

# Research on Multidimensional Synergistic Development Evaluation of PBL Teaching Model in College English Extended Courses\*

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**Abstract**—The PBL teaching reform in Chinese college English extended courses is designed to realize an overall harmonious development of students' language ability, team spirit, critical thinking and creative potential. Based on five basic assessment principles, the multidimensional synergistic development assessment system stresses its revising and improving functions, conducting an overall quantitative assessment of students' personal comprehensive abilities and the team creative ability, which include seven aspects, consisting of twenty items. The assessment system also covers a qualitative assessment of the reflection and feedback after the project. The multidimensional synergistic development assessment can facilitate the students' overall progress and optimize the classroom teaching effects. The assessment system is the regulation guarantee that arouses students' deep language learning and meaningful learning and propels their self-development in PBL.

**Keywords**—English extended courses; project-based learning (PBL); multidimensional synergistic development assessment

## I. INTRODUCTION

With the deepening of the reform of the teaching system in colleges and the improvement of the English teaching requirements of the Ministry of Education, the reform of college English teaching with the core of applied foreign language talents with high-quality language application ability has blossomed in many colleges and universities. In this context, Xuzhou University of Technology follows the reform concept of "student-centered, project-based, application-oriented, and ability-based", implements project-based learning and teaching reform in the digital environment in the college English extended courses, and emphasizes the integration of language acquisition and content learning to cultivate the comprehensive ability of learners. The reform is fully in line with the guiding principle of "College English is oriented towards the practical application of English and focuses on cultivating students' practical application skills" clearly stated in the

2015 "College English Teaching Guide". This paper will study the reform of the evaluation system of PBL teaching mode in the College English extended courses of Xuzhou University of Technology.

## II. APPLICATION OF PROJECT-BASED LEARNING (PBL) IN COLLEGE ENGLISH EXTENDED COURSES

### A. The Connotation of Project-based Learning (PBL)

Project-based Learning (PBL) is a teaching model based on "projects". It originated from Dewey's "Learn by doing" teaching philosophy. According to John W. Thomas, the so-called "projects" are complex tasks based on challenging questions that encourage students to participate in design, problem-solving, decisive, and investigative activities, thereby giving students the opportunity to learn relatively independently for a longer period of time and ultimately producing a viable outcome or report. [1] At the same time, he proposed that the "project" in project-based learning must have the following qualifications:

- The center of the curriculum rather than the edge;
- Driving students to face the concept or principle of the subject center;
- Motivating students to build constructive investigation;
- Authenticity.

Therefore, the American Buck Institute of Education (BIE) defines project-based learning as "a systematic approach to teaching. It is a process of inquiry into complex and real problems. It is also a process of carefully designing project works, planning and implementing project tasks. In this process, students are able to learn by doing to acquire the knowledge and skills they need." [2]<sup>4</sup>

Boss and others believe that in the process of completing the project, students can build their 21st century capabilities from four aspects: critical thinking, cooperation, communication and creativity, so that they can prepare for academic, personal and career success, and enable them to face the challenges of their lives and the world they will

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inherit. [3] Because PBL is an innovative teaching model, the Buck Institute of Education clearly stated on its own website that "in the case of project-based learning, teachers can revitalize students' learning". "As a result, students develop deep content knowledge and enhance critical thinking, creativity and communication skills in the context of real and meaningful projects. Project-based learning frees the creative energy of students and teachers." [4]

As far as the application of PBL in language teaching is concerned, Professor Zhang Wenzhong believes that project-based learning emphasizes the communicative and functional attributes of language learning and the integration of language and content learning to highlight the students' ability to use language. [5] This is also the advantage and essence of PBL for language teaching.

### B. Application of PBL Teaching Mode in Extended Courses

In view of the strong driving force of project-based learning for in-depth language learning, Xuzhou University of Technology has implemented project-based teaching reform since 2015, based on the concept of "student-centered, project-based, application-oriented, and ability-based". The combination of language skills and project themes aims to develop students' comprehensive skills in language communication skills, teamwork skills and thinking skills.

First of all, in the process of implementing PBL teaching reform, the criteria of excellent project themes have been repeatedly defined and revised from four dimensions (see "Fig. 1"): the theme of the project must be based on the talent training program and teaching objectives of Xuzhou University of Technology. Project implementation must be based on the principle of stimulating students' interest and easy operation. The project selection must aim at promoting students' speculative ability and comprehensive development, and the project source must be as close as possible to the society and related hotspots. These four criteria are the fundamental guarantees for project selection that has both social value and teaching requirements. The project theme of any extended course should be as close as possible to this framework. A good theme choice is the primary prerequisite for successful project-based learning.

