

# The Establishment and Disclosure of Training Goals for Printing Engineering under the Background of Professional Certification

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**Abstract:** In order to cultivate innovative talents for engineering practice, the printing engineering major of our school has participated in professional certification work. The thesis first introduces the basis of the revision of the training objectives of the printing engineering specialty and the content of talent training. Then the thesis discusses the relationship between professional training objectives and the orientation of the school's undergraduate education, the characteristics of professional talent training, and the needs of social and economic development. It is discussed that the training goal of the printing engineering major is in line with the school's orientation and development needs, highlights the professional characteristics, and also meets the needs of the service industry based in Beijing. Finally, it also sorted out the channels and measures for the openness of training objectives, and pointed out the direction for related propaganda work.

**Keywords:** professional certification, printing engineering major, training objectives, talent cultivation characteristics, outstanding talents, publicity

## 1. Introduction

The revision of the training goals of Printing Engineering in Beijing Institute of Graphic Communication is based on the 2015 training program and in accordance with the engineering education certification standards (2015 edition). This revision is student-centered, guided by the capital's economic development and the talent needs of the national printing industry, and combined with the undergraduate education positioning of the Beijing Institute of Graphic Communication and the characteristics of the printing profession, it is jointly formulated by professional teachers, enterprises and industry representatives. The training goals are open to all teachers and students, both inside and outside the school, and its purpose is to give a general description of the professional and professional achievements that graduates of this major will achieve in the next 5 years.

The training goals are formulated based on the school's school-running positioning and the overall goal of talent training, and combined with the needs of the society and the development of the printing industry for talent training. The goal of talent training determined by the 2016 level training program for printing engineering major is as follows. The training of this major meets the needs of socialist modernization, and the comprehensive development of morality, intelligence, physicality and beauty. Students have a solid foundation of engineering knowledge and basic theories and skills of printing engineering, have a sense of social responsibility and ethical culture, have a sense of innovation and strong engineering practice capabilities, and can be engaged in printing, packaging, publishing, advertising and related industries Composite applied engineering and technical personnel working in process design, technical management, quality control, equipment and equipment marketing, etc.

## 2. Professional Training Objectives and the Orientation of Undergraduate Education

Beijing Institute of Graphic Communication is located in Daxing District, South Beijing-the new gateway to the capital's International contacts. With the mission of "inheriting and promoting printing

civilization, innovating and developing publishing culture", the school opened a precedent for higher education in publishing and printing in China, insisted on taking root in the industry, and made every effort to build an important platform for education and research in the field of publishing and printing.

### ***2.1. The school insists on strengthening the school with talents, and constantly improves the level of teaching staff***

It has a team of industry-leading talents, such as a large number of national and Beijing press and publishing industry leaders, winners of the Chinese Publishing Government Award and Bisheng Printing Outstanding Achievement Award, and Beijing High-tech Innovation Project Leaders. There are a team of specially-appointed part-time professors composed of more than 100 high-end talents in the industry. In addition, it also has a group of high-level talents and outstanding teaching talents, such as experts with special government allowances from the State Council, high-level talents from the Beijing Talents Strong School Program, Great Wall scholars, national outstanding teachers, Beijing outstanding teachers, Beijing science and technology stars, young top-notch talents, etc<sup>[1]</sup>.

### ***2.2. The school insists on innovation-driven, and strives to promote scientific research***

The school has 11 key laboratories and research bases at the provincial and ministerial level and above. It has made a series of achievements in the research and development of printing and packaging materials and equipment technology, the application of new technologies in publishing and printing media, and industry development consulting, etc. It has a number of independent intellectual properties rights in printing inks, environmental protection and smart packaging materials and technologies and promotes its application. It publishes industry development reports such as "China Printing Industry Development Report (2013-2016)" and "Implementation of Green Printing Achievement Report (2012-2017)". It formulates a series of national standards and industry standards, such as the first international standard in the printing field led by China and the application of new technologies for book distribution, etc. It leads the transformation and upgrading of the publishing and printing industry.

