

Design and Realization of Project-based Computer English Learning System

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Abstract—This paper describes the design principles and realization process of project-based computer English learning system. The subjective initiative of project-based learning is applied to English learning as a starting point, allowing full play to learner's analytical, problem-solving and self-exploration ability. Combined with the computer database SQL Server and other related procedures, we established an English project-based learning system, investigated its user satisfaction and collected relevant statistics. This system plays a promotive role in providing guidance for English learning and lifting the informatization level of English teaching.

Keywords—project-based learning, English learning, project-based learning system, computer database.

1 Introduction

Informatization is the big trend of global economy and development, and the degree of informatization in China's education field is increasing year by year. In order to adapt to the new perspective of basic education reform proposed by the central government, more and more Chinese scholars have paid attention to the field of informatization research in the education industry [1]. Among them, the education of English learning tends towards informatization and internationalization. English education and training institutions such as New Oriental and Wall Street provide more alternatives of English learning. In the process of school education, the traditional teaching mode is still widely used in China's English teaching, which not only deviates from the trend of educational informatization, but also fails to adapt to English learning and other disciplines that require highly-valued and active involvement between learners and teachers [2].

Despite its obvious advantages in cultivating students' self-exploration and cooperative learning ability, project-based learning is not functional in classroom teaching in a genuine sense, because it fails to satisfy the requirements of comprehensive learning, investigative study, and collaborative learning [3]. Project-based learning is an emphasis on the cultivation of learner's comprehensive ability in practice, but it is difficult for classroom teaching to meet the demands for learning resources. Against this background, the development of informatization provides for the implementation

of project-based learning based on network platform which is centered on computer technology, multimedia technology and network technology [4].

The development of computer-based English learning system is to improve the degree of involvement and informatization of English learning. Based on computer database technologies and project-based learning, we realized the organic combination of curricular and extracurricular English learning on the platform of our system. In this way, the system helps in fostering learners' capacity of independent thinking and problem analysis, and strengthens the sense of existence on educator's side and the sense of involvement on learner's side. This new model of learning is an organic integration of computer information technology with curriculums.

2 The overview of basic theories and technologies of project-based learning

2.1 Concept definition

Project-based learning (abbreviated for PBL), also known as project teaching method or project teaching, is usually defined as a teaching method that helps learners acquire knowledge and skills involved in working projects and develops their learning ability in this process [5]. With the all-in-one (teaching, learning and acting) characteristics, project-based learning is more functional in courses of practical ability. In teaching practice, all technological products and services are project alternatives, which combines theoretical knowledge acquisition with practical ability development, so that cultivating learners' hands-on ability and the ability to find, analyze and solve problems. As a new learning mode, project-based learning consists of contents, community, activities, context and products [6].

2.2 The comparison between project-based learning and traditional teaching mode

The basic elements of teaching include: teachers, learners and learning content. Instead of independence and irrelevance, they are intertwined and interacting as a whole [7].

The traditional teaching mode is centered on "transmitting-accepting" or Herbartianism: stimulate learning motivation – do revision - teach new knowledge - to consolidate and use new knowledge – to check and evaluate. In the traditional teaching mode, the teacher is the center of teaching, who spreads and imparts knowledge to learners linearly and controls the teaching process in the full sense. Learners can only passively accept the teaching content taught by teachers, thus becoming less enthusiastic and provocative in exploring knowledge. The learning result is aimed at cramming for teaching materials [8].

In the project-based learning model, teachers act more as a guide and organizer, while learners are the involver and self-designer of a project. Learners finish projects at all stages according to self-interest and learning habits, in whose process the practi-

cal ability is enhanced. When cultivating learners' learning initiatives, project-based learning also provide phased objectives for learners to choose from, converting learning achievements into project results. Therefore, project-based learning has become the priority for many schools and educational institutions to foster skilled individuals.