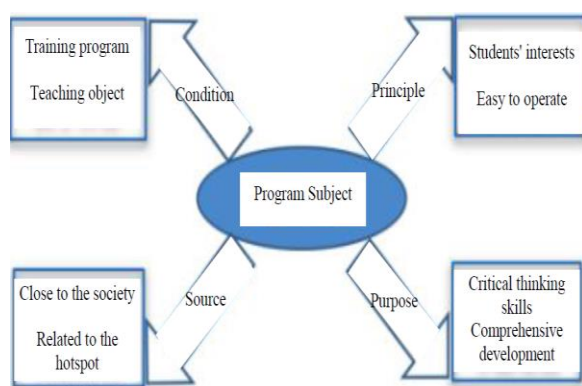


Fig. 1. Four-dimensional standard of the project theme.

Secondly, different researchers and teachers have different steps for the implementation of the PBL teaching model. For example, Zhong Zhixian and others believed that it takes six steps, and Yan Hanbing proposed seven steps. Qin Yaou et al. proposed eight steps. [6] Based on the research and absorption of the existing PBL teaching model, based on the characteristics of the university English reform and the needs of the extended curriculum, Xuzhou University of Technology have developed a circular PBL teaching process consisting of 3 modules and 10 links based on the school's teachings and academic conditions (see "Fig. 2"). The three modules are: project theme determination process, project production process and project work evaluation process. The digital teaching environment provides three supports for the implementation of PBL: teaching resource support, network technical support and member interaction support. In this way, PBL teaching and digital network are organically integrated and mutually supportive, forming a complete teaching system. However, the smooth implementation of the teaching system depends on the simultaneous application of perfect multidimensional synergistic development evaluation.

