

Research On Big Data Talent Training Based on Integration of Scientific Research and Education

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Abstract

The high-quality development of vocational education is imperative to promote the integration of scientific research and education. The integration of scientific research and education is a new path for the development of vocational education in the new era and an important convergence point for the in-depth implementation of the strategy of rejuvenating the country through scientific research and education and the innovation-driven development strategy. The School of Information Engineering of Jiangsu Maritime Institute has built the Jiangsu Provincial Shipping Big Data Engineering Research Center and the Jiangsu Provincial High-level Professional Group into a new carrier of scientific research and education integration of professional group + platform to realize the reform of the professional group teaching system under the integration of scientific research and education. The reconstruction of the curriculum system, the creation of the teaching staff and the development of new paradigms of scientific research will build an interactive spiral professional group development model driven mainly by industry to meet the economic development needs of the region.

Keywords

Vocational education, integration of scientific research and education, integration of industry and education, dual-qualified teachers, project-based teaching.

1. Introduction

The report of the 20th National Congress of the Communist Party of China creatively put forward the new requirements of *three integrations* to promote the integration between vocational education and general education, between industry and education, and between scientific research and education [1]. The integration between vocational education and general education is the key, the integration between industry and education is the focus, and the integration of scientific research and education is the new direction. Literally understood, the integration of scientific research and education refers to integrating science and technology research into education. For vocational education, the integration of scientific research and education means a new development model of science and technology + vocational education. It emphasizes that the development of vocational education requires the close integration of the power of scientific research and education innovation and the work of educating people, integrating into a powerful force to help the country modernization construction.

The School of Information Engineering of Jiangsu Maritime Institute relies on the construction of the Jiangsu Provincial Engineering Research Center - Shipping Big Data Engineering Research Center and the Jiangsu Provincial High-level Professional Group - Big Data Technology and Application Professional Group. Under the background of the construction of upgrading to undergraduate institution and Double-High Plan, and in view of the concept of scientific research and education integration under the new situation, it innovates a new operating model for the integrated development of higher vocational education and industry. It studies how to

further promote the integration of scientific research and education, and realizes the integration of the engineering research center and the high-level professional group, and implements the Two-line integrated development. It uses scientific research to optimize the talent training model, curriculum system construction and teaching model innovation, and uses education to connect scientific and technological innovation, strengthens the research foundation and research team, and realizes the two-way empowerment of scientific research and education. It makes talent training more accurate, teaching content more realistic, teachers development more efficient, applied research levels more higher, and social service capabilities more significant.

2. Research Review

2.1. International Research

From the experience of founding the University of Berlin to the localization practice and development of Gilman and Boyer in the United States, the integration of scientific research and education has been proven to play an important role in cultivating innovative talents. Since the beginning of the 21st century, developed countries around the world have successively launched a series of educational reform programmatic documents oriented toward technological innovation and talent cultivation, emphasizing the integration of scientific research and education development and talent cultivation.

The practice of European universities of applied sciences has proven that promoting the integration of scientific research and education helps to cultivate talents with the ability to analyze and solve problems and adapt to the changing needs of future society. On the other hand, it also helps to serve regional innovation and the needs of small and medium-sized enterprises [2]. American universities promote the organic integration of scientific research and education through interdisciplinary research, practical education, entrepreneurial support, and international cooperation, providing students with rich learning experiences and promoting social innovation and development [3]. Japan has promoted the reform of higher education and absorbed the educational philosophy of European and American research universities. While attaching importance to openness and freedom in teaching and research, it continues to provide stable funding support for scientific research [4].

2.2. Domestic Research

In December 2022, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the *Opinions on Deepening the Construction and Reform of the Modern Vocational Education System*. The opinions mentioned that the integration of scientific research and education should be the new direction to promote the construction and reform of the modern vocational education system in an orderly and effective manner. In July 2023, the General Office of the Ministry of Education issued a notice on the key tasks of accelerating the construction and reform of the modern vocational education system. The notice arranged the creation of a municipal industry-education consortium, an industry-education integration community, and an open regional industry-education integration practice center. The construction of these tasks will have a positive impact on promoting the integration of industry and education, the integration of scientific research and education, and building a high-quality vocational education development ecosystem.

In order to better empower the high-quality development of the economy and society, many higher vocational colleges have seized the opportunities of the times, deeply promoted the integration of industry and education, and the integration of scientific research and education, built a new paradigm for the high-quality development of vocational education, and cultivated more high-quality technical and technical talents. Rizhao Polytechnic integrates teaching and

scientific research into a chain, exploring joint technological research and collaborative talent training to solve corporate difficulties and serve students' growth [5]. Guangdong Polytechnic of Science and Technology adheres to the integration of scientific research and education, uses science to promote construction, science to promote learning, science to promote education, and science to promote production, and achieves an organic integration of technological research and development innovation with education, teaching, and practical training [6]. Changzhou Vocational Institute Of Mechatronic Technology has built a five-in-one artificial intelligence and advanced manufacturing industrial center of production, learning, research, training, and innovation to promote the effective connection of the education chain, technology chain, industrial chain and value chain [7].

