Reform Practice of Front-end Development Curriculum System Oriented by Occupational Skills

Haibin Xue

School of Information Engineering, Yangling Vocational & Technical College, Xianyang, Shaanxi, 712100, China

Abstract: The field of front-end development has always been one of the highly regarded and in-demand occupations in the field of information technology. In the digital age, almost every business and organisation needs to have great websites and applications, which makes the skills of front-end developers more and more in demand. However, the rapid growth and constant evolution of the front-end development field means that traditional curriculums can lag behind market demand. In order to cultivate front-end developers with practical application skills, the front-end development curriculum system needs to be constantly reformed and upgraded. This paper analyses the necessity of reforming the front-end development curriculum system oriented to vocational skills, and explores the strategy of reforming the front-end development curriculum system oriented to vocational skills.

1. Introduction

Front-end development has been ubiquitous in the digital age, from websites to mobile applications to cloud services, front-end technology has been driving the development of the digital world. However, the rapid evolution of the front-end development field and the constant emergence of new technologies have made front-end developers face great challenges and need to constantly upgrade their professional skills to keep up with the pace of the times. In order to meet the need for front-end developers to continually upgrade their skills, the front-end development curriculum system needs to be reformed to better reflect current market realities and future trends. This reform needs to focus on how to provide students with a more practical and in-depth learning experience that is orientated towards vocational skills, so that they can be competent in a variety of challenges in their careers.

2. Analysis of Front-end Development Talent Demand and Curriculum Development Current Situation

2.1. Analysis of front-end development talent demand

With the change of social background, the use of computer equipment and mobile electronic devices is becoming more and more widespread, the mobile network user data is explosive growth,

the network industry also ushered in a new opportunity and challenge. Front-end development is one of the main technologies required for the development and promotion of mobile phone applications and network sites, and is also the most influential factor in allowing users to intuitively feel the product interface and design. As the market demand continues to increase, resulting in today's mobile software development industry for the demand for talent has also increased dramatically, the market industry gradually revealed due to a shortage of talent caused by the phenomenon of uneven development. However, due to the textbook knowledge is more rigid, while the industry due to rapid development, showing rapid changes, technology change faster, therefore, the industry for the ability to master the skills of the talent and learning ability also puts forward higher requirements. Based on this industry background, the educational institutions in the front-end development course education, to vocational skills-oriented, combined with the current industry technology hotspots, to cultivate more to meet the market demand, adapt to the industry changes in the quality of talent. At the same time, the emergence of vocational skills certificate validation assessment that can reflect the level of skills mastery, undoubtedly provides a new education path for the front-end development course education system. The implementation of the "1 + X" certificate system provides a new educational prospect for the development of courses, and also has a far-reaching impact on the relevant industry sectors.[1]

2.2. Front-end development course development status

The rapid development of the network industry has led to the iterative updating of related technologies, so there is a certain lag in the technical teaching content of the course materials relative to the network technology used today. For example, the front-end development courses of some educational institutions, the content of the textbook remains in the past HTML and css combination of front-end development of basic teaching, this technology is mainly produced by static web pages, and now the mainstream development of mobile application software front-end technology using HTML5 + css3 technology in the user interaction as well as the interface aesthetics and so on, it shows a greater advantage, to be able to bring better user experience and perception. The lag in teaching content is extremely fatal for the training of talents, not only restricting the learning of students' own network technology skills, but also not conducive to driving the front-end development course iteration and the development of the industry. In the current "1 + X" system, it is also unable to effectively assist students in passing the relevant qualification examination.[2]

The lack of practice opportunities is also an important reason why students can not get effective growth in professional ability. Comprehensive view of the current stage of education in China's colleges and universities, professional education is mainly based on the transmission of cultural knowledge, teachers are more inclined to follow the sequence of the textbook to teach students different units of professional knowledge. For some students with poor comprehension ability, this teaching method is difficult for students to integrate the knowledge of the course, and the knowledge learned is only the so-called "paper", the lack of relevant practical tests, which does not allow teachers to accurately grasp the learning situation of each student, which seriously affects the efficiency of teaching. Moreover, the relatively long teaching time of the course, combined with the abundance of content, results in a lack of practice opportunities. This leads to students being unable to effectively consolidate their knowledge. As a result, they often experience difficulty retaining information learned earlier in the course. For this situation, teachers should connect practice and teaching, extracting typical cases in the classroom to explain, let the students get hands-on programming to understand the weakness of their own knowledge, so as to achieve the consolidation and deep understanding of the teaching content of the purpose.