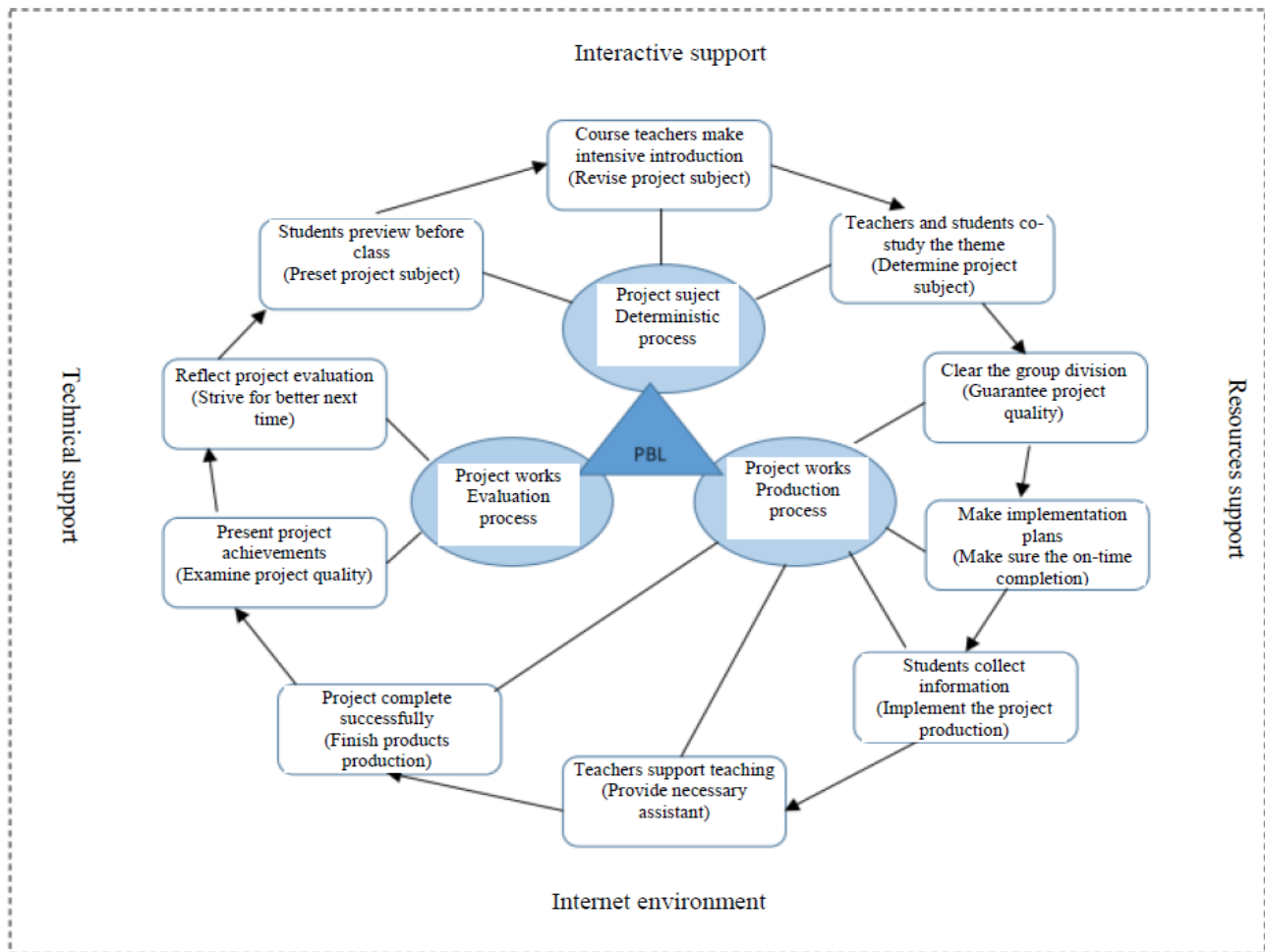


Fig. 2. Flow chart of the extended course PBL teaching mode.

### III. THE REALISTIC BACKGROUND OF MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION

#### A. The Meaning of Development Evaluation

Learning evaluation is an activity that grasps, measures, and judges students' learning processes and outcomes. Through learning evaluation, teachers can observe and promote the quality of students' learning, and give value judgment and feedback on their progress, academic performance, progress, personality, ability or other performance. [7] As everyone knows, the development of students in higher education is not only reflected in the improvement of academic performance, but to promote its comprehensive development including critical thinking, cooperation, communication and creativity. Development evaluation is an important means of achieving this goal. Development evaluation is based on giving full play to the promotion of students' learning and development. Based on the integration and teaching and evaluation, teachers use evaluation tools to continuously conduct action research and reflection, thereby improving their teaching and curriculum design as an intermediary, and ultimately promoting the evaluation of the common development of students, teachers

and curriculum. [8] Research shows that developmental evaluation can promote students' potential, individuality and creativity, and realize the all-round development of students. This is what the US assessment expert Stufflebeam said, "The most important intention of evaluation is not to prove, but it is to improve." [9]<sup>141</sup>

#### B. The Inadequacy of the Evaluation System of Colleges and Universities

The official management system of higher education in China determines that there are many disadvantages in the existing evaluation methods that are not conducive to student development. For example, Lu Jing proposed that there are many inherent defects in the evaluation of colleges and universities in China: management value is supreme, neglecting the need of multiple values; scientism evaluation paradigm leads the whole teaching evaluation process; education evaluation niche in college teaching evaluation is disordered; the teaching evaluation system is simple and extensive; the purpose and means of teaching evaluation in colleges and universities are reversed. [10] Professor Liu Jing also pointed out that the current university teaching evaluation emphasizes the commonality and general trend too much, ignoring the value of individual differences and individualized development; it uses quantitative results too

much, and rarely uses qualitative evaluation; it pays too much attention to the evaluation results, ignoring the progress and efforts of the evaluators in each period, failing to achieve a constructive evaluation in the true sense; it neglects the positive feedback of the evaluators and the positive identification of the evaluators, so that the reflection and guidance of the feedback of the evaluation results cannot be fully utilized. [11]

On the whole, there have been the universal management mode of "the examination is the evaluation" and "the evaluation is the examination" in college teaching, which objectively creates the opposition between teachers and students, makes it impossible to form benign teaching feedback, and makes it difficult for the incentive and promotion of teaching evaluation and the promotion of the students' comprehensive development. In view of this, it will be significantly necessary to convert "teaching for evaluation" to "evaluation for teaching" and establish an evaluation system that can really promote the overall development of students. At the same time, the latest fourth-generation evaluation theory requires the evaluation process to consider the needs of multiple value subjects and abandon the "managerialism" drawbacks in the evaluation. In the new teaching evaluation system, the evaluation of discourse power should be controlled by monologues to dialogue and negotiation. The evaluation criteria should be generated from presupposition and determination to dynamic generation. The content of the evaluation should be context-free, and the collection of evaluation information should be from quantitative assessment to qualitative description. [12]<sup>44</sup>

