

# Promoting internationalization of China's applied technology education: CLIL bilingual textbooks play a significant role

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**Abstract:** The "Belt and Road" strategy is developing quickly, while the number of international students from countries involved in the "Belt and Road" are increasing rapidly. This raises the requirements for China's applied technology education and vocational institutions about the bilingual education. CLIL is proved a powerful tool in the modern educational environment. Constructing CLIL textbooks for professional courses in both Chinese and English is a way to reduce the difficulty of international teaching and learning, facilitating the spread of Chinese culture, and making China's applied technology education more international. Suggestions are provided for making policies of developing CLIL bilingual textbooks.

**Keywords:** CLIL textbooks, applied technology education, internationalization

## 1. Introduction

The reform of higher education triggered by globalization has made bilingual teaching the forefront of applied technology education. A technology called CLIL (Content-Language Integrated Learning) has been widely used around the world, and many European universities have applied this method to the teaching of business, engineering, medicine and many other subjects <sup>[1]</sup>. Of course, it is mostly used at a higher level of teaching, and it has not been widely used in the teaching of professional courses in applied technology universities and vocational colleges. It advocates the idea of combining language and professional subjects with a common goal, that is, using the language as a tool for learning other subjects and a means for developing communicative skills. Learning a professional subject and a foreign language share the same process. With the deepening of China's "Belt and Road" strategy, international applied technology education is facing unprecedented opportunities and challenges. How to attract more international students along the "Belt and Road" to study in China in a short period of time and enjoy high-quality education has become a topic that the education sector has to consider.

At present, the internationalization level of China's higher education, especially applied technology education and vocational education, is not high. Bilingual teaching in China usually refers to English medium teaching, that is, the use of English in the teaching process of non-foreign language professional courses <sup>[2]</sup>. By switching between two languages (usually English and Chinese), teachers enable students to think and learn professional knowledge in two languages. Teacher resources for bilingual education in China are also quite scarce, and there are very few teachers with both deep professional knowledge and English skills at the same time <sup>[3]</sup>. Bilingual teaching has a high requirement for students' admission threshold, which makes bilingual teaching have to face the problems of educational equity. However, blindly lowering the admission requirements without making great changes in the existing teaching conditions has also laid the root of the decline in teaching quality. However, the development of teaching materials used in bilingual education in China is lagging behind, and most of them are original English teaching materials. This is not conducive to teaching Chinese language, especially Chinese terminology and other related knowledge to international students from countries along the "Belt and Road", nor is it conducive to displaying China's social, scientific and technological achievements as a medium, nor is it conducive to publicizing China's social system and promoting Chinese culture.

The systematic adoption of CLIL method in the development of Chinese-English bilingual textbooks at the national level is conducive to utilizing the dominant position of English in the international science,

technology and social fields, enabling China's applied technology and vocational education to quickly meet international standards, and enabling Chinese students who choose bilingual teaching to improve their English proficiency while learning professional knowledge and understanding the development of applied technology in the world. It provides a good opportunity to understand the culture and society of countries along the "Belt and Road" [4]. At the same time, international students from countries along the "Belt and Road" can learn professional knowledge and Chinese professional terms through such bilingual textbooks. Furthermore, they have a deep understanding of China's social system and Chinese culture in the process of communicating with Chinese students. It can also lower the entrance threshold for Chinese students who choose bilingual teaching, they can still use CLIL bilingual textbooks to keep up with the pace of teaching and catching up with the English gap before their English proficiency meets the established requirements. This is conducive to social equity, so that talented students who cannot afford the high tuition fees of language classes, can also have the same opportunity to broaden their international horizons and learn about international cultures. In facing of the difficulties in the cultivation of international education teachers, the implementation of CLIL Chinese-English bilingual textbooks in the field of technology and vocational education at the national level enable some educational institutions and teachers who are not equipped with bilingual teaching to quickly obtain teaching resources and carry out related teaching activities. In a short, CLIL Chinese-English bilingual textbooks can make up for the shortcomings of current bilingual teaching and make China's applied technology and vocational education more Chinese and international at the same time.

