

The Connotation, Value and Principles of Long Academic System Education for High-End Technical and Skilled Personnel

Zhongwen Shi

Shanghai Art and Design Academy, Shanghai, 201808, China

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Abstract: Cultivating high-end technical skill talents is an important mission of vocational education to serve industrial transformation and upgrading, and the long academic system is an effective initiative to cultivate high-end technical skill talents. This paper analyzes the basic connotation of the long academic system for high-end technical and skilled personnel with the objective of cultivating vocational ability for high-end positions, the main features of systemic, integration and diversity and the value and significance of optimizing the allocation of educational resources, improving the effect of vocational education and enhancing the employability of graduates, starting from the background of the times, education and policies proposed by the long academic system. It also proposes the main principles that should be followed in the cultivation of high-end technical skill talents in the long academic system from four dimensions: consistency of cultivation objectives, continuity of curriculum, synergy of educational methods, and articulation of educational assessment.

At present, China is in a critical period of transformation from a manufacturing country to a manufacturing power, and traditional skilled personnel are increasingly difficult to meet the needs of industrial transformation and development. The high-end technical and skilled personnel with good learning skills and innovations who can be "engaged in high-precision industries, mastering high and new technology, qualified for high-end positions as well as to achieve sustainable development of the overall quality of the high quality of the vocational skills, innovation ability" ^① is gradually becoming the main demand for high-end enterprises and high-end positions. As for the three-year higher vocational speciality, four-year vocational undergraduate and applied undergraduate levels, which are the mainstay of vocational education, are not yet able to fully support the cultivation of high-end technical and skilled talents in terms of cultivation objectives, curricula, allocation of class hours, teaching content and practical training and assessment. In 2019, the State Council issued the "Notice on the Issuance of the National Vocational Education Reform Implementation Plan" (hereinafter referred to as "the plan"), which proposed to "accelerate the improvement of the high-level application-oriented talent training system and explore the long academic system to train high-end technical and skilled talents."^② The introduction of the Program, for the first time, put forward a pioneering "long academic system" training model for high-end technical skills personnel in the field

of vocational education, and the long academic system has become one of the important means and paths to explore the cultivation of high-end technical skills personnel, and an important breakthrough for vocational education to lead the innovation of talent training model.

1. The connotation of the long academic system for cultivating high-end technical and skilled talents

1.1 Background of the long academic system

The long academic system is a type of vocational education system, and it has a profound background: one is the background of the times. Keeping up with the times is the inherent requirement for the development of vocational education. At present, human society has entered into the era of knowledge economy, and the structure of talent demand has changed tremendously, and the quality of talents has replaced the quantity of talents as the core of the demand for talents in high-end enterprises and high-end positions in enterprises. The long academic system is an important change for vocational education to meet the development of the times, and it shoulders an important mission of the times. Second, the educational background. Secondary education and higher vocational education are the two main positions of vocational education in China at present, and vocational undergraduate is still in its initial stage, and the articulation and integration among the three is the key content to improve the quality of vocational education as a whole. However, the articulation of the three is not ideal, "facing problems such as ambiguous positioning of talent training, poor continuity of teaching materials, large differences in assessment methods, and non-uniform management mechanisms"^③, which greatly restricts the quality of vocational education for high-end technical skill talents. Third, the policy background. The long-study system has received strong support from the national level, and the Ministry of Education called for vigorous promotion of five-year senior vocational education at the beginning of the new century, and the National Implementation Plan for Vocational Education Reform issued in 2019 explicitly proposed "exploring the long-study system to cultivate high-end technical and skilled talents". Therefore, the long academic system can help vocational education optimize, develop and improve itself and achieve high-quality development.

1.2 The basic connotation of long academic system

The school system, that is, the school education system, is the core content of the modern education system. The school system in the broad and narrow sense refers to "the admission conditions, educational tasks and study years of schools of all levels and types according to the relevant national laws and policies"^④ and other regulations made. The school system at the narrow level refers specifically to the number of years of schooling at all levels. The school system in the long school system has both narrow and broad connotations. On the one hand, the superficial content of the long school system is longer years of study, and on the other hand, the long school system involves the overall change of school education, such as the change of educational philosophy, the change of professional settings, and the change of curriculum resources. Moreover, in today's deepening integration of industry and education, the long academic system is also regarded as "a talent training system based on the deep integration of industry and education"^⑤. The long academic system can be traced back to the five-year technical specialties that were first piloted in 1985. Since the new century, with the support and encouragement of the state and education authorities, the long-school system has developed greatly in both form and mode, and has also formed diverse features, especially in vocational education where relevant schools have explored various forms of long-school system running mechanisms and teaching modes with regional characteristics and professional features, respectively. Based on relevant research and practice results, this paper summarizes the connotation

of long schooling system in vocational education types as follows. Based on relevant research and practice results, this paper attributes the connotation of long academic system in vocational education types as follows: it is a kind of academic system which takes the integration of industry and education as the foundation; the cultivation of vocational ability of high-end positions as the goal; the five-year and seven-year education as the main form of the academic system. The five-year and seven-year education usually takes coherence of middle-vocational education succeeding to higher-vocational specialized or vocational undergraduate education as the main part and the integration of vocational education and general applied undergraduate education subsidiary part.

