Region-Educational Research and Reviews, 2025,Volume 7, Issue 4
DOI:10.12238/rerr.v7i4.3840
ISSN Online:2661-4634
ISSN Print:2661-4626

Vocational-General Integration Innovative Construction Between North China University of Technology and Beijing Polytechnic College

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Abstract: This paper aims to explore the innovative practices and achievements in the integration of vocational education and general education between North China University of Technology and Beijing Polytechnic College. In the process of vocational-general integration, there are significant differences in training programs between specialized and undergraduate levels, poor school-enterprise docking, and a severe shortage of dual-teacher faculty. Under the joint efforts of "secondary-higher vocational-university-enterprise", the two schools have adopted specific measures of "integrating courses, integrating teachers, general education, and industry integration" to address the strategic positioning of the capital city. This study delves into the formulation of training programs, the construction of dual-teacher faculty teams, and the comprehensive collaboration of schools and enterprises, providing a reference for effectively promoting vocational-general integration and optimizing vocational education training paths.

Keywords: Vocational-general integration, talent cultivation, "double-qualified" teacher team construction

Introduction

To promote the integration and mutual access between vocational education and general education, providing diversified pathways for the growth and talent development of associate degree students, the integration of vocational and general education (referred to as "Vocational-General Integration") has become a crucial aspect of educational reform in the new era.

The report from the 20th National Congress of the Communist Party of China clearly stated, "Coordinating innovative collaboration among vocational education, higher education, and continuing education, advancing Vocational-General Integration, industry-education integration, and the convergence of science and technology with education, optimizing the positioning of vocational education types," which once again clarifies the direction of vocational education development. In 2024, President Xi Jinping pointed out at the National Education Conference that it is necessary to "build a vocational education system that integrates vocational and general education and promotes industry-education integration[1]." This not only identifies Vocational-General Integration as an important task for the development of vocational education but also elevates vocational education to a status of equal importance to general education.

In order to better adapt to the demands of the new era and provide strong technical and skilled talent support for the

high-quality development of the capital city, the North China University of Technology (hereinafter referred to as “NCUT”) and the BPC Beijing Polytechnic College (hereinafter referred to as “BPC”) have actively responded to the national call. They are accelerating the construction of a vocational education system characterized by Vocational-General Integration and industry-education integration.

1. Related Research Status and Development Trends

Since the mid-20th century, countries such as Germany and Japan have intensified the cultivation of technical and skilled talents through vocational-general integration reforms. Currently, a variety of vocational-general integration training models have been formed internationally, with Germany, Singapore, and the United States being typical examples.

Germany has introduced the “dual system” vocational education model, which has elevated the status of vocational education to be on par with general education, and it is highly independent, based on a dual-track curriculum integration[2]. Singapore has adopted an educational streaming mechanism to establish a comprehensive vocational education mechanism and educational system. The United States places both vocational and general education under the same institutional arrangement, which is a single-track model, and achieves a more thorough vocational-general integration by developing an integrated curriculum system.

In 1983, China first proposed that the proportion of vocational to general education to be “approximately equal”, the understanding of the relationship between vocational education and general education has been continuously deepening. In recent years, to further advance vocational education reform and explore new paths for cultivating high-end technical and skilled talents, provinces and cities across China have launched vocational-general integration training programs[3]. Many regions and schools have explored diverse talent training models such as “3+2” and “3+4,” achieving the connection from secondary vocational education to higher vocational education, and from higher vocational education to undergraduate education, broadening students’ pathways for advancement.

A representative example is the “2+3+2” high-level technical and skilled talent integrated training program, which was launched by Beijing in 2015[4]. In this process, students study at vocational colleges for the first 5 years and at undergraduate universities for the last 2 years. Typically, vocational education mainly imparts practical experience and skills, while general education cultivates theoretical, reflective knowledge, and scientific abilities. However, the curriculum system shows obvious fragmentation, and the practical platform resources are relatively scarce, making it difficult for integrated students to quickly adapt to undergraduate education. In addition, there are fewer double-qualified teachers in undergraduate colleges, and most teachers mainly face traditional theoretical teaching, lacking experience in practical skills and platform operation skills required for integrated training. Therefore, constructing an integrated specialized-undergraduate training plan, building a high-quality double-qualified teacher team, and creating internship and training bases targeted at specialized-undergraduate students have significant research importance[5]-[7].

2.Inter-institutional Cooperation Initiatives

NCUT nd BPC have jointly explored various new cooperation models. The schematic of this strategy is depicted in Figure 1

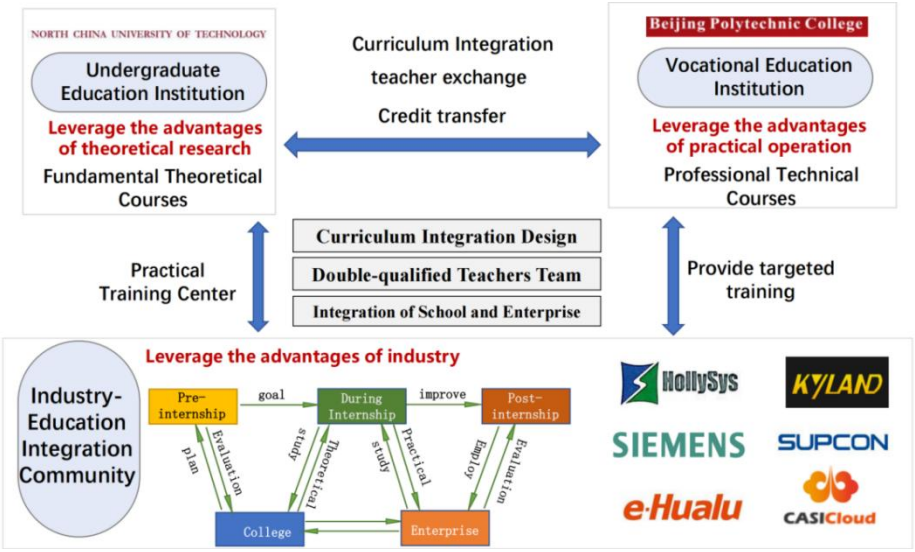

Figure 1. The schematic of the cooperation strategy.

2.1 Vocational-to-Undergraduate Integrated Training Model

NCUT and BPC have jointly formulated the work plan for the transfer examination of the articulated training project from associate degree to bachelor's degree. The higher vocational majors and undergraduate majors that are connected in the execution of the articulated project are listed in Table 1.

Table 1. Name of the vocational major and its corresponding undergraduate major.

Vocational Major (in BPC)	Undergraduate Major (in NCUT)
Computer Network Technology	Computer Science and Technology
Mechatronics Technology	Mechanical and Electronic Engineering
Big Data Accounting	Accounting
E-Commerce	Business Administration
New Energy Vehicle Technology	Traffic Equipment and Control Engineering
Artificial Intelligence Technology Application	Artificial Intelligence

Through the implementation of the "2+3+2" integrated training model, NCUT and BPC have achieved the maximum sharing of high-quality educational resources. BPC utilizes its advanced training equipment to provide a good hands-on platform for lower-grade students, while NCUT's high-level teaching staff offers more in-depth professional guidance for higher-grade students.

Focusing on the construction of Beijing's "four centers" and the layout of high-end, precise, and cutting-edge economic structures, BPC has implemented a "five focuses, five creations" strategy, forming a professional group serving the development of Beijing's smart city. After entering NCUT, they rely on the Drone College to study theoretical courses. Outstanding students can continue to pursue a master's degree, opening up a professional path for associate degree students. Statistics show that in recent years, the pass rate of BPC's associate degree graduates in transition exams has reached 100%, and most of them have entered well-known enterprises to work after graduating from NCUT.

2.2 Dual-qualified Teaching Team

NCUT and BPC have jointly built a team of "dual-qualification" teachers, among which the proportion of "dual-qualification" teachers at BPC has reached 92.75%. NCUT has been approved by the Beijing Municipal Education Commission as a "dual-qualification" teacher training base for school-enterprise cooperation, focusing mainly on 5G

engineering training. NCUT has established a management method for the recognition of “dual-qualification” teachers, clarifying the basic capabilities and recognition conditions that “dual-qualification” teachers should possess to promote the construction of the “dual-qualification” teaching team. In addition, NCUT and BPC jointly carry out pilot programs for the “1+X” certificate system and modular teaching practices, sharing high-quality teaching resources and online teaching resources.

2.3 Industry-Education Integration Community

In recent years, the collaboration between NCUT and BPC in the integration of industry and education has achieved significant results, which are reflected in the following aspects:

(1) Establishment of the National Intelligent Transportation Control Industry Education Integration Consortium: NCUT, BPC, and Beijing E-Hualu Information Technology Co., Ltd. have jointly led the establishment of the National Intelligent Transportation Control Industry Education Integration Consortium. This is a national, industry-wide, and cross-regional non-profit organization aimed at promoting the development of the intelligent transportation control industry.

(2) Establishment of the Low-Altitude UAV Talent Training and Practice Base: NCUT, BPC, and Shanghai Huace Navigation Company have established a low-altitude UAV talent training and practice base for industry colleges and vocational colleges. It is mainly used for vocational college students to learn and master professional UAV operation skills and basic extended applications.

(3) Signing of Strategic Cooperation Agreement: NCUT, BPC, and Shougang Institute of Technology have jointly signed a strategic cooperation agreement. NCUT and BPC have jointly participated in several school-enterprise cooperation projects, such as cooperating with DJI Technology Co., Ltd. to carry out comprehensive, in-depth, and effective series of school-enterprise cooperation, achieving good results. These cooperation projects reflect the active exploration and practice of NCUT and BPC in school-enterprise cooperation, aiming to jointly cultivate high-quality technical and skilled talents through industry-education integration, resource sharing, and complementary advantages, and promote regional economic and social development.

3. Conclusions

NCUT and BPC have achieved significant results in the integration of vocational and general education under the cooperation policy. This collaboration has not only provided a large number of high-quality technical and skilled talents to the capital but also played an important role in demonstrating and leading the reform of vocational education. In the future, as China’s modernization process continues to advance, these two institutions will continue to leverage their strengths, deepen their cooperation, and jointly explore more efficient talent cultivation pathways to help the country achieve high-quality development goals.

Acknowledgment

This research is funded by the Beijing Municipal Education Science “14th Five-Year Plan” 2024 Annual Project: Exploration of the Training Path for High-End Technical Skill Talents with "Dual Integration and Dual Connectivity" (CDAB24212), Research Project on the Reform of Graduate Education and Teaching “Exploration of the Integration of Ideological and Political Education with Teaching in the "Intelligent Control" Course” (YJS2024JG15).

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