

Postgraduate Curriculum Construction of Web Services and Standards

Ziyi Meng*

College of Computer Science and Technology, Shandong University of Technology, Zibo, Shandong, China

**Corresponding author*

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Abstract: Web Services and Standards is a basic course for computer technology graduate students, which plays an essential role in cultivating students' application ability, analysing, and solving problems. Good curriculum construction is essential to improve students' international competitiveness and global vision. For postgraduates, it is challenging to comprehend and apply theoretical knowledge to the practice and the solution of scientific research. To meet this challenge and improve students' international competitiveness, this paper explores and constructs the postgraduate course of Web Services and Standards from the perspective of teaching methods and teaching evaluation in combination with domestic and international construction status and development trends. Based on the concept of "design pattern" in software engineering, the case teaching method is adopted to sort out typical cases and establish an English case library to help students understand application knowledge. Set up English question and answer session, the main body of students can be brought into play. Test the teaching quality through multi-dimensional evaluation. Finally, precise training and effective improvement of scientific research ability will be realized.

1. Introduction

"Web Services and Standards" is an introductory course for graduate students of electronic information (computer technology) degree. It is of great significance to the cultivation of postgraduates and is also one of the fundamental ways to cultivate postgraduates' scientific research abilities. Its teaching goal is to enable students to discover new knowledge through "drawing inferences from one instance" and achieve accurate training and effective improvement of scientific research ability. Relying on the professional construction of Big Data College, the college has formed an excellent professional atmosphere of data science and technology and has a good experimental environment and faculty. The college can strongly support the course regarding policy, teachers, and a realistic environment.

The globalized environment has prompted the internationalization of graduate education, making it an important goal to cultivate creative international minds. Therefore, we have to train international talents [1, 2]. Course construction is the key to cultivating postgraduates' academic quality and ability [3, 4]. At the same time, curriculum internationalization is of great significance to realize the internationalization of graduate education and cultivate international talents. For

postgraduates, it is challenging to comprehend and apply theoretical knowledge to the practice and the solution of scientific research. Therefore, to arouse students' interest in the course, to learn more about service computing, and to enhance their professional English communication ability, this paper explores and researches the construction of Web Services and Standards course so as to better play the role of this course in postgraduate training. Section 2 shows the construction and development trend of web services at home and abroad. In section 3, we introduce the Web service and standard curriculum construction scheme in detail. Finally, we make a summary in section 4.

2. Overview and Development Trend of Construction at Home and Abroad

The research on Web services and service composition first appeared in 2003. Since then, the academic circle has conducted extensive investigation and research on it [5]. Microsoft considers Web services to be at the heart of .NET and defines web services as Web components that are programmatically accessible through standard Web protocols. Sun Microsystems thinks Web services are the Internet. Intelligent Web service standard is of great significance to the information age. Web services are applicable to any type of Web environment. The White Paper on the Development of China's Cloud Computing Industry points out that cloud computing technology has great potential to facilitate the modernization of traditional businesses, reduce the cost of digital renovation of companies, and encourage the interconnected development of upstream and downstream industries [6]. It has become a key supporting technology in promoting the progress of the digital economy. It allows for the abstraction and packaging of data, software, and hardware into services that can be either paid for or obtained free of charge and deployed on request. Owing to the features such as dynamic deployment, on-demand services, and high scalability, many companies and government organizations place great importance on related services. Service composition combines existing cloud services with multiple functions and single functions in a certain logical sequence to solve complex tasks that cannot be completed by a single service, enabling complex cross-enterprise business process integration.

Service computing has become a remarkable example of taking infrastructure and solutions as services. Adding an optimization algorithm to this can reduce the search time and area while also raising the accuracy and effectiveness of the solution. Integer programming, genetic algorithm, and other techniques can find the most satisfactory or near-optimal resolution to the issue using a global optimization algorithm. However, calculation complexity tends to grow immensely with a rise in the number of variables, which is not in line with customer requirements. A heuristic optimization algorithm is able to reduce the computing time, cut down the search space, and raise the efficiency of service composition by discarding services with low competitiveness or categorizing services with similar features [7]. However, the solution of the heuristic optimization algorithm is often not the optimal solution. Therefore, researchers often need to choose between the degree of optimization of solution and search space. It is an inevitable trend to study web services and standards, and it also meets the development requirements of the emerging cloud computing, which has important theoretical significance; Exploring the complex problems of service computing in the era of big data can provide key technologies for relevant industries and has broad application prospects.