3 Project-based learning system software development technology

3.1 .Net Framework

Server software are those that operate in C / S or B / S. We applied .NET-based Web server is mainly applied to our system proposed in this paper [9]. Considering that we have Windows system as the operating system of the Server, in which .NET Framework is used, we will focus on the application of .NET Framework. It lays foundation for the construction of a new-generation operating system with Internet itself, and expands the design thought of Internet and operating systems. As a result, designers can create application procedures independent of equipment, which realizes Internet connection in an easier way [10]. The structure of .Net framework is shown in Fig. 1.

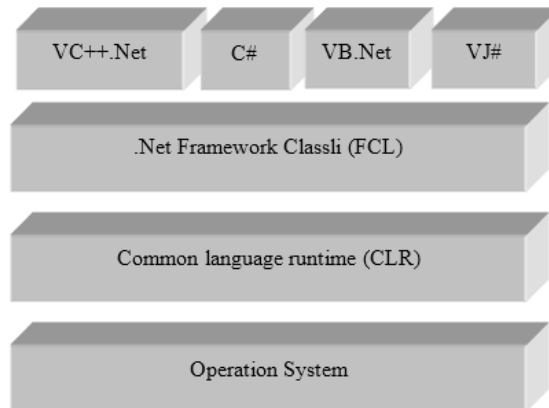


Fig. 1. .Net Framework architecture

3.2 Database technology

Database is "a warehouse that organizes, stores, and manages data according to the data structure." Some of the frequently-used databases are IBM's DB2, Oracle, Fox-Pro database, Access database, mySQL, SQL Server. Among them, SQL Server database receives a wide range of applications because of its graphical user interface and powerful programming language [11]. SQL Server is a relational database management system (DBMS) developed and promoted by Microsoft, which was originally co-developed by Microsoft, Sybase, and Ashton-Tate [12].

Based on the knowledge and analysis of the above technologies, we realized the openness of our project-based learning system in combination with SQL Server and data access layer. Net.

Table 1. List of project system development program

Classification	Name
Server	Web Server
Platform Components	NET FRAMEWORK
Database	sql server
Data Access Layer	ADO.NET
application development	ASP.NET
Business logic (background coding language)	C#writing

4 The design of project-based learning computer English learning system

4.1 Requirement analysis of the project-based learning system

With the development of internet technology, internet learning has been popularized because of its convenient and diversified services. What project-based learning system trains is learners' self-learning ability, for which more emphasis is paid on the development of their hobbies and interests. The online platform learning meets such requirements of project-based learning. The computer English learning system mainly serves for on-campus students' needs of English assisted learning. By using this system, teachers assign projects to students to cultivate their English competence, in a way that is more targeted and phased-goal-oriented [13].

Based on requirement analysis, we somewhat abstracted a variety of system roles into a data model, so that forming a conceptual model. Table 2 lists the system privilege assignment results.

Table 2. System privilege assignment results

Item	Role Name	Function and permissions
1	Administrator	Management of the project module; project role division; evaluation of project results; participation in the exchange of discussion.
2	Project Leader	Register the basic information, create a project repository, assign, manage project tasks
3	Project member	Register the basic information, Complete project assignment, manage project tasks

4.2 The design of the project-based learning management module

After the logic program design of internal programs is used to complete the matching of system requirement analysis [14], the to-be-designed system modules need to

clarify the role of each project member and the procedure of project execution in the form of framework [15], as shown in Fig. 2.