### ***2.3. The school adheres to the awareness of the best and is committed to serving the industry and the development of Beijing***

Centering on the school-running characteristics of "creative design, integration of art and industry", the school has formed a dual innovation development model "one hospital and three parks": based on the scientific research achievement transformation platform of Beijing Institute of Green Printing and Packaging Industry Technology, with the University Science and Technology Park, Cultural and Creative Industry Park and University Student Innovation and Entrepreneurship Park supporting each other and integrating development, to form the double highlights of "Beijing Science and Innovation" and "Beijing Cultural and Creative", and build an integrated industrial complex of production, education, research and use. The school carries out a series of research on scientific and technological research, creative design and consulting decision-making. These activities revolve around large-scale national events, the development of national strategic emerging industries, the construction of Beijing's "four centers", and the transformation, upgrading and integrated development of the publishing and printing industry. And on this basis, it has created a batch of high-level cultural and creative works that serve major national events, and has obtained a batch of research results highlighting the characteristic service industry and the capital, such as the "Guidelines for the Upgrade of Beijing's Publications Printing Guarantees Capital Core Function Construction".

School orientation is that the school always adheres to the socialist direction of running a school and fully implements the party's educational policy; adheres to the fundamental task of cultivating people with morality, inherits and promotes printing civilization, and innovates and develops publishing culture; "School", take the road of connotation, characteristic, and differentiated development; insist on being based in Beijing, rooting in the industry, and building a distinctive, high-level publishing and communication university.

The general goal of the school's talent training is that cultivate compound application-oriented senior professionals who are responsible for national rejuvenation, have a sense of social responsibility, innovative spirit, practical ability and comprehensive qualities.

Printing Engineering is the school's oldest major and the core major of the school's engineering professional group. Based in the capital, it will cultivate printing engineering composite

application-oriented engineering and technical personnel for the Beijing-Tianjin-Hebei region and the whole country. On the basis of in-depth research and full demonstration, the professional talent training goal is established in accordance with the school's school positioning and the general goal of talent training, combined with the characteristics of the specialty. The goal is to guide students to have a sense of social responsibility and ethical culture, have a sense of innovation and strong engineering practice capabilities, and become a composite application-oriented engineering and technical talent in process design, technology management, quality control, equipment and equipment marketing, etc.

The printing engineering major is a pilot major of the Ministry of Education's "Excellent Engineer Education and Training Program", which requires students to fully participate in enterprise practical learning and technological innovation. Schools and enterprises jointly formulate training programs, strengthen the integration of production and education, strengthen school-enterprise collaborative education, and improve the quality of training applied innovative talents. The professional training goal is in line with the school's talent training positioning and the collaborative education model of government, industry, university and research. Printing Engineering has also become one of the school's three characteristic disciplines in printing and packaging. In addition, it is also an important part of serving the Beijing-Tianjin-Hebei regional economy and the development of the national publishing and media industry<sup>[2]</sup>.

### **3. The Relationship between Professional Training Goals and Professional Talents Training Characteristics**

This major is based on modern printing technology, information science technology, and material science technology. This major is characterized by the combination of printing technology and digital information technology, the application of computer integrated printing systems, and the application of functional printing product manufacturing technology. This major is outstanding Cultivation of printing technology application and process design and development capabilities in a digital environment, cross-media information processing and dissemination capabilities for media integration, and digital manufacturing capabilities for functional printed products.

This major has constructed a school-enterprise joint training model of "four combinations" and "four transformations". Further highlight the professional characteristics. Implement the "four combinations" of "the combination of basic knowledge education and cultural quality training, the combination of professional theoretical education and practical skills training, the combination of quality education and the cultivation of innovative spirit, and the combination of basic skills training in school and practical production applications outside the school". This application-oriented high-level specialized talent training model highlights the cultivation of engineering practice capabilities. Implement the "Four Changes" of "talent training specifications is changed from unified specifications to individualized development, talent training methods are changed from simple course teaching to improving engineering quality, knowledge learning and application is changed from imparting knowledge to engineering capabilities, and printing production awareness is changing from basic skills training to comprehensive engineering training ". The "Four Changes" education and teaching methods of "change" focus on the cultivation of comprehensive quality and enhance the ability of innovation and entrepreneurship.