3. Curriculum Construction Scheme

The classroom is an essential means of gaining knowledge for students. Course education is a fundamental job for graduate students. Curriculum construction affects the quality of postgraduate teaching and the cultivation of high-level talents, which is crucial to the training of graduate students [8]. Along with the improvement of education level and demand for talented people in our

country, curriculum construction under traditional education can hardly satisfy the need for graduate education. This section will explore the course construction of Web Services and Standards from the perspectives of teaching methods and evaluation means so as to meet the contemporary demand for high-quality graduate students.

3.1. Teaching Method

To meet the developing tendency of web services, it is essential to carry out the course of Web Services and Standards. A reasonable teaching method is an important basis for a smooth course. To get students interested in the course of web services and standards, a combination of various teaching methods will be adopted in the course of learning. The course Web Services and Standards stresses the combination of theoretical knowledge and operational capacity, stresses the extraction of problems from reality, and develops students' ability to analyse and deal with real issues independently. Web Services and Standards includes basic professional knowledge and practical operation. Basic professional knowledge is taught through interactive discussions between teachers and students and flipped classrooms. In the practice part, the case teaching method is adopted to design typical and appropriate cases to help students better understand and solve problems.

To improve students' professional English and promote the globalization of education, we will use English for teaching. To make sure that course construction goes smoothly, teachers need to investigate students' mastery of professional English before the class starts and appropriately help students with a weak foundation. Therefore, we conducted a survey on the English level of graduate students in the college. As is shown in Table 1, the English level of postgraduates is generally not high. Only 27.42 percent have passed CET-6, 20.97 percent can read English academic reports, 14.52 percent can skillfully communicate in English, and 37.10 percent can read English papers. Before class, teachers should send the classic English literature and related English nouns of Web services and standards to students so that students can understand the course of Web services and standards in advance and get familiar with the key English words and sentences in the course in advance.

Table 1: English level survey.

Total number of people	Pass CET-6	Understand English academic report	Proficient in English communication	Understand English papers
62	17	13	9	23
proportion	27.42%	20.97%	14.52%	37.10%

Basic professional knowledge is guided by teachers. Build the concept of "student-centered," highlight the subjectivity of students, encourage students to complete the task of course learning by consulting materials, independent thinking, and other methods, and achieve teaching objectives. The teacher's main duty in the teaching process is to guide students correctly. The use of flipped classroom method can fully highlight the main position of students. The flipped classroom class is a kind of reversal of the traditional teaching model of the teacher's direct narration. [8]. Let the student become the teacher; the teacher listens to the student's point of view and corrects. Teachers have changed from narrators of knowledge to guides of students' learning. Before class, the teacher will send the content and video related to the Web service and standards to the students, and the students will learn independently. In class, students present what they have learned and raise the questions they face in their study, and the teachers help them to solve their problems. Students can put forward their opinions at any time in class. It can arouse the students' interest in the study, improve students' autonomous learning ability, and enhance their ability to think independently. At the same time, the teacher-student interaction discussion method is used in class, and English

questioning and discussion sessions are set up [9]. At the stage of graduate education, students' independent learning has become the main way of learning. The use of the teacher-student interaction method cannot only help students solve the confusion but also make students move from a "passive" classroom to an "active" interaction so as to further improve students' interest in this course. Setting English questions and discussion sessions can improve the professional English proficiency of graduate students and enhance their English communication ability, and further enhance postgraduate scientific research ability in order to achieve the goal of cultivating international talents.

In recent years, our graduate education training mode has gradually changed from academic-oriented to academic-oriented and applied-oriented [10]. The cultivation of engineering practice ability is the core of graduate training. The content of the Web Services and Standards course is rich, and the traditional teacher-narrated teaching method is not suitable for this course. The case teaching method introduces rich case library content, makes the classroom atmosphere active, so as to improve the teaching efficiency [11]. Therefore, the case teaching method is adopted in practice, classic cases are selected for sorting out, the English case base is established, teaching quality and teaching effect are improved, and students are helped to understand and proficiently apply what they have learned. The method of case study comes from Harvard Business School. It is a method for teachers to choose classic and representative cases and guide students to study and understand the cases, so as to form their own opinions. Case teaching is a teaching method combining theory and practice, which can exercise students' practical ability and arouse their interest in learning. The teaching design and teaching method of case teaching method can realize the situational knowledge of classroom teaching. Through the analysis, reflection, and discussion of classical cases, the students will be able to exercise independent thinking and grasp the contents of the curriculum.

