



Discussion on the Cultivation of Talents Integrating Industry and Education Through “Collaborative Education” in Industrial Design Major

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Abstract. Based on the reconstruction of the social value chain, it is proposed to build a “collaborative education” community of industry and education that crosses the boundary of industry, industrial design and education, and integrates with each other. Enterprises and universities can realize the transformation from “cooperation” to “integration” through exploring new and effective teaching organization forms, identifying the problems restricting the cooperation between industry and education, and organizing the “collaborative education” integrated teaching of industry and education, the “collaborative education” of industrial design major is studied as an example. School-enterprise cooperation provides students with practical training opportunities and cultivates backup talents for enterprises. This cooperation also plays a role of publicity and promotion for the local government and provides a new teaching theory for the in-depth integration of education and breakthrough research in China.

Keywords: Industrial design · Collaborative education · Integration of industry and education

1 Introduction

Since 2014, “collaborative education” and “industry-education integration”, as “hot words” in the field of education, have appeared in national education policy documents

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such as the development of modern university education, the construction of “double First-class” and the transformation of application-oriented universities. “Collaborative education” and “industry-education integration” have become an important mechanism for China to optimize the supply-side structure of higher education and improve the quality of education. As the main supplier of industrial talents in product design, industrial design has always been the typical and pioneer of “collaborative education” integration of industry and education. However, for a long time, due to the mutual restriction of industrial innovation and education development, the imbalance between education chain and industrial design talent training chain, and the mismatch between talent chain and industrial chain, some phenomena happened, such as the lack of drive, integration without combination and a mere formality of the combination of school and enterprise training. Because “cooperative education” integration involved different level of cooperation between colleges and enterprises, there was a gap between talents training pattern and education subject with the deepening integration between colleges and enterprises. It would lead to set-off or be rejected, which will cause the restriction to coordinated development between industrial design industry and the education training mode; In the teaching practice, many colleges and universities industrial design major in the implementation of “collaborative education” integration of industry and education, there is an imbalance phenomenon of “school enthusiasm, enterprise in difference”. During the period of industrial upgrading and critical period of reform of the supply side, in the face of industrial products consumer fission violent growth and promotion of Chinese culture industry innovation, a series of problems, such as how to connect industrial design system of industrial organization with school teaching closely, how to develop industry-education integration, needed to be figured out theoretically and practically in order to meet the needs of regional economic development and talent market and the reform of higher education. The present situation of education shows that schools and enterprises must break down the barriers of cooperation in order to truly realize the deep integration of “collaborative education”.

The core of “collaborative education” lies in “integration”. In 2019, the Responsible departments of the Chinese government issued the Implementation Measures for The Construction of Industry-Education Integration Enterprises (Trial), The Implementation Plan for the Pilot Construction of National Industry-Education Integration, and the Work Plan for The Pilot Construction and Cultivation of National Industry-Education Integration Enterprises, which sublimated the integration of industry and education to promoting the integration of education chain and industrial chain. It puts forward a new point of view and a new direction for the integration of educational system and industrial system. Discussed based on the characteristics of industrial design major, based on the reconstruction of the social value chain, plans to build across the cultural innovation of industrial design industry, education, border mutual harmony symbiosis of fusion community education, collaborative and educating people crack restriction cooperation, to explore the mutual harmony symbiotic ecosystem made with fusion, synergy and educating people from the transformation of “cooperation” to the “convergence”. To provide new ideas for the in-depth integration and breakthrough research of domestic education, and promote the development of the combination of theory and practice.

2 Relevant Research in China and Abroad

2.1 Relevant Research in Developed Countries

Developed countries have a lot of successful experience in the “collaborative education” talent training mode of industry-education integration, which can be summarized as the following three modes:

- Enterprise-led mode

This mode is characterized by corporate training, supplemented by regular school teaching. For example, enterprise training education in Japan and “dual system” education in Germany. Students spend half of their academic time studying in vocational schools and the other half working as interns in companies.

- School-enterprise model

This model is characterized by the close combination of practical labor and school teaching, and its reference significance lies in the cultivation of students’ practical application ability. The CBE cooperative education model in the United States determines the goal of vocational ability training based on the needs of social talents. The significance of learning and reference lies in taking the market as the guidance, allowing enterprises to participate deeply and cultivating students’ working ability. In addition, the “sandwich” education mode in Britain also requires students to go to enterprises for practical training and internship during the whole training period, which is similar to “sandwich” in form.

- School-led mode

This kind of model takes the school as the center and focuses on cultivating students’ comprehensive ability. In France, apprenticeship training is conducted alternately between work and study. Students spend 2/3 of their time receiving training in enterprises and 1/3 of their time studying in apprenticeship centers. “Cooperative education” made with fusion model from abroad, government played the role of the financial support and policy guidance, and stressed the synergy of the government, schools, enterprises, in staffed, funds investment, played an important role in such aspects as curriculum, has obtained the good training effect, These teaching methods of cultivating talents are worthy of reference for technical application-oriented universities.

In addition to the above research results on the industry-education integration model of “collaborative education”, scholars in developed countries have also carried out collaborative promotion from aspects of “elements of cooperation” “collaborative education”, “mechanism and guarantee of industry-education integration” and so on.