#### C. *The Proposal of Multidimensional Synergistic Development Evaluation*

Based on the imperfection of the existing evaluation system and the advanced nature of the fourth-generation evaluation theory, there can be a proposal of a multidimensional synergistic development evaluation system in the teaching reform of extended courses. The so-called multidimensional synergy refers to the multidimensional evaluation type, multidimensional evaluation structure, multidimensional evaluation content, multidimensional evaluation methods and multidimensional evaluation subjects to form a complete evaluation system to participate in the development evaluation of students to ensure the scientific nature of the evaluation. Given the challenging and complex nature of project-based learning, learners need to conduct surveys, designs, and rely on member synergy and mutual assistance to solve problems, make decisions, and ultimately complete projects in a classroom presentation or delivery of electronic works. In the process, "what students learn and how they learn depends to a large extent on how they think they will be evaluated." [13] This means that the development of a scientific and effective evaluation system is essential for examining the effectiveness of learning and promoting student empowerment. The multidimensional synergistic development evaluation emphasizes the effective application of evaluation improvement and promotion functions, and guides students to like to study, be good at study, be capable to study, be diligent to study, study from

each other, and help each other to study. In this way, it can promote deep language learning and meaningful learning with specific evaluation indicators, achieve a comprehensive and coordinated development of students' comprehensive quality, and implement the application-based undergraduate talent training program in Xuzhou University of Technology.

### IV. IMPLEMENTATION PRINCIPLES OF MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION

"The fundamental purpose of evaluation is to promote development." [14]<sup>151</sup> Effective evaluation can "improve performance and promote learning, improve students' learning, practical and innovative abilities, and thus point to deep learning." [15] In order to maximize the promotion function of multidimensional synergistic development evaluation, its implementation must follow five basic principles.

#### A. *The Principle of Inspiration*

The implementation of the PBL teaching model in the College English Development Program is challenging and complex for any student, requiring team members to make certain efforts to accomplish it together. In order to promote students' common progress and enthusiasm and positivity for project-based learning, PBL's evaluation system must first follow the incentive principle, that is, "to emphasize the incentive and regulation functions of evaluation, to stimulate students' internal development motivation, to promote their continuous progress, and to realize their self-value". [14]<sup>154</sup> This evaluation system not only focuses on assessment of learning, but also on assessment for learning.

#### B. *The Principle of Comprehensiveness*

Since the completion of the project requires the formation of themes such as theme determination, project planning, small component work, data collection, product production and product display, it is a test and promotion for students' language ability, team spirit, speculative ability and innovation ability. To this end, PBL's evaluation system must follow the principle of comprehensiveness, and monitor the whole process of project-based learning from the initial theme selection to the final work display to comprehensively evaluate students' various performances in various aspects of project implementation.

#### C. *The Principle of Continuity*

In order to promote the continuous occurrence of students' deep learning and meaningful learning, and promote the continuous development of students' comprehensive ability, the evaluation of PBL teaching mode must follow the principle of continuity, and should not be as anticlimax and intermittence. Only by making the language acquisition mode of "learning by doing" lasting can the continuous improvement of students' language application ability be realized.



#### D. The Principle of Synergy

In order to measure and evaluate the performance of each classmate in project-based learning more scientifically and comprehensively, this evaluation system follows the principles of quantitative evaluation and qualitative evaluation, formative evaluation and summative evaluation in the evaluation method. The evaluation subject follows the principle of coordination of teacher evaluation and group evaluation, self-evaluation and others evaluation. It follows the principle of online and offline collaboration on the evaluation platform, and participates in the development evaluation of students to ensure the fairness and justice of the evaluation to efficiently inspire students' sense of competition and team awareness.

#### E. The Principle of Feedback

In order to stimulate the advanced, supervise and urge the less advanced, and constantly improve the various aspects of project-based learning, and the PBL evaluation system always follows the principle of timely feedback. On the one hand, the teacher should feedback the results of each project evaluation to the students in a timely manner. On the other hand, the students should also feedback the thinking and

ideas of the project implementation to the teachers in time to correct the shortcomings in the project implementation. Through the common self-reflection, self-evaluation and self-regulation of teachers and students, it can achieve the optimization of the teaching effect and the purpose of "promoting learning by evaluation" and "promoting teaching by evaluation".

