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Research on the Pathways to Enhance the Quality of Higher Education under the Strategy of Building a Leading Educational Nation

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Abstract: *As the core pillar of the national innovation system, the strategic position of education cannot be improved without a high level of education quality. To promote internal educational reform, this study proposes research on pathways to enhance the quality of higher education under the national strategy of building China into an education powerhouse. Taking the quality of higher education as the research object, we systematically explain the dual connotation of system quality and object quality, and emphasize the decisive role of internal factors, such as talent cultivation objectives, curriculum system, professional settings and teaching methods. Concurrently, the concept of competence-based education theory is brought in and integrated with the Outcome-Based Education (OBE) framework. It is emphasized that higher education should prioritize the development of competencies and establish a flexible adjustment system that aligns with the evolving needs of industries. The need to enhance educational quality stems from the necessity to modernize governance philosophies, ensure a seamless integration of professional skills with industry requirements, and foster the establishment of collaborative innovation platforms. To address these needs, it is suggested to establish a comprehensive, cooperative governance framework involving governments, universities, enterprises, and industries. This includes enhancing policy and regulatory support mechanisms, as well as pioneering participatory teaching approaches that leverage project-based learning to ignite students' creative potential. The ultimate goal is to nurture top-tier professionals capable of adapting to future industrial transformations and contribute to the national strategy of strengthening education.*

Keywords: *education power; higher education; education quality; enhancement path; strategy research*

1. Introduction

Connotative development of higher education is a kind of development that emphasizes the comprehensive quality improvement as the core, and it is a new requirement for higher education in the new era to support and guarantee the social and economic development. For higher education, improving quality is the core of connotative development of higher education. In terms of conceptual equivalence and implication, connotation and quality are inseparably related, connotation is broader than quality, and quality is the embodiment of connotation in some sense[1]. At the same time, scientific and technological progress and national strength rely more and more on higher education, higher education must take the initiative to seek changes from within itself and improve the quality in order to meet the growing demand for education and talents in social development. Only due to the historical tradition, cultural factors, economic conditions and other reasons, countries into the stage of mass higher education path choice is different. Experience has demonstrated that, despite variations in how different nations approach the expansion of higher education to reach a broader population, a common trend emerges: as universities and colleges grow in size, they invariably encounter quality-related challenges to varying extents. On the other hand, research shows that higher education itself has a general law that transcends countries[2]. Therefore, this paper tries to analyze the achievements of China's higher education in the development process and the realistic dilemmas it faces at the present time against the background of the strategy of a strong contemporary education nation, and to provide a direction of thinking for the improvement of the quality of China's higher education[3]. Under the guidance of the scientific development concept, China's higher education should continuously enhance its intrinsic quality and connotation to better serve the nation's socioeconomic development.

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2. Concept definition and theoretical basis

2.1 Quality of education

The former stipulates the general quality requirements of the trainees, which are also the fundamental quality requirements of education, while the latter stipulates the specific quality requirements of the trainees, which are the quality specifications to measure whether the talents are qualified or not"[4]. There are many factors affecting the quality of higher education, macroscopically it is the internal factors of higher education itself and external environmental factors. However, given the inherent relative independence of education, the internal elements within higher education itself play a pivotal role in determining its quality. These micro-level factors influencing the caliber of higher education encompass the objective and rational establishment of talent cultivation goals, the comprehensiveness of the curriculum system's construction, the appropriateness of specialty settings, and the alignment of teaching methodologies with students' developmental needs.

2.2 Competency-based education

Competency-based education is mainly used in vocational education and skill training. To put it simply, schools need to hire a group of experts in the industry to form a professional committee, according to the needs of the job group[5], to determine the ability standard to be possessed by the industry, that is to say, to stipulate the ability requirements to be achieved by the students when they graduate, and then carry out the implementation of education and education according to these ability requirements[6]. Under the socialist market economy system that conforms to modern culture, the higher education system should be built on the cornerstone of the comprehensive and full development of human abilities. All human activities, relationships, and pursuits should revolve around how to unleash human abilities. The OBE approach emphasizes the ultimate learning outcomes achieved by students, as well as the cultivation and enhancement of their abilities upon completion of their studies[7].The professional accreditation of engineering education under the guidance of the OBE concept emphasizes "student-centeredness", and advocates that all the curriculum design and teaching links should serve for the achievement of students' final goals. Competency-based education is basically used as a relative concept to traditional education that emphasizes the transfer of subject knowledge, and its purpose is not to train scholars or researchers, but to provide education or training based on the specific competencies and qualifications or learning outcomes required by industries or specific occupations.