2.2 Relevant Research in China

As early as the 1980s, China first put forward the slogan of “integration of schools and enterprises”, and in 2011, put forward the theory of “integration of industry and education”. It was not until 2013 that “collaborative education” and “industry-education integration” were clearly regulated. Due to the complex problems in the process of “collaborative education” industry-education integration in China, domestic scholars have

made many beneficial explorations in the research of “collaborative education” industry-education integration from different aspects. The research content mainly focuses on “collaborative education”, “extension and expansion of the connotation of industry-education integration”, “influencing factors”, “research on integration and cooperation mode”, and “mechanism and system construction”. Chinese scholars also use the theory of factors of production, the “three helix” theory and the “stakeholder” theory to study the realization path of “collaborative education” and “industry-education integration”, which plays a certain role in promoting the development of “collaborative education” and “industry-education integration”.

With the rapid development of China’ industrialization and the needs of the transformation and development of higher education, the results of the integration of industry and education of “collaborative education” in industrial design major are also constantly enriched. Most of the research focuses on the discussion of professional “collaborative education” mode of production-education integration, education mode and other aspects, and the early focus on the research object is mainly focused on China’ vocational colleges. From the point of view of the existing results, most of them are the research results of vocational and technical colleges in the empirical research on the integration of industry and education in “collaborative education”. Limited by the scope of research, the problems reflected in the “collaborative education” industry-education integration are applicable to different objects and different schools, which is difficult to truly reflect the current situation of “collaborative education” industry-education integration in China. There are a series of problems in the integration between industry and education, such as the lack of practical research results; Practical research is disjointed from local employment, and students recruited by enterprises cannot directly take up posts and need secondary employment training; The operability of the suggestion of teaching correspondence is not strong. Industrial design specialty as a practice, it is necessary to strengthen the depth of fusion research production and education, encourage education and enterprise integration, synergy and educating people push applied universities, industrial organization, government, social organization continued cooperation continued to deepen, breeding value points, and eventually form a resultant force broken path.

3 The Framework for the Integration of Industry and Education of “Collaborative Education” in Industrial Design Major

3.1 The Connotation of “Collaborative Education” Integration of Industry and Education

The deep cooperation between schools and enterprises and the integration of industry and education have become a community of “collaborative education”. The word “community” first appeared as a sociological concept, proposed by the German sociologist Ferdinand Tönnies in his book *Community and Society*. Tönnies defined the concept of “community”: “a group formed through a positive relationship, a unified combination of internal and external functions, is a realistic and organic combination of life.”[1] Collaborative education” and “industry-education integration” community are effective

new teaching organization forms on the basis of industry-education integration and community. On the basis of integrating the core of “triple helix” theory practice and value tension, the organization focuses on and promotes the spiral balanced and benign development shared by universities, industry and government. At the same time, more colleges and universities, industry, government, society, outside embedded within drivers drive, drive elements combination of catalytic and interactive driving factors, overlap together mutual benefit and reciprocity, mutual superposition gain of a form of talent cultivation education structure reengineering, has the interest, the network multiple attributes, value and responsibility, Thus constitute a “university - industry - government - society” cooperation and interaction win-win model.

3.2 The Deep Integration of Industry and Education

The integration of industry and education of “collaborative education” involves the theme of multi-party cooperation, and it is the builder and promoter of the community of industry, school and researcher. As different social organizations, these three elements are different in their essential attributes, demands and social functions, so they need to run in and blend together to seek harmonious development. Therefore, actors with different capital depend on each other and restrict each other, forming a dynamic relationship of integrated development. The interaction and influence of these three elements constitute a complex social system and sustained social relationship of industry-university-research cooperation [1].

First of all, from the industry system, the deep integration of production and education demands is to rely on social innovation forms, innovation industry, is based on the regional economic development and cultural industry transformation and upgrading of industrial design, to promote cultural creative industries actively involve in “cooperative education”, stimulate creative industry innovation training function and to provide training for industrial design talents with the deepening of integration of industry and education; Secondly, from the perspective of application-oriented universities, it should tailor to the needs of industrial enterprises and provide guidance for local industrial design majors to cultivate application-oriented talents with combination of the characteristics of industrial clusters, professional groups and talent training approaches with an aim to improve talent ability and the quality of benign teaching. Thirdly, from the perspective of the government, it is necessary to provide policy suggestions to promote the integration of industry and education through “collaborative education”, implement relevant institutional guarantee, and systematically design the integration mechanism of industry and education from the macro and overall perspective. Thirdly, from the perspective of social organization, it can fill the vacancy of talent demand for skills and social service functions, promote economic and social development, and realize the superposition and gain of talent cultivation, social service, knowledge creation and other functions. Industrial design major, the author of Jiangsu university of science and technology in recent years to develop talent training outside school practice bases construction, for example, Jiangsu Yuyue Medical Equipment & Supply Co., Ltd., changzhou FRP shipbuilding Co., Ltd., German love d door industry (kunshan) Co., Ltd, ma on shan embellish grain classical annatto products Co., Ltd., west group jiujiang lai, the boat

industry Co., Ltd. School-enterprise cooperation provides practical training opportunities for students, cultivates reserve talents for enterprises, and promotes publicity for local governments. Schools, enterprises, students and the government have given good feedback, promoted the development of industry-education integration, and constantly innovated and optimized, and achieved gratifying results.