#### V. MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION SCALE OF PBL TEACHING IN THE EXTENDED COURSES

Project implementation in PBL teaching is a very challenging process that requires students a lot of time to make great efforts to complete. This requires a scientific and effective evaluation scale to regulate students' learning behavior, stimulate students' internal motivation, and promote students' self-development. To this end, the characteristics of each extended course can be comprehensively analyzed, to develop a multidimensional synergistic development evaluation scale as the evaluation standard of the PBL teaching mode of the college English extended courses (see "Table I" below).

TABLE I. A MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION SCALE

Evaluation category	Evaluation structure	Evaluation content	Evaluation index	Evaluation score					Evaluation subject
Quantitative evaluation	Student personal ability	Network application ability	Computer operation ability	5	4	3	2	1	Intra-group (70%) Individual (30%) (On-line)
			Information retrieval ability	5	4	3	2	1	
			Multimedia production ability	5	4	3	2	1	
			Network interaction ability	5	4	3	2	1	
		Self-management ability	Project division completion progress	5	4	3	2	1	
			Reasonable degree of time arrangement	5	4	3	2	1	
		Problem solving ability	To assist the team in solving various problems in project implementation	5	4	3	2	1	
			Coordination with project team members	5	4	3	2	1	
		Teamwork ability	Coordination with teachers	5	4	3	2	1	
			Contribution rate of project works	5	4	3	2	1	
		Autonomous learning ability	Enthusiasm for project participation	5	4	3	2	1	
			Self-summary reflection of division of labor	5	4	3	2	1	
			Learning initiative	5	4	3	2	1	
			Fluency of language expression	5	4	3	2	1	
	Project team capability	Language expression ability	The correctness of language expression	5	4	3	2	1	Inter-group (50%) Teacher (50%) (On-line)
			Accuracy of pronunciation and intonation	5	4	3	2	1	
			The relevance of project theme and subject knowledge	5	4	3	2	1	
			Artistry of the project work	5	4	3	2	1	
		Team innovation ability	Innovation of project works	5	4	3	2	1	
			Scientific nature of project summary	5	4	3	2	1	
Qualitative evaluation	Post-project reflection and feedback	Through questionnaires and interviews, this is to learn about students' learning effects and needs, and improve project teaching links.		Excellent	Good	General			Teacher (Off-line)

#### VI. MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION SCALE

Perfecting the learning evaluation scale is an important guarantee for the smooth development and high-quality completion of the whole project-based learning process. It is necessary to carry out a comprehensive scientific evaluation of the individual performance of the individual students and

project teams displayed in the project process and project works. It can be seen from the evaluation scale that the multidimensional synergistic development evaluation system includes two evaluation methods: quantitative evaluation and qualitative evaluation. Quantitative evaluation involves two levels of student personal ability evaluation and project team ability evaluation. The student's personal ability refers to the performance of the individual students in the project implementation process, including network application

ability, self-management ability, problem solving ability, teamwork ability, self-learning ability and language expression ability. There are six dimensions and 16 indicators. The team's ability mainly focuses on the team's ability to innovate in the project's work, with a total of 4 indicators. Since the first five dimensions of a student's individual abilities are demonstrated in the project implementation process, they are classified as intra-group evaluations, consisting of evaluations by other members of the group (70%) and individual self-evaluations (30%). Language expression ability refers to the verbal ability of students to present their work in the classroom (generally 2-3 students in each project group simultaneously staged in English to present, perform or promote their project works), and it will receive inter-group evaluation (50%) and teacher evaluation (50%) simultaneously with the project work that is the result of team innovation. The score of language expression ability belongs to individual students, and the score of innovation ability of the project team is owned by all members, which can effectively improve the team's cooperation awareness. About the inter-group evaluation, generally, 2-3 people in each group are elected as the evaluation subject of this group to evaluate other groups, which can save the evaluation cost and avoid the cumbersome calculation caused by too much data. As can be seen from the scale, this scale particularly highlights the status of students as the subject of evaluation, with the aim of improving students' attention and competition. Qualitative evaluation is to understand the overall learning effect and learning needs of the project team through questionnaires and interviews, so as to better improve all aspects of project-based teaching. The evaluation results are given to each project team according to the students' reflection and feedback performance (excellent, good, general), not included in the student evaluation score, and only taken as a basis for individual assistance and improvement of classroom teaching. In the entire development evaluation system, the quantitative evaluation is in the form of a spreadsheet, which is operated online and is also convenient for total scores. All evaluation data are all electronically archived and uploaded to the designated network disk for reservation and sharing. The qualitative evaluation is implemented offline because of its subjectivity and it is not included in the evaluation score. The paper evaluation results are retained by the teachers and used as teaching references.