Writing excellent teaching cases is the basic premise and necessary preparation for case base teaching. This course aims at various data sets in different fields, including medical service data sets, catering service data sets, transportation service data sets, entertainment service data sets, etc., to establish service and service portfolio cases. The case base mainly focuses on Restful and WSDL service technology, service discovery technology, service mapping technology, and service composition technology. Primary cases include Restful user database service, registration and discovery of existing services, mapping of WSDL service and UDDI, etc. Restful user database service case is shown in figure 1. Restful user database service requires students to use HTML, XML, and other languages and use NetBeans IDE tools and relational databases to write restful user database service to deepen the understanding of restful architecture, better understand and apply restful. Registration and found the existing service case is shown in figure 2. Service providers use WSDL and UDDI standards to describe and publish services. Students need to write or modify existing "web crawlers," find existing services' URLs to obtain service information and return detailed information described in XML language. In the case of mapping the WSDL service to UDDI, students need to design the WSDL service, publish the service using UDDI, and map the WSDL service to UDDI. Comprehensive cases include the implementation of homogeneous and heterogeneous BPEL business processes and the automatic composition of Web services. Students need to complete the implementation of homogeneous and heterogeneous BPEL business processes with the help of teachers. To explore and analyse the problem of the automatic composition of web services, students need to use web search engines and web crawler technology to find existing web services on the network. Because the traditional keyword-matching method matches services from the syntax level, the returned results are rough and must be more accurate. Semantic service matching overcomes the restriction of keyword matching, can help service providers better understand users' needs, and improve the efficiency and accuracy of service discovery. Through learning, students can use ontology connection and potential semantic index to expand service

selection from syntax level to semantic level and design service semantic matching algorithm based on logical reasoning and semantic similarity matching principle. For the automatic composition of web services, students can choose a depth-first search algorithm, width-first search algorithm, genetic algorithm, planning graph method, depth learning, fuzzy logic analysis, and other optimization algorithms to solve the automatic composition of web services.

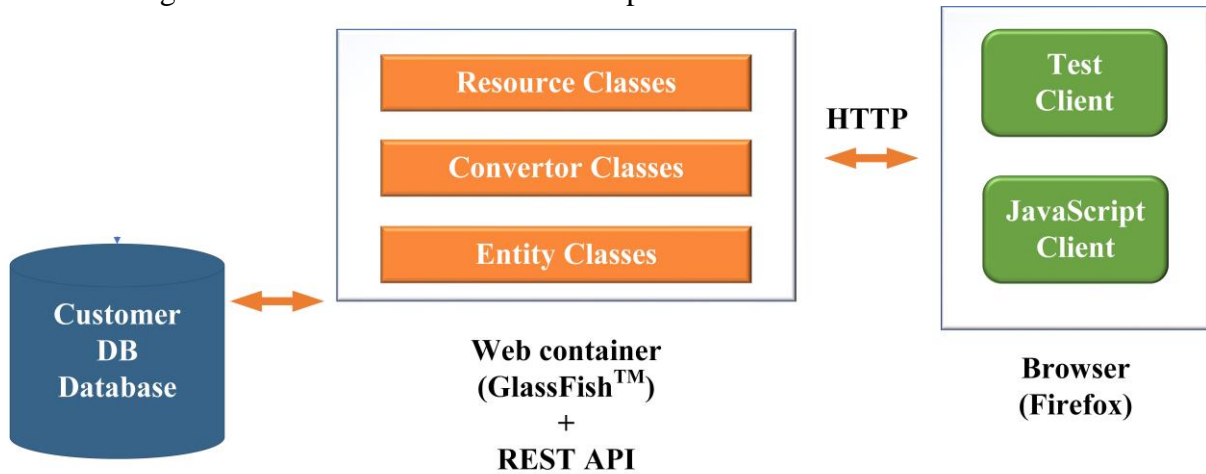


Figure 1: Restful user database service.

