

## Practice and Effect on Printing Engineering Education Internationalization Facing the One Belt and One Road

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**Keywords:** the One Belt and One Road; printing engineering education; internationalization; first-class undergraduate major; Bisheng innovative talent

**Abstract:** Based on "The One Belt and One Road" national strategy, promoting the internationalization of printing engineering education is one of the important directions of school development in the current and "The Fourteenth Five-Year Plan " period, and also one of the effective ways to strengthen cultural exchanges between China and the West and improve the quality of training of printing engineering talents. This paper introduces the implementation path of the internationalization of printing engineering education from three aspects, summarizes the effects and innovation points of the work, and also states its application and popularization, in order to provide some useful reference for the relevant professions to carry out international exploration and practice.

### 1. Introduction

The modern printing higher education of our country started at the beginning of last century when the Qing government set up the Surveying and mapping school of Peking. After the founding of New China, the rapid development of cultural publishing, the urgent need to train a number of publishing and printing talents, the state began to send international students to the Soviet Union to study advanced printing technology, for China's printing higher education reserve teachers. In 1978, the Printing Technology Department of the Central Academy of Arts and Crafts came out independently and established the Beijing Institute of Graphic Communication, and China's printing higher education opened a period of development opportunities, the level of personnel training gradually improved, and the training system was further improved.

Under the background of the "One Belt and One Road" initiative, the enthusiasm of colleges and universities in various industries in China to participate in the construction of "One Belt and One Road" and take the road of internationalization is growing. In July 2016, the Ministry of Education issued the "Promoting the Construction of the One Belt and One Road" Education Initiative, stressing that countries along the route should focus on education interconnection and cooperation in personnel training, build the Silk Road cooperation mechanism and build an educational community. President Xi delivers a keynote speech at the 2nd One Belt and One Road International Cooperation Summit in April 2019. He pointed out that China will actively build bridges between civilizations and learn from each other, and carry out in-depth cultural cooperation in education, science, culture, sports, tourism, health, archaeology and other fields. It can be seen that the internationalization research and practice of printing engineering education oriented towards the "One Belt and One Road" is just in time, it innovates the new model of printing education and opens a new chapter of cultural exchange between Chinese and foreign printing<sup>[1]</sup>.

As an industry-specific university that mainly serves the field of printing packaging and press and publishing, The BIGC has launched the internationalization of printing engineering education almost at the same time as the One Belt and One Road Initiative, combining its own characteristics

of running schools and the advantages of professional resources of disciplines, to speed up the training of high-level international talents. Relying on the "first-class undergraduate major" construction resources and "excellent engineer education training program", the school intends to strengthen the linkage with high-quality enterprises in export-oriented industries, promote international cooperation with the "One Belt and One Road" along the country and regional universities, lay out the printing project international education demonstration points, accelerate the training and export of international talents in the printing industry, increase the "One Belt and One Road" national and regional industry education and local technical training, and further strengthen the printing engineering education and internationalization strategy.

## **2. The Implementation on the Internationalization of Printing Engineering Education**

### **2.1. Respond to the "double ten thousand plan", strengthen the construction of first-class undergraduate specialty, and promote the cultivation of Bisheng excellent and innovative talents**

The major of printing engineering has integrated superior resources, successively participated in the construction and comprehensive reform plan of the first-class undergraduate major application of Beijing and the Ministry of education, optimized the major structure and personnel training mechanism, and gradually strengthened its professional characteristics and advantages. From 2017 to 2019, the printing engineering specialty has been approved as the first batch of "advantage specialty", the first batch of "first-class specialty" in Beijing, and the first batch of national "first-class undergraduate specialty" construction sites. Taking the construction of the national "first-class undergraduate major" as an opportunity, the major adheres to the demand-oriented, standard oriented and characteristic oriented, and takes "the combination of Ideological and political education and professional comprehensive education, the combination of theoretical course education and innovation and entrepreneurship education, the combination of basic subject education and off campus engineering practice education" as well as the "close to the needs of industry characteristics and the collaborative development strategy of Beijing-Tianjin-Hebei" Under the guidance of the new concept of "three combination, Three Closeness" of "close to students' growth goal", we should constantly strengthen the construction of professional connotation and cultivate first-class compound application-oriented talents. In the past three years, printing engineering has increased investment in professional construction planning, personnel training program, practical teaching resources, curriculum and characteristic teaching materials construction, and teaching staff construction. The school running practice has improved significantly, and gradually realized the transformation from traditional engineering to new engineering <sup>[2]</sup>.