The level of teachers is an important factor affecting the teaching effect of the programme. Although more and more schools have begun to pay attention to students' vocational skills under the implementation of the "1+X" certificate system, the level of teachers varies from school to school. However, due to the varying levels of schools, the construction of the teaching staff also varies, resulting in some schools failing to achieve the desired educational effect of the front-end development programme. Even some school teachers are not skilled enough due to professional skills, resulting in serious derailment of the teaching content and the actual development of the industry, not only is not conducive to the enhancement of the students' own professional skills, but also a greater constraint on the school, is not conducive to the enhancement of the level of curriculum education.[3]

3. The necessity of reforming the front-end development course system oriented to vocational skills

3.1. Rapid changes in front-end open technology

The rapid change of technology in the field of front-end development is a challenge and the urgency of the reform of the front-end curriculum system. Front-end development is a field with rapid technological updates. Every year, new programming languages, frameworks, libraries, and tools emerge to meet the growing demand for Internet and mobile application development. These new technologies can dramatically improve development efficiency and user experience, so students need to know and master them to stay competitive in a highly competitive job market. And with the diversity of different devices and browsers, front-end developers need to ensure that their websites and applications work well in a variety of environments, which requires students to familiarise themselves with the best practices of cross-browser and cross-platform development to ensure that their products have good compatibility and accessibility in all situations. Also with the increase in cybercrime activities, front-end developers need to be security conscious enough to protect sensitive data on websites and applications. Also, front-end performance optimisation has become a key issue as users expect pages to load quickly and be responsive. The curriculum needs to include training on these aspects to ensure that students are able to take these important factors into account during the development process.

3.2. Changing Industry Requirements

The evolving needs of the industry is another important driver for the reform of the front-end development curriculum system. With the widespread popularity of mobile devices, mobile development has become an important branch of the front-end field, and students need to learn how to develop responsive designs to ensure that the websites and apps that are created work well on a variety of mobile devices. And with modern users wanting to be able to access websites and apps seamlessly across different devices, responsive design has become a core requirement for front-end development. Front-end courses should include the principles and practices of responsive design to enable students to create user interfaces that adapt to a variety of screen sizes and resolutions. Also users expect websites and applications to load quickly and provide a seamless user experience. Front-end performance optimisation is one of the key factors, and students need to learn to use tools and techniques to improve website performance, reduce load times, as well as reduce resource consumption. Front-end developers need to focus not only on technical implementation but also understand the basic principles of UX design, which includes knowledge of user interface design, user research, usability testing, etc. Front-end development courses should be integrated with UX design principles to develop students' ability to create user-friendly applications.[4]

3.3. Interdisciplinary Requirements

Interdisciplinary requirements have become one of the core features of the modern front-end development field, and therefore reforms in front-end development courses need to emphasise this more. In current times front-end needs to work closely with back-end development to create complete applications. Front-end developers need to understand the fundamentals of the back-end in order to be able to collaborate with back-end developers on tasks such as data transfers, API calls, etc. This requires that the fundamentals of back-end development be included in front-end curricula in order to facilitate interdisciplinary collaboration. And since front-end applications often need to interact with data, students need to understand the fundamentals of data analytics, including data visualisation, data manipulation, and data storage, so that they can manipulate and present data. Teamwork and communication are crucial in modern software development. Front-end developers need to collaborate with various team members such as project managers, designers, testers, etc. Therefore, the course should develop students' teamwork and communication skills so that they can work effectively with people from different professional backgrounds. In addition to this, students need to understand the basic principles of project management in the learning process so that they can effectively manage project schedules, task allocation and resource allocation at work, which will help them to better organise their work in their careers.

4. Reform strategy of front-end development course system oriented to vocational skills

4.1. Clarify course objectives

In the "1+X" certificate system, "1" refers to the academic certificate and X represents the vocational skills level certificate. That is, under the same conditions, the more vocational skills level certificates, the higher the vocational skills level of the talent. Based on this premise, teachers should make clear the primary goal of curriculum system reform, that is, to be oriented to vocational skills, and committed to improving students' professional skills and knowledge level and industry learning ability. For the front-end development course, teachers can synthesise the vocational skills demand for front-end developers from major recruitment websites, and make certain adjustments to the teaching objectives of the course. To train students in front-end development technology, it is essential to ensure that they understand the complete website development process. During this training, students should be proficient in using front-end development languages such as HTML5, CSS3, and JavaScript to create both PC and mobile interfaces. The aesthetic design of the front-end interface plays a critical role in shaping the user's intuitive experience of the product. Therefore, it is important for teachers to focus on enhancing students' aesthetic capabilities by teaching them how to effectively design and beautify website front-end interfaces. Finally, the development of network application products can not be separated from teamwork, while focusing on improving students' individual ability, teachers should also strengthen the importance of cultivating students' independent thinking ability and teamwork ability. From the product requirements to the product acceptance stage, each stage is inseparable from the overall collaboration of the development team, therefore, in the handover of work, but also on the development of personal ability to work habits, communication skills and execution ability to put forward certain requirements. Therefore, in teaching, teachers can improve students' teamwork and communication skills through the form of group work.[5]

