

# Research on English for Specific Purposes in New Engineering Based on CIDO Education Mode

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**Abstract:** *The construction of new engineering has proposed new and higher demands for engineering talented people, yet the acute problem is that basic knowledge in English for Specific Purposes (ESP) has obtained too much attention while the professional knowledge of the engineering courses has not been given sufficient attention. Other questions such as a limited cultivation in English language ability, a backward teaching mode in ESP learning, ineffective teaching effect, a single teaching evaluation mechanism are also hindering the training of talented people. Under new engineering background, it is highly urgent to adopt new mode of the cooperative cultivation of students especially new engineering plus ESP by strengthening cultivation scheme, curriculum system, teaching resources, and supporting platform among others. That can help to cultivate the comprehensive engineering talented people with a solid knowledge foundation, technology ability, higher ESP ability, cross-cultural ability, as well as humanistic presence.*

**Keywords:** *new engineering, ESP ability, engineering talented people, evaluation system*

## 1. Introduction

CDIO engineering education model is the latest achievement of international engineering education reform in recent years. After four years' exploration, four institutions of higher learning, namely Massachusetts Institute of Technology, Royal Institute of Technology of Sweden, Chalmers University of Technology of Sweden and Linkping University of Sweden, founded the concept of CDIO engineering education and established an international cooperation organization in the name of CDIO. CDIO stands for Conceive, Design, Implement and Operate, which enables students to learn in an active, practical and organically linked way.

Constructing and developing new engineering is the practical necessity to deepen higher education engineering education, paradigm reform as well as satisfy the national industrial economic development[1]. The Fourth Session of the 13th National People's Congress reviewed and approved the 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of Long-term Goals for 2035, which provided basic compliance for China to formulate medium-and long-term plans in the field of education. It is clearly pointed out that to build a high-quality education system and build a strong educational power by 2035, it is necessary to improve the quality of higher education, build first-class universities and first-class disciplines in different categories, speed up the training of talents with short supply in fields such as science, engineering, agriculture and medicine, strengthen the training of innovative, applied and skilled talents, support the development of high-level research universities and strengthen the training of basic research talents. To achieve the above-mentioned goals, the innovation of engineering education mode in China triggered by the construction of "new engineering" can not only meet the national strategic needs, and more importantly, it can also meet the personal growing needs of students. In the construction of "new engineering" in universities, taking CDIO education mode as the teaching concept can work as an implementation path with systematic integrity, and individual needs, so as to achieve the goal of speeding up the training of talents with short supply in science and engineering and other majors. Zhou Min and Zhu Yirong pointed out that the construction of new engineering is helpful when it comes to the promotion of China made 2025, Internet plus and Belt and Road Initiative, which can also help to stimulate the prosperous development and building of world first-class universities and first-class disciplines[2].

## **2. Domestic and international current situation of ESP**

### ***2.1 International current situation of foreign countries***

Despite the comprehensive introduction of ESP courses for engineering students at many universities across the globe, engineering students show a general lack of concern regarding the significance English has for their future careers, and there are several reasons behind this lack of motivation and interest[3]. At present, the global economy is recovering, with political, economic, scientific research as well as trade exchanges and interactions being increasingly frequent. English occupies an important position in international affairs, which also provides objective conditions for English to become a common language in the world. In order to meet the specific needs of society, linguists have put forward new requirements for English courses, which has promoted the development and progress of English for Specific Purposes (ESP). Since then, English-speaking countries began to study ESP in the 1960s, and since then, the scope of ESP research abroad has made remarkable progress, mainly involving language research, skill research, ESP teaching classification, teaching methods, needs analysis, textbook design, teacher training, corpus research, assessment and testing, among others. Hewings makes a detailed analysis of ESP teaching in the past 20 years, which mainly includes three aspects namely the research region, the theme and the cited literature.