3.3 “Collaborative Education” Policy and Market Development

With the change of economic development mode and the adjustment of industrial structure, industrial design has rapidly developed into a pillar industry of creative product design, and industrial design is in the ascendant. As a professional with clear industry orientation, industrial design focuses on cultural creative industry, product design and other fields, and carries out the integration of industry and education to jointly cultivate creative talents with professional operation skills in applied design and service. The Chinese government has issued relevant policies on collaborative education, requiring universities and colleges to strengthen discipline construction, encourage university students to actively participate in innovative and entrepreneurial activities, and effectively improve their practical ability. At present, the demand for cultural creative design talents in the industrial design market is increasing year by year. Creative design talents with strong professional skills are favored, and composite cultural creative design talents with comprehensive knowledge are more in demand. The emerging field of complex and cross-boundary industrial design culture and creative design has become a big gap in talent demand, and talents with advanced innovation ability have become the trend of social demand.

The reform of the industry requires the industry and enterprises to deeply participate in the various links of talent training. The 19th National Congress of the Communist Party of China has clearly proposed “deepening the integration of industry and education and school-enterprise cooperation”. From the “13th Five-Year Plan” to the “13th Five-year Plan” for education, the integration of industry and education has been repeatedly emphasized as an important content, rising from vocational education policy to national talent training strategy. [1] Therefore, from the perspective of external factors, policies and market demand promote the rapid growth of the industry-education integration community.

3.4 Multi-party Interactive and Collaborative Education

Universities, industries, governments and society belong to different institutional fields. Multi-dimensional interactive cooperation needs to better realize the identity and interest appeal of each cooperative subject and form a good operation and guarantee mechanism in the process of interaction driven by relying on the value connection of the community (“Fig. 1”). As an industry-education integration community of “collaborative education” in industrial design, its essence is to dock the development of industrial design industry as the guide, strengthen practical education, break the isolation of education chain, industry chain and talent chain, and carry out cooperative education. This has high compatibility for universities, industry, government and society. Therefore, the value connection of the

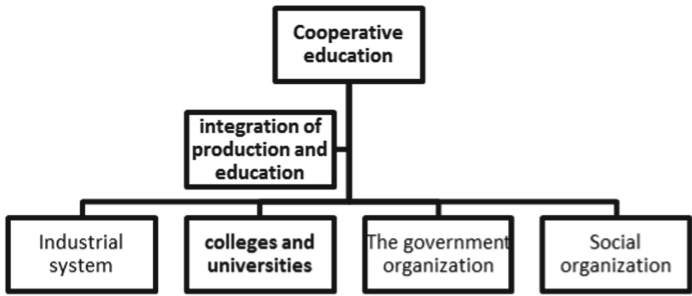


Fig. 1. The framework of industry-education integration community of “collaborative education” for industrial design major.

industry-education integration community lies in the cultivation and promotion of high-quality talents. [1] By taking education as the same goal and driving force, the advantages of all parties are integrated to produce a more powerful social service function, forming the superposition gain of talent cultivation, social service and knowledge innovation and creation function, and bringing multiple growth of value.

4 Conclusion

The cultivation mode of mutual integration and co-existence and deepening integration of production and education takes “collaborative education” as the result of promoting the diversified expansion of multiple subjects, and takes co-creation, sharing and co-existence as the ecological circle; With the development concept of mutual integration, co-existence and joint education, a new effective organizational form of interactive and multi-dimensional cooperation will be formed. The construction of training mode should improve the top-level design of “collaborative education”, and realize the pattern of industry-education integration, in which the industrial chain, education chain, talent chain and innovation and entrepreneurship chain are linked and developed in a coordinated way. We will construct a governance structure, interaction mechanism, supervision and balance mechanism, and guarantee mechanism based on the value level of education identity, and the system level of the key multi-subject; Take the technical level as the guarantee, rely on the innovative technology smoothly transformed into productivity, realize the presentation and dissemination of the integration of industry and education. Finally realize the practice path of “collaborative education” industry and education integration community.

The trend of “collaborative education” in industrial design lies in “breakthrough” and “deepening”. In order to deepen the integration of the industrial design system and the education system, it is necessary to construct the cross-border industry-education integration mechanism of internal and external collaborative education through the collaborative participation of multiple subjects. Through policy and market demand of embedded drive, multiple subject and multidimensional interaction of endogenous power, we will perfect the benefit coupling mechanism as the core, set up in colleges and universities, industry, government and social good cooperation between the network, so as to build

the value of mutual benefit community of rational logic, thus forming a holographic and symbiosis of the fusion community education together and educating people. It absorbs multiple main forces in an all-round way to participate in the coordinated promotion of the “collaborative education” industry-education integration ecosystem, so as to realize the optimized teaching mode of “collaborative education” industry-education integration talent training for industrial design major.

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