"Excellent Engineer Education and Training Program" is a basic platform for professionals to deepen cooperation between schools and enterprises, promote the cultivation of innovative talents, and form a brand effect. By 2020, the program has been in place for nine years, with each session of a Bisheng excellence class" with 180 graduates, quickly becoming the backbone of the industry. Professional and the United States Michigan State University, Chiba University of Japan, Linköping University in Sweden, the University of Leeds in the United Kingdom and Taiwan University of the Arts in China to carry out exchange and study programs, and with the domestic double-class universities, the Chinese Academy of Sciences to implement the graduation design joint guidance of the " Practical training plan." Bisheng class students also actively participate in China's "Internet plus" college students innovation and entrepreneurship contest, "Challenge Cup" capital university students extracurricular academic science and technology works competition and the national university students printing science and technology innovation contest and other disciplines practice innovation activities, professional comprehensive literacy and international vision has been improved. In order to strengthen the foundation of outstanding innovative talent training, printing engineering professionals in the overall framework of the school, with Shenzhen Yutong Packaging Technology Co., Ltd., Nanjing Amity Printing Co., Ltd., Sichuan Huili Industry Co., Ltd., Fujian Nanwang Environmental Protection Technology Co., Ltd. and other more than 10 enterprises to

deepen cooperation between schools and enterprises, and jointly promote the "One Belt and One Road" along the country and regions of the printing industry layout, technology output and talent exchange research.

## **2.2. Meet the "One Belt and One Road" strategy, for our school printing engineering education brings opportunities and challenges**

In recent years, with the transformation and upgrading of China's manufacturing industry and production capacity export, some of China's packaging and printing giants (with Yutong, Hexing, Meiyingsen, Hongxing as the representative) closely follow the country's "One Belt and One Road" strategy, have set up production bases overseas (Southeast Asia, Africa and other places), near to provide customers with services. "One Belt and One Road" along many countries and regions along the development base is weak, industrial structure is single, technical education and training backward, human resources quality is not high, but the population base is large, the development potential is sufficient, the continuous demand for new technologies, new equipment is strong. Under the background of "One Belt and One Road", the international high-end talents with good foundation of English and knowledge of printing expertise and technology will be in short supply, which is also the future development direction of printing education.

The BIGC established the Institute of International Education at the end of 2012 to provide academic education and technical training for international students in the areas of printing and packaging, publishing and dissemination, design and art, and new media technology. The school is in talks with Allama Iqbal Open University, Pakistan's largest university, to build a printing Confucius Institute in the Gwadar port area, with the aim of integrating industrial cooperation with education and training to increase the influence of China's printing and packaging education and industry in the One Belt and One Road Initiative. The school also signed contracts with 11 enterprises, including Beijing TPU Printing & Packaging Supplies Co., Ltd., to jointly build a printing Confucius Institute<sup>[3]</sup>.

Yutong Packaging Technology Co., Ltd. is our school's cooperative enterprises, has been in Southeast Asia, Vietnam, India, Indonesia and other places set up four factories, mainly to carry out electronic products box printing business. Nanjing Amity Printing Co., Ltd., Fujian Nanwang Environmental Protection Technology Co., Ltd. and Sichuan Huili Industry Co., Ltd. also set up branches in Ethiopia, Malaysia, India, Pakistan and other countries, or to develop business in the local, involving the Bible, tickets, paper bags, medicine boxes, books and other printed materials, there is a strong demand for printing talent. However, to do a good job in the internationalization of printing engineering education, but also to continue to strengthen the "One Belt and One Road" along the country and region of the printing and packaging industry structure analysis and demand research, do a good job of recruitment publicity, and to adjust the development of ideas, solidly promote the construction of printing Confucius Institutes and schools, and promote the localization of services.

## **2.3. "Going out" and "please come in" are two-pronged efforts to steadily promote the internationalization of printing engineering education**

Today of economic globalization, we need to train people who understand professional knowledge and management, and who are also well understood in international standards and affairs. The profession has increased the number of bilingual courses and supported the participation of teachers in the development of international standards for printing and academic exchanges. Two professional teachers presided over the international ISO/TC130 Printing Technical Committee and the post-press convening group standard-setting work, led the development of two printing international standards, and a number of graduates to participate in the international ISO/TC130 management affairs work. Professional "excellent engineer education training program" as a platform, with Europe and the United States, Japan and Taiwan universities in the printing image professional extensive cooperation, each year in the form of "31" (one year, one semester, one vacation time) to carry out exchange students, through selection and language examinations, send students to choose courses, focus on short-term research projects, research the local printing

industry, and so on, to implement the "going out" strategy, greatly enhance students' academic literacy and thinking style, expand their international perspective<sup>[4]</sup>.