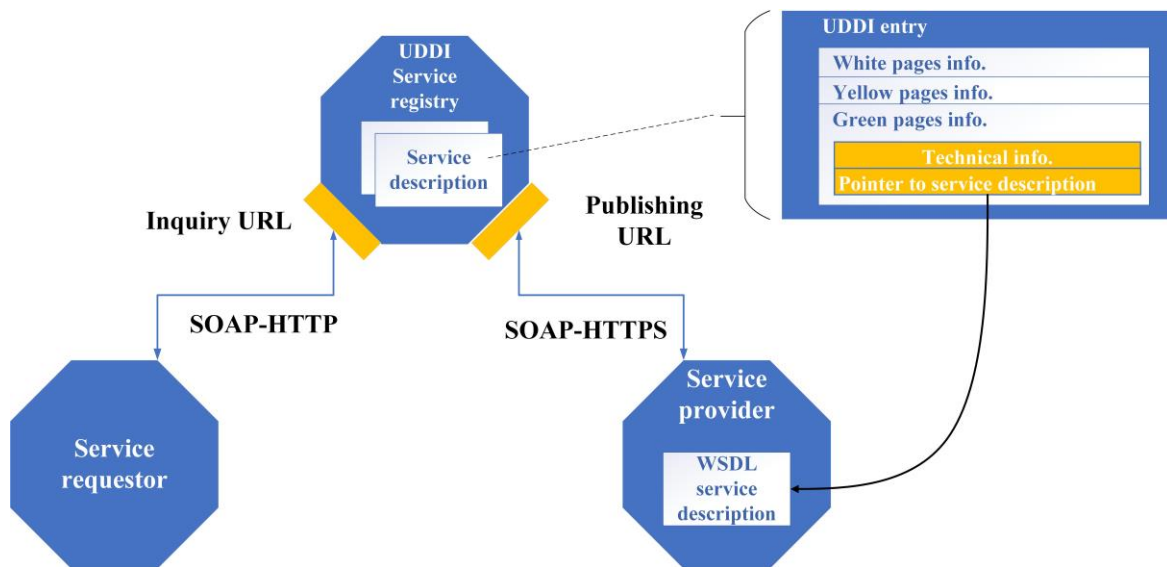


Figure 2: Registration and discovery of existing services.

In the actual teaching process, make full use of the school curriculum website platform, smooth the interactive channel between postgraduates and teachers, exert the positive function of the website platform, and form an open, shared, and convenient interactive network teaching mode between teachers and postgraduates. Teachers can upload the course ppt, relevant English papers and the website address of the course, and so on to the course platform. Postgraduates can download and study the content before or after class through online platforms. In this way, graduate students can find the critical course content and fully use their spare time to study. The course platform is the bridge between the teacher and the student exchange. On this basis, teachers can release exercises on the Internet to know the students' learning progress at any time so as to adjust their teaching methods and provide better learning guides for students. Postgraduates learn according to the teaching content published by the teacher on the Internet and can give feedback in time when they

encounter problems. Therefore, making full use of the course learning platform can enhance the learning effect of students and improve the teaching quality.

3.2. Evaluation Method

Curriculum evaluation, as a part of curriculum teaching, is an important part of embodying the quality of training talents. In the traditional way of assessment, examination occupies a large part of curriculum evaluation activities. The traditional way of examination only focuses on the theoretical knowledge investigation and cannot examine the student's ability to use knowledge well. Teachers have no way of knowing students' attitudes toward the classroom or how students think. Web services and standards is a course that combines theory with practice. It is impossible to judge the practical application of students' knowledge only by examination. Therefore, only relying on the traditional way of assessment cannot reach the curriculum goal of training high-quality talents. To this end, combined with the teaching characteristics of Web services and standards, we flexibly use a variety of evaluation methods, from students' classroom interaction performance, homework completion, teamwork ability, achievement display, and other aspects, multidimensional evaluation of students' grasp of the course, and comprehensively examine the students' academic research level and academic accomplishment.

Class performance mainly includes class attendance, flipped class performance, English communication, class discussion, etc. Homework completion mainly includes classroom exercises, homework, independent learning before class, etc. The evaluation of cooperative ability mainly includes group communication and the display of team achievements. The final result display mainly includes the final test and the writing of English papers. The final exam is designed to test the student's ability to grasp theory fundamentals. By using the knowledge learned in class, students refer to the literature related to Web Services and Standards in the past five years, think independently, condense and analyse the problems, and write the paper. This process not only examines students' mastery of Web Services and Standards but also helps improve students' scientific research ability.

4. Conclusion

Researching web services and standards is in line with the evolving needs of The Times, as well as the evolving requirements of cloud computing. Therefore, the curriculum construction conforms to its development trend. Based on the development trend of Web services and standards, this paper explores and builds this course from the perspectives of teaching and evaluation methods. By introducing English cases, this course is designed to arouse students' interest and thirst for knowledge to better understand service computing. At the same time, the English question and answer session is set, which reflects the students' subjectivity in learning, exercises their independent thinking ability, and improves their English professional level. It is hoped that through the construction of this course, students can expand their ability to use professional skills and enhance their practical innovation ability, promote the internationalization of graduate education, and improve its training quality.

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