3. The necessity of improving the quality of higher education under the strategy of a strong education nation

3.1 Demand for improving the concept of education quality governance

Under the strategy of a strong education country, the improvement of higher education quality needs to be supported by a modernized governance system. The reform of contemporary governance system emphasizes the participation of multiple subjects, which provides an important direction for higher education governance[8]. In the field of higher education, the diversification of governance subjects not only includes the education authorities and school management, but also needs to absorb the in-depth participation of core stakeholders such as industrial enterprises, teachers and students[9]. By building collaborative governance platforms such as councils, industry enterprises can participate in key aspects such as specialty setting, curriculum development, and practical teaching, so that talent cultivation goals can be accurately dovetailed with industrial needs. This synergistic mechanism not only enhances the practicality of education, but also strengthens the ability of colleges and universities to serve regional economic development.

In the case of higher vocational colleges and universities in a province, for example, although some colleges and universities have set up councils, their functions have not yet been brought into full play[10]. In the future, it is necessary to further standardize the operation mechanism of the council, and promote the industry enterprises from "consulting role" to "decision-making main body", for example, through the establishment of industrial professorships, joint laboratories, etc., to form a community of destiny between schools and enterprises. At the same time, teachers, as the main body of teaching innovation, and students, as the object of education services, their feedback mechanism needs to be incorporated into the governance system[11]. Through the establishment of regular channels for

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representatives of teachers and students to participate in governance, such as the Academic Committee and the Teaching Steering Committee, it can stimulate the vitality of the grassroots and promote the scientific and democratic governance decision-making[12]. This governance model of multiple co-governance can integrate the resources of all parties, form the synergy of education quality improvement, and lay the institutional foundation for the high-quality development of higher education.

3.2 Demand for Deep Integration of Professional Competence and Industrial Demand

A fundamental goal of the national strategy to fortify the country via education is to nurture top-tier professionals capable of meeting the demands of future societal progress. To elevate the caliber of higher education, it is essential to prioritize the profound integration of professional expertise with the requirements of industries as a pivotal starting point[13]. At present, the accelerated upgrading of industrial structure has put forward higher requirements for the professional skills, innovation ability and interdisciplinary literacy of talents. Higher education needs to break through the traditional job adaptation training-oriented model, and turn to the "thick foundation, wide aperture, strong ability" talent cultivation path[14]. Colleges and universities need to optimize professional settings, dynamic adjustment of the curriculum system, the industry's cutting-edge technology, green development concepts into the teaching content. For example, science, technology and agriculture majors can build industrial colleges with leading enterprises, develop modular courses, and realize "teaching - practical training - R & D" integrated training. On the other hand, it is necessary to strengthen the practical teaching link and enhance students' hands-on ability and ability to solve complex problems through modern apprenticeship and project-based learning. Data show that the income level of graduates with high degree of professional relevance is significantly higher, which indicates the positive correlation between professional ability and career development. Colleges and universities should be oriented to build a progressive training system of "theoretical learning-practical application-innovation and creation", so that students have a solid professional foundation and can adapt to the career changes brought by technological iteration. Taking science and technology majors as an example, the relationship between the degree of relevance of science, technology and agriculture majors and monthly income in a university is shown in Figure 1.

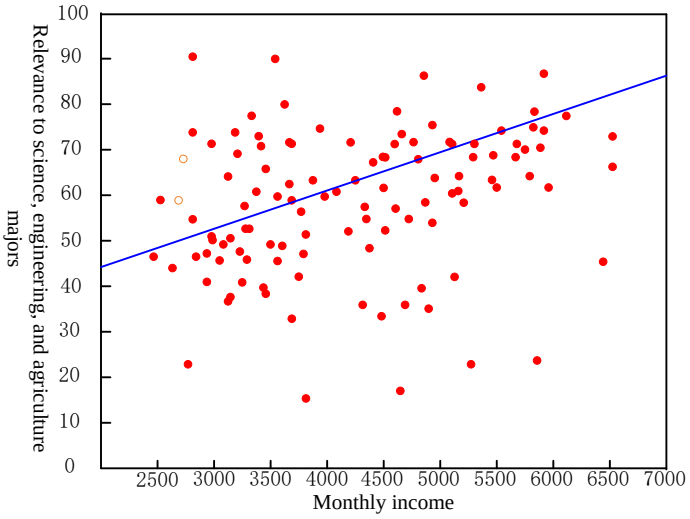

Fig.1 Between the relevance of S&E and agriculture majors and monthly income in a college or university

It can be seen from the above figure that the higher the degree of relevance of S&E majors, the higher the income of students after graduation. Most of the students recruited from the central and western part of the country can not stay in the local development because of their low professional ability, resulting in the income level is also not high, so they have returned to their hometowns. Ultimately, the decline in the number of local employment, can not support the development of local industries. In addition, higher education needs to focus on cultivating students' lifelong learning ability. Against the background of accelerated knowledge updating, universities should broaden students' horizons and enhance their ability to adapt to future career transitions by offering general education courses and interdisciplinary programs.