"Please come in" strategy is divided into two forms: to invite foreign excellent teachers to teach in the school, to recruit foreign students to carry out undergraduate education. In the past three years, the professional promotion of all-English teaching methods, has hired Xiao-ying RONG from the image communication department in California Polytechnic State University, to teach "printing principles and processes", "printing professional English (printing electronic topics)" courses; Starting in 2018, Professor Kai-da XIAO of School of Design in the University of Leeds will be hired to teach color science and technology. In September 2018, the printing engineering major participated in the development of the international student training program of the School's School of International Education, and carried out the first training of 12 undergraduate students in printing engineering. These students are all from Liberia, Ethiopia, Ghana, Benin, Congo and other African countries, enjoy the Beijing Foreign Student Scholarship and Beijing Printing College Student Scholarship tuition waiver. Currently, international students are beginning to come into contact with professional courses in printing engineering, such as Functional Materials for Printing, Color Management and Application, Digital Image Processing, Curriculum Design of Color Management, etc. They are learning printing production internships and other innovative practical courses, and could grasp printing new technologies, new materials and other advanced knowledge.

In order to practice the "please come in" strategy in a broad and in-depth way, the faculty is key. At present, the professional faculty of printing engineering students mainly comes from the professional English expression ability is high and has the experience of overseas study backbone teachers or young doctors, but overall, the number of teachers is still insufficient, the structure is not completely reasonable, the professional level also needs to be improved. Since 2016, the printing profession has set up an international curriculum teaching team and carried out a key school-level education reform project research on "international cooperative school-running model research", which has accumulated a foundation. In May 2018, team member Mr. He participated in the launch ceremony of the world's first "One Belt and One Road" Standardized Education and Research University Alliance held at China Jiliang University, and defined the objectives and ways to develop international standard talents and faculty. In 2018-2019, the printing engineering major sent four young Ph.D. teachers to universities in the United States, Canada and Sweden to conduct study and strengthen language skills training. At the same time, the professional also selected qualified teachers to participate in bilingual skills upgrading training courses.

As Beijing's "One Belt and One Road" national talent training base and printing industry famous schools, the school actively hosted the national double-creation week series of activities and "One Belt and One Road" national talent training docking activities, and with China Printing Museum, industry associations and China Institute of Printing and Research media and other institutions to maintain close communication and cooperation, based on the letterpress heritage and printing culture mutual examination, printing big data and cloud printing, printing of the new four (green, digital, intelligent, integrated) and other major propositions, Bigger and stronger base brand, in order to further promote the "One Belt and One Road" strategy to do a good job in technical support and service support work<sup>[5]</sup>.

### **3. The Project Practice Effect and Innovation**

#### **3.1. The effect of international practice of printing engineering education**

The pilot construction of the printing engineering majors at the national level and the first-class majors at the Beijing level and the teaching practice of the Bisheng excellent classes have condensed the composite applied talent training model of the integration of industry, science and research, formed a brand and demonstration effect, the prospect of professional enrollment-cultivation-employment integration is good, and the competitiveness of graduates' further education and employment has been significantly enhanced. Professional construction and the achievement of the landmark achievements of teaching resources have laid a solid foundation for the improvement

of printing engineering strength, radiation demonstration and internationalization of education.

"Going out" and "please come in" the internationalization strategy of printing engineering education in the gradual form and steady progress, promote the enterprise deep participation in the training of talents in all links, for China's printing technology and talent output, printing culture exchanges and the expansion of overseas markets to provide a strong support, and gradually cultivate a number of professional literacy, strong practical innovation ability, a broad international perspective of outstanding graduates. Printing engineering graduates (especially after a short period of foreign exchange and study) to Europe and the United States, Australia and Japan to continue their studies in the proportion of higher and higher, professional undergraduate students in the school period has also been a number of enterprises continue to pay attention to.

Printing engineering professional to create a printing civilization heritage experience center, Letterpress lithography workshop and other creative space, so that traditional Chinese engraving skills, lithography and Western convex printing here collision and integration, attracting a group of undergraduates and international students to participate in the practice of innovation activities, the realization of Chinese and Western culture and exchange.