3. Professional Construction Practice of Integrating Scientific Research and Education

In order to comprehensively promote the integration of scientific research and education and solve outstanding problems in big data talent training, the big data major has constructed a new professional talent training model that integrates provincial and line construction as shown in Figure 1.

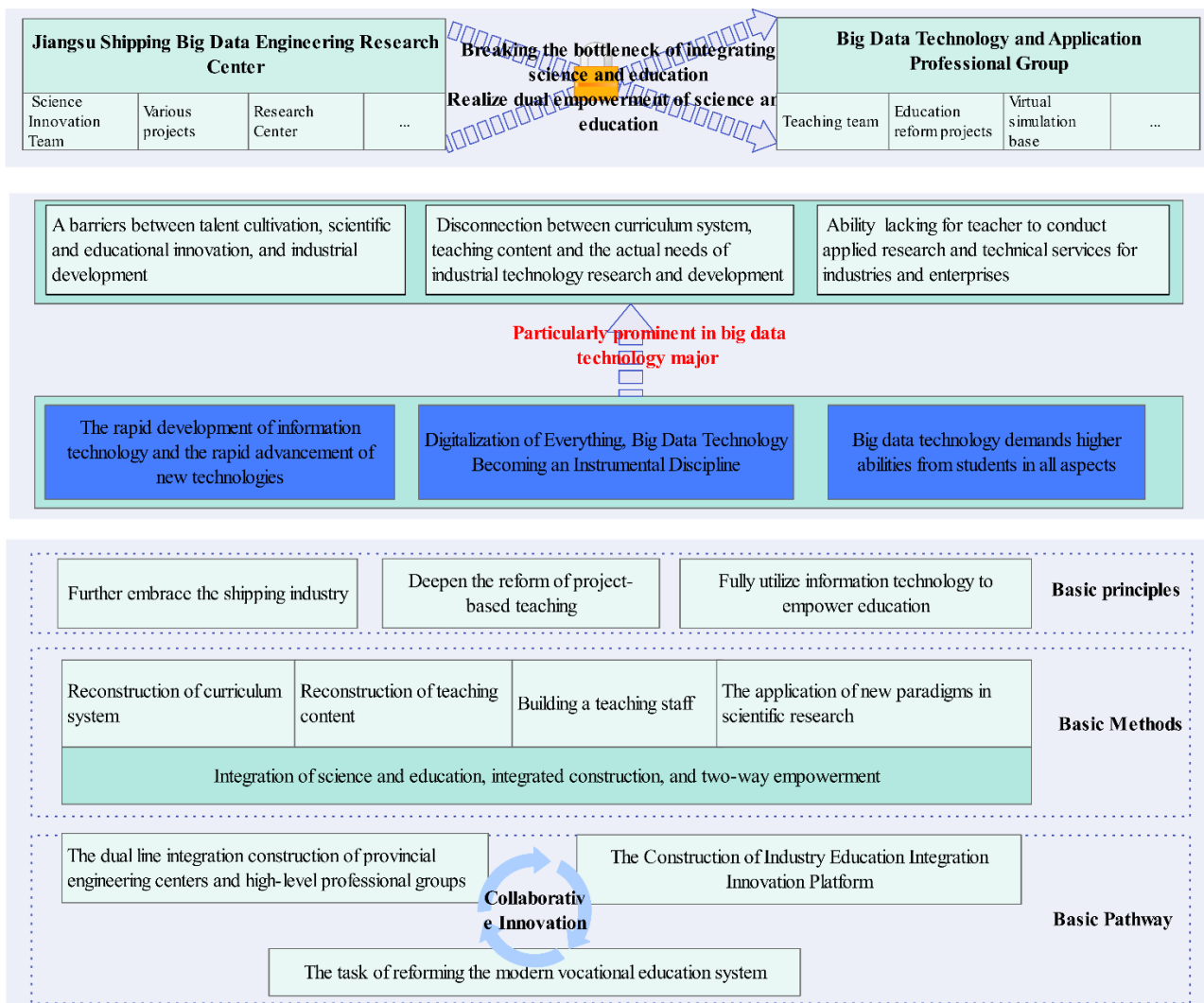


Figure 1: integration of scientific research and education

3.1. Promote the Reform of the Big Data Professional Group Teaching System by Integrating Scientific Research and Education

The advancement of the integration of scientific research and education will introduce more applied research projects into professional teaching content. The model of courses + projects will become a new way of integrating scientific research and education. The integration of scientific research and education should not only introduce scientific and technological achievements, but also introduce engineers engaged in applied research in enterprises into the professional teaching staff of vocational colleges, and unify the project development process of applied technology research and the training process of students' scientific research and innovation capabilities to the greatest extent. With the goal of training students to solve practical technical problems faced by industry enterprises, majors and corresponding course systems have been set up.