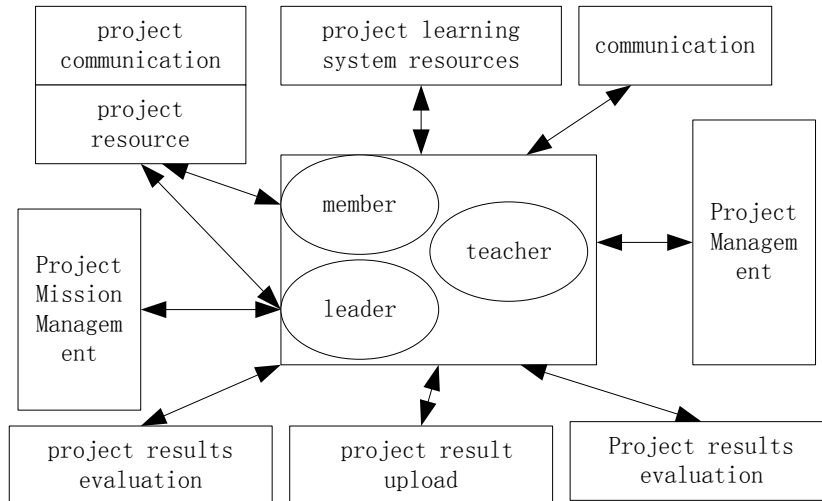


Fig. 2. The diagram of the project-based learning system structure

There are three roles played in the project-based computer English learning system: teacher or administrator, project leader, and project member. Teachers can serve as administrator, the role of project leader can be established according to actual situations, and project members are learners participating in system projects. Then we completed the design of the project-based learning system by designing project communication module, theme discussion module, project discussion module, and project result management module.

4.3 The implementation of the functional modules of the project-based learning management system

Implementation of user registration module. To participate in the project-based learning computer learning system, project members should first log on the system, register as one of the three system roles, and remember user names and passwords [16]. The log-on module interface is the only access to learners, teachers and administrators as registered, as shown in Fig. 3.

Implementation of project management module. The purpose of the learner is to learn English better. System management tasks are in the charge of teachers and administrators, including system creation, project state management, and the management of project team members. Fig. 4 is the project management module after logging on.

Fig. 5 is the interface of the system in creating a project. Through the description of project contents and the starting time, the administrator can better monitor the progress of project execution and the status of project members in the system.

