

Exploring the Educational Needs of Learners in the View of Software Engineering

Jing-si XI¹, Zhi-ping LI^{1,*}, Li-hui ZHANG¹, You-song GUO² and Kai ZHAO¹

¹Yunnan Normal University, Kunming City, Yunnan, Peoples Republic of China

²Sichuan Normal University, Chengdu City, Sichuan, Peoples Republic of China

*Corresponding author

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Abstract. Software requirements in software engineering link software and hardware, and link users and developers. It is the key process of software engineering. In this paper, the view of software engineering to analyze education, through in-depth analysis of each process of software requirements, the content of education needs and the process of obtain for a deep thinking and consummation.

Introduction

Software requirement is one of the most important processes in software engineering, its goal is to use a systematic approach and engineering management tools to develop a software requirements that accurately represents the user's needs. Ferd Broohs has written a word: The hardest single part of building a software system is deciding precisely what to build[1]. This statement fully illustrates the importance of software requirements in software engineering. From the initial stage of computer development to the popularization of computer and then to the gradual maturity of computer, the development of software scale is also from small to large, from simple to complex. And the software needs from the not clear to the ever-changing, to the the current professional needs analysis process. Software demand analysis is not only the primary stage of software development, it also runs through the entire software engineering life cycle. Through literature research, we can find that the software needs are not only derived from the software requirements analysis document, but also appeared the more professional software engineering [2], software requirements analysis model [3]and so on. The important role of requirements and the importance of requirements analysis has received great attention in various fields. in the field of education, education's needs and analysis is more important.

This view has been widely accepted that the process of education begins with the birth of a human being and lasts for life. From ancient times to the present, education has always been the foundation of the powerful nation. In China's traditional classroom education, mainly to explain the teachers, followed by student lectures. Curriculum design, teaching content, and to achieve the goal of education, are derived from the book or the teacher, that is not from the perspective of educational needs, ignoring the education environment, content, and the needs of the students, not conducive to student learning and development. Under the background of the new era, is the support of multimedia teaching environment and development policy Internet plus education, students need to achieve personalized learning development goals. Therefore, education needs to be widely presented in the actual teaching process, demand analysis is also as the initial stage of the teaching, academic research on education needs analysis becomes more in-depth, more rich content, such as a specific subject learning needs [4], analysis of learning environment [5]and so on.

By the analysis the important role of software requirement in software engineering, and the importance of education need in education, this study find the common value of both: as the initial content of the process exists, they are in the whole process of software engineering and education, it plays an important role in the development of the project and education. Through further analysis, we can find out the process and content of the educational needs acquisition with practical value, which will bring some value for the development of teaching and students.

Research Foundation

Software Requirements

The focus of software requirements is to use a systematic approach and engineering management tools to efficiently develop software requirements that accurately represent the needs of users. With the development of software development technology, software demand analysis system is more and more perfect, not only the specific performance of software analysis manual, as well as the relevant analysis model, the formation of a rich demand for structural analysis of the content. Through further analysis, the software requirements are divided into two levels (refer with: Fig. 1), one from the user's own needs, the user is usually a user or a company, in order to solve a problem or profit generated the software exploit needs; Second, the demand from the software itself, because the user's own lack of relevant technology, so the demand is analyzed by the software developers, it mainly contains two aspects, on the one hand, software development needs hard requirements, such as the development environment, hardware configuration requirements etc., on the other hand is the soft demands, including the development of design analysis and user object analysis, such as page design, database design, and user object feature analysis etc. Users put forward their own needs, developers through the perspective of hardware and software analysis, the two roles in the continuous interactive feedback, the completion of the initial design of the software, if the user's needs in the current technology can't be achieved, the user is to reduce their own needs or Change the demand content. Through continuous iteration, and ultimately to achieve the user's proposed software goals [6].

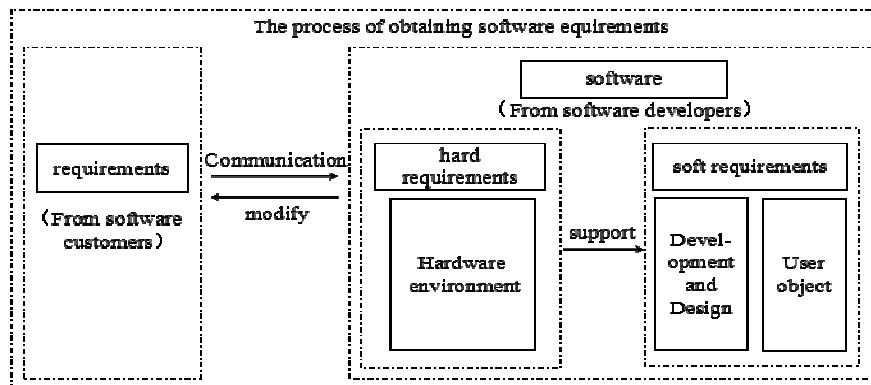


Figure 1. Software requirements analysis system.