In August 2017, The Massachusetts Institute of Technology (MIT) launched a new round of engineering education reform called New Engineering Education Transformation (NEET) program which aims to reconstruct the engineering education and teaching in MIT, and fundamentally carry out a systematic reflection and reform on engineering education. The focus of the reform lies in students' learning methods and learning contents, and the goal is to cultivate leading engineering talents who can lead the future development of industry and society. On the ability reconstruction of engineering talents, MIT advocates that in the future, the industry will pay more attention to the performance of engineering talents' learning ability and thinking ability, and the engineering education, which originally emphasized knowledge acquisition and cognitive ability training, and that will be challenged. Therefore, the new engineering should pay more attention to the cultivation of students' critical thinking.

### ***2.2 Domestic situation***

At present, as a national education development strategy, new engineering has attracted sufficient attention, and there is also a certain scale of research. In 2019, Maxwell Technology and Tencent Education CSIG (Cloud and Smart Industries Group) became educational partners, and conducted in-depth cooperation in new engineering curriculum development and sales management, creating a new talent training mode of cooperation between Tencent education new engineering and universities and higher vocational colleges. At the same time, Maxwell Technology was selected into the first batch of collaborative education projects of industry-university cooperation by the Ministry of Education in 2019, supporting five major projects namely new engineering construction, teaching content and curriculum system reform, teacher training, practice conditions and practice base construction, and innovation and entrepreneurship education reform. However, there are few researches on ESP teaching in colleges and universities under the background of new engineering. Domestic scholars have put forward their own views on English teaching for engineering majors in colleges and universities under the background of new engineering. For example, Yang Shuo proposed to reform teaching methods with the goal of English practical application ability, use modern technical means, and improve teachers' traditional teaching mode, that is, to give priority to teaching[4]. He believed that ESP should be organically combined with professional courses to cultivate college students' English practical application ability. Sun Jianguang and Liu Yujun proposed to enhance the pertinence of teaching and teach students in accordance with their aptitude[5]. In addition, it is necessary to stimulate students' interest in English learning and adopt diversified evaluation methods. However, we need to see that most of the current research stays in the discussion stage, and has not formed a conclusion. Although it has certain reference significance, it has its own limitations. At present, the present situation of ESP teaching in colleges and universities in China is not optimistic, and some of them are even worrying. Liang Xuesong once pointed out: "At present, there are many problems that need to be solved urgently in the process of ESP teaching in colleges and universities, which can almost be described as chaos[6]. Therefore, we should notice that the research on ESP teaching is constantly moving from theoretical research to empirical research. In particular, the teaching reform in China should focus on the development of students, the promotion and implementation of the core educational concept focusing on the cultivation of innovative spirit, innovative ability and practical ability, and the cultivation of

high-level new engineering talents with strong professional English ability, which is an inevitable requirement for realizing the development of the "Chinese Dream" era.

### **3. The importance and value of the research**

The new concept of engineering provides a new perspective and opportunity for reform in current college teaching, especially in ESP teaching, which needs to be reformed urgently. Students must learn their own ESP knowledge well while learning professional knowledge in engineering if they are to lay a foundation for improving their practical ability in the future. Under the CDIO education mode, ESP teaching aims to serve the construction of new engineering and that should not be limited to improving students' language knowledge. Instead, we should pay more attention to the cultivation of language practice ability and comprehensive quality, and focus on cultivating students' abilities (language practice ability, autonomous learning ability, international vision, cross-border integration ability, innovative thinking ability, humanistic feelings, communication ability, teamwork ability, engineering leadership ability, to name just a few.) required by engineering education through the design of teaching tasks and teaching activities. This topic is helpful to further enhance the awareness of the importance of ESP teaching in colleges and universities, and improve students' ability to apply their ESP language knowledge to solve practical problems in real life, so that students can truly have international competitiveness.

This research will effectively realize the innovation of ESP teaching mode of new engineering in colleges and universities, provide reference and ideas for interdisciplinary personnel training under the background of new engineering, and accelerate the training of innovative, applied and skilled personnel.

### **4. Main content**

This research will review the current situation and existing problems of ESP teaching under the traditional engineering background by analyzing the causes of the existing problems, and then put forward the solutions to the current actual situation. Through a comparative study, this paper applies CDIO teaching model to engineering English teaching, so as to analyze and observe students' school effect feedback.

In the process of implementing CDIO teaching mode, we should emphasize the self-organization of teaching, practice and management, break through the organized process that teachers strictly control teaching content and teaching progress according to the syllabus in the past, and fully consider the self-organization of teaching system and knowledge exchange. The specific operation method is as follows:

Teachers in a suitable teaching environment, through teaching means, urge students to use learning methods, interact and learn from each other; Renewing and interacting knowledge between teachers and teaching contents; Students acquire knowledge from teaching content, and students' needs promote the renewal of teaching content. Under the support of the integrated teaching system, the teaching objectives are determined, and the teaching objectives determine the teaching content. Through teaching evaluation, teachers' teaching effect can be improved, and students' knowledge acquisition and ability cultivation can be promoted. "Teaching" and "learning" in CDIO teaching mode are different from traditional ideas, where "learning" is the source power, so in the implementation process of CDIO teaching mode, we must pay attention to guiding students to play an active role. In addition, during the implementation of CDIO teaching mode, practical teaching is emphasized and importance is also attached, which also meets the practical requirements of ESP ability training and really plays a role in cultivating new engineering talents' foreign language proficiency.

### **5. Innovative features of research**

#### ***5.1 Innovation in academic thought and point of view***

Distinguishing liberal arts majors and carrying out research based on engineering majors. At present, most of the research on teaching mode concentrate on liberal arts majors, which is inconsistent with the training and construction of new engineering talents advocated by Chinese society at present. Therefore, the author conducts relevant research on the basis of his own teaching experience of ESP with

engineering background, which can provide reference for the innovation of English teaching mode and means for engineering students. At the same time, the innovation of teaching mode can be organically combined with students' experience, which can not only realize the innovation of teaching mode. More importantly, it enhances students' experience of specialized English learning.

### 5.2 Research result innovation

Compared with the traditional teaching mode, CDIO can effectively test the benefits of the new teaching mode, and achieve the dual goals of students' professional knowledge learning and English language ability improvement. Under the CDIO education mode, students can learn English for their majors and occupations by deepening the teaching mode. Secondly, the deepening of teaching mode can improve the language knowledge, cultural connotation and professional English knowledge and ability required by new engineering talents; Flexible use of various teaching methods can give students the opportunity to observe, experience and feel, and enhance students' sense of participation; Through multi-dimensional teaching evaluation, students are guided to pay attention to the experience of the process and the professional quality of striving for perfection. These paths can not only effectively improve the teaching effect of professional English courses. More importantly, it can enable professional English courses to serve as a booster for the training of new engineering talents, explore the quality standards for universities and industries to jointly study the training of professional talents in emerging disciplines, and update the education plan for outstanding engineers. In addition, the research will deepen the reform of talent training mode of integration of production and education and school-enterprise cooperation, and fully rely on university science parks and technology incubators to establish a platform for learning and practicing college English with the participation of schools, localities, industries and enterprises.

## 6. Conclusion

Combining the realities of teaching in practice and basis of current research, the author tries to make reform of ESP ability for engineering and scientific talented people by putting forward a new cross-disciplinary mode of "new engineering + ESP" under CDIO mode. Meanwhile, suggestions and advice related to culture scheme or plan, curriculum system, teaching resources, supporting platform, teaching method, as well as evaluation system have been given. M.Chandrasena Rajeswaran proposed that it not only requires dedicated and trained teachers who are facilitators and monitors in the broadest terms, but who understand the learners and their needs in a classroom that believes in practice[7]. That not only conforms with the real need of construction of "new engineering". More importantly, it can help to reinforce the professional ability of engineering and scientific Talented people, ESP ability and humanistic pressure.

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