



Research on the Innovation of Integration between industry and education from the Perspective of Educational Services: A Case Study of Hainan Lingshui Li'an International Education Innovation Pilot Zone

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Abstract. In June 2020, Lingshui Li'an International Education Innovation Pilot Zone (hereinafter referred to as the "pilot zone") was formally established as an important carrier of the international education innovation island construction under the policy guidance of *Implementation Plan for Supporting Hainan's Deepening Education Reform and Opening-up*. The *Regulations on the Lingshui Li'an International Education Innovation Pilot Zone of Hainan Free Trade Port* was officially promulgated and implemented in January 2024, marking the entry of the experimental zone into a new stage of accelerated development. High-quality educational services lay a solid foundation for high-quality development within the pilot zone, while the innovation of Integration between industry and education acts as the way to provide high-quality educational services. Against this background, this paper aims to explore the integration of high-quality educational services and deep-seated industries. To this end, this paper clarifies the research scope through the concept analysis of the core nouns represented by "Integration between industry and education". Simultaneously, through the innovative planning of "the deep Integration between Education, Science, Industry, and City", this paper further consolidates the strategic positioning of the new benchmark for the innovative development of educational services in the pilot zone.

Keywords: Integration between industry and education Integration between Education, Science, Industry, and City.

1 Introduction

1.1 Policy Background

To thoroughly implement the spirit of General Secretary Xi Jinping's important speech at the 30th anniversary of Hainan's establishment of a special economic zone, and fully implement the Guiding Opinions of the Central Committee of the Communist Party of

China and the State Council on Supporting Hainan's Comprehensive Deepening of Reform and Opening-up [1], the Ministry of Education, in conjunction with the Hainan Provincial People's Government, studied and formulated the Implementation Plan on Supporting Hainan's Deepening of Education Reform and Opening-up [2] (hereinafter referred to as the "Plan") in June 2019, with a view to supporting Hainan's construction of an international education innovation island, promoting the sustained expansion of education opening-up and the comprehensive deepening of reform. In the foregoing Plan, it is demonstrably proposed to promote the coordinated development of education, science, and production. More precisely, first and foremost, the Plan is intended to build a higher education cluster with the integrative development of production, learning, research, and application. Secondly, the Plan encourages the establishment of a higher education innovation consortium and supports top universities and scientific research institutions at home and abroad to set up branches, key laboratories, or scientific and technological achievements incubation and transformation centers in Hainan around key areas in an attempt to share teaching and scientific research resources, jointly implement teaching and scientific research activities.

In June 2020, the Lingshui Li'an International Education Innovation Pilot Zone (hereinafter referred to as the "pilot zone"), an important carrier of the international education innovation island construction jointly established by Hainan Province and the Ministry of Education, was formally established. In January 2024, the Regulations on the Lingshui Li'an International Education Innovation Pilot Zone of Hainan Free Trade Port [3] (hereinafter referred to as the "Regulations") was officially promulgated and implemented. The Regulations explicitly pointed out "deepening the Integration between industry and education". Specifically, first of all, the Regulations emphasized that the pilot zone should support educational institutions, scientific research institutions, enterprises, and other entities to implement collaborative innovation around industrial development and promote the integration of higher education into science and technology and industrial innovation systems in an attempt to push forward the incubation, transformation, and industrialization of scientific and technological achievements, thereby realizing the integrative development of "education, science, industry, and city". Secondly, the Regulations proposed that the pilot zone should support the establishment of various types of scientific research achievements transformation bases in colleges and universities.

1.2 Research Significance

The pilot zone, as the first park with education opening up as its core mission and one of the 13 key parks in Hainan Free Trade Port, is committed to introducing the establishment of schools initiated by first-class universities at home and abroad and creating diversified high-quality international education, with a view to realizing the grand vision that "studying in Hainan is equivalent to studying abroad". Notably, the pilot zone serves as a pilot project of Hainan International Education Innovation Island with the support of the Ministry of Education, with its overall construction being divided into two phases. In detail, the first phase of its construction focuses on the function of international education, whereas the second phase concentrates on the function of bearing

the integrative development of education, science, industry, and city. In addition, with the primary objective of building a national demonstration zone for educational innovation and development, an international and innovative talent cultivation base as well as an important destination for international students from countries along the Belt and Road, the pilot zone strives to build a gathering platform for Chinese-foreign cooperation in running schools in China's first-class universities, intending to evolve into a new benchmark for China's education opening-up.