The big data major builds a new model for cultivating professional talents that integrates scientific research and education, feeds the projects of the Engineering Research Center back into teaching, builds a project-based teaching system that integrates scientific research and education, and further improves the quality of education and teaching. The big data major is based on the Big Data + Shipping scientific research and production projects, follows the rules of education and teaching, interdisciplinary majors, reconstructs the curriculum system of Bottom Sharing, Middle Modules, High-Level Direction and Project Penetration to solve the problem of curriculum system, The problem of teaching content not adapting to the needs of industrial development. Innovate a diversified big data professional group talent training model of Project-Led, Professional Diversion, and Ability Advancement. Freshmen in the professional group study basic professional courses regardless of direction, sophomores are divided into majors according to students' wishes, and juniors choose project classes that suit themselves, using real work projects as the carrier, in real work scenarios, and according to corporate R&D processes. Collaborative innovation between schools and enterprises creates mutual learning and application, stimulates learning motivation, and enhances employment and entrepreneurship capabilities. Solve the problem of a single talent training model that is not suitable for students' diverse career development needs.

3.2. Create a Teaching Team by Integrating Scientific Research and Education

The advancement of the integration of scientific research and education will strengthen the connection between education, science and technology, and talents, and achieve deep integration of the vocational education chain and the industrial chain. Implementing the integration of scientific research and education will lead and support professional construction with scientific and technological innovation, open up the boundaries between majors, scientific and technological innovation and industrial system chains, optimize the professional system, curriculum teaching system and resource allocation system, and be close to new fields and new business formats in the development of modern science and technology industries. Give new momentum to the profession and open up a new track.

The big data major cooperates with shipping companies, schools and enterprises to build shipping big data engineering research centers and scientific and technological innovation teams. It provides teachers with learning opportunities and project development platforms to solve the problems of teachers' weak practical ability, lack of project development experience, and difficulty in implementing the integration of scientific research and education. The major creates a teaching team with double-responsibilities, double-positions, double-salary team that understands the entire process of shipping business, knows the entire process of big data development, and can use mainstream technologies to solve smart shipping problems.

3.3. Carry out Scientific Research Paradigm Innovation by Integrating Scientific Research and Education

The advancement of the integration of scientific research and education will create a number of high-level collaborative innovation and cooperation platforms. The model of major groups + platforms will become a new carrier of the integration of scientific research and education. Major groups are an important carrier for higher vocational education to actively connect with industrial chains, job groups and knowledge chains. The platform is a carrier for major groups to provide technical services and a channel for scientific and technological innovation to feed back the construction of major groups.

The big data major relies on innovative mechanisms of Jiangsu Maritime Institute. These mechanisms include Management Measures for Identification, Accumulation and Transformation of Learning Achievements, Several Measures to Promote Scientific and Technological Innovation and Transformation of Achievements, and Measures for the Review of Professional and Technical Qualifications. The major connects scientific research innovation with professionalism and integrates scientific research, teaching, majors, student growth and other elements to promote the integration of engineering center and high-level professional group construction tasks. Through the three-level Unveiling and Leading projects at the provincial, school and engineering center levels, a scientific research innovation team and platform composed of professional dual leaders, key teachers, students, and corporate engineers has been created. It promotes the transformation of scientific research results into the market and into teaching.

4. Conclusion

The integration of scientific research and education is to promote the reform and development of higher vocational education and improve the quality of education. It is an inevitable choice to realize the modernization of higher vocational education in our country. The big data major is characterized by Shipping, serving the construction of a powerful shipping country. It builds a scientific research and education integration carrier of Big Data Major Group (provincial high-level major group) + Big Shipping Data Research Platform (provincial engineering center), and integrates scientific research results into teaching, and further deepens the project-based teaching reform. It will give full play to the advantages of technical resources in the shipping industry and cultivate high-skilled big data talents serving smart shipping. The implementation of the integration of scientific research and education has effectively improved the quality of big data professional talent training in Jiangsu Maritime Institute, and has been optimized in aspects such as faculty construction, talent training models, curriculum system construction, and teaching model innovation related to major construction. The integration makes talent training specifications and talent ability models more meet the technological development needs of industry enterprises.

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