### **4. The Relationship between Professional Training Goals and the Needs of Social and Economic Development**

The "Cultural Industry Revitalization Plan" adopted by the State Council in July 2009 clearly pointed out that the printing industry is one of the nine major cultural industries in China. The cultural industry is the country's key development industry. It is also the supporting industry of the "cultural center", which is one of the four major functions of the capital. The printing industry has the dual attributes of culture and manufacturing, and is an important part of China's cultural industry. China is the second largest printing country in the world. As of the end of 2019, after industrial optimization and adjustment, China has 97,000 printing companies with 2.58 million employees, achieving a total printing output value of 1.38 trillion yuan, and key printing companies above designated size (annual revenue) The total output value is 804.7 billion yuan, a year-on-year increase of 5.04%. The goal of the "Thirteenth Five-Year Development Plan for the Printing Industry" issued by the former State Administration of Press, Publication, Radio, Film and Television in April 2017 is: "Promote China's printing industry to accelerate the development of 'green, digital, intelligent, and integrated'. Promote

the optimization and upgrading of the industrial structure, increase the level of large-scale intensive specialization, and realize the initial transformation from a printing power to a printing power." On September 19, 2019, the Press and Publication Administration, the National Development and Reform Commission, the Ministry of Industry and Information Technology, and the State Administration of Market Supervision of the Ministry of Ecology and Environment jointly issued the "Opinions on Promoting the Green Development of the Printing Industry"<sup>[3]</sup>. The opinions pointed out that we must adhere to the correct political orientation, highlight the problem orientation and the effect orientation, deepen the supply-side structural reform of the printing industry, strengthen the design of the printing industry's green development system, promote the overall upgrade of the printing industry's green development, and promote the printing industry through innovation High-quality development. During the "14th Five-Year Plan" period, the "Four Modernization" will still play a leading and leading role in the development of the printing industry.

#### ***4.1. Based in Beijing, delivering outstanding talents for the economic and social development of the capital***

The functional positioning of Beijing's "four centers" has led to a strong demand for printing talents. There needs to be a group of printing companies with confidentiality qualifications to serve the central and state agencies, the military and other units, a group of cultural and creative and publishing companies that meet the cultural and educational needs of citizens and improve the cultural quality of the capital, and a group of representatives of the printing industry. A cross-media and digital printing company in the future. The Beijing Institute of Graphic Communication takes "based on Beijing and serving the capital" as its purpose. This major is responsible for cultivating forward-looking and innovative engineering practice talents for Beijing's economic and social development, cultural creativity, publishing and other industries. The printing industry will continue to be an important position for the party's propaganda and ideological work when it is gradually transforming and upgrading to the cultural and creative industry. According to the "Guidelines for the Construction and Upgrading of Beijing's Publication Printing Services for the Core Functions of the Capital", in order to improve the ability to serve the capital's core functions, and to promote the high-quality development of Beijing's publication printing, in June 2019, the Propaganda Department of the Beijing Municipal Committee of the Communist Party of China recognized 22 companies including Beijing Artron Art Printing Co., Ltd., Beijing Shengtong Printing Co., Ltd., and Beijing Lifeng Accor Great Wall Printing Co., Ltd. "Protecting enterprises" to protect the core functions of serving the capital, such as important party and state documents, major theme publications, important newspapers and periodicals, and textbooks for primary and secondary schools in the city. It also focuses on printing products that ensure the maintenance of the functioning of the capital city, such as children's publications and publicity, art, cultural and creative, secret-related, bills, and functional printed materials. Give priority to service guarantee tasks<sup>[4]</sup>.

