

# *Research on Teaching Web Front-End Development Course Based on Unstructured Interview Method*

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**Abstract:** The Internet has entered the Web2.0 era, and the role of users in the front-end development of the Web has become increasingly prominent, which makes the research on users have received extensive attention. "Web Front-end Development" is a professional course of computer major in secondary vocational schools, and it is also a very important course in higher vocational schools and undergraduate stages. In the context of the rapid development of the Internet and the expansion of higher vocational enrollment, the traditional "Web Front-end Development" course has gradually shown some problems, such as old teaching content, unable to meet the needs of industry development and students' further study, the organization and implementation of the course is not suitable for the development of secondary vocational students, and ignores the cultivation of students' comprehensive quality. Centering on the teaching goal of "Web Front-end Development" course, this study systematically expounds the practical research on the course development of "Web Front-end Development" project in secondary vocational schools by taking project-based teaching as the course organization form and task-driven teaching method. Through the course implementation and evaluation process, it is verified that the course developed in this research can help secondary vocational students master the web programming ability required for front-end development, and is conducive to cultivating students' information literacy. At the same time, it also verifies the validity of the improved model proposed in this study, which can be applied to the development of the same type of curriculum in secondary vocational schools.

## **1. Introduction**

### **1.1 Research Background**

In recent years, the rapid growth of China's economy has promoted the rapid development of the Internet industry, making more and more residents begin to use the Internet, and people's lives have been greatly affected. People's Internet from the initial browsing information and access to information has gradually extended to work, entertainment and communication and other aspects of life.

In China, the current situation of Web front-end development courses was mainly searched on China University MOOC, a high-quality Chinese MOOC learning platform in China, and the search

keyword was set as "Web front-end development", and a total of 117 records were searched. Among them, 23 courses are related to Web front-end, including "Web Front-end Development", "Website Design and Development", "Mobile web Development", "Mobile Application Development" and so on. These courses are basically set up for higher vocational schools, but the knowledge points related to HTML, CSS, JavaScript and JQuery in the course content will be involved in the Web front-end development courses, so these courses can also be used by secondary vocational students. Similarly, these courses can provide experience for secondary vocational Web front-end development courses.

In order to solve the problems existing in the "Web Front-end Development" course of secondary vocational schools and make the course suitable for the requirements of the connection between secondary and higher vocational schools, combined with the ability requirements of front-line jobs related to front-end development, through the investigation of the requirements for the connection of relevant courses of "higher vocational colleges" and the problems of secondary vocational courses, guided by the relevant theories of project curriculum development, Develop a practical "Web front-end Development" project course. The course can not only improve students' professional ability, but also realize learning by doing and learning by learning in project-driven classroom teaching. It can enable students to use information tools to find effective solutions when solving practical problems through project learning, so as to cultivate students' vocational skills and improve their information literacy ability in the course.

## **2. Overview of relevant theories**

### **2.1 Overview of Web front-end development**

Web front-end refers to the interactive interface of Internet applications, which is one of the most important parts of web design. The elements that interact with users on a web page include text, images, forms and multimedia. Due to the increasing demand and complexity of Internet business, Web pages have become quite complex, and performance has become one of the issues that have to be considered. Many factors jointly promote the vigorous development of Web front-end technology. In the development process of Web front-end, front-end technology continues to grow and is widely used, a variety of user needs, the development of front-end pages more exquisite and beautiful, more colorful functions, interaction effect is more significant. From Web1.0 sharable network era to Web2.0 interactive network era, and then to Web3.0 aggregable network era. After 2010, MVVM, MVC and other frameworks gradually emerged, front-end developers from the development of ordinary pages gradually evolved into the development of front-end applications, and then to today's mobile Web applications, only need to deploy it on the server, users can use a variety of electronic devices in the browser to browse and use, the user experience has been continuously improved<sup>[1]</sup>.

Different types of operations need to be carried out in as short a time window as possible, therefore, the life cycle of Web front-end pages and the request and response mechanism are analyzed, their performance is quantitatively assessed, the main factors affecting the system performance are summarized, and finally the specific optimization measures are used to carry out technical transformation.

