

New Quality Productivity for Innovation in Undergraduate Vocational Education

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Abstract—With the increase in the number of undergraduate vocational colleges and universities, China's education structure is undergoing profound changes. The establishment of an effective and smooth bridge for vocational education can help focus on the national development plan and major strategies. In this way, high-level, applied and technical talents can be cultivated, and more 'national craftsmen' can be forged. Vocational education at undergraduate level shoulders the important task of cultivating high-level technical and skilled talents adapted to the needs of new quality productivity. The article explores the connotation, characteristics, and talent cultivation requirements of the new quality productivity, and analyses the problems of non-adaptation and mismatch with the current vocational undergraduate economic and management professional talent cultivation. The article also puts forward optimization strategies and implementation paths in terms of talent cultivation positioning, curriculum system construction, faculty construction, and industry-teaching integration. This article provides powerful talent support for the development of new quality productivity.

Keywords—new quality productivity, vocational undergraduate, innovation of education

I. INTRODUCTION

As of early June this year, the Ministry of Education (MOE) has approved 51 undergraduate-level vocational schools, including Nanjing University of Industrial Technology and Shenzhen University of Vocational Technology. The Catalogue of Vocational Education Professions (2023), published by the Ministry of Education, contains 281 vocational undergraduate majors, such as artificial intelligence engineering technology, equipment intelligent technology, Internet of Things engineering technology, and modern seed technology, which are divided into 19 major categories. These majors are all the advantageous majors of various vocational and technical universities. Compared with general undergraduate majors, they are more vocational and technical in nature. This can simultaneously meet the dual needs of students who have both undergraduate qualifications and technical skills. The diploma of

vocational undergraduate programmes and general undergraduate programmes are of equal value, and have the same validity in terms of employment, graduate studies and public examinations [1]. The scale of vocational undergraduate education is gradually expanding, providing more opportunities for high school students to choose. The enrolment of vocational undergraduate programmes nationwide in the past five years shows that vocational undergraduate education has gained a certain degree of attraction. For example, the minimum scores of six undergraduate majors of Shenzhen University of Vocational Technology 2023 for submission exceeded those of 11 established undergraduate colleges and universities in Guangdong.

II. THE CONNOTATION AND CHARACTERISTICS OF NEW QUALITY PRODUCTIVITY AND ITS NEW REQUIREMENTS FOR VOCATIONAL UNDERGRADUATE PERSONNEL TRAINING

A. Connotation and Characteristics of New Productivity

New quality productivity refers to the new type of productivity that can significantly improve the production efficiency and economic benefits with scientific and technological innovation as the core, and with intelligence, informatization, and networking as the characteristics [2]. It is a contemporary advanced productive force that has been spawned by revolutionary breakthroughs in technology, innovative allocation of production factors, and in-depth transformation and upgrading of industries. At the same time, it takes the qualitative change of workers, labour materials, labour objects, and their optimal combination as its basic connotation, and the improvement of total factor productivity as its core symbol [3]. Unlike traditional productivity, new quality productivity represents a leap in productivity. It involves new fields and high technological content, and relying on innovation is its key and prerequisite [4]. The proposal of new quality productivity means to promote industrial innovation by scientific and technological innovation. At the same time, it embodies the construction of new competitive advantages by industrial upgrading and winning the initiative of development [5]. It is characterized by the following features: First, high technological content. The

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new quality of productivity is highly dependent on scientific and technological innovation to promote industrial upgrading and economic development through continuous technological breakthroughs and transformation of achievements. Secondly, the degree of informationisation is high. The wide application of information technology is an important symbol of the new quality productivity. It realizes the rapid transmission and efficient processing of information and improves production and management efficiency. Third, the level of intelligence is outstanding. Intelligent production is an important feature of the new quality of productivity intelligent equipment and systems are applied to achieve the automation and intelligence of the production process. Fourth, the network characteristics are obvious. The application of network technologies such as the Internet and the Internet of Things has made the new productive forces more capable of cross-border integration and global resource allocation [6].

B. New Requirements for Vocational Undergraduate Talent Cultivation in the Development of New Quality Productivity

Based on the connotation and characteristics of the new quality productivity, it puts forward new requirements for vocational undergraduate talent cultivation. The first is to update the professional knowledge structure. Vocational undergraduates need to have broader knowledge, deeper professional basic skills, and cross-border integration ability. This can adapt to the demand for multidisciplinary knowledge of new quality productivity. Secondly, we should pay attention to the cultivation of innovation ability. Innovation is the core of new quality productivity [7]. Vocational undergraduate talents must have innovation consciousness and innovation ability, and constantly promote technological innovation and product upgrading. Finally, it is to strengthen the practical ability [8]. The new quality of productivity pays more attention to practical application. Vocational undergraduate talents need to have strong practical ability and problem-solving ability. In particular, they should be able to judge, make decisions, and deal with practical problems in the field, and be able to transform theoretical knowledge into practical productivity.

III. THE ROLE OF VOCATIONAL UNDERGRADUATE TALENTS IN ECONOMICS AND MANAGEMENT IN THE DEVELOPMENT OF NEW QUALITY PRODUCTIVITY

A. Promote Enterprises to Adapt to Industrial Upgrading and Economic Development

Professional undergraduates in economics and management play an important role in the development of new quality productivity. They play a positive role in promoting the development of new quality productivity by giving full play to their professional advantages and practical ability. They have rich management knowledge, market insight, and innovation ability. They can play a key role in industrial upgrading and economic

development. Participating in enterprise decision-making, formulating marketing strategies, and promoting technological innovation enable them to help enterprises adapt to changes in market demand and improve production efficiency and economic benefits. In turn, they can promote the upgrading of the whole industry and the development of the economy [9].

B. Promote the Transformation of Enterprise Achievements and the Improvement of Management Efficiency

The development of new quality productivity cannot be separated from scientific and technological innovation and achievement transformation. Vocational undergraduates majoring in economics and management play an important role in scientific and technological innovation and achievement transformation. They not only have the awareness and ability of scientific and technological innovation, but also can transform scientific and technological achievements into actual productivity. Through participating in scientific research projects, skills competitions, and entrepreneurial practice, they can promote the connection between scientific and technological innovation and industrial demand, and promote the transformation and application of scientific and technological achievements [10]. At the same time, they can also introduce international advanced management concepts and technical means to improve the internal management efficiency and innovation ability of the enterprise, so as to enhance the core competitiveness and internationalization of the enterprise.

IV. PROBLEMS AND CHALLENGES IN THE CULTIVATION OF VOCATIONAL UNDERGRADUATES IN ECONOMICS AND MANAGEMENT

A. Unclear Positioning of Talent Training Objectives

At present, there are many different opinions and understandings in the academic circles about the positioning of vocational undergraduate talent cultivation, but there are relatively few descriptions and researches of talent cultivation objectives at the level of specific majors. In addition, the positioning of vocational undergraduates has been blurred and converged. It is mainly reflected in two trends: the first one is to add directly to the talent cultivation objectives of higher vocational colleges and specialties, with technical skills continuously upgraded and theoretical level of undergraduates insufficiently embodied. The second is the convergence with the general undergraduate training objectives, and the attributes of vocational education are weakened. Both trends fail to fully reflect the characteristics of vocational education and the new quality of productivity needs. The evaluation index of technical skills of economic and management professionals pays more attention to soft power [11]. The second trend is more likely to appear in the training objectives of professional undergraduate talents in economics and management. The result is that the cultivation of technical skills is weakened by the attributes of general undergraduate training [12].

B. Unreasonable Curriculum Setting

Through researching and visiting many vocational undergraduates, it is found that the curriculum system of economics and management of vocational undergraduates is a combination of the theoretical system of general undergraduates and the practical system of higher vocational colleges. Firstly, the theoretical course system imitates the general undergraduate course system. The new curriculum system is formed only by increasing the number of professional courses to support the four-year theoretical course hours. There are problems of inadequate implementation and imperfect evaluation systems. Secondly, the concentrated practice course system continues the higher vocational professional practice course system. Focus only on the proficiency of technical skills to improve, ignoring the comprehensive integration of professionalism training and technical skills. This leads to a disconnect between talent training and market demand [13].

C. Weak Teaching Staff

At present, the number and structure of teachers in vocational undergraduate colleges have become the bottleneck that restricts the development of vocational undergraduate pilot work. Teachers mainly come from four categories: the original higher vocational specialty teachers, whose experience accumulated over a long period of time is still somewhat different from that of undergraduate teaching; the front-line personnel of industrial enterprises, who lack theoretical teaching experience; fresh graduates who have just joined the faculty, whose teaching experience and practical ability need to be further cultivated; and the status of vocational undergraduate education, treatment, and social acceptance, which makes it difficult to attract high-level talents [14]. Therefore, the growth of vocational undergraduate teachers still needs some time to be cultivated, and the vocational undergraduate education is in urgent need of high-level dual-teacher teaching staff in a certain period of time there are varying degrees of contradiction.

D. The Integration of Industry and Education Needs to Be Deepened

The integration of industry and education is an important feature of vocational undergraduate education. It needs to be promoted by the government, industry, and schools in a concerted effort and integrated into the whole process of talent cultivation. At present, all vocational undergraduate colleges and universities have carried out multi-angle integration and exploration in different degrees and in different ways [15]. However, from an overview, vocational undergraduate education still needs to further strengthen the closeness and depth of the integration of industry and education. It should not only be reflected in the construction of practical training bases, coeducation of talents, and order cultivation, but also in the formulation of industry and enterprise standards, cooperation and participation in enterprise projects, and the transformation of technical services and innovative achievements [16]. Through the formation of a virtuous

cycle of ‘combining industry and education, teaching and learning, promoting production with teaching, and supporting teaching with production’, students can learn and master real skills in the real working environment. Teachers should be allowed to stand on the front line of industry and enterprises, and introduce the frontier of development and real needs of industry and enterprises into the whole process of talent cultivation [17].

V. STRATEGIES AND IMPLEMENTATION PATHS FOR OPTIMIZING TALENT CULTIVATION FOR VOCATIONAL BACHELOR’S DEGREE IN BUSINESS ADMINISTRATION

A. Clarify the Positioning of Talent Training Objectives

Vocational undergraduate colleges and universities should be closely related to the development needs of the new quality of productive forces. Vocational undergraduate is to cultivate talents for the industry in the next four years, and must have a certain degree of foresight on the basis of being close to the needs of actual positions. The formation of new productivity is to lead the development of strategic emerging industries and future industries, and vocational undergraduate talent training goals are consistent. Therefore, it is necessary to combine the formation of new quality productivity needs, highlighting the characteristics of vocational education and high-level technical skills training. The cultivation of economic and management professional talents should further clarify the positioning of talent training objectives. It is necessary to make students and actual jobs seamlessly match, but also to take into account the learning ability of students accumulated when facing the rapid development of industry and trade. It is necessary to provide students with lasting momentum for lifelong education and sustainable development. We will endeavour to explore and actively practice the innovative model of vocational undergraduate talent cultivation proposed by the university’s pilot work on vocational education at the undergraduate level. ‘Three Identities’, students must be recognized by all sectors of society, the business community and the education sector; ‘Two Standards’, in line with vocational skills standards and professional teaching standards; ‘Four Elements’. Talent cultivation should have four elements of ‘use, newness, specialization and craftsmanship’ [3]; ‘1’ is to establish a closed-loop feedback information system for talent cultivation in vocational education at undergraduate level; ‘8’ is Eight dimensions of school-enterprise cooperation, namely, professional setting, cultivation objectives, curriculum construction, technical skills, teaching staff, practical training conditions, professionalism, and student employment, are proposed as the measurement criteria for school-enterprise cooperation, i.e., the eight degrees of school-enterprise cooperation suitability.

Talent cultivation should have the four elements of ‘use, newness, specialization, and craftsmanship’; establish a closed-loop feedback information system for talent cultivation in vocational education at the undergraduate level; and put forward eight dimensions of professional setting, cultivation objectives, curriculum construction, technical skills, faculty, practical training

conditions, professionalism, and students' employment as a measure of school-enterprise cooperation.

That is, eight degrees of school-enterprise cooperation.

B. Constructing a Scientific and Reasonable Curriculum System

Students cultivated by vocational undergraduate programmes are required to have technical skills higher than those of higher vocational specialties, and general abilities higher than those of general undergraduate programmes. Therefore, to build a curriculum system oriented to market demand, combining theory and practice, and giving equal importance to vocational qualities and professional skills is the foundation for realizing the goal of talent cultivation. Following the growth of high-level technical and skilled talents and the law of students' physical and mental development, dealing with the relationship between public basic courses and professional courses, theoretical teaching and practical teaching, academic certificates and various kinds of vocational training certificates, and designing teaching activities as a whole, we can cultivate students with the "four kinds of abilities", namely, the ability to learn, the ability to think, the ability of vocational ability and the ability of sustainable development. The teaching and learning activities are designed in a holistic manner to cultivate students with 'four abilities', namely, learning ability, thinking ability, vocational ability, and sustainable development ability, so that the vocational undergraduates cultivated will be able to keep abreast of the times and have the ability of lifelong independent learning in the face of the ever-changing new technologies and new jobs. A curriculum teaching system consisting of public foundation courses, general education courses, major foundation courses, and professional courses is actively constructed. The public foundation courses focus on the basic cultivation of humanities and logical thinking, while the general education courses emphasize the cultivation of students' comprehensive qualities and all-around development, and the major foundation courses cultivate students' basic knowledge and basic abilities to carry out their work in their professional fields, and the professional courses aim at cultivating the main knowledge that students should possess in their professional fields. The basic courses of major categories cultivate students' basic knowledge and basic abilities to work in their professional fields, while the professional courses focus on cultivating students' main knowledge in their professional fields and their abilities for sustainable development after graduation, reflecting the characteristics of the majors and the individual development needs of the students in parallel, so as to expand the space for students' independent choices.

C. Strengthening the Construction of 'Dual-Teacher' Teaching Personnel

Teachers are the cornerstone of the high-quality development of vocational undergraduate programmes. Improve the method of introducing high-level talents. Introduce a group of skilled masters and technicians with

rich practical experience in enterprises; secondly, for teachers whose work experience is mainly teaching, increase enterprise practice and participate in solving front-line problems in enterprises; finally, for teachers whose work experience is mainly in enterprises, highlight the enhancement of teaching ability. Through the teacher training programme, teachers can master the teaching method as soon as possible. Cultivate, approve, and accumulate the establishment of provincial teaching studio, provincial skills master studio, and university youth innovation team. Take this as an opportunity to establish school-level teams and studios to strengthen echelon construction. The university introduced the employment and management methods of high-level talents. The school actively selects and employs a group of professional leaders, backbone teachers, and masters of skills to drive the development of professional high-level characteristics. Through school-enterprise cooperation and industry-teaching integration, we will create a two-way integration path for talents, and establish a 'dual-teacher' teaching team with school-enterprise sharing, two-way sharing, and common training of talents.

D. Deepening School-Enterprise Cooperation in Industry-Teaching Integration

First of all, strengthen the cooperation and exchange with industrial enterprises. Share resources by jointly building industrial colleges, order classes, training bases, and laboratories. Promote the in-depth development of industry-education integration and improve the pertinence and effectiveness of talent training. Front-loading the talent training process of enterprises to cultivate high-skilled talents that can be seamlessly connected; secondly, combining talent training with the laws of enterprise operation, reconstructing the practice course system. On-campus practice is based on typical work tasks of professional positions, and off-campus practice is based on real work tasks. According to the law of industry, the projects that can be operated in school are introduced into school. Through dual tutors, whole process, all-round, and all-real project training, the employment education function is perfected. Provide human resources support for enterprise operations. Finally, give full play to the advantages of teachers' scientific research transformation and nurturing to solve the actual problems of enterprise operation and management, and participate in the talent cultivation and enhancement projects of enterprise employees at all stages.

VI. CONCLUSION

Establishing effective and smooth vocational education bridges helps to focus efforts on implementing national development plans and major strategies. Through this approach, high-level, applied, and technical talents can be cultivated, forging more 'national craftsmen'. Undergraduate vocational education shoulders the important task of cultivating high-level technical and skilled talents who can adapt to the needs of new quality and productivity. This article explores the connotation, characteristics, and talent cultivation requirements of new

quality productivity, and analyzes the problems of unsuitability and mismatch with the current talent cultivation of undergraduate economics and management majors in vocational colleges. The article proposes optimization strategies and implementation paths from the aspects of talent cultivation positioning, curriculum system construction, faculty team construction, and industry education integration.

CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

AUTHOR CONTRIBUTIONS

Lingzhao Deng wrote the paper and conducted the research; Hang Chen combed the literature; Xi Pei and Kun Ni revised the manuscript; all authors had approved the final version.

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Lingzhao Deng serves as first authorship; Hang Chen and Xi Pei serve as co-corresponding authorship in this study.

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