## **2. The main problems of the international bilingual education of applied technology in China**

At the national level, important progress has been made in the implementation of a series of key projects of the "Belt and Road" strategy. While economic and trade exchanges have made important progress, Sino-foreign vocational education cooperation in the form of "Luban Workshop" has also been carried out, and through such cooperation in education and other fields, international mutual learning between civilizations and international people-to-people exchanges have been promoted. It also enhances the friendship between peoples who come from all countries [5]. A pattern of diverse and interactive cultural exchanges has been shaped. At the societal level, studies show that many students have realized the importance of bilingual teaching, and most of them hold positive attitudes towards it [6]. However, in facing of the increasing requirements of international education, bilingual education in China faces many challenges in the fields of students' English skills level, bilingual teacher cultivation, bilingual textbook development, educational equity, curriculum ideology and politics.

### ***2.1. The English skills level of Chinese students who choose bilingual education is insufficient***

Students are the center of teaching activities in modern education, and students' English proficiency plays a crucial role in the success of bilingual education. The development of English-medium teaching comes with the internationalization of higher education, and many universities around the world have switched to teaching in English as a way to attract international students, as well as to enhance international employability for local students. For transnational higher education, international universities' branch campuses or joint programs in China, there is usually a language requirement for admission, with an IELTS score of 5.5 or above or equivalent in another language test. Top universities in China, such as "C9", "985", "211" and "Double first-class", also set a higher English score for the entrance exam. But studies have shown that schools do not consider students to be at the appropriate level of academic English, the colloquial language, and technical terminology that used in classroom communication can be a barrier to learning. Many schools have to provide language support, such as using language experts at language centers to provide tutoring, set up advanced language courses, or assign classes based on language achievement. Even so, teachers of specialized courses have to reduce the proportion of English in their actual teaching and use a lot of Chinese for explanation and discussion.

For universities of applied technology or vocational education institutions, the situation is even more serious. Research shows that some students in bilingual classes oppose bilingual teaching because of their insufficient English ability, and less than 50% of the students like English teaching. More than half of the students said they were not confident in their English reading and writing skills. The vast majority of students even said they would choose to read Chinese textbooks if they were available in both English and Chinese. Teachers also reported that the proportion of students using English in classroom teaching was far below 50%. In other words, students have difficulty taking notes in English, answering questions from teachers, understanding lectures, and participating in class discussions. It can be seen that students' English level is a key factor affecting applied technology and vocational education.

## ***2.2. There are not enough qualified teachers for international bilingual education***

Teachers are the key factors leading bilingual education, and they are also the implementers of bilingual education. The success of bilingual education is closely related to the English proficiency of teachers. Although there are a large number of English teachers in China, they are mainly engaged in English teaching and do not participate in the teaching of professional courses. Language centers of multinational higher education institutions in China will arrange English major teachers to provide language support in professional courses of bilingual teaching, but it is not advisable to require English teachers to teach specialized courses as well. However, in the bilingual courses of many local universities, especially universities of applied technology and vocational education institutions in China, many teachers have graduated from local universities with low academic qualifications, have not experienced in English teaching environment, and lack opportunities to study abroad. Their vocabulary and grammar expressed in foreign languages are not accurate and professional, and a lot of professional knowledge is still taught in Chinese. Such a teaching mode cannot stimulate students to use English, cannot achieve the ideal bilingual teaching effect either. The teaching methods of bilingual education in China are quite different from the popular teaching methods in the world, and the international students who come to China to study may not adapt to them, which will affect the bilingual teaching effect. This requires teachers of professional courses not only to have solid professional knowledge, excellent English knowledge, and English communication skills, but also to have teaching methods that are in line with international standards.

## ***2.3. The teaching materials of bilingual education in China do not meet the teaching requirements***

There is no unified compilation of bilingual textbooks for professional courses in various disciplines in China, so there are few bilingual textbooks for professional courses that meet Chinese characteristics. Some scholars believe that the implementation of bilingual teaching should use the international classic textbooks, such textbooks are widely used in the world, it is convenient for students to have access to authentic English, and teachers can also learn the international advanced teaching methods and concepts. However, this far underestimates the applicability of original foreign language textbooks. First of all, the original English textbooks are very expensive. The price of some original English books exceeds the teaching materials cost per student in many universities for one semester. Considering the current income level of China's national economy, this is unaffordable. The original foreign English textbooks are greatly influenced by the author's own opinion, which reflects the author's independent thought and habit of thinking. When Chinese students use such books to study, they often have conflicts of thinking modes and values. The professional terms of the original English textbooks are difficult to understand without Chinese explanation, which requires each teacher to spend a lot of energy on translation and explanation, occupying a lot of time in the teaching of professional courses, thus affecting the teaching progress and teaching effect. Even if some Chinese-English textbooks or materials are well translated, there are still many literal translation phenomena, which will make the translated Chinese difficult to understand, and even have a lot of language problems, which is not conducive to use and learn for foreign students, and also has a negative impact on teaching activities.