2. The value of the long academic system for cultivating high-end technical and skilled talents

2.1 The main characteristics of the long academic system

First, it is systematic. As one of the main academic systems of vocational education, the long academic system is a complete system and, moreover, has the characteristics of complexity and dynamics. It is composed of several subsystems, such as education subject subsystem, education resource subsystem, education assessment subsystem, etc. Each subsystem is interdependent and influences each other, and promotes the development of the long academic system together. Second, integration. The long school system is very different from the traditional sense of secondary and higher vocational articulation, which is the articulation of two different boards of secondary education and higher vocational education, and there are still clear barriers between secondary education and higher vocational education, while the long school system integrates secondary education, higher vocational education and general education in one, which is the deep integration of multiple subjects. Third, diversity. The long academic system is generally 5 or 7 years, and the specific division includes 3+2, 2+3, 2.5+2.5, 3+2+2, 2+3+2 and other types. In recent years, with the increasingly close relationship between secondary and higher vocational education and undergraduate education, the long academic system has gradually expanded from 5 years to 7 or 8 years, for example, Beijing "selects advantageous majors that dovetail with industrial development to recruit fresh junior high school graduates to carry out a seven-year (eight years for nursing majors) through-training experiment"^⑥

2.2 The value and significance of long academic system

For the cultivation of high-end technical and skilled talents in vocational education, the implementation of the long academic system has important values and practical significance:

Firstly, it optimizes the allocation of educational resources. Middle school education is for junior high school graduates, and the academic system is 3 years, while higher vocational education is for high school graduates and middle school graduates, and the academic system is also 3 years. In the era of knowledge economy, the importance of education is becoming more and more prominent, so the primary choice of secondary school graduates is to improve their education, and enrolling in higher vocational colleges is the main way. Taking this as an example, the original secondary and higher vocational education takes 6 years. The long academic system, on the other hand, organically integrates secondary and higher vocational education and compresses the academic system to 5 years, which can optimize the allocation of educational resources and achieve better educational effect with shorter education time.

Secondly, it improves the effect of vocational education. The long school system breaks the barriers of secondary and higher vocational education, whether it is the long school system of 3+2, 2+3 mode or other forms of long school system, the core content of which is the seamless connection and organic integration of secondary and higher vocational education, which can effectively

overcome the problem of poor coherence of vocational education. So that students can be fully developed within a consistent long school system.

Again, it can enhance the employability of graduates. The current employment situation of college graduates is not optimistic due to factors such as international financial crisis and new crown epidemic. Meanwhile, the human resource market is facing the problems of unbalanced supply and demand and misalignment of supply and demand at the same time. The most prominent one is the contradiction between the high demand of high-end positions with high technical content and the insufficient supply of high-skilled personnel training in schools. The long-study system integrates the professional education of secondary and higher vocational levels, which can strengthen the professional learning effect of students, especially in the practical training of professional core courses and the practical training of professional core competencies. The long-study system can provide a more scientific and standardized system design, which can provide multiple guarantees for cultivating technical skill talents with high quality and high skills who can be competent for high-end positions.

3. The principles that should be followed for the cultivation of high-end technical and skilled personnel in long academic system

3.1 Focus on the consistency of cultivation goals

Cultivation goal is the purpose that talent cultivation tries to achieve, which not only plays a guiding role in talent cultivation, but also is an important basis for measuring the effect of talent cultivation. The cultivation of high-end technical skill talents should focus on the consistency of cultivation objectives. First of all, keep close to the attributes of vocational education. Serving the development of regional industries is an important task of vocational education. Based on the situation and development needs of regional industries, we should reasonably adjust the direction of vocational education, rely on professional settings, curriculum system construction and practical teaching, strengthen the inner connection between vocational education and regional industrial development, and reasonably determine the cultivation goals from the inner connection between the two. Secondly, we should keep close to the characteristics of high-end skilled talents. Compared with the general skilled personnel, high-end technical skilled personnel "must be multi-specialist with knowledge, skills and innovation who are both moral and talent"^⑦ not only can master the professional skills, but also can understand the professional skills related to the professional skills and professional development skills. What's more, the high-end skilled personnel should have a strong desire for knowledge and innovative consciousness, with the development of the time, they can continue to enrich their own with the valuable qualities of the learning talents and innovative talents. Under the long school system, there is only a difference in the level of talent cultivation goals between the secondary stage and the higher vocational stage, and there is no substantial difference. It is necessary to integrate the task of vocational education to serve the cultivation of talents in regional industries and the requirements of cultivating high-end skilled talents into the talent cultivation objectives, highlight the consistency of the talent cultivation objectives at the secondary stage and the higher vocational stage, and provide clear directions for the cultivation of talents.