#### ***4.2. Serving the industry to meet the demand for human resources in the reform of the printing industry***

In the future, printing companies should provide customers with new features and high value-added products. On-demand printing, green innovation, and intelligent manufacturing are the inevitable development trends of future printing. Based on the new development direction, industry enterprises have more urgent needs for all-round development of talents, and put forward higher requirements for the quality of diversified talent training. Facing the opportunities and challenges of the new situation, this major has passed all-round reforms and practices: innovation of talent training model, core curriculum design, design of practical links, transformation of scientific research results, etc. This series of reforms has gradually achieved results in the areas of printing creative design competitions, Construction of government-industry-university-research base, student exchange programs, education of outstanding engineers, international training, and industry-leading technology research. At the same time, through flexible introduction of Overseas Hi-Tech talents and National high-level talent Program professors, leading the development of industry technology, strengthening school-enterprise interaction and integration, and building national, provincial and ministerial educational resources and sharing platforms. Broaden students' horizons, make talent knowledge structure and practical skills training oriented to the entire industry chain, and meet the needs of industries and enterprises for high-end talents.

The development of the industry requires technological innovation and progress, and it is also

inseparable from the guidance of macro-industrial policies and the support of intellectual resources. A series of industry development reports under the guidance of the Printing and Distribution Bureau of the Central Propaganda Department and the school's participation: "Research Report on the Development of China's Printing Industry", "Research Report on the Development of China's Printing Industry (2013-2016)", and "Technical Development Route Map for China's Printing Industry (2016-2025)" "The Yangtze River Delta Region Printing Industry Integrated Development and Upgrading Guide", "The Pearl River Delta Printing Industry Development and Upgrading Guide", "Quanzhou Printing Industry Transformation and Upgrading Route Map", etc., to provide intellectual support and data reference for the development of national and local industries, It also reflects the professional's ability to control the technological development of the industry. In the past five years, this major has presided over 10 National Natural Science Foundation of China, 20 provincial and ministerial scientific research projects, more than 50 enterprise horizontal cooperation projects, and solved a number of key technical problems in green printing and digital printing; presided over a number of international, national and Compilation of industry standards, won 2 second prizes of Beijing Science and Technology Progress Award<sup>[5]</sup>.

## **5. Cultivating Channels and Measures for Openness to the Target Society**

The school is located in southern Beijing, adjacent to the National New Media Industry Base, Beijing Daxing International Airport Economic Zone, and China (Beijing) Pilot Free Trade Zone high-end industrial area. As a local college and university in the district, serving the local economic and social development of Daxing District is an unshirkable responsibility of the school. The school attaches great importance to publicizing and publicizing the training goals to the society, and mainly uses the following methods to make students, teachers and the society understand the training goals of this major.

### **5.1. Channels and measures to publicize training goals for students**

#### **5.1.1. Publicity through freshman enrollment education**

Entrance education for freshmen is the first lesson of university education. The purpose is to let freshmen understand the school's characteristics and advantages, understand the college's professional settings and subject advantages, and deepen students' understanding of the training goals of professional talents. The heads of the colleges and majors respectively preached the professional training goals from different angles, and the head teacher and academic tutors carried out publicity and education to the students by holding thematic class meetings to guide the students to clarify the training goals and training programs of the major. At the same time, in courses such as Introduction to Printing Engineering, students are guided to understand the professional training goals and future service areas as soon as possible, to enhance the self-consciousness of learning, and to lay the foundation for personal career planning.

#### **5.1.2. Publicity through classroom teaching**

Majors are taught through four-year university teaching activities, especially through professional course lectures, professor lectures, professional introduction, student academic guidance, professional internships, graduation design practice and other teaching links to deepen students' understanding of the training goals of the major. The professional introduction courses are set up in this major to publicize the development history, current situation and frontier trends of the major. In the professional courses, students are guided to deepen their understanding of the professional training goals by introducing the support relationship of the course goals to the graduation requirements and training goals.

#### **5.1.3. Publicity through daily management**

In their daily management, counselors, class teachers, and academic tutors provide guidance on professional learning and academic planning through class meetings, lectures, seminars, individual counseling, etc., to help students understand the training goals of the major, and guide students to understand and clearly learn early Professional content and development direction.

## **5.2. Channels and methods for teachers to publicize training goals**

### **5.2.1. Publicity by revising the training plan**

The training plan is revised every four year, and the teaching plan is fine-tuned in accordance with the actual situation every year. The professional person in charge (or department head) organizes a training program revision team composed of teachers to propose a revised draft based on the opinions of industry experts and the results of social needs surveys, and it is reviewed and approved by the college's teaching work committee. Through in-depth participation in the revision of the training plan, teachers further understand the professional training goals and graduation requirements and implement them in the course teaching.

### **5.2.2. Publicity through the revised syllabus**

Major revise the curriculum syllabus in real time according to changes in training objectives and training programs. In the revision of the syllabus, it is stipulated that the syllabus should clarify “the corresponding relationship between the curriculum objectives of the course, the curriculum objectives and the relevant graduation requirements index points, the correspondence between the curriculum objectives and the teaching content and methods, and the curriculum assessment methods”. Through the drafting and review of the syllabus, the syllabus makers, verifiers and executors deepen their understanding of training goals and graduation requirements.

### **5.2.3. Publicity through various meetings**

Teachers can understand the training objectives and training plans of their profession, and grasp the direction and ways of training talents of the profession by participating in the college teacher conference, new teacher pre-job training, teaching seminars, class teachers and academic tutors and other ways.

## **5.3. Channels and methods to publicize training goals for graduates and alumni, society and employers**

### **5.3.1. Admissions Promotion**

Schools and majors make full use of media such as broadcasting, the Internet, and newspapers to actively publicize the school's enrollment and professional training goals every year, so that candidates, parents and the society can understand the professional training goals in a timely manner. At the same time, the professional training goals and professional characteristics will be made into various publicity color pages and other materials, and sent to the middle schools of the provinces and cities, and the provincial and municipal examination institutes and high school recruitment offices across the country; During the enrollment promotion period, the school carefully produced environmental protection bags, posters, etc., and distributed them widely in the promotion activities; The school also organizes professional teachers to conduct enrollment publicity in relevant middle schools in Beijing, introduces professional training goals and professional characteristics, and attracts outstanding students to apply for our school<sup>[6]</sup>.

Since 2007, the school has held a campus open day event every year. On the day of the event, college entranced examination candidates and parents are widely invited to visit the school. Professional teachers, department heads, professors and other professional teachers actively participate in campus open day activities to introduce professional training goals to students and parents.

### **5.3.2. Publicity through the admissions information network and the college homepage**

Majors are prominently located on the admissions website and the college homepage, introducing major training goals, employment prospects, and expectations for training students. The school conducts a questionnaire survey of freshmen entering the school every year, and actively improves work based on the candidates' concerns.

### **5.3.3. Publicity to employers through campus job fairs.**

Every fall and spring, the school holds a graduate employment double election meeting. Through the double-election meeting, graduates and teachers introduce the professional training goals to the participants, so that the society and employers have a deeper understanding of the professional training goals.

### **5.3.4. Publicity through corporate internships, corporate cooperation, corporate research, etc.**

Through the internships between teachers and students in enterprises, and the exchange of scientific research between teachers and enterprises, this major will promote the training goals and professional characteristics of the professional to the cooperative enterprises in a targeted manner. Based on the opinions and suggestions of cooperative enterprises, this major offer targeted courses and practical links in the student training link.

## **6. Conclusion**

This paper discusses how to establish and open the training objectives of printing engineering under the background of professional certification. It first introduces the basis of revising the training objectives of the printing engineering specialty and the content of personnel training. Then it discusses the relationship between the professional training objectives and the orientation of undergraduate education, the characteristics of professional personnel training, the needs of social and economic development. The training objectives of the printing engineering specialty are in line with the school's orientation and development needs, highlight the professional characteristics, and meet the needs of Beijing based service industry. Finally, the publicity work of the training objectives is combed.

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