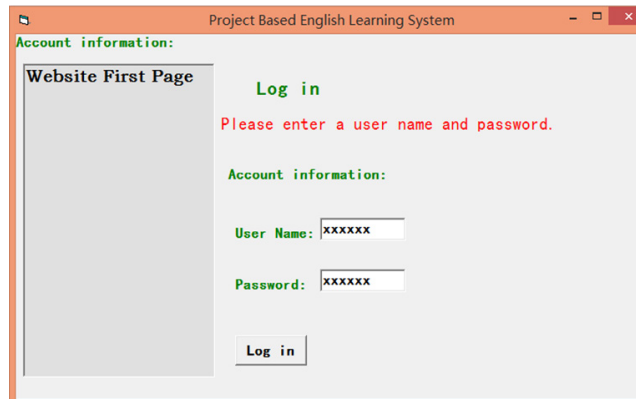


Fig. 3. User login interface display

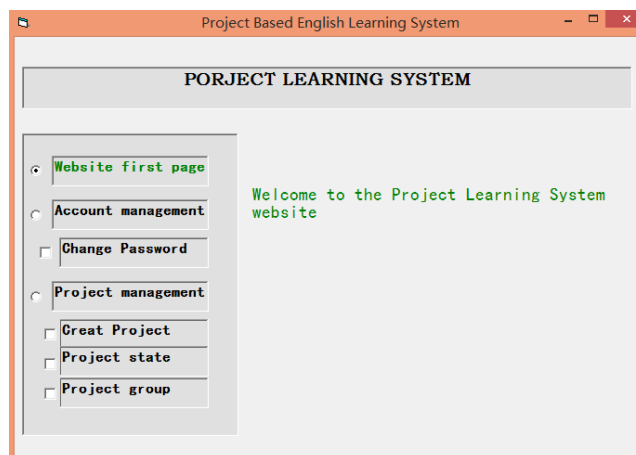


Fig. 4. Project management module

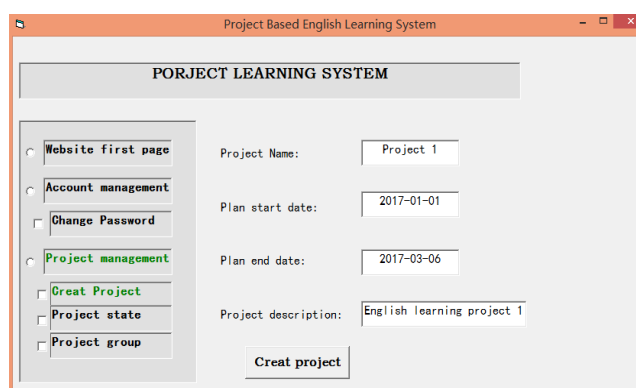


Fig. 5. Project creation module

Then the project module is designed as scheduled. The project-based computer English learning system is implemented after completing the design of these function modules: project resource management, project content exchange, project result submission, and project result evaluation.

4.4 Survey of user satisfaction of the project learning management system

The general steps of project-based learning are: select projects, formulate learning plans, study and inquiry, display and evaluate project results. In order to better verify the effectiveness and feasibility of the project-based English learning system, it is inevitable to conduct research on practical teaching. To this end, we applied our system to the English learning of 80 students (Grade 2015) in the Department of Automation in a college in Chengdu, and formulated customer-made learning schemes with the assistance of teachers. We followed the general steps of project-based learning to launch the practical analysis of our system.

The project was completed in two months, with the active participation and task fulfillment of every project member. By referring to the mode of teaching evaluation, we assessed the instructional objective completion level, the instructional value and other indices of the English learning system. Table 3 is a feedback questionnaire for the project-based learning system.

Table 3. Feedback questionnaire of the project-based learning system

Evaluation index	Project participants(80)		
	In-class	Outside class	Both
In your system for the time distribution of learning English	5	12	63
Through the use of project learning system, your interest in teaching content	High 59	General 21	No affect 0
Which of the following teaching models do you like?	Class teaching	Class teaching + training	Class teaching +project learing
	0	18	62
Do you think the system's resource management is reasonable?	Reasonable	General	Be to improved
	35	55	0
Through the use of the system, do you think the system is helpful for your English study?	Yes	General	None
	52	28	0

Through the above table, we can see from the teacher’s point of view that: the system saves class time because teachers have the alternatives to employ the finite time for an in-class instruction and analysis of knowledge scopes; meanwhile, the system learning software acts as the extension of courses in the sense of teacher-student communications. From the student's point of view: students utilize extra-curricular time well with our system; not only can they learn more knowledge than otherwise in the project planning time, but they are possible to be more subjective and creative in English learning, which is different from the traditional mode of passive classroom learning. In addition, the results of the survey show that project-based learning helps

students be more interested in English learning materials and that the mode of resource distribution obtains the acceptance of most of the surveyed project members. From a comprehensive perspective, 52 of all the survey participants considered that the project-based computer learning system was effective, and the percentage of effectiveness reached 65%.

5 Conclusion

With project-based learning as the theoretical basis, this paper used computer program software such as .Net Framework and database SQL server to complete the design and implementation of the computer learning system. To address the problems of poor initiatives and lack of reasonable time arrangement for students in English learning, we assigned project tasks of English learning to learners at fixed time and in fixed quantity, because project-based learning can render learners more proactive and communicative. Learners should learn English, communicate with teachers and submit project results within the required time. In the result evaluation process, the English learning results are checked. Finally, the result of practical application shows that the feedback and evaluation of the design and implementation of the project-based computer learning system are high. It is concluded that the learning system has the following characteristics:

1. By reviewing literatures on theories of project-based learning, we successfully applied the theory of project-based learning to English learning, which is of certain novelty in learning design.
2. This learning aid provides a comprehensively controllable platform for both learners and educators.
3. The project-based English learning system not only cultivates the initiative of learners, but also improves their collaborative ability and practical ability.

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