In this way, the student's personal development evaluation score formula is as follows:

Individual development evaluation score = intra-group member evaluation \* 70% + personal evaluation \* 30% + inter-group evaluation score \* 50% + teacher evaluation score \* 50%

Since the number of extended courses classes in Xuzhou University of Technology is 50-60, each class is usually divided into 10 groups, and a total of 4 rounds (monthly) of the project presentations are presented in each semester. The average score of each student's personal development evaluation in the four rounds of project implementation is the final grade of the student for the semester, and it will be included in the final grade (40%).

## VII. THE EFFECTIVENESS OF MULTIDIMENSIONAL SYNERGISTIC DEVELOPMENT EVALUATION AND THE PROBLEMS IN URGENT NEED OF FURTHER RESEARCH

### A. *The Effectiveness of Multidimensional Synergistic Development Evaluation*

As early as 2010, the "Outline of the National Medium- and Long-Term Education Reform and Development Plan (2010-2020)" has clearly stated that education should "create a good environment for independent thinking, free exploration, and innovation", "promote students' all-round development, focus on improving... the innovative spirit of being brave to explore and the practical ability to solve problems", the purpose of which is to advocate the focus of education from simple transfer of knowledge to the development of students' comprehensive quality. As far as Xuzhou University of Technology is concerned, the school emphasizes the communicative and functional attributes of language learning of the project-based teaching reform under the guidance of the reform-oriented principle of "student-centered, project-based, application-oriented, and ability-based". The school strives to implement the "learning by doing" teaching concept, organically integrates language skills and project themes, and promotes the spiraling rise of students' comprehensive skills such as language ability, cooperation ability, thinking ability and innovation ability with the students' enthusiasm and learning initiative being significantly improved. However, this achievement is largely due to the simultaneous implementation of multidimensional synergistic development evaluations. The kind of evaluation means determines the kind of learning style and learning content the students have. Since the implementation of PBL reform and development evaluation in the English extended courses, the students have changed from the initial negative perfunctory to the current positive enthusiasm, and the teachers have changed from the initial incompetence to the current initiative teaching and research. The English class has evolved from the initial teacher-student conflict to the current teacher-student win-win, while teaching benefiting teachers as well as students: the teachers see the guidance and encouragement of PBL to the students from the reform, and realize the sense of teaching achievement brought by the reform; from the reforms, students have found a stage to play and express their potential, and they have experienced the development and changes of their comprehensive ability on the stage. The development evaluation made the English development class realize "promoting teaching by evaluation" and "promoting learning by evaluation".

### B. *The Problems in Urgent Need of Further Research*

With the deepening of the reform, it can also be found that there are still some problems in urgent need for the further research. First of all, the teaching mode requires teachers and students to spend a lot of time and energy to prepare and complete, which is difficult and challenging. This is difficult for many teachers and students to maintain the consistency. Therefore, the development evaluation mechanism must be further refined and deepened to ensure that the evaluation indicators are fully covered. At the same time, it is still necessary to delve into other supporting

measures to encourage students to learn. In order to ensure a fair and reasonable evaluation of students' efforts, it is necessary to develop a monitoring mechanism to ensure fair and reasonable evaluation within and between groups. In addition, it is necessary to think hard to find ways to achieve social value for excellent project works. Realizing the effectiveness or usefulness of the project's results may promote the deep learning and meaningful learning of the students more than the teaching evaluation. The author believes that this is the true meaning of "learning by doing." Future project-based teaching research should be paid attention and explored. Finally, under the situation of "management first", how to obtain more policy support and financial support from the school's academic affairs office is also a necessary condition for the in-depth development and sustainable development of project-based teaching reform. The impact of external environmental factors on the success or failure of teaching reform cannot be underestimated.

### VIII. CONCLUSION

Implementing a project-based teaching model reform in the College English Development Program is a new attempt. Years of teaching practice have shown that project-based learning can promote the development of students' comprehensive abilities. In view of the challenge and complexity of project-based learning, a multidimensional synergistic development evaluation system has been developed as a formative evaluation tool to monitor the whole process of project-based learning. From the seven dimensions, the comprehensive evaluation of the individual performance of the students and the project team has effectively ensured the smooth implementation and sustainable development of the project-based learning, and achieved a win-win situation of "promoting education by evaluation" and "promoting learning by evaluation". However, due to the complexity of teaching and the diversity of curriculum development, the multidimensional synergistic development evaluation scale needs to be continuously improved and enriched in the future implementation process in order to promote students' self-development more effectively.

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