The pilot zone, as one of the "three new novelties" of Lingshui County's economy, will become a new highland for scientific and technological innovation and transformation. In this connection, it is of paramount significance to focus on the research on the innovation of the education mode of Integration between industry and education in the direction of improving educational services for the pilot zone which is at the key node of the completion of the first phase of construction and the initiation of the second phase of construction. It is necessary, therefore, to explore the innovative mode of "educational services plus digital economy" in the second-phase planning and construction of the pilot zone, and to cultivate high-tech industries and modern service industries based on data by relying on the advantages of disciplines and talents in colleges and universities, thus filling the blank of industrial layout. Most importantly, the urgent task is to explore an effective mode for multi-subjects encompassing enterprises, schools, governments, etc. to jointly build a base for transforming scientific and technological achievements, thereby fully realizing the high-quality integrated development of education, science, industry, and city.

1.3 Literature Review

1.3.1. Concept Definition.

1.3.1.1. Integration between industry and education.

In retrospect, the term "Integration between industry and education" was put forward in the Opinions of the Ministry of Education on Deepening the Comprehensive Reform of Education in 2013 [4], which pointed out that "the school-running system should be reformed and the integration system of production and education in vocational education should be improved". In 2015, the Action Plan for Innovation and Development of Higher Vocational Education (2015-2018) [5] promulgated by the Ministry of Education put forward that "the basic principle is to adhere to the Integration between industry and education as well as school-enterprise cooperation ...". In December 2017, Several Opinions on Deepening the Integration of Industry and Education [6] issued by the General Office of the State Council proposed to "deepen the integration of industry and education and promote the organic connection between education and talent chains and industry and innovation chains". To put it simply, the aforementioned document provides explicit examples of the application field of the term "Integration between industry and education", although it fails to make a comprehensive definition and explanation.

Currently, the academic and industrial circles have diverse understandings of the concept of "Integration between industry and education". Guan [7], for instance, advocated that "production" in "Integration between industry and education" refers to both industry and enterprises, whereas "education" embodies various connotations such as education and teaching. Particularly, "integration" embodies mutual blending and joint completion, indicating the closer and integrated relationship between the two parties involved. Kong [8] argued that "the Integration between industry and education refers to the integration of production and teaching during the education process, which involves two aspects, one of which is the integration of education and teaching process with production and work process, indicating a kind of integration in the way of education, whereas the other is the integration of education and teaching content with production technology and skills, demonstrating the integration of educational content."

Among numerous concept analyses, the definition of "Integration between industry and education" summarized by Yang et al. [9] through accurate retrieval covering key journals and CSSCI journals is relatively recognized by academic circles and industries.

More precisely, from a macro perspective, "Integration between industry and education" is defined as the integration of industry (i.e., industry and enterprise) and education (especially school education), which primarily involves the coordination of industrial development and education development. By contrast, from a micro perspective, it refers to the integration of production and teaching, mainly involving the docking of the production process and teaching process. Overall, the specific content of Integration between industry and education encompasses the docking of specialty and industry, school and enterprise, curriculum content and professional standards, and teaching process and production process.