Educational Needs and Categories

The need is an expression of the desired behavior, which deals with the object or the entity, and the educational needs refer to an expectation of people in the educational service. In the field of education, we can according to the needs of the content of education needs will be divided into three areas. One direction is the scope of learner's demand, the object of education is the so-called learners, students are the main body of education, teaching and learning process to fully reflect this point, analysis and respect for students' learning characteristics and style, learner-centered. The needs of students from two aspects, one is their own internal learning motivation, the other is the requirements of external factors [7]; The second direction is to learn the content, the education of the entity is our learning content. So we educators should be based on the absolute needs of learners have to understand the situation has been mastered, and their own initiative to get our learners most in line with their own educational needs to arrange teaching classes, teaching teachers and teaching content to ensure that students learn the content is needed, and is suitable for their own forms of expression [8]; The last direction is education environment analysis, different background, hardware and software support to education is not the same as the traditional classroom, blackboard, chalk and other environment. Today is gradually replaced with multimedia environment, mobile learning environment etc. and in different environment, to design the teaching content should according to the specific characteristics of the environment, content and evaluation methods [9]and so on.

Classification of Educational Needs

In software engineering, software requirements are usually divided into business requirements, user requirements and functional requirements of three categories. The needs for education is based on the learner, and the learner's own learning needs can be divided into two types: active demand and passive demand. The demand of the initiative mainly refers to the learner's own needs, their own conditions and interests of the decision of the demand; and passive demand is mainly including social needs and target needs, this type of demand is urgent, high-intensity needs, the need for long-lasting process, the social environment, their own conditions in the moment must have the capacity needs.

The Content of Educational Needs and Acquisition Process

Professor Mei-na WU has a very important revelation about the general pattern of instructional design. She suggests that the general model of instructional design allows us to clarify the process of teaching design, where she will be take the need analysis at the top of the process, that can sees its importance. The educational needs are similar but not the same as the learning needs analysis, the purpose of learning needs too much emphasis on the acquisition of students, and the purpose of teaching needs is to carry out the teaching process.

The Content of Educational Needs

Based on the analysis of software requirements, we draw out the brief system of software analysis, and then compare the system and the educational content find that there are a lot in common. The individualized learning era emphasizes the teaching of students 'needs, and in the teaching, according to the students' needs, the teacher should analyze the environment, the content and the individual characteristics of the learners. The interaction of teaching and learning ultimately achieve the student's learning goals and realize the personalized development of students. It is not difficult to find the corresponding equivalence in the education process by combing the content of the software requirements analysis (refer with: Table 1).

Table 1. Comparison of software requirements and educational needs.

Software requirements	Educational Needs
Participants: Developers, Users	Participants: Teachers, Students
User usage requirements	Learners' learning needs
Hardware development environment	Teaching environment (classroom, multimedia etc.)
Development design requirements	Teaching content design requirements
Proprietary business requirements	Analysis of learners' learning characteristics
Objective: to realize the software functional	Objective: to achieve the teaching objectives

Through the above analysis, combined with the specific content of the software requirements analysis process, this study suggests that the analysis of educational needs mainly includes the following contents (refer with: Fig. 2):

(1) Learning needs analysis: In daily learning, students' learning needs are more extensive, it mainly includes the content demand and the external demand due to external factors. No matter what kind of demand, in order to facilitate the teaching content of the proportion, the teacher must take the student's learning needs analysis.

(2) Teaching environment: Teaching environment analysis is one of the important contents in teaching design, we know that the different teaching environment will adapt to different teaching content and performance, therefore, the analysis of teaching environment is not only related to the progress of teaching, but also affects the teaching effect.

(3) Learning content analysis: Learning content is an important part of the whole teaching. The formation of students' knowledge network comes from the construction of new knowledge and

pre-knowledge network. Therefore, according to the learning needs, learning characteristics and the characteristics of the environment to design learning content and form of expression and so on.

(4) Learner analysis: It stressed that the teacher stood in the student's point of view, approaching the students, understanding the characteristics of students' learning styles, and to develop the corresponding learning content and form according to the students' personalized learning style.

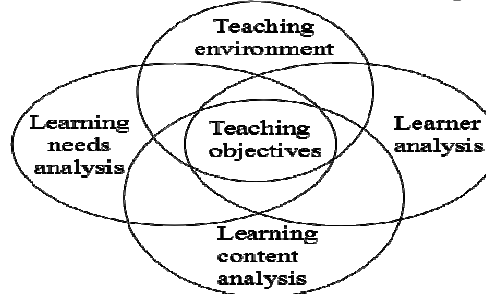


Figure 2. Comparison of educational needs analysis.

Among them, it is worth emphasizing that several content of the educational content analysis, not isolated exists, is mutual influence and interdependence. The entire analysis of the design process is constantly rising spiral of an iterative process, through continuous feedback changes, the final able to carry out educational activities, to achieve the goal of student learning.

The Acquisition of Educational Needs

It is very important to get the right information for better achieve the teaching goal, and in order to ensure the smooth implementation of all the plans, we should pay special attention to the accuracy of the analysis of educational needs. Generally speaking, in the process of acquiring educational needs, we should pay special attention to the following processes.

(1) Determine the Analysis of the Object and Establish a Professional Team

First of all, we determine the study object to be analyzed, and then through the selected techniques and methods, at the same time to establish a professional team of students as the proposition team and analysis team, and to complete the initial demand for access to the preparation.

(2) Form a Scale and Data Collection

We make a comprehensive survey of learners' learning needs, learning characteristics, learning content expectations and learning objectives through the design scale, and the data is marked in the learner records that require special treatment. In the process of collecting data, we have to take full account of the size of the sample and its structure, to ensure the number of participants at the same time to achieve a certain quality. To ensure the quality of education, we should make sure that the educational needs are related to each learner, rather than taking some representative individual. The main methods of data collection are test, interview. Under certain conditions, we can also mix with the parents of surveys to assist the form.

(3) Analyze Data

Clustering is the main work done in the data analysis phase, in this study, we used cluster analysis in multivariate statistical analysis, because it is good to put some unmarked, regular samples in accordance with a certain criterion is divided into several categories, so that similar samples are classified as one class as much as possible, and the dissimilarity of the sample is divided into different classes. Analyze and judge the learner's recent classification, through their learning needs, learning characteristics, expectations of learning content, expectations to achieve the learning objectives of the four categories of content. And then grouped the same class of students teaching, and for the purpose of the type of style to select and design a specific teaching environment, teaching methods, etc.

(4) Write Analysis Report

Writing analysis reports mainly involves analyzing the purpose of the study, describing the process of analysis and the participants, describing the results of the analysis through tables or simple numbers. The Education and teaching staff analysis report by reading the whole knowledge of

learners can grasp the situation there is a comprehensive summary of the analysis, and then to the children more accurate counseling, focused education, to them really want and need education.

Reflection on the Application of Educational Demand in Education and Teaching

The hardest step in software engineering is to determine exactly what to build, the same, it is also hard for our educators to determine what kind of talent we are finally shaping. Demand analysis is a very important part, if there is an error, you must spend a lot of energy to repair and adjust. Therefore, we should pay attention to a lot of problems in the process of doing demand analysis. First of all, we should pay attention to the integrity of requirements, because incomplete demand analysis can't be applied to practical teaching, it does not have a reference value. Secondly, we should pay attention to tracking, there is no timely update of the demand is unscientific, and will not play a leading role in promoting the long-term development of students. Finally, we should pay attention to the uniformity of demand standards, and always consistent, and timely update should also be unified update details.

Summary

On September 3, 2014, China's State Council issued Document No. 35 of 2014, its main content is the reform of the examination system, which is important is the national unity of the general college entrance examination in the text, science will no longer sub-subjects. This shows that in high school before the education, students can no longer avoid weaknesses, on the contrary, in order to avoid the occurrence of partial phenomenon, they should be more comprehensive learning basic knowledge, comprehensive development of their own subject knowledge. According to the software requirement analysis in software engineering, this paper puts forward the concrete content and process of the education demand analysis, and through the actual development, so that teachers fully understand the needs of learner's education, and then help them learn, and the school can better configure the teacher resources, so that students really get "Teaching in accordance with their aptitude".

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