## ***2.4. Higher English requirements may lead to social inequality***

Bilingual courses are generally more "elite" friendly. For example, students with a good command of English and those whose families can afford the higher cost of English courses have a greater chance of being admitted and their English proficiency can quickly adapt to bilingual education projects. However, it is difficult for low-income families to afford the high cost of extra-curricular English tutoring and international language tests. This results in the exclusivity of the admission criteria and the privileged position of students who develop English in high school, which may lead to permanent inequality in China's higher education. However, English proficiency varies widely among provinces, with the developed eastern coastal provinces significantly higher than the inland provinces, especially the western provinces. The policy of selecting and recommending admission qualifications for bilingual education based on the college entrance examination scores may also create social inequality.

## ***2.5. The ideological and political construction of bilingual teaching curriculum is very difficult***

With the rapid development of transnational higher education and English media education in China, students are vulnerable to the impact of different cultures, different ideologies and different values. In this context, curriculum ideological and political construction is particularly complicated and difficult.

First of all, many of China's international education adopts the situation that Chinese students and foreign students are taught separately. Chinese students communicate and study together, while international students form independent classes [7]. Chinese students and international students are independent, without language and cultural exchanges, temporarily unable to meet the requirements of the "Belt and Road" for education internationalization. The effect of promoting China's scientific, technological, and social development achievements, spreading Chinese culture will be greatly reduced. Chinese students participating in independent bilingual teaching will also lose part of the opportunity to understand international culture and improve English skills level. At the same time, improper teaching materials and teaching organization may have a negative impact on national identity and cultural identity. In the learning process, local values and experiences can be overshadowed by a dominant, hegemonic global perspective. When the international dominance of English is accepted by local students, they tend to define themselves as weak, ignore the significance of multilingual existence, and avoid participating in cross-cultural communication. In a short, there is a long way to go in the ideological and political construction of international bilingual teaching.

### **3. The important role of compiling CLIL bilingual teaching materials**

The key elements of CLIL include acquiring knowledge and skills, accelerating higher cognitive processes, improving communicative interaction skills, and shaping intercultural competence [8]. When the student's learning goal is to learn both a second foreign language and a professional knowledge, it can combine the two learning activities into one, providing a real contextualized context for foreign language learning, as well as the interpretation and communication of two different languages for professional courses learning. Based on this theory, bilingual textbooks for professional courses can provide opportunities for learning a second foreign language and professional subjects, activate the knowledge transfer between the two fields, help improve the efficiency of teaching foreign language and professional subjects, promote the formation of thinking patterns and self-realization of students, and promote the construction of culture and national identity. The course materials developed in accordance with the CLIL methodology should be avoided by mistranslating the teaching materials of the major subjects into foreign languages. The textbooks developed on the basis of this theory can help to lower the threshold of students' English entrance and improve social equity, provide materials for bilingual teachers' teaching, make up for the deficiencies of single-language English textbooks, and serve as an important part of curriculum ideological and political construction, making China's applied technical and vocational education more Chinese and international.

#### ***3.1. Bilingual textbooks can lower the entrance threshold and improve social equity***

After the Ministry of Education of China issued the "Belt and Road" Education Initiative in 2016, the number of foreign students coming to China has been risen. According to data in 2018, more than 490,000 foreign students were studying in Chinese universities that year. Providing excellent bilingual textbooks in the teaching of international students can provide high-quality Chinese services for them in China. At the same time, it also lowers the entrance threshold for international students in China, so that more international students who cannot communicate Chinese temporarily but can study in English have the opportunity to study in China. It can also provide equal opportunities for international students who have good Chinese but relatively poor English as well as Chinese students who choose English medium for teaching. In other words, bilingual textbooks can help improve social equity, so that more Chinese students and international students can have equal opportunities to receive bilingual teaching [9]. As there is a growing call for assimilation of local students and international students, excellent bilingual textbooks can also help establish unified teaching standards and evaluation indicators for local students and international students, so as to improve the teaching quality of international students' education in China [10].