1.3.1.2. Integration between Education, Science, Industry, and City.

"Integration between Education, Science, Industry, and City" is a brand-new concept put forward by the pilot zone in the Regulatory Detailed Planning of Hainan Lingshui Li'an International Education Innovation Pilot Zone (Phase II) [10], with the "1-2-3-4" development strategic planning of the pilot zone serving as its core gist. To be specific, first of all, the foregoing "1" refers to "one core", which can be summarized as the construction and operation of Chinese-foreign cooperatively-run schools, with "international higher education" as the core drive of the pilot zone. Furthermore, the foregoing "2" refers to "two wings", which can be summarized as developing "educational innovation" industries related to international education and promoting related industries with the main purpose of "Integration between industry and education", thus forming two wings to support the development of international higher education. Moreover, the aforementioned "3" refers to "three synergies", which can be summarized as relying on the development of the two-wing industry in the pilot zone to further attract those enterprises that possess certain leading technologies and are mainly deeply involved in the above two industries, thus realizing the coordinated and advanced development of education, industry, and science and technology. Lastly, the aforementioned "4" refers to "four integrations". In other words, the pilot zone should bear the multiple and compound functions of "university campus", "industrial park", and "living community" to shape the integration concept of education, science, industry, and city characterized by

"promoting production through education", "attracting talents through production", and "building the city through talents", thereby building a demonstration area that sternly practices China's "education+" diversified development model.

1.3.2. Research Actuality.

Conceptually, educational service is defined as a series of supporting work provided for educational activities. Educational service products, as a commodity, have both use value and exchange value. Educational services form an educational market during the process of market exchange [11]. By means of advanced retrieval in the China National Knowledge Infrastructure (CNKI) database, this research takes "Integration between industry and education from the perspective of educational services" as the keyword under the column of "journals" and sets the retrieval deadline of 2018 for accurate retrieval, covering CSSCI and core journals. Ultimately, effective journal papers were not determined. Likewise, this research utilized "Integration between industry and education from the perspective of educational services" as the keyword to implement further retrieval through the search engine in Google Scholar, with no effective journal papers being identified[12]. In summary, the "research on the innovation of Integration between industry and education from the perspective of educational services" still exposes a significant academic gap in related studies.

2 Planning Recommendations for the Integration of "Education, Science, Industry, and City" within the Pilot Zone from the Perspective of Educational Services

2.1 Planning Objectives

The overall objective is to build a regional model of the digital science and technology industry with educational services as its central tenet and the deep Integration between Education, Science, Industry, and City as its feature, and to build a demonstration base for talent cultivation with integration of production, learning, research, application, training, and innovation as well as a Integration between industry and education base in high-tech direction.

2.2 Planning Content

2.2.1. Creating One "Industrial Cluster"

Relying on the advantages of the pilot zone as an educational strategic highland, it is recommended to build an educational service industry cluster with geographical agglomeration characteristics. Hence, it is imperative to realize the spatial agglomeration of educational service enterprises, their supporting formats, and auxiliary institutions, such as trade associations and financial departments, intending to form a flexible educational service industry complex and build regional core competitiveness centered on the pilot zone.

2.2.2. Forming One "Regional Brand"

"Regional brand", produced by the common production area of enterprises, is a symbol of brands, such as French perfume and Swiss watches. Employing the overall strength of the enterprises within the cluster, it is easier to form a "regional brand" by utilizing the group effect. Compared with a single enterprise brand, a "regional brand" presents a broader and persistent brand effect. In terms of the Pilot Zone, the urgent task is to build Li'an into a "regional brand" of the strategic highland of international education and to effectively integrate the industrial chain and improve the operational efficiency among enterprises through the cluster development of education service industry, thereby realizing the strong competitive advantage of sustainable development.

2.2.3. Building Four Empowerment Centers

Depending on the resource advantages of the educational service industry cluster, it is suggested that the pilot zone should build four empowerment centers as shown below.

2.2.3.1. Integration between industry and education Demonstration Center.

At this point, it is suggested to build an exclusive digital and intelligent Integration between industry and education platform suitable for the pilot zone, universities, and enterprises, which involves talent cultivation, project development, scientific research cooperation, achievement transformation, technology trading, and innovative services between schools and enterprises, intending to promote the deep integration of talent chain, innovation chain, and industrial chain. In addition, some basic projects can be transformed into teaching cases. Through providing internship and training courses for college students, the foregoing projects can be leveraged to tackle the "last-kilometer" problem from college graduates to industrial talent recruitment, contributing to teaching research and reform. On the other hand, some scientific research projects can be utilized to form relevant horizontal subjects between schools and enterprises. Utilizing joint research between schools and enterprises, knowledge spillovers in colleges and universities are more beneficial to the development of empowerment industries, thereby facilitating the sharing of achievements (as shown in Figure 1).