4.2. Update and Integrate Teaching Resources

The updating and integration of teaching resources is also very important to promote the reform

of front-end development course system. For front-end development courses, educational resources mainly consist of successful cases and web development tools. In the past web front-end design course teaching, the main development tool used is Dreamweaver, the main feature of the software is that it pays more attention to the design of the page than the code composition. In terms of its characteristics, the software is more suitable for novice front-end developers and programming enthusiasts. For professional developers, programming ability is more important professional ability. Therefore, compared to DW, the current front-end development courses usually use Hbuilder as a development tool. hbuilder is a web front-end development tool that supports html5, which not only has syntax hints, code blocks and other quick programming features, but also for developers to enhance the efficiency of the work to provide a lot of help. Its user-friendly software design also reduces the programming difficulty for developers, which is a very obvious advantage for students to learn programming courses, so that students are no longer afraid of programming due to their limited English proficiency level. In terms of teaching cases, teachers can contact enterprises through school-enterprise co-operation to obtain some successful cases as teaching content for students to explain the relevant technical content. Mature software development cases for students can not only help them understand the process of industry development, but also help them intuitively feel the advantages of emerging industry technologies. Therefore, it is very important to explain the case for the front-end development course system reform to highlight the significance of the teacher in guiding students and helping them understand various aspects of software development and programming content. This will also serve as a typical example for students to enhance their professional competence through relevant group work, teamwork, team communication, and link docking.

4.3. Continuously Follow Industry Trends

Continuously tracking industry trends is a key step to ensure that the front-end development course system is always in line with the market demand. By establishing close partnerships with the front-end development industry and keeping in touch with companies, practitioners, and professional associations, students can be better informed of the current state of the industry. These partners can provide valuable insights and feedback to the curriculum, as well as real-world projects, internships and employment opportunities for students. Teachers and educational institutions can also actively participate in industry events in the field of front-end development, such as seminars, conferences, and workshops. These events are an excellent opportunity to learn about the latest technologies and trends, as well as provide networking opportunities with industry experts. Teachers should encourage students to participate in real front-end projects, such as open-source or community projects, as part of their teaching process. This not only helps students to apply what they have learnt to real-world situations, but also gives them a deeper understanding of the latest developments in the industry. An industry advisory board can also be set up within the school, consisting of professionals in the field of front-end development. This board can provide advice on course content, structure, and updates to ensure that the curriculum is aligned with industry trends. Teachers should also, in the course of teaching, utilise online resources and front-end development social media platforms and regularly visit blogs, news, social media and professional websites to keep track of the latest news and trends in the industry. In addition to this, teachers need to regularly attend professional development programmes and seminars to keep their own knowledge and skills up to date with the industry so that they can effectively impart the latest information to their students during the teaching process.

4.4. Choosing more flexible course content

Ensuring the flexibility and timeliness of course content is critical to the successful reform of the front-end development curriculum system. Teachers should divide course content into modules, each containing specific topics or skills, and this modular structure makes it easier to add, delete, or update content. Emerging technologies and trends can be easily added to relevant modules without having to change the entire structure of the course. At the same time teachers need to establish a regular mechanism for content review and updating. At each review cycle, teachers and course developers should reassess the course content to understand which sections need to be modified or updated to reflect the latest technologies and trends. Teachers can include real-world projects and case studies as part of the curriculum so that students can apply what they have learnt, and these projects can be adapted to reflect the latest technologies and trends to ensure that students are equipped with the necessary skills for real-life work. Teachers are also required to provide students with a number of elective courses or specialisations as part of the delivery process so that they can choose specific courses based on their interests and career goals, which will allow students to better adapt to individual needs and industry trends. Teachers can also invite industry experts in the field of front-end development to participate in course design and content updating during the instructional design process. They can provide insights about the latest technologies and practical applications to ensure that the course content is practical and feasible.

5. Conclusion

The reform of front-end development curriculum system oriented to vocational skills is a key step to meet the market demand and cultivate competitive front-end developers. By updating course content, introducing new educational methodologies, and providing real-world project experiences, we can better prepare students to succeed in the ever-changing field of front-end development. Such changes will not only benefit students' careers, but also contribute to the continued prosperity and innovation in the field of front-end development.

Acknowledgements

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