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3.3 Demand for the construction of collaborative innovation mechanism

The strategy of a strong education nation emphasizes the deep integration of higher education and economic and social development, and collaborative innovation is a key path to achieve this goal. As the main position of training technical and skilled talents, the demand for "dual-teacher" teacher team construction and innovation of school-enterprise cooperation mode is the inherent requirement of the synergistic development of higher education and industrial demand. Teachers gain industrial experience through enterprise practice, which can not only enhance the relevance of teaching, but also feed the choice of scientific research direction, forming a benign interaction of "teaching-practice-scientific research". Enterprises involved in the talent training process, can lock in advance to meet the demand for human resources, reduce human resources costs, and at the same time, with the help of universities and colleges research power to solve technical problems. Universities and enterprises can realize equipment sharing, technology co-research and results transfer through the construction of industry-university-research cooperation platform, avoiding the duplication of construction and waste of resources.

4. Pathways to Enhance the Quality of Higher Education under the Strategy of Building a Leading Educational Nation

4.1 Establishing the framework of multi-dimensional collaborative governance system

Improving the quality of higher vocational education is a complex process involving multiple stakeholders, including the government, non-governmental organizations, enterprises and higher education institutions. The government should be responsible for formulating a macro policy framework and providing necessary policy support for the development of high-quality vocational education. As the key players in the improvement of vocational education quality, institutions of higher education should take the initiative to play the role of coordinating and governing leaders in the light of their own specific development trajectories and unique strengths, and carry out active exchanges and cooperation with enterprises, industries and industrial organizations, encouraging the active participation of all stakeholders in Talent training and academic research. The specific governance framework is shown in Figure 2.

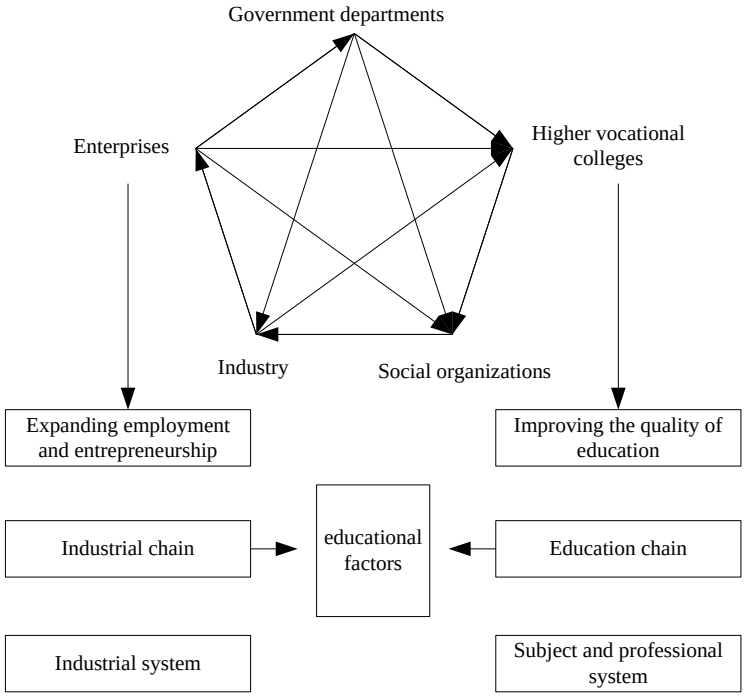

Fig. 2 Framework structure of multi-collaborative governance system

The government should emphasize the formulation and guidance of laws, regulations and policies, establish a comprehensive education quality guarantee system, and strengthen the supervision, evaluation and monitoring of education quality. Higher vocational colleges and universities should

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assume the core responsibilities, establish efficient organization and management systems, optimize the multi-collaboration mechanism among the government, schools, industries and enterprises, certification and evaluation diagnosis and improvement systems[15]. Companies ought to assume a pivotal position in school-enterprise partnerships, actively engaging in collaborative efforts with higher vocational institutions. They should be committed to jointly nurturing talent, providing training, fostering innovation, and achieving mutual development, thereby forging a shared future through school-enterprise cooperation. The industry should play its role of participation and support, and strengthen the service level of the industry in the areas of coordination and guidance, talent demand prediction, teaching guidance, skill appraisal service and third-party quality assessment.