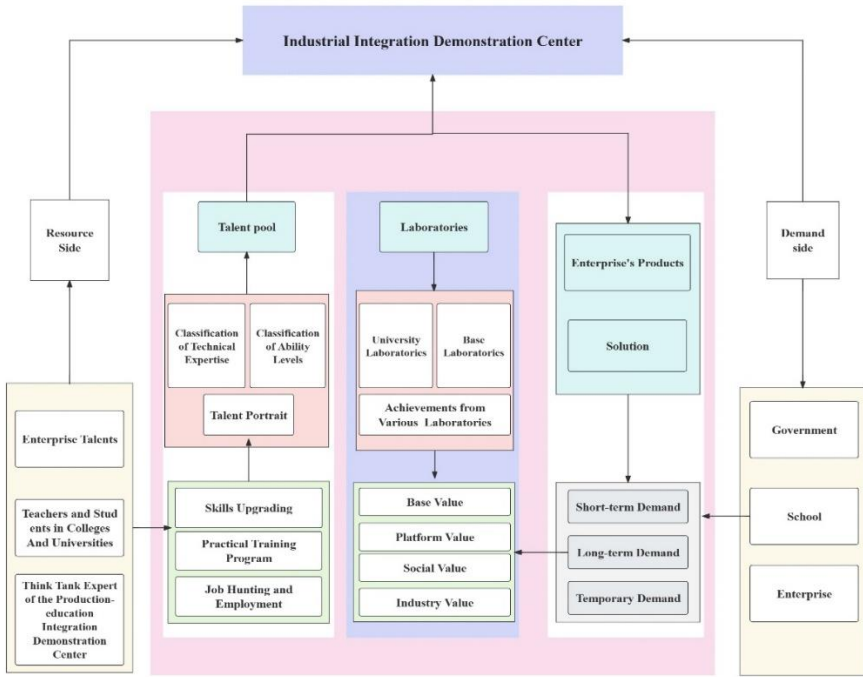


Fig. 1. Production-education Integration Demonstration Center

2.2.3.2. Industry-university-research Center.

Based on the specific demands of regional industrial development, the Industry-university-research Center should guide educational resources to tilt to key industrial fields in combination with the development orientation of the pilot zone. Simultaneously, the Industry-university-research Center should improve the pertinence and practicability of talent cultivation, and continue to promote targeted research in diversified fields such as high and new technology, digital economy, smart education, and information technology application innovation industry chain. Moreover, the Industry-university-research Center, in conjunction with eco-enterprises and leading enterprises within the industry, should jointly conduct project cooperation as well as declaration of scientific research results around core resource development, key technology R&D, thereby jointly enhancing the visibility and influence of the pilot zone at home and abroad. On the same note, while promoting the integration of districts and counties as well as promoting the transformation and upgrading of enterprises, the Industry-university-research Center should guide settled enterprises to increase R&D investment to enhance their industrial technological innovation capabilities and encourage enterprises to achieve revenue targets with tax refund policies.

2.2.3.3. Business Startups and Innovation Center.

It is suggested to build the first digital industry innovation incubation cluster in Ling shui County. To this end, for one thing, it is imperative to build an online one-stop

ecological open platform. For another, it is necessary to complete the project development in the way of cooperation between teachers and students and enterprise experts according to the real project operation process of industry and enterprise offline, thus improving students' practice and innovation ability. In this regard, the Business Startups and Innovation Center can be equipped with an industrial research institute. Meanwhile, schools and enterprises can jointly send relevant personnel to set up training and research bases to undertake real projects and complete the output of relevant achievements.