#### ***3.2. Bilingual textbooks can provide teaching materials for teachers***

A high-quality CLIL textbook can make use of the two languages and professional knowledge to interact and promote each other, which not only provides beneficial help for students' learning, but also provides more convenience for teachers' teaching. The use of bilingual textbooks can save teachers a lot of time to translate professional vocabulary, and can provide a wealth of cases, examples, and assignments for teaching. It can make the teaching units that do not have bilingual teaching for the time being have the conditions to carry out related teaching work after the effective use of bilingual textbooks,

so that teaching resources can be released or supplemented in a short time. Therefore, CLIL teaching materials can provide beneficial help to improve the efficiency and effectiveness of bilingual teaching.

### ***3.3. Bilingual textbooks make applied technology education more Chinese and international***

Qualified bilingual textbooks developed on the basis of CLIL principle can make up the shortcomings of the original English textbooks in foreign countries. In the process of writing, they can reflect Chinese elements, show Chinese culture, add real cases reflecting China's economic, social, scientific and technological development, and enhance the influence of China's applied technology and vocational education. For the majority of international students, bilingual textbooks can make China's applied technology and vocational education more Chinese. Bilingual textbooks can also help Chinese students who choose bilingual teaching have the opportunity to improve their English skills in the process of learning professional courses, to understand the international development trend of science and technology and the culture of other countries, to serve as a common carrier and platform for communication with international students, which making China's applied technology and vocational education more international. At the same time, they could also avoid weakening Chinese students' national and cultural identity due to the dominance of English.

## **4. The national strategy for promoting bilingual textbooks of applied technology**

### ***4.1. Overall planning to reflect the advantages of the national system***

In view of the uneven development among different regions and between schools, the national education authorities can make overall plan from the national level and formulate the overall development strategy of CLIL bilingual textbooks. In order to adapt to the complex situation, the education authorities need to stand at a new starting point, take the internationalization of higher education as a basic strategic consideration, and incorporate the construction of CLIL bilingual textbooks for applied technology and vocational education into the overall strategy of internationalization of higher education. First of all, seeing the country as a whole, setting up the overall development plan and directories, configurating of bilingual teaching material development special support, encouraging the development of original, embedding the Chinese culture and the achievements of science, technology, social development. The bilingual textbooks embedded with infectious Chinese story, make China's applied technology education bond more Chinese characteristics. In terms of publishing propaganda policy and funding support, textbooks could be given policy tilt. Bilingual teaching material awards is advise to commend and reward, especially excellent bilingual teaching material. At the same time, for the publication and distribution of bilingual textbooks, domestic and foreign experts should be invited to conduct different levels of review to strictly control the quality of textbooks.

At the same time, teachers should go abroad and cooperate with the competent departments of other countries' education systems to introduce excellent original English teaching materials and translate to adapt Chinese educational environment according to the principles of CLIL. High-level international experts and scholars should be invited to participate in the compilation of textbooks, so that more Chinese local students have the opportunity to understand the development of foreign science and technology, and familiar with rich and diverse international culture. These activities could make China's applied technology and vocational education more international.

### ***4.2. Linkage between the upper and lower levels, giving the universities a leading role in the development of CLIL textbooks***

Universities of Applied technology and vocational education institutions are the main bodies of talent training, as well as the actual developers and users of CLIL bilingual textbooks, therefore, they should play a main role in the field of textbook development. In the process of national overall planning policy formulation, the centralized education management agency does not understand the school's professional areas of expertise, teachers, CLIL application level and bilingual teaching material development level, so it is not easy to directly assign tasks. However, universities of applied technology do not understand the key needs and main themes at the national level, and sometimes lack the curriculum ideological and political experience of bilingual textbooks. This needs to establish effective education departments and applied technology and linkage mechanism in colleges and universities.

Under the overall planning of the education department, competent experts could be organized to

compile a catalogue of general bilingual teaching materials, then the applied technology and vocational colleges will be with the strength and ability to choose their own specialties in the catalogue to declare, after this, they could complete the compilation of teaching materials under the support of national policies. With the help of the national bilingual textbook platform, universities could share the experiences and textbooks to others.

#### ***4.3. Promote internal and external development and strengthen international exchanges and cooperation***

CLIL bilingual materials should be available to both domestic students and international students for studying Chinese alongside their professional courses. Not only for international students who studying in China, but also for students who studying abroad and who interested in Chinese language, Chinese culture, and Chinese science and technology. Organizing international teaching exchange activities at the national level, such as seminars on Chinese bilingual teaching materials, book exhibitions, and a series of Sino-foreign interactive activities, so as to promote bilingual teaching materials written by Chinese scholars and educators to the world, and to introduce the achievements of Chinese language, culture, and science and technology to the world.

At the same time, we should strengthen the international exchange activities of bilingual textbook writers. It is suggested to strengthen the international exchange and cooperation between Chinese and foreign CLIL teaching material writers. Different forms of activities such as joint writing and overseas training are carried out, so that CLIL bilingual textbook writers can learn more advanced bilingual textbook theories, improve teachers' international literacy and expand their international vision. In the communication and interaction of textbook writers, they have also increased their international literacy. These exchange activities should be carried out in different organizations and at different levels, not only at the national level, but also at the local authorities should provide strong support for the cross-border bilingual teaching materials exchange activities. As the main body of the writing teaching material, university also should actively promote international communication.

#### ***4.4. Optimize policies to enhance equity in public education***

In the process of implementing the internationalization of applied technology and vocational education in China, improving the fairness of public education is an important link to promote the sustainable development of education. This is also a key step in the "high-quality development" of public education. Although China has set a relatively uniform college entrance examination and other examinations, there is a huge gap between different regions in terms of the English skill level of students. The English skill level of economically backward provinces is generally low, while the English skill level of economically developed provinces is generally good, the English skill level of rural areas is generally low, and the English skill level of urban areas is generally good. Entrance requirements are the threshold for the students who English foundation is relatively weak. Universities can reduce the standard appropriately, conditional admission are advisable, for example using Chinese teaching material of to learn professional knowledge in the beginning, it gives them time and space to improve English skills. After the English skill level reach the standard, they could be officially accepted. This actually improves the fairness of Chinese learning for international students. International students' Chinese proficiency is insufficient when they enter the school, and many Chinese universities have set high Chinese proficiency requirements. At the same time, the Chinese proficiency of international students from different countries is also unbalanced. The Chinese proficiency of Chinese students from Malaysia and Singapore is generally good, while the Chinese proficiency of international students from other countries and regions such as Africa is generally insufficient. The CLIL bilingual teaching program can appropriately reduce the Chinese skill level requirements for admission, and international students can learn professional knowledge in English first, which also gives them a strategic space to learn Chinese. These policies can promote more foreign students to study in China. It makes Chinese applied technology education more and more international.

In a short, vigorously promoting CLIL bilingual textbooks can reduce the entrance threshold of international teaching programs of applied technology, and reduce the difficulty of teaching English and Chinese, which can provide strong help to prevent the intergenerational transmission of knowledge to poverty and improve the policy of educational equity.

## 5. Conclusions

From the perspective of the internationalization of China's applied technology and vocational education, combined with the actual situation, this paper summarizes the shortcomings of international bilingual teaching in China from the aspects of students' and teachers' English proficiency, the use of bilingual textbooks, social equity, and curriculum ideological and political construction. At the same time, in view of these weak links, it extracts the important impact that the development and construction of CLIL bilingual textbooks can bring, including lowering the entrance threshold, improving social equity, providing teaching materials, and making China's applied technology and vocational education more Chinese and international. Finally, according to the characteristics of CLIL bilingual textbooks, from the perspective of policy formulation, it discusses how to plan the overall development policy, give full play to the main role of universities, strengthen international exchanges and cooperation, and optimize policies to improve the equity of public education. Before the policy is issued, as teachers and managers of applied technology universities and vocational education institutions, they can consider cooperation in the compilation of bilingual textbooks and take this opportunity to create highly internationalization bilingual teaching courses with Chinese characteristics to meet the requirements of higher-level internationalization that proposed by the "Belt and Road". High-level applied technical talents would be trained to promote regional economic development.

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