The printing engineering major and School of International Education work together to implement the "please come in" strategy of international student education. The two sides have worked together to develop a training program and curriculum system for international students, created a team of teachers who can carry out all-English teaching, and promoted the undergraduate teaching of international students in an orderly manner. Relying on the production base at home and abroad of the cooperative enterprises of the school and enterprise, gradually formed the international student training-internship-employment linkage mechanism, and promoted the "One Belt and One Road" national printing high-end personnel training and the transmission of Chinese printing civilization.

### **3.2. The characteristics and innovation of the project**

To One Belt and One Road, printing civilization, engineering education, internationalization and other key words as the core, to carry out the internationalization of printing engineering education research, is the ancient and today, China and the West, civilization and science and technology, culture and education, such as multi-level, multi-angle cross-integration, which is a major feature.

To hire overseas excellent teachers to carry out printing engineering undergraduate all-English course teaching, domestic teachers and students to Europe, the United States and Japan and other developed countries exchange learning as two contrasting models, focus on improving students' international vision and international exchange ability; To our school's Institute of International Education to train foreign students to China, printing Confucius Institutes and cooperative enterprises overseas production base training and training of foreign students and technical personnel as two fulcrums, to "One Belt and One Road" as the main chain, for foreign students to carry out printing engineering education and technology output, promote cultural complementarities and talent exchanges.

## **4. The Application and Promotion of Project Results**

In the 2017 Printing and Packaging Industry "One Belt and One Road" International Cooperation Summit Forum, the Publicity Department of the Communist Party of China and the State Administration of Press, Publication, Radio and Television put forward the "Silk Road scholarly project", aimed at improving the "One Belt and One Road" along the country and region publishing and printing practitioners' technical and management level, and for China's printing and equipment, equipment enterprises and products to overseas markets to do a good job of talent. As an important participant, the school proposed that in the training of talents, we should realize the export of equipment, talents and other resources to the "One Belt and One Road" countries and regions through the "production line and people" approach. At the 2018 China Printing Industry Innovation Conference, the school actively promoted the opening up of schools and the education of international students based on the national "One Belt and One Road" policy, and promoted the

development of Chinese printing and publishing culture through the training and exchange of international and professional talents.

At the 2017 Beijing "One Belt and One Road" National Talent Training Base Project Exchange, the school developed the school-based special English courses - "Chinese Culture" series of courses (including "Chinese Printing-A Window to Chinese Culture"), for the service of the "One Belt and One Road" national strategy, training "Chinese known and friendly" wide-caliber composite talent provides an excellent teaching platform. The teaching team of printing engineering has participated in the second to fourth national university printing engineering professional dean/department director forum. Colleges and universities on the first-class professional construction, "new engineering" background printing engineering undergraduate education innovation talent training, printing education internationalization and so on. Our school representatives shared the first-class professional construction practice, the internationalization of printing engineering education, etc., the relevant practices and mechanisms have been recognized by the experts.

At the 10th China printing and packaging academic conference and science and technology integration innovation and development forum in 2019, our university shared the achievements of international standard research on printing, greening and intelligence of printing, internationalization of printing engineering education, and exchanged deeply the foreign academic education projects with Xi'an University of Technology, Anhui Vocational College of Press and Publishing, Shanghai Publishing and Printing College, which was considered to be a pragmatic measure to strengthen "Cultural Self-confidence".

The educational mechanism and achievements of the "Excellent Engineer Education and Training Program" have been recognized by Drexel University in the United States, The University of Leeds in the United Kingdom, Linköping University in Sweden, etc., and have accepted my professional teachers and students to study and exchange, and timely exchange visits to our school. Our cooperative enterprises also specially come to the school to hold recruitment seminars, not only to attract students of the excellent class, but also look forward to African students in the future employment in their overseas branches to play a bridge role.

## 5. Conclusion

"One belt, one road" is the prerequisite and foundation for printing industry to go out in the 14th Five-Year Development Plan. Internationalization is the direction of engineering professional development and the only way to improve the quality of talent training. This paper mainly carries out the beneficial exploration of international education of printing engineering based on the international student education of Beijing Institute of printing, and shares its implementation path, promotion effect and innovation points, which lays a foundation for the professional certification of printing engineering and the audit and evaluation of a new round of undergraduate education and teaching, It has made a good attempt for international talent training and printing capacity output.

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