3.2 Pay attention to the continuity of the curriculum

Curriculum is the main carrier of talent training, and the continuity of curriculum setting is an important part of the cultivation of high-end technical and skilled talents in the long academic system. First of all, the curriculum system should be designed with vocational ability as the core. Good vocational ability is the inherent requirement of high-end skilled talents. We should break through the limitation of knowledge-based curriculum design in the past, take vocational ability as the main basis

of curriculum design from students' professional background, and "create an integrated curriculum system starting from the educational tasks of middle and higher vocational stages"^⑧. Meanwhile, at the same time, "the curriculum is organized and developed in modular units, forming platform+module, foundation+platform+module+direction"^⑨ and other curriculum systems to provide curriculum dynamics for the systematic integration of students' professional core competencies and the cultivation of career expansion abilities in touch with the class. Secondly, the course contents of different stages should be set reasonably. Under the long academic system, the course contents of middle and higher vocational stages should have both the difference in level and good continuity. The curriculum content of the secondary level is based on "professional basic knowledge and the breadth of educational content"^⑩, the content of the curriculum at the senior level is based on professional application knowledge, focusing on the depth of educational content, and the two are interconnected and interactive. Finally, we should strengthen the development of school-based curriculum in school-enterprise cooperation. School-based curriculum is an integral part of vocational education curriculum under the current curriculum management system, and, compared with national and local curriculum, school-based curriculum gives vocational institutions full autonomy. The school-based curriculum development should be regarded as the key work to enrich the curriculum resources for the cultivation of talents in the long school system, and play the role of medium in the articulation and matching of the curriculum in the secondary stage and the higher vocational stage.

3.3 Focus on the synergy of education methods

Under the traditional school system, secondary education and higher vocational education face different groups of students, and there are also some differences in education methods. Secondary education still focuses on lecture teaching method, focusing on the explanation and transmission of knowledge, while higher vocational education introduces many new education methods from the main position of students. The difference of educational methods makes it difficult to effectively connect secondary education and higher vocational education. We should pay attention to the synergy of educational methods and integrate the educational methods that fit the characteristics of vocational education and students' learning conditions into the whole process of talent cultivation. For example, strengthen the application of module teaching method. Module is a concept originally used in the field of product production. The American scholar H. Simon regarded module as a special structure and explained the connotation of module from the perspective of system theory. Baldwin and Clark, professors of Harvard University, put forward the concept of modularity on the basis of modules, and the so-called modularity, that is, "according to certain logical relations, such as hierarchical relations, juxtaposition, etc., the complex system, process, split into independent, but also interrelated modules"¹¹. The modular approach is a teaching method that focuses on the modularization of teaching contents. It requires teachers to decompose the list of vocational competencies according to certain themes and decompose the knowledge scattered in different courses to construct a complete system of knowledge and skill modules. The module teaching method uses modules with clear themes as teaching contents, which helps teachers and students get rid of the shackles of teaching materials to a certain extent, and teachers can carry out modular and combined teaching flexibly according to students' learning situations.

3.4 Focus on the articulation of assessment methods

Education assessment is an important part of vocational education. The assessment methods of secondary education and higher vocational education have certain differences. The assessment of secondary education is mainly in the form of final examination, which is difficult to accurately reflect

the development of students' practical ability and professionalism, while the assessment methods of higher vocational education are more diversified, but they also face the problem of disconnection between professional education and employability training. The training of high-end technical skills talents in long academic system should focus on the articulation of assessment methods, and the integration of courses and certificates is the focus of the articulation of assessment methods in long academic system. The implementation plan of national vocational education reform requires to start the pilot system of "academic certificate + several vocational skill level certificates", which strengthens the connection between academic education and vocational skill education and overcomes the problem that teaching is detached from practice and profession is detached from job in the past. Therefore, it is necessary to make the grade certificates a key element of students' assessment under the long school system. Among them, there is a difference in the levels of junior and intermediate skill level certificates at the secondary level and intermediate and senior skill level certificates at the senior professional and vocational undergraduate level.

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