### **2.2 Non-structured interview**

The opposite of structured interview is unstructured interview. "Structured interview has a set of stylized interview process, which represents a kind of constraint." In unstructured interviews, there are not too many constraints, there is no need for fixed answers, and even there can be no fixed

questions, and the interviewer and the interviewee can talk freely. In this process, both sides of the interview can play freely without a clear purpose. Compared with structured interviews, "non-structured interviews are more likely to dig deeper questions"? But also because there is no clear theme, interview survey results are often uncontrolled and not suitable for quantitative analysis. The unstructured interview will reduce the antagonism of the interviewees to the interview itself, so that the interviewees can express themselves more naturally in front of the camera. Semi-structured interview refers to an informal interview conducted in accordance with a broad outline of the interview. This method has only a rough basic requirement for the conditions of the interviewee and the questions to be asked, and the interviewee can flexibly make necessary adjustments according to the actual situation of the interview. There are no specific requirements on the way and order of questions, the way of interviewees' answers, the way of interview records, and the time and place of interviews, which are handled flexibly by interviewees according to the situation.

### **2.3 Connotation of user expectation**

User expectation refers to an objective existence of "waiting in advance" and a psychological standard established for the Web site according to the user's previous experience and the user's own needs before or during contact with the Web site<sup>[2]</sup>. From the understanding of the definition of user expectations, it can be seen that user expectations always affect users during the whole process of using products.

Moreover, through the analysis of expectation theory, it can be found that, contrary to user demand, user expectation focuses on the process of studying motivation from "external goals", so as to motivate people to generate motivation and behavior towards their expected goals. Therefore, the design and selection of appropriate external goals are the key factors to motivate users to use Web sites and maintain user stickiness.

### **2.4 Generation of user expectations**

#### **2.4.1 Brand reputation**

The generation of user expectations first comes from the brand reputation of the Web site, especially when the user has not had a preliminary experience and contact with the Web site. Brand reputation is built up from many aspects, including the quality of the Web site itself, word-of-mouth and so on. Once the brand image is established in the user's mind, the user will naturally establish corresponding expectations for it. For example, when users contact "Renren" for the first time, after understanding the functions provided by the website, they will naturally have expectations such as "contact old classmates".

#### **2.4.2 Previous experience**

User expectations are largely based on previous experiences<sup>[3]</sup>. In the initial use of Web sites, there may only be some basic "functional expectations" to meet the basic needs, and with the satisfaction of basic functions and the deepening of experience, it is likely to produce higher requirements of "experience expectations", that is, in addition to useful functions, users should also feel that these functions are simple to use and operate smoothly.

In addition, user expectations may be generated by competitors or similar products. If the user feels good about a function or its performance when using a competitor's product before, when the user is not satisfied when using other similar products, it is easy to form a gap with the user's expectations before, and the consequence is likely to be that the user chooses to leave. If the user

has a poor experience when using a competitor's product before, and other similar products can meet the user's experience well, then it can maintain a good viscosity.

## **2.5 Feature Analysis Expected by Users**

Users expect a level, on the one hand, users never contact the product to in-depth experience of the product is a gradual process, is a shallow to deep process. Professor Woodruff uses the "goal-path chain theory" to put forward the consumer value hierarchy model, which believes that the path-goal model forms the expected value. It mainly includes the following three levels: whether they are satisfied with the specific attributes and attribute effectiveness of the product (the lowest level); Expressing satisfaction with achieving the expected results (level 2); Form expectations for differences in goal achievement (top level)<sup>[4]</sup>. The corresponding levels of user experience are: expectations based on appearance and feeling (the lowest level); Expectations based on interaction behavior (Level 2); Expectations based on emotional experience (highest level). On the other hand, users will measure their expected satisfaction by comparing the expected value of the product with the perceived value in the process of experiencing the product. According to the satisfaction degree of user expectation, user expectation can be divided into two categories: desirable expectation and ideal expectation<sup>[5]</sup>. These two expectations respectively represent the degree of user satisfaction with user expectations, and the degree increases in turn.

The level of customer expectation can be studied from the breadth and depth of two aspects: the breadth is the level of expectation in user experience, and the depth is the level of expectation in user satisfaction.

The research on user expectations in Web sites can be conducted from the perspective of the hierarchy of user expectations, from the perspective of user experience in breadth and user expectations in the perspective of user satisfaction in depth. From the perspective of breadth, the expectation of users in the Web site mainly includes the expectation based on the appearance and feeling of the Web site, the expectation based on the interactive behavior of the Web site, and the expectation based on the emotional experience of the Web site. From the depth point of view, the user expectation in the Web site mainly includes desirable expectation and ideal expectation.

According to the hierarchy of expectations in user experience, user expectations in Web sites mainly include the following three types: expectations based on the appearance and feeling of Web sites, expectations based on interactive behavior of Web sites, and expectations based on emotional experience of Web sites. These three levels of expectation are interrelated, interlaced, and progressive<sup>[6]</sup>.

### **2.5.1 Expectations based on the look and feel of a Web site**

User expectations at this level are mainly related to visual interface design, considering more visual and auditory sensory factors, and paying more attention to whether the visual interface of the product can attract users or make users like it in the Web site. Visual interface display to the user's first impression, is the Web site to affect the user's expectations of the most direct factor, if a Web site at first glance can not meet the user's expectations, then the user is likely to be ready not to continue to use, can not achieve the goal of user experience. On the other hand, a user interface that is attractive enough will maintain a good user viscosity and make users happy to interact with it.

### **2.5.2 Expectations based on Web site interaction behavior**

User expectation at this level is mainly related to interaction design, and more behavioral factors are considered. In Web websites, it mainly includes information architecture, interface layout and interaction mode, and focuses on whether users are satisfied with the use of products. This level

contains most of the user's activities and is related to people's goals. How to quickly and effectively help a group of users to obtain information or complete a certain goal is the main task of this level. Web sites are characterized by the completion of specified tasks on a virtual interface, lacking the physical feel of traditional products. Users almost rely on vision to judge whether it is completed (including a part of hearing), which puts forward higher requirements for the design of interactive behavior in terms of usability and understand ability.

### **2.5.3 Expectations based on the emotional experience of Web sites**

User expectations at this level are mainly related to user research, and are also greatly affected by visual design and interaction design, and pay more attention to psychological factors such as product value and the realization of life dreams. In the case of Web websites, users' operational fluency when using Web websites and satisfying their own values are mainly concerned. With the popularity of the Internet, people's lives are increasingly dependent on the Internet, which not only helps users live better, but also has become a place for people to pin their emotions and realize their self-value.

Of these three levels, look-and-feel based expectations are the foundational level, which can have an impact on higher level expectations. Usability researchers have shown that users tend to initially believe that an attractive interface is more usable, and that this belief will persist until they have accumulated enough experience with the product interface to overturn their initial opinion. The expectation based on the experience of interactive behavior has a role of inheritance, which directly affects the processing of the other two levels, and is directly affected by the other two levels. If the product looks attractive enough to the user, but the experience is not good, it is likely to cause the user's initial impression and reality are disconnected, the user has frustration, let alone meet the expectations of emotional experience. Therefore, in Web website design, we should mainly meet the expectations based on interactive behavior, and the expectations based on appearance and feeling are harmonious and unified with the expectations based on emotional experience, so as to design products with good experience.

## **3. Case study**

### **3.1 Investigation and analysis of the status quo of user interaction with Web sites**

The rapid development of the Internet has a huge impact on people's lives. While bringing convenience to users, the Internet often confuses users because of its particularity. Through the user interview, the problems encountered in the process of using the Internet are investigated, and the reasons for these problems are analyzed. At the same time, it also investigated the conditions that a good Web site should have.

By randomly searching for objects for interview, collect the problems encountered by netizens in the process of using the Internet at the interactive level, or the places that are prone to confusion. Before the user interview, some open questions are designed to guide the interviewee to think.

The interview questions are as follows: a. Nowadays, the functions on Internet websites are becoming more and more complex. When you use these functions, do you have any confusion? If so, when did they happen? b. Have you encountered any problems in the process of Internet operation? If so, what are the problems? c. Which of these problems will seriously affect your operation?

In the process of the interview, the opinions and questions raised by the interviewees were recorded and collected. By studying the collected problems, it is found that the main reasons for the problems encountered by users in the process of using Web sites are as follows: a. The navigation of

the Web site is not accurate and clear enough, so that users get lost. For example, the Web site can not clearly tell the user has jumped to which page, what should be done next. b.The navigation information of the Web site is ambiguous, and the user is not clear about what the content is, often different from what he thinks. c.The function and information structure of the Web site do not conform to the user's psychological model. d.the operation mode of the Web site does not meet the user's habits. e.Web sites sometimes fail to provide users with timely feedback and useful situational analysis, so that users are not sure whether the operation is effective. f.The Web site cannot provide emergency measures in a timely manner when the user encounters frustration and the interaction is not smooth.

According to the six reasons obtained from the analysis, the object is selected to conduct in-depth user interviews to investigate the relevant conditions that a good website should have for users. Summarizes how to let users establish a good first impression of Web site design strategy, so that Web site design in line with user expectations. Its strategy mainly includes two points: to meet the user's aesthetic and cognitive expectations and to meet the expectations of interface information transmission.

The support was provided by proposing strategies to help users achieve their goals quickly and effectively. Its strategy mainly includes two points: to meet the user's "understanding" expectations and to meet the user's "operation" expectations. The ultimate goal of Web site design is to make the user happy in the process of using the Web site to accomplish the goal. The strategy to make users happy mainly includes two points: to meet the expectation of operational fluency and to meet the expectation of personal value presentation.

### **3.2 Application research of college students' cycling website design**

Cycling is a new way of leisure in recent years, and it is also a healthy and natural way of sports tourism. During the ride, people want to enjoy the ride, enjoy the natural beauty and relax their nerves. Because of this characteristic of riding, it is sought after by more and more young people, especially college students. Because college students are full of passion and adventurous spirit, they are young and energetic, and like to pursue freedom and self. Therefore, the target users of this college students cycling website are college students who love to ride.

#### **3.2.1 Develop a questionnaire**

Through questionnaire questions, narrow the scope of target population, screen out potential user groups. For example: question: "Do you like riding?" Subjects who choose the "dislike" option are not part of the potential user group. After screening out potential user groups, prepare for subsequent user interviews. See Appendix 4 for detailed questionnaires. This questionnaire is mainly distributed to graduate students and undergraduates of our university. A total of 500 copies were issued and 489 were recovered. In the process of data processing, we should first identify valid questionnaires and discard invalid ones. Among the recovered questionnaires, 476 were valid, with an effective rate of 95.2%. For the first three questions of the questionnaire, the subjects who answered "like", "yes" and "yes" respectively are the potential user groups of this design. There are 326 questionnaires, including 150 graduate students and 176 undergraduate students.

#### **3.2.2 User interview**

Interview subjects: In order to achieve the best effect of the interview, the interviewees were selected from college students of different grades, including college students 1 (5 people), College students 2 (5 people), college students 3 (5 people), college students 4 (5 people), graduate students 1 (5 people), college students 2 (5 people), and college students 3 (5 people).



Before the interview, prepare some simple, neutral and open questions to obtain high information quality. The questions are as follows:

a. "What cycling experience have you had?" b. "What do you usually do to prepare for a ride?" c. "Before you ride, do you go online to collect information about the ride? If so, both What to collect?" d. "Do you find the information available on existing cycling websites useful?" e. "If you go to a cycling website, what do you pay attention to?"

In the process of interview, under the premise of good communication with interviewees, record the concerns, questions and suggestions of each interviewee. Through user interviews, identify the core user group. Through the analysis of user expectations of functional indicators under the demand, we can conclude that for users, the priority of these five aspects of user needs should be: sharing information = organizing or participating in activities > Learn knowledge > Get information > Trading > Make friends. The demand for trading and making friends is lower than the average, therefore, in the design of the cycling website, we should consider lightly or even abandon these two needs. The other three needs should be given priority.

In view of the above research, the product positioning of the cycling website design should be: a community website for college students cycling enthusiasts to share various cycling information and knowledge, provide a platform for participating in and organizing outdoor cycling activities, and share and exchange outdoor cycling experience.

#### 4. Conclusion

The value of application research of user expectation in Web site design can not only provide support for design, but more importantly, encourage enterprises to focus on user expectations when designing Web sites, so that every step of Web site operation is in user expectations, so as to maintain a good user experience. In the three aspects of Web site design (content design, interaction design, visual design), this topic conducts applied research on user expectations respectively, and uses qualitative and quantitative methods to understand the preferences of users' expectations at each design level, which provides good support for the specific design of Web sites. By analyzing the existing website, the developer puts forward the strategy to meet the user's expectation in the website design. Finally, the design case of college students' cycling website is verified by an example. The main conclusions are as follows:

a. Content design level: The application research of user expectation is carried out at the content design level. The "function" of the Web site is mainly taken as the index of user expectation evaluation. Through the analysis of demand priority, the degree of user expectation for specific functions can be obtained, so as to find out the functions with high user expectation and carry out key design.

b. At the level of interaction design, the application research of user expectations is conducted at the level of interaction design. Through task analysis and other methods, it can be found that the "understanding" and "operation" of the Web site do not meet the expectations of users, and then improve the user experience of the Web site.

c. Visual design level: In the visual design level, the application research of user expectations, through image projection and other methods can understand users' expectations and preferences for Web site interface elements, and provide support for visual design, so as to design a visual interface that can make users excited.

d. According to the hierarchy of Web site users' expectations, the main strategies for Web site design to meet users' expectations are: to establish a good first impression, quickly and effectively help users achieve the established goals, and make users feel happy.

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