4.2 Improve the education quality policy and regulation system

After the development of higher vocational education to a certain stage, there is an urgent need for some mature regulations as a guide to action, in the higher vocational education funding, social forces to participate in the governance of incentives, employment and hiring protection, talent quality diagnosis and evaluation of the different types of higher education, in order to help the main body of the governance of the further clarification of the identity of the clear responsibility to become a "rightful" part of the governance of the higher education. The government needs to play a good role as a "legitimate" member of the higher education governance. The government needs to play a good role as a "hub-type node organization," transitioning from an "excessive government" to a "limited government," clarifying the shift in government identity—the government is the "helmsman" rather than the "oarsman." The government is the "helmsman" rather than the "oarsman". Firstly, it is necessary to improve the structure of laws and regulations, and establish a multi-level and all-round structure of laws and regulations, including macro policies, medium and long-term planning, operation guidelines, evaluation standards, etc.: It is necessary to establish a complete legal framework of vocational education at the national level, which is based on the Vocational Education Law and includes a series of basic laws, administrative laws and regulations and specific implementation regulations, to ensure that there are clear provisions for each level and content. This framework is based on the Vocational Education Law and includes a series of basic laws, administrative regulations and specific implementing regulations to ensure that all levels and contents are clearly defined. In addition, there is a need to coordinate with various governmental departments, such as human resources and social welfare, finance, and other governmental departments, to revise and improve the existing enterprise income tax law, labor law, contract law, and other related laws, so as to motivate enterprises to participate in higher vocational education in a correct and appropriate way through the strategy of incentives and penalties in parallel. Vocational colleges and universities need to improve the local legal system, and should formulate local laws and regulations in line with the Vocational Education Law, which should be practical and targeted, and highlight the local characteristics, so as to ensure that the management of the quality of higher vocational education can be regularized, systematized and rationalized.

4.3 Innovative participatory teaching mode

"Instrumentalization" is a long or long professional "externalization" stage that graduates of science and engineering majors experience when they go out of the campus and enter the workplace. It refers to the fact that after entering the workplace, the graduates only apply the professional knowledge they have learned in their work, and do not participate and integrate into the workplace wholeheartedly, and give full play to their creativity. They don't show and apply other qualities and potentials other than their professional knowledge to their career development, and their sense of actual participation is low. How to enhance the "sense of participation" of graduates after joining the workforce and improve their contribution to career development and social and economic growth will be the "potential" huge energy of students. How to eliminate the tendency of education to "instrumentalize" people and gradually increase the potential of graduates to become "human resources" for the society will, to a certain extent, determine the quality of education in colleges and universities.

Participatory teaching can make students in the learning process to develop a willingness to participate in the process, diligent participation, and good at participating in the habit, in addition to professional knowledge of the students can tap the huge "potential" ability. Participatory teaching is in the teaching of teacher-led, student-led, teachers and students to plan together to complete a specific complete, practical value of the course scenario. This teaching method pays more attention to the process of teachers and students to complete the whole project together, so that every student can

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participate in the creative practical activities. Colleges and universities in the practical operation process can be combined with science and engineering disciplines and participatory teaching methods to carry out project-based "big classroom" mode of instruction. That is, the teaching content to the "project" form of presentation, the same college students of different majors organized together in the classroom. The students are divided into different project groups. The project leaders can be teachers of different majors, and the members of the project team are mixed students from different majors. The courses are organized according to the degree of difficulty of the project, and the degree of difficulty of the course is the degree of integration of different majors. Students in the project as a "project leader" role, so that students, whether from the ideological and emotional and attitudinal, or in the actual operation of the method can actually experience the "engineering people" feeling.

5. Conclusion

Based on the background of the strategy of a strong education nation, this study focuses on the core proposition of quality improvement in higher education, and systematically explores the internal logic and practical needs of the three major paths of pluralistic co-management, professional competence advancement and collaborative innovation. The study responds to the systematic requirements of the strategy of a strong education nation for the high-quality development of higher education, reveals the multi-dimensional driving mechanism of quality improvement, and provides theoretical support for the modernization of higher education governance.

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