

Thoughts on Development of Vocational Education at Undergraduate Level

Shang Wang*, Xuele Wang and Zhixin Feng

School of Automotive Engineering, Beijing Polytechnic, Beijing 100176, China

**Corresponding author. Email: wangshang@bpi.edu.cn*

ABSTRACT

In recent decades, vocational education has provided strong talent support for China's economic and social development. However, with the continuous industrial upgrading and economic structure adjustment, all industries need higher-level applied talents. At present, vocational education at undergraduate level has shifted from the research stage to the concrete implementation stage. However, the relevant research is very scarce. This paper expounds the policy background and significance of undergraduate vocational education, and puts forward the core viewpoint of maintaining the characteristics of vocational education. On this basis, some targeted suggestions are put forward. The conclusions have reference value for education policy-making departments and vocational college teachers.

Keywords: Undergraduate level, Vocational education, Vocational colleges, Targeted suggestions.

1. INTRODUCTION

Vocational education and general education are two different types of education with equal importance. Since the reform and opening up, vocational education has provided strong talent support for China's economic and social development. As China enters a new development stage, industrial upgrading and economic structure adjustment are accelerating, and the demand for technical and skilled talents in all walks of life is becoming more and more urgent; therefore, the important position and role of vocational education are becoming more and more prominent [1].

With the transformation of China's economy from high-speed growth to high-quality development, higher vocational colleges has also changed fundamentally in terms of development situation, the transition of which from focusing on scale expansion to strengthening connotation construction has become an unavoidable proposition of the times. Strengthening connotation construction is the fundamental requirement for higher vocational colleges to achieve high-quality development and the basic path to improve their core competitiveness. After years of demonstration, vocational education at the undergraduate level began to enter the historical stage. In the period of major reform and transformation of vocational colleges, it is a very meaningful work to make some thorough ponders to the development of undergraduate vocational education.

2. BACKGROUND AND POLICY

China has the most complete industrial system in the world. To push forward the upgrading of manufacturing industry and the development of emerging industries and promote industrial development from medium and low-end to medium and high-end, there is an urgent need for a large number of highly skilled talents. However, at present, the total number of highly skilled talents is only more than 50 million in China, accounting for only 28% of the total number of skilled talents, while that in developed countries is generally more than 40%. It is estimated that by 2025, there will be a demand gap of nearly 30 million high skilled talents in the top ten key fields of China's manufacturing industry. Meanwhile, the medium and low-end jobs in traditional industries have been reduced, and structural contradiction of employment on more than 9 million college graduates is very prominent; therefore, it is imperative for the higher education to reform its structure and there is an urgent need for its transformation and development. Developing undergraduate vocational education to cultivate more highly skilled talents is an important means to solve the structural contradiction of employment.

In January 2019, the State Council issued the National Plan for Implementation of Vocational Education Reform, which clearly proposed to "carry out a pilot of undergraduate vocational education" and

“explore a long-term education system to cultivate high-end technical and skilled talents” [1]. In September 2020, the Ministry of Education and other nine departments issued the Action Plan of Vocational Education for Enhancing Quality and Cultivating Excellence (2020-2023). The document clearly puts forward “taking the development of undergraduate vocational education as a key link to improve the modern vocational education system, cultivating high-quality innovative technical and skilled talents and unblocking the growth channel of technical and skilled talents” [2]. In January 2021, the Ministry of Education issued the Measures for the Administration of Specialty Setting of Undergraduate Vocational Education (for Trial Implementation), which specifies the conditions, requirements and procedures for setting up specialties of vocational education at the undergraduate level [3]. This indicates that after years of demonstration, undergraduate vocational education has finally changed from research stage to comprehensive practice stage. In the future, China’s vocational education system will be composed of three-level educational system, namely vocational secondary education, vocational junior college education and vocational undergraduate education. This is a major breakthrough in the construction of modern vocational education system, which will have a far-reaching impact on the development of vocational education and make vocational education play a greater supporting role in the realization of the goal of 2035 modernization.

Different from traditional undergraduate education, the undergraduate education in vocational colleges is an education extended from the interior of vocational education, or an undergraduate level education held in full accordance with talent training law of vocational education. Vocational undergraduate education is practical and professional in nature. Vocational undergraduate education is a talent training education rooted in practice, the starting point of which in talent training is post ability demand of various industries. How to build undergraduate vocational education is a subject with important research value and should be widely considered and actively explored.

3. REFLECTIONS ON DEVELOPMENT OF VOCATIONAL EDUCATION AT UNDERGRADUATE LEVEL

As a vocational education at undergraduate level, the undergraduate vocational education should follow the basic law of vocational education in terms of talent training mode. Since it is an undergraduate education, its talent training must reach the level of undergraduate education. However, we cannot simply believe that undergraduate vocational education is to copy the undergraduate model of general education into the vocational education system. The construction and

development of undergraduate vocational education, on the one hand, cannot be separated from original intention and characteristics of vocational education, on the other hand, should reflect the high level and specialization of undergraduate level.

3.1. Orientation of Talent Training Should Adhere to the Characteristics of Vocational Education

The talent training orientation of vocational education is to train technical application-oriented talents to all sectors of society. Among them, the talent training goal of secondary vocational education is to provide productive skilled talents for the front line of enterprises. The talent training goal of higher vocational education is to provide the front line of enterprises with higher technical talents, mainly including compound talents and innovative talents. Although there are certain hierarchical differences in the orientation of talent training between secondary vocational and higher vocational educations, they are both targeted at meeting the demand of economic and social development for talents. In this sense, vocational undergraduate education should cultivate more high-end technical practical talents who can be directly employed by enterprises and immediately bring economic benefits to enterprises, and who should be competent in senior operation positions with technical complexity or grass-roots leadership positions that provide technical solutions for front-line operators.

3.2. Features of Teaching Should Highlight Operational Skills

According to the main functions of human resources in the process of social activities, talent types can be divided into academic talents and practical talents. Vocational education mainly trains practical talents with technical skills [4]. Based on the differences of practitioners’ operating skills and theoretical knowledge, H. W. French put forward the occupational spectrum theory. He divided practitioners in the engineering field into three types: skilled workers, technicians and engineers, which are distributed on the occupation spectrum from left to right (as shown in Figure 1). Different regions represent different requirements for operation skills and theoretical knowledge. The closer to the left of the occupational spectrum, the higher the requirements for operational skills and the lower the requirements for theoretical knowledge; while it is opposite for the closer to the right [5]. With the continuous upgrading of science and technology, enterprises have put forward higher and higher requirements for their posts in both mastery of operational skills and theoretical knowledge. It is in this context that undergraduate vocational education is highly valued and entrusted with an important task.

Undergraduate vocational education is mainly aimed at the cultivation of senior technicians and engineering personnel. Different from the engineers trained in general education, the engineers trained in vocational colleges have strong operational skills, which inevitably requires the cultivation of operational skills to be highlighted in teaching. If vocational colleges only emphasize the study of theoretical knowledge, but ignore the cultivation of operational skills, the undergraduates trained by them will have no characteristics and have no advantages in job hunting.

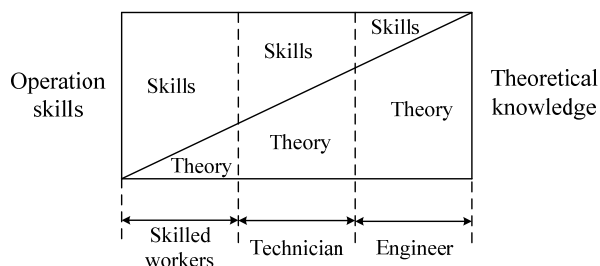


Figure 1 Schematic diagram of occupational belt theory.

3.3. Adhere to Integration of Industry and Education and Cooperation Between Schools and Enterprises

As the orientation of talent training is front-line practical talents in industries, vocational colleges are closely linked with enterprises. Under the background of developing undergraduate vocational education, vocational colleges should actively cooperate with enterprises in talent training, technological innovation, employment and entrepreneurship, social services and so on according to their own characteristics and talent training needs. In recent decades, China's industrial upgrading and economic structure adjustment have been accelerating. This trend will not change in the next few decades. The ability requirements of enterprises for practical talents will also be continuously improved. The undergraduate level talent training in vocational colleges just meets the job demand trend of enterprises. Vocational colleges should build a talent training platform for the cooperation between school and enterprise and establish an industry-education alliance. With the help of the alliance, schools and enterprises jointly study and formulate undergraduate level talent training programs, and timely incorporate new technologies, new processes and new norms into teaching standards and teaching contents.

3.4. Promote "Vertical Connection" of Vocational Education

Similar to general education, vocational education has different levels. However, at present, the connection between various levels of vocational education is not good. Vocational colleges at undergraduate level, as the

highest level of vocational education at present, should vigorously promote the "vertical connection" between various levels in the system. One of the most conventional "vertical connections" is: from secondary vocational schools to ordinary higher vocational colleges, and then from ordinary higher vocational colleges to undergraduate higher vocational colleges, as shown in Figure 2. This means that starting from the secondary vocational school, students have a rising channel in addition to graduation, and can finally get an undergraduate degree. The "vertical connection" of vocational education can also promote cooperation and exchange between vocational colleges at different levels, and avoid the "island" effect of vocational education at all levels.

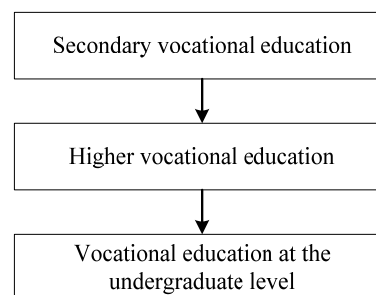


Figure 2 A model for promoting qualifications in the vocational education system.

3.5. Highlight High Level and Specialization

The development of various undertakings of vocational colleges at the undergraduate level should highlight the high-level and specialization, and should play an exemplary and leading role in their region. The professional layout of these colleges should give prominence to the combination of work and study, and actively serve the advanced and modern industrial chain; teaching content settings and graduation conditions shall not be lower than those of ordinary undergraduate schools; their cultivation of students should focus on solving complex problems and engaging in complex operations; graduates should have the ability to produce and process medium and high-end products and provide medium and high-end services, and should be able to engage in a certain degree of scientific and technological innovation in their posts and have the ability to transform scientific and technological achievements into industries.

3.6. Develop Professional Teaching Plans and Curriculum Standards

According to undergraduate level teaching requirements and focusing on the training scheme of professional talents, vocational colleges should revise original professional curriculum standards and clarify curriculum objectives. These colleges should also rely

on the curriculum standards to establish a curriculum resource R & D team composed of professional teachers, industry experts and teaching and research personnel, to optimize the curriculum content, to standardize the teaching process, and to timely incorporate new technologies and processes into curriculum resources. Front line teachers should conduct extensive discussions, accurately grasp the teaching requirements of the course, standardize the preparation of teaching plans and do a good job in the overall curriculum design; they should also select teaching materials according to procedures and make rational use of all kinds of auxiliary teaching resources. Furthermore, vocational colleges should make overall planning and build a team of curriculum resources construction with combination of industry and education and excellent quality.

3.7. Strengthen Practical Links

According to the requirements of relevant national policies, the construction of curriculum resources in vocational colleges should highlight practicality. In principle, the teaching hours of practical courses account for more than 50% of the total class hours. Vocational colleges should actively promote cognitive practice, follow-post practice, in-post practice and other practice methods, and strengthen assessment and evaluation of education-oriented practice and training. The time of in-post practice for students is generally 6 months, which can be arranged centrally or in stages according to the actual situation of specialties. Vocational colleges should comprehensively promote cultural and practical education, and widely carry out various social practice activities; meanwhile, they should strengthen the whole process management, assessment and evaluation of practical teaching links such as practice, training and graduation design.

4. CONCLUSION

China's economy depends on the support of the real economy, which requires a large number of professional and technical talents and a large number of craftsmen of the nation. Vocational education is an important part of the national education system and human resources development, and shoulders the important responsibility of cultivating diversified talents, inheriting technical skills and promoting employment and entrepreneurship. In the new journey of building a socialist modern country in an all-round way, vocational education has a broad prospect. Upgrading vocational education to undergraduate level is the development trend of world vocational education since the late 20th century. It can be expected that in the near future, more and more students will get undergraduate degrees from vocational colleges, master professional skills and obtain satisfactory jobs.

The main conclusions of this paper are as follows:

(1) The vocational education at undergraduate level will lead the integration and high-quality development of vocational education. The way of carrying out undergraduate pilot of vocational education and implementing long-term education system to train highly skilled talents has broken the "ceiling" of vocational education at junior college level, overcome the embarrassment of upgrading high-quality vocational education to ordinary undergraduate education. Vocational colleges at undergraduate level, as the highest level of vocational education at present, should vigorously promote the "vertical connection" between various levels in the system, and unblock the growth channel of high skilled talents.

(2) There are obvious differences between vocational education and general education, and the construction and development of undergraduate vocational education cannot be separated from the original intention and characteristics of vocational education. Undergraduate vocational education is practical and professional in nature. The logical starting point of talent training of undergraduate vocational education corresponds to the requirement of vocational ability in all walks of life. If vocational colleges only emphasize the study of theoretical knowledge, but ignore the cultivation of operational skills, the undergraduates trained by them will have no characteristics and have no advantages in job hunting.

AUTHORS' CONTRIBUTIONS

Xuele Wang wrote the first draft of the article. Shang Wang contributed significantly to analysis and manuscript preparation. Zhixin Feng helped perform the analysis with constructive discussions.

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REFERENCES

- [1] Xinhua News Agency. Implementation Plan of National Vocational Education Reform. [EB/OL]. http://www.gov.cn/xinwen/2019-02/13/content_5365377.htm
- [2] Ministry of education. Action plan for improving the quality of Vocational Education(2020-2023). [EB/OL]. http://www.gov.cn/zhengce/zhengceku/2020-09/29/content_5548106.htm

- [3] Ministry of education. Measures for the administration of specialty setting of vocational education at undergraduate level (for Trial Implementation) . [EB/OL]. http://www.moe.gov.cn/srcsite/A07/zcs_zhgg/202101/t20210129_511682.html
- [4] H. Xin. Research on talent training mode of the connection between Higher Vocational College and applied undergraduate from the perspective of career belt theory. *Adult Education*, 2017, pp. 80-83. DOI: <http://doi.org/10.3969/j.issn.1001-8794.2017.02.021>
- [5] Q. Lei, Z. Lei, Z. Dawei. Re-recognizing and Thinking on the orientation of talent specifications and training objectives of Higher Vocational Education. 2018, pp. 73-77. DOI: <http://doi.org/10.3969/j.issn.1001-8794.2018.01.018>