The Construction and Practice on Excellent Engineer Innovative Talents Training Mode under the Transformation and Upgrading of Printing Industry

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Abstract. Since “13th Five-Year”, the printing industry has been restructuring and upgrading, and has showed well future development prospects, so it has still maintained a strong demand on the high-end technical personnel. This paper briefly analyzed the cultivation ways of “excellent engineers” innovative talents, also introduced the achievements of the talents cultivation mode on the teaching reform, teaching resources construction and students ideological situation, students' ability of engineering practice in the past three years. Finally, it pointed out that the "excellent engineer" innovative talents training mode has been recognized by similar institutions, society and industry, and has been strong demonstration and international influence.

Introduction

In 2009, the State Council promulgated the "cultural industry revitalization plan", and it was clearly pointed out that the printing industry was an important engineering and technical support for cultural and creative industries as one of China's nine cultural industries. In July 2016, it was pointed out that the situation on integrated development among culture, technology and other related industries would gradually form in Beijing "13th Five-Year" cultural and creative industries development plan, and. It should focus on the development of green printing and on-demand printing, and promote the "sophisticated" cultural and creative industry system construction. In the mid of 12th Five-Year Plan, especially after 13th Five-Year Plan, from the industrial transformation and the expected goal of better development, based on powerful drive of the national innovation strategy, "Internet plus" strategy, the good policy for cultural and creative industries and the growth of social consumer goods retail market, Chinese printing industry has showed a good momentum of development, and still remained the strong demand for high-end innovation talent in engineering technology.

In order to carry out and implement national education reform and development programs for medium and long-term (2010~2020) and national talent development plan for medium and long-term (2010~2020), The Ministry of Education started the excellent engineer education cultivation program in June 2010, and it aims to train and bring up a large number of high-quality engineering and technical personnel who have strong innovation ability and meet the needs of economic and social development. Beijing Institute of Graphic Communication is one of the second batch construction units on excellent engineer education cultivation program of The Ministry of education (printing engineering is one of the trial majors), and took part in the establishment of the Beijing city university union on excellent engineer education cultivation program in January 2012. In November 2012, the school issued the excellent engineer education and training plan, and excellence program trial class - "Bi Sheng excellence class" came the opening ceremony, which marked the high-level innovative talents training work getting to a newer and higher development stage.
The Effective Way of Constructing Innovative Talents Training Model for Printing Excellent Engineer

School refined the new “Three Integration” ideas for talents cultivation as the printing culture elements integrating quality education, the elements of innovation and entrepreneurship integrating into professional education, the business practice elements integrating into engineering education, and also refined the new "Two Services" target for talents cultivation as serving the demand for printing industry transformation and upgrading, serving the demand for the collaborative development of Beijing, Tianjin and Hebei. We drew up the prospective printing professional direction and training system for excellent engineer, and created a "Five in One" complete platform for innovative education as “cultural lead, comprehensive training, scientific research, practice innovation and enterprise practice", and formed of teaching resources sharing and operation mechanism for the inside and outside of curriculum, major or region [1]. Through the following measures, school has established an innovative talents training mode featuring "knowledge imparting, ability training and diathesis improvement".

Formulating the major orientation, updating the curricular system, optimizing the knowledge structure, and then enhancing the major attraction based on characteristic major construction and “two trial projects”. Printing represents dual features of culture and manufacture, which is one of the nine components in cultural creative industry and is also crucial to technical support. The printing engineering in Beijing Institute of Graphic Communication is the national characteristic specialty. Through explaining the policy, analyzing printing industry, investigating on-the-spot, planning personal career, adding printing culture elements and then combining with successful case, school has completed the major education and strengthened the identification to printing industry. Nowadays, with the development of “Internet Plus”, “made in China” in 2025 and tide of greening, a printing factory of wisdom and green printing are going to appear. In the meantime, grasp the opportunity of “Excellent Engineer Plan Trial” and “Professional Comprehensive Reformation Trial” in Beijing to found the “Bisheng Excellence Class” and further promote “the quality of undergraduate education and the project of educational reform”. Since 2013, the project team has put emphasis on organizing three projects of Beijing educational reform and three major projects in school-level [2]. By done those, the project team have further explored and effective assessed for frame system, main content, implementing method and application effect of the “excellent engineers” innovative talents in the field of printing. And the new idea and new mode for cultivating applied advanced technology talents are concluding gradually.

In addition, the university set up three professional orientations as digital printing and cross-media dissemination, printing manufacture and integrated printing, and put up Chinese Culture History, Chinese Printing, Publishing Introduction, Art Introduction, 3D Printing Technology and Application, the Theory and Technology of Cross-Media Dissemination, Functional Printing and Modeling Materials, Digital Interactive Media Technology, Management overall planning in curriculum system. The scale of updating professional curriculum was over 30%, which optimized students’ professional knowledge structure, and it is beneficial to cultivate high-level comprehensive professional talents and achieve the “Two Services”.

Creating the first-class education platform and resources, promoting the deep school-enterprise cooperation, and improving students’ innovation consciousness and practical ability with the core of “three integration” talent cultivation idea. In the “Three Integration” talent cultivation idea as the starting point, school built the Chinese Printing Museum, Printing Engineering Comprehensive Training Center, Printing Electronic Engineering Training Center, Printing and Packaging Comprehensive Innovative Practice Base, Beijing Artron External Talent Cultivation and other municipal or national level of practice and innovation platform into a “Five in One” innovative practice system [3]. The project team urged the enterprise to involve the school’s training courses deeply, played a role in school-enterprise interaction and enhanced the character of engineering practice in talent cultivation mode. For example, school set the high practical courses of
Digital Interactive Media Technology, Color Management and Printing Process into practical courses. Both school and enterprise made jointly the practical plan, and the enterprises dominated the teaching and testing process. The project team actively hosted or organized students to participate in the top of professional skills contest or the domestic and foreign academic competitions and innovation activities, by emphasizing the connection between learning and searching, promoting studying and working [4]. Through the combination of competition and training, school trained students’ innovation consciousness and practice ability. At the same time, the project team concentrated on guiding students with special skills to join the professional skill assessment which used as an optional to train innovate talents with comprehensive quality, achieving the effect that teaching the students on ones’ need, cultivating the students separately as individuals. Through systematic practice training and innovative ability cultivation, students could change their roles quickly to achieve the requirement of the occupation, and develop their professional advantages gradually so as to improve their employment.

