



Research on the Training Model of Software Technology Standardization Talents under 1+X Vocational Skills Certification

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Abstract. Under the trend of economic globalization, due to the vast employment market for software technology professionals, there is a serious shortage of professional talents. How to cultivate the professional talents required by the market is currently the focus of software technology education. Nowadays, universities in various regions are gradually optimizing traditional education models and expanding practical education content based on the technical talent requirements of enterprises. The cultivation of practical talents is gradually showing diversified and intelligent characteristics. Therefore, based on an understanding of the current situation of talent cultivation in software technology, this article explores in depth the standardization of software technology talent cultivation models under the 1+X certificate vocational skills certification system, based on the practical significance of 1+X vocational skills certification work, in order to reserve basic strength for modern economic development.

Keywords: 1+X Professional Ability Certification; Software technology; Professional talents; School-enterprise cooperation; The curriculum reform.

1 Introduction

Under the background of the new era, the educational goal of computer software technology specialty is to cultivate a group of senior practical professionals with rich theoretical knowledge, proficient in at least one mainstream software development platform, and strong programming ability. These talents can be engaged in the investigation, testing, maintenance and production management of software development in enterprises and public institutions, government agencies and IT enterprises. However, from the perspective of the current training mode of professional talents, the training objectives with practicability and applicability are not obvious, which leads to the failure of effective connection between professional talents and market demand. Under the current college education mode, software technology major mainly focuses on classroom teaching tasks, and teachers are the leader of practical teaching activities. For example, students should have logical ability and mathematical foundation when they

first get to know software technology. In practice, students do not have the consciousness of active participation, so the participation of practical activities is low, which is not conducive to the cultivation of students' practical ability and professional quality.[1.2.3.4]

From the Angle of market development, professional software technology is a close to the real life of the subject, in the rapid development of computer technology, computer office automation system technology become the norm in daily work, such as containing a large number of software is used to solve practical work problem, so we need professional and technical personnel mastering the technical principle and software functions. However, from the current situation of software technology professional training, there is a deviation between students' knowledge and market environment. On the other hand, it is difficult for students to find the most advanced programming techniques and software development methods in market dynamics and other excellent works. This kind of deviant training mode will lead to students' knowledge ability and thinking consciousness gradually deviating from the market environment, and the applicable performance will be questioned by people. Although China's vocational education has achieved excellent results, it can not really meet the fundamental needs of social and economic development. The introduction of "20 Articles of Vocational Education" has brought great opportunities for vocational education. Software technology professional education meets the requirements of 1+X certificate system to a certain extent. Therefore, in order to further implement the certificate system comprehensively, it is necessary to study the standardized software technology professional talent training mode from various aspects.[5.6.7]

From the perspective of the current market development, the proposal of 1+X certificate system is not only an important reform proposed by the Party and the state according to the current form of social development, but also the main countermeasures for the innovative development of China's education field. Based on the experience gained by western developed countries in vocational education, the implementation of 1+X certificate system will have a positive impact on China's current economic development and help vocational education to develop in a rational and scientific direction. However, the connection between the training of software technical personnel and the certificate system requires a deep study of the current situation of software technical personnel training under its vision. Therefore, this paper takes Web front-end development as an example, mainly analyzes the training path of standardized software technology professionals under the 1+X certificate system, and analyzes it from the perspective of current education innovation, which has the significance of The Times.

2 Method

2.1 Significance of Cultivation

After China put forward the implementation plan of national vocational education reform in 2019, this represents the official start of the pilot work of 1+X certificate system. In this pilot work, on the one hand, encourage and support vocational college stu-

dents to obtain multiple vocational skills certificates while obtaining academic certificates; On the other hand, it is necessary to gradually expand students' awareness of employment and entrepreneurship to alleviate the structural employment contradiction in the current market. It can be seen that under the framework of 1+X certificate system, the comprehensive quality of professional students in vocational colleges can be comprehensively improved. Web front-end development as the core of the 1+X certificate system certification, software technology professional training is an important assessment project, The specific content involves the production of professional Web pages, HTML5 development foundation and application, PHP technology and application, JavaScript program design, website project actual combat, Web front and back end data interaction technology, mobile Web design and development and other professional courses.[8.9.10]

2.2 Training Objectives

The professional training objectives of Web front-end development 1+X certificate are divided into three levels: the first is the primary level, the second is the intermediate level, and the last is the advanced level. By putting forward requirements for assessment standards of different levels, training objectives and professional abilities of different levels are formulated, as shown in Table 1 below:

Table 1. Training objectives of professionals

Occupational Skill Level	Training goal	Obtain employment direction	Main Professional Abilities
Primary Web front-end development	1. Master the basic knowledge of Web front-end development technology; 2. Able to independently complete static website page design, development, functional debugging and system maintenance management; 3. Capable of coding Web front-end application software; 4. Capable of comprehensive software engineering testing, software system management and technical consulting services, etc	1. Static web page making and reactive web page building for enterprises and institutions; 2. Static web page making and reactive web page building for the informatization and digitization of government units	1. Learning Ability Of Front End Websites To Develop New Knowledge And Skills. 2. Capable of static web design and manufacturing
Intermediate Web front-end development	1. Capable of front-end development of website; 2. Possess technical skills of mobile terminal development; 3. Familiar with the front-end and back-end data interaction of Web; 4. Basic ability of dynamic website design, research and development, debugging and maintenance; 5. Capable of Web front-end and application software programming, testing, software technical services, intelligent terminal interface research and development	1. Software development, software system testing and system operation and maintenance departments needed by IT Internet enterprises and newly transformed traditional enterprises; 2. Software development, software system testing and system operation and maintenance required by government institutions; 3. Website planning and construction, website development and maintenance, development and management of relational database, etc. 4. For-	1. Have Front End Knowledge, New, Technology Learning And Innovative Entrepreneurial Skills 2. Ability of network planning and construction; 3. Capable of relational database product design and management; 4. with network reaction development ability; 5. Data exchange capability

		ulate policies and manage technical solutions according to network development needs	
Advanced Web front-end development	1. Familiar with Web foreground framework application, system performance optimization, automation technology and other professional knowledge; 2. Have the basic ability of foreground framework, mobile smart terminal user development technology, Web component development technology and so on; 3. Capable of Web foreground framework product design, relevant technology selection design, Web componentization, etc	1. Application software product development, application software testing and information system operation management department of IT Internet enterprises; 2. Application software development, testing and information system operation departments of traditional enterprises and institutions in network transformation; 3. Development of application software products for government agencies, and operation of application software detection information system; 4. Designed the foreground framework product, developed the mobile terminal project management technology, wrote the Web module and class library and other management work; 5. Provide framework product design and management and implement technical solutions according to network development needs	1.Master Front End Knowledge,Learn New Technologies And Innovate Entrepreneurial Skills 2. Master the ability of front-end system framework design; 3. Capable of mobile terminal research and development; 4. Have front-end componentization ability; 5. Ability to optimize network performance

Combined with the above table analysis, it can be seen that the primary goal of Web front-end development belongs to the basic requirements of professional and technical personnel, who should not only have good professional ethics and professionalism, but also master the knowledge and skills of front-end development, and have the ability to independently complete the work of page design and development and function debugging. And the ultimate goal is to high and new technology industry put forward the fundamental demand, companies will be hiring staff basic vocational skills and comprehensive qualities as cultivating the core, its aim is to raise the morals attainment of software technology professionals, and be familiar with Web front-end and back-end data interaction, development technology and other professional knowledge, can actively participate in software programming interface, technical services, such as research and development work. Senior objectives should regard enterprise employment objectives as the main orientation, vocational and technical development ability and comprehensive quality as the core content, and focus on cultivating good moral and humanistic quality of professional students, so as to participate in Web component optimization, Web front frame product design, related technology selection design and other posts.[11.12]

2.3 Cultivation Mode

First, implement post education in school-enterprise cooperation. According to the certificate assessment standards of front-end development, the professional talent training mode will be gradually optimized, and the cooperation and communication between schools and enterprises will be strengthened to build a second-level college of mixed ownership. In this cultivation program, we should integrate and use the resources of the

subject courses, and do a good job of course teaching and management jointly. Among them, the school is mainly responsible for the provision of teaching laboratories, and set up public compulsory courses and some basic courses, so as to provide education and technical support services for enterprises.

Second, construct quality system in curriculum reform. The standardized educational curriculum for software technology professionals is the result of the investigation of the needs of the industry and enterprises. It should not only meet the vocational and technical requirements, but also show the teaching principle of taking students as the center. According to the analysis of the examination requirements of the Level iii certificate of Web front-end Development, the modular curriculum system should be used to divide the professional courses into three parts, the first is the basic module, the second is the professional module, and the last is the post characteristic module. The specific design is shown in Figure 1 below:

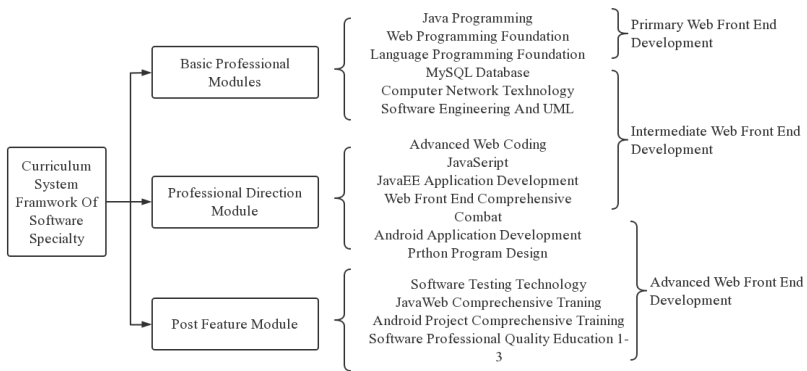


Fig. 1. The framework of the curriculum system

Third, design teaching tasks in continuous optimization. The teaching tasks of the course should be designed and analyzed around the teaching content closely assessed by the 1+X project, such as using special teaching research to conduct case teaching, or designing teaching mode combining with the working process of enterprises, so as to accelerate the reform of the course content and teaching methods. According to the analysis of training needs of software technology professionals in the new era, teaching task design should be adjusted according to knowledge requirements and skill requirements, and the specific process is shown in Figure 2 below:

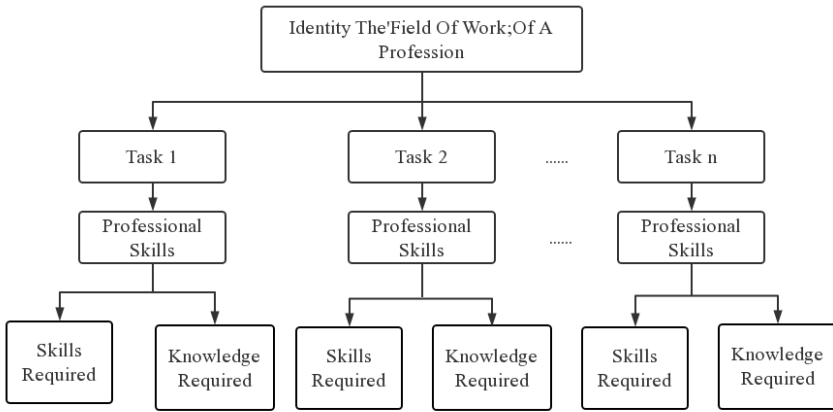


Fig. 2. Flow chart of teaching task design

3 Result Analysis

3.1 Research Significance

According to the training situation of software technology professionals in colleges and universities in China in recent years, the education work under the 1+X certificate system has the following significance: First, it helps to improve the training quality of professional talents. It is the essential attribute of professional education to master professional skills while improving students' professional qualifications. The pilot work of 1+X certificate system is the basic task of creating this orientation, on which to quickly connect with the job training work needed by China's social and economic development; Secondly, it helps to optimize the talent training mode. Deepen the reform of teachers, teaching materials and teaching methods, and on this basis guide schools around the country to carry out a combination of training, short and short, internal and external, so as to comprehensively carry out the training work of various vocational skills certificates. For example, the training mode of 1+X certificate system and modern apprenticeship system is shown in Figure 3 below. Finally, it is helpful to actively explore basic engineering. When carrying out the pilot work of 1+X certificate system, vocational colleges should actively explore the countermeasures of vocational education reform proposed by the state, so as to ensure the connection between the education system and the national education requirements, and gradually expand the cultivation path of technical skills talents. The Web front-end development studied in this paper needs to connect with professional courses based on the requirements of certificate ability, as shown in Figure 4 below:

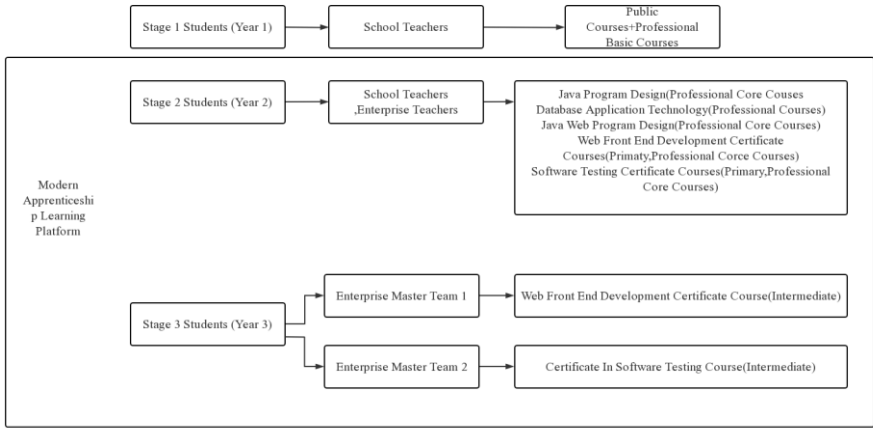


Fig. 3. Cultivation mode of integration of 1+X certificate system and modern apprenticeship system

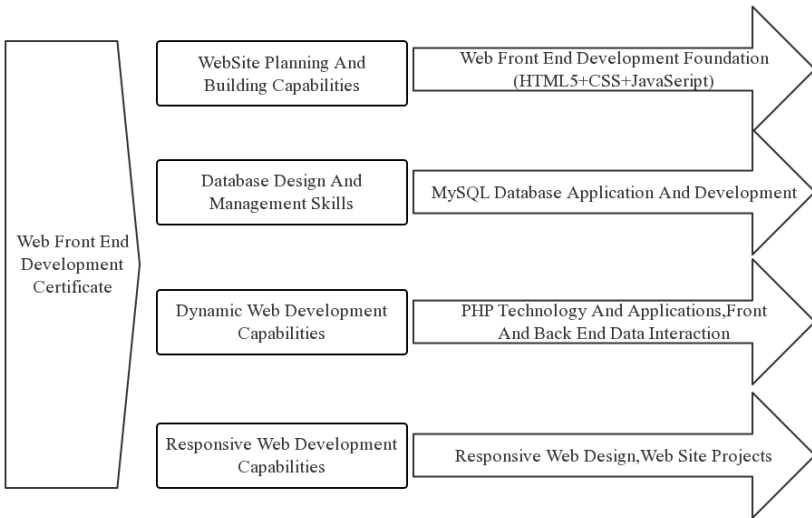


Fig. 4. Connection between competence requirements and professional courses

3.2 Future Exploration

According to the analysis of the cultivation status of standardized software technology professionals in colleges and universities in recent years, after the comprehensive implementation of the certificate system, the relevant professional curriculum system began to reform in the following aspects: First, bilingual teaching mode. In the teaching

work of software technology specialty, while changing the traditional thinking, bilingual teachers should be employed actively, and practical teaching methods should be adjusted, so as to expand students' thinking space and provide effective basis for them to participate in the development of technical software. Secondly, personalized teaching mode. In the teaching work of software technology major, we should not only adhere to the principle of consistency of major main line, but also put forward personalized teaching mode combining students' interests and hobbies, and combine teachers' tutor system to integrate students with different interests into different groups and continuously optimize their comprehensive level. Finally, practice teaching mode. On the one hand, practical teaching links should be strengthened in professional courses. On the other hand, school-enterprise joint laboratories should be established in the combination of production, learning and research, so that students can directly participate in the actual projects of enterprises during school, which will help students apply what they have learned to practical work and accumulate more rich experience.[12.13]

4 Conclusion

To sum up, software technology professionals, as the basic conditions for enterprises to explore technological innovation, are also the focus of education under the trend of economic globalization. After the 1+X certificate system is put forward in China, according to the technical personnel requirements of the industry and enterprises, the training work of software technology professionals is constantly optimized, and the guidance goal of practical education is gradually improved, which can further improve the training level of software technology professionals and cultivate more excellent technical personnel for the social and economic development. Therefore, on the basis of integrating the previous teaching experience, the software technology specialty in colleges and universities around the country should put forward more perfect training countermeasures from the perspective of the long-term development of the industry and enterprises, combined with the 1+X certificate system, so as to provide long-term technical talents for the society.

Fund Project

Provincial Quality Engineering Project of colleges and universities in Anhui Province, Key teaching and research projects(2021jyxm1461).

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