoids the disadvantages brought about by traditional assessment methods, thus can truly reflect the students' true learning. Besides, mandatory requirements for teamwork among students can effectively mobilize the enthusiasm of the students (Xu, Guo, & Zhou, 2009; Li, 2009; Yu, 2011).

6. TEACHING REFORM CHALLENGES

(a) Select the course of the project, according to the needs of enterprise software talent and interest of students choose a course of project-driven teaching, the need for cutting-edge software for in-depth research to develop enterprise software for students to meet the learning needs of the project personnel system, As students on the basis of uneven learning attitudes vary, project selection is more difficult, Complete simulation of internal course development mode, select Item Title questionnaires and through seminars, capacity-building evaluation system, students of their own programming and analytical skills too high led to some estimates project topic too difficult, in the learning process the problem occurs.

(b) Traditional software development methods older, more suitable for beginners to learn, agile development is the mainstream of development enterprise development approach, its group members high quality requirements limit their own development, since learning differences, to develop a practical approach to software development learning progress control, in order to achieve enable students to experience different development model of software development process, due to the last hours of learning time and project failure case appears.

(c) Student-centered teaching, because of its short time, the number of people in order to allow each student has the opportunity to sl 请补卷期页 the project and develop a detailed plan of classroom teaching, allocation of time for students, teachers and develop appropriate strategies to deal with different scenarios of teaching, there has been some basic difference between the learning of the students are not active participation, the lack of self-learning ability in teaching scene.

(d) The appropriate choice of teaching evaluation based on problems encountered in the process of teaching and teaching conditions. Teaching Evaluation and traditional test of conflict, since the final project as a group, objective evaluation of the proposed new requirements.

7. SUGGESTIONS ON THE TEACHING REFORM

(a) Due to the special nature of computer science, as computer professional teachers, we should continuously improve our theoretical level, the research level and actual project development capacity, and to participate in the actual software development project, to learn new methods of software development and new technologies constantly, and integrated these techniques and methods into teaching.

(b) Strengthen the laboratory building and build a specialized laboratory for the professional software engineering practice, so that different students can have a complete software development environment support, and timely open laboratory for students.

(c) Follow the software industry changes, timely have the laboratory facilities and teaching content updated to meet the changing times.

CONCLUSION

Based on comprehensive and practical features of Software Development and Practice, this paper put forward a new teaching method which is case-based and can strengthen the relevance of the various disciplines. And we proposed reform measures from the classroom, practice, assessment and other aspects. Through exploration and practice in recent years, the teaching reform of our software development and practice courses has great effect on the development of students' personal skills, sense of innovation and capacity of innovation, reaching the goal of our fostering of engineering application type talents. Teaching Reform of Software Development and Practice is a long and arduous task, with updated technology constantly changing, we must continue to strive in the process of reform and innovation.

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