Taking “two services” as the target, carrying out the education reform, putting the teaching management and operation mechanism of multi-level resource sharing into effect, opening the vision of students, and improving comprehensively students’ comprehensive quality. The project team developed steadily Beijing higher education reform program and school level key reform project. It has been focused on the theme of the excellent engineer innovation and entrepreneurship training and engineering practice. In addition, the project team also took part in three Beijing higher education reform project and one school level key reform project. The one of the Beijing higher education reform project "exploration and practice of innovative talents training mode encouraged the going and trying beforehand through the Beijing Institute of Graphic Communication" high level talents cross fostering plan, adhered to problem oriented, explored a new idea of cooperative education, which is guided by "outside training program" and "teaching community with dual training plan", and has achieved remarkable results in education and teaching reform [5].

Based on the cross regional exchange of learning and foreign training, double training and practical training in Beijing, the project team actively carried out students exchange learning activities with domestic university (such as Tianjin University Of Science and Technology, Hangzhou Electronic University Of Science &Technology Of, etc.), which enriched experience and extensive knowledge. Besides, school also promoted mutual training and collaborative instruction on graduation design, student innovation programs with foreign universities (such as Taiwan arts university, Bauer State University of USA, etc.), domestic universities and research institutions (such as Beijing Jiaotong University and Chinese Academy of Sciences, etc.), which expanded external superior resources, enriched practice and innovating teaching means, greatly broadened the horizons of students and improved their comprehensive quality. The multi-level resource sharing system enables students to have more choices, and it not only meet the actual needs of the industry, but also focused on the future industrial upgrading and the region coordinated development of Beijing, Tianjin and Hebei.

The Application of Creative Talents Training Mode

This creative talents’ training mode not only has achieved remarkable application in Beijing Institute of Graphic Communication, but also promoted an excellent demonstration effect in Jing-Jin-Ji region as well as similar colleges and universities.

Enhancing students’ sense of identity with print culture and industry, improving substantially their practice innovation abilities, international vision and comprehensive quality. In recent years, by combining the teaching processes including special major courses, special training in enterprise, summer social practices and so on, the project team has developed cooperation between teachers and students for Print Culture Quest, in which we can know the development history and current situation of printing industry, we can shoulder the mission and commitment to transmit printing civilization [6].
In the process of talents' training, the project team attached great importance to guiding and tempering students’ ideological and moral quality, as a result, class studying atmosphere improved significantly. 2012, 2013 and 2014 Bisheng Excellent Classes and their league branches gained many reputations such as “Beijing Advanced Class Collective” and “Beijing Pioneer Cup Excellent League Branch” for nearly three years. 2013 Bisheng Excellent Class was successively awarded the honorary title “Excellent grass-roots organization” of Beijing universities and the league branch of 2013 Packaging 1 Class was honored with “Demonstration League Branch” in practicing the core socialist values among institutions of higher education in 2015.

In the big competitions, for example, China printing industry job skill competition, SHOTS global competition, National college context of packing structure design, "Sun cup" Asian label design Grand Prix, College students “Internet Plus” innovation and entrepreneurship competition, "Challenge cup" capital university student extracurricular academic science and technology works competition, students have made remarkable achievements including national awards 32 items, the province departmental level awards 55 items, high-quality papers 25 pieces, authorized patents 3 items.

Students not only go to overseas colleges and universities such as Michigan State University, Bauer State University, Suffolk University, National Taiwan University of Arts to carry on academic exchanges, and also greatly improve their practical innovation ability, international vision and comprehensive quality by learning the intramural English teaching courses, bilingual courses and professional training courses [7].

The teaching resources, teaching materials and the construction of teaching staff were advanced, and the reform in education has achieved remarkable results. In the past five years, municipal platforms such as the Integrated Training Center for Printing Engineering and the Integrated Innovation Practice Base of Printing and Packaging have been accepted or approved successfully by the public [8].

"Packaging and Printing Technology (Second Edition)" was named the National Boutique Textbook (2015), "Digital Prepress Processing Principles and Technology" was rated as Beijing Boutique Textbooks (2013), "Postpress Technology" was rated as the Excellent Textbook for Chinese Light Industry (2014).

The comprehensive quality of the teaching staff has improved significantly. At present, there are 34 full-time teachers in the printing industry, with doctorate degrees, senior titles, and teachers under the age of 45 accounting for about 50 percents. Among them, 2 people won the Beijing Teaching Master Awards, 1 person won the Beijing High Innovation Program Leading Talent Award, 2 people won the title of Beijing Excellent Teacher, 2 people are the member of ISO-TC130 (International Printing Standardization Organization), 3 people won the title of National News and Publishing Industry Leader, 1 person received the award for Outstanding Achievement in Printing, 5 people won the Bisheng Awards or Senzeev awards, 1 person was awarded the title of 100 Scientific and Technological Innovation Pacesetter in the National Printing Industry, 2 people received the Beijing Science and Technology Nova, 6 people won the National Science Youth Fund, 10 people get the qualification of National Referee in Printing Professional Skills Contest, and 2 people were international G7 certification qualification.

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References