Firstly, Student-related Benefits: Improving Employment Competitiveness

Based on the real project operation process of enterprises, the cooperation between teachers and students and enterprise experts can be employed to cultivate students' operational ability and improve their professional quality, practice, and application innovation ability. Most importantly, through project practice, they can accumulate project experience and create project outcomes, which is conducive to improving their employment competitiveness and opening up new ways to start their businesses.

Secondly, School-related Benefits: Building a Socialized Team.

Several factors, encompassing school-enterprise linkage, the introduction of real enterprise projects, and the integration of innovation and entrepreneurship education in the whole process of professional personnel training, are beneficial to promoting the construction of socialized teams in colleges and universities. In the meantime, the above-mentioned two sides can provide various services such as skills upgrading, comprehensive quality improvement, and technical empowerment for enterprise employees as well as teachers and students in colleges and universities by jointly holding special training courses and competition training classes, thus helping universities and enterprises to obtain professional projects while developing synergistically, and encouraging relevant personnel to declare research subjects or participate in related competitions through actual projects.

2.2.3.4. Talent Construction Center.

On the one hand, it is necessary to strengthen the construction of double-qualified teams. Specifically, the pilot zone can integrate settled enterprises and universities to implement the teacher-sharing and cooperation model, and invite enterprise executives and technical experts to serve as part-time teachers in universities to share practical work experience and opinions on career planning for students. Additionally, colleges and universities can encourage teachers to obtain industry-related professional qualifications or technical qualification certificates, organize teachers' teams to regularly conduct industry technical training, and go deep into enterprises in industrial parks to implement field research, with a view to ensuring the synchronization of teachers' professional quality and skill level with industrial development.

On the other hand, it is suggested to speed up the construction of the "one-stop" examination and training certification center. In this regard, combined with the ecological strategy of the digital industry and the emerging occupations promulgated by the Ministry of Human Resources and Social Security and the Ministry of Industry and Information Technology, the pilot zone can establish empowerment systems and certification standards for universities, enterprises, institutions, and social groups, focusing

on a variety of technical fields encompassing big data, cloud computing, artificial intelligence, information technology application innovation, integrated circuits, information security, and meta-universe. Concurrently, the Pilot Zone can initially promote the implementation of a "one-stop" service covering education, examination, and training, and realize training, examination, and certification in one step, thereby setting a new benchmark for vocational skills examination and training certification mode.

2.3 Planning Gain

In the first place, Development of Educational Service "Industrial Cluster" as an Important Way to Promote Regional Economic Growth. To begin with, the development of industrial clusters is conducive to the snowball-like agglomeration effect, which in turn attracts more related enterprises to gather in the pilot zone. In addition, the development of industrial clusters is conducive to the rapid derivation and growth of enterprises in the cluster.

Moreover, Building "Regional Brands" as a Correct Way to Improve the Brand Influence and International Popularity of the Pilot Zone. For one thing, building regional brands is beneficial to attracting investment, introducing talents, gathering information, and expanding markets. For another, the regional brand building within the pilot zone is primarily led by the education service industry and supported by several well-known leading education enterprise brands.

Eventually, Construction of "Four Empowerment Centers" as an Effective Strategy to Achieve Accurate Investment Promotion in Industrial Chain. Firstly, the "four empowerment centers" are both a collection of market segments of the educational service industry and a strategic framework for forming accurate investment promotion within the industrial chain. Secondly, the "four empowerment centers" act as the "core structure" of the industrial chain, which takes tangible products or intangible services as the object and value-added as the orientation.

3 Conclusions

This article takes the international innovative education service in the pilot zone as the research purpose, and takes the integrated construction planning of education, science, industry, and city as the practical goal. Through on-site inspection and combined with the "Regulatory Detailed Planning(Phase II)" of the Pilot Zone, Proposed Innovation of Integration between industry and education from the Perspective of Educational Services. To build an educational service "Industry cluster", Forming international education "Regional brands", building Industry-university-research Center, Business Startups and Innovation Center, Talent Construction Center, Production-education Integration Demonstration Center. This can achieve political and economic benefits such as promoting regional economic growth, improving the brand influence and international popularity of the pilot zone, and achieving precise investment in the industrial chain.

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