

Research on the Construction of Industry Education Integration Industrial College and Dynamic Adjustment of Majors

Jing Xu*, Mao Mao, Miao Hu

College of Science and Technology of China Three Gorges University, Yichang 443002, China

*Corresponding author: Jing Xu, mmyy8285@163.com

Copyright: © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: In the context of the national comprehensive promotion and implementation of the strategy of revitalizing the country through science and education, strengthening the country through talents and innovation driven development, based on the local application-oriented university's own school running orientation and regional development goals, relying on the school running foundation of the relevant advantageous majors of the university, taking the construction of modern industrial college and the dynamic adjustment of majors as the way to explore a new type of higher education development model that adapts to the development of the times and the needs of the industry, strengthen the synergy between the education system and industry departments, optimize the structure of disciplines and majors, adjust the direction of talent training, achieve the overall goal of matching and promoting each other between disciplines and the industry chain, innovation chain, and talent chain, and effectively enhance the adaptability of talents to high-quality economic development.

Keywords: High-quality development; Integration of industry and education; Industrial college; Dynamic tuning

Online publication: October 25, 2024

1. Introduction

The report of the 20th National Congress of the Communist Party of China clearly states that “education, technology, and talent are the fundamental and strategic supports for the comprehensive construction of a socialist modernized country. It is important to adhere to the principle that technology is the primary productive force, talent is the primary resource, and innovation is the primary driving force. We must deeply implement the strategies of rejuvenating the country through science and education, strengthening the country through talent, and innovation-driven development, opening up new fields and tracks for development, and continuously shaping new driving forces and advantages for development. We will coordinate the coordinated innovation of vocational education, higher education, and continuing education, promote the integration of vocational and general education, industry education, and science education, and optimize the positioning

of vocational education types. We will implement the employment priority strategy, and employment is the most basic livelihood. We will strengthen employment priority policies, and improve employment promotion mechanisms”^[1].

On July 30, 2020, the General Office of the Ministry of Education and the General Office of the Ministry of Industry and Information Technology issued the “Guidelines for the Construction of Modern Industrial Colleges (Trial)” (Jiao Gao Ting Han [2020] No. 16), which emphasized that universities should take moral education as the fundamental task, focus on student development, break through traditional path dependence, fully leverage industrial advantages, give full play to the important role of enterprises in education, deepen the integration of industry and education, promote universities to explore the construction mode of modern industrial colleges, strengthen advantageous characteristic majors, improve the collaborative mechanism of talent cultivation, cultivate a large number of high-quality applied, composite, and innovative talents needed by industries, and provide talent support and intellectual support for improving industrial competitiveness and gathering new development momentum^[2].

On February 21, 2023, the Ministry of Education and five other departments issued the “Plan for Adjusting, Optimizing and Reforming the Setting of Disciplines and Majors in General Higher Education”, which clearly stated that “Serving the country’s development should be guided by serving the high-quality development of the economy and society, we should think what the country wants, respond to the urgent needs of the country, and build disciplines and majors that are urgently needed for a national strategy and regional development. We should highlight our advantages and characteristics, take the construction of new engineering, new medicine, new agriculture, and new humanities as the guide, strengthen advantageous disciplines and majors, and form a highland for talent cultivation; optimize characteristic disciplines and majors, and achieve classified and characteristic development. We should strengthen collaborative linkage, enhance the linkage between the education system and industry departments, strengthen the coordination of talent demand prediction, early warning, training, evaluation, and other aspects, and achieve disciplinary development. Professionalism and industry chain, innovation chain, and talent chain are mutually matched and promoted the work objective”^[3].

2. School development positioning and discipline construction planning

2.1. School development positioning

In the more than 20 years of school development and construction, the school has condensed the motto of “respecting morality, valuing ability, cultivating oneself, and being wise.” It has always regarded deepening teaching reform and continuously improving teaching quality as important breakthroughs in realizing the transformation and upgrading of the college. It has formed a school philosophy of “taking talent cultivation as the center, serving local social and economical construction as the purpose, using the three classrooms as carriers, and cultivating applied technology specialized talents for the front line of production”^[4]. At present, the university is transforming into an independent college, with a clear development positioning of being an applied technology local university, student-centered, market-oriented, and dynamically adjusting professional settings, enrollment plans, and talent training programs as the core. Schools actively promote comprehensive education and teaching reforms, and accelerate the construction of a characteristic applied talent training system with competitive advantages, clear industry direction, and high market fit.

2.2. Subject construction objectives

Taking the landscape architecture major with high applicability, innovation, and comprehensiveness as a pilot and carrier, integrating design, engineering, and other related majors with high disciplinary relevance, actively building a high-quality education and teaching system, further deepening teaching reform and discipline construction, taking the cultivation of innovative technical talents as the core, adapting to the times and ensuring employment as the goal, improving education and teaching level and talent competitiveness, strengthening practical and digital thinking ability, and exerting the innovative leading role and reform demonstration role of the new engineering new humanities integration professional group throughout the school, realizing the integration of industry, academia, and research, promoting the employment and entrepreneurship of college students, and cultivating innovative and applied technical talents that meet the development of the times and the employment needs of the industry ^[5].

2.3. Construction planning measures

- (1) Comprehensively strengthen the connection with the industry, integrate into local economic construction, understand industry development trends, break away from conventional education models, continuously develop, revise, and improve relevant professional “one specialty, multiple abilities” talent training programs, and promote the “classroom enterprise project” alternating and interconnected teaching mode ^[6].
- (2) Based on the construction of new engineering disciplines in landscape architecture and the integration of design-related majors, actively plan and establish the “Innovation Industry College” and “Industry Talent Order Class” with high-quality enterprises, play the role of multiple stakeholders, and explore new development models for cooperation between universities and industries in running schools ^[7].
- (3) Actively apply for new majors that meet the needs of the times and industries, dynamically adjust the training objectives and skills of related traditional majors, promote the integration of university teaching with industry development, gradually eliminate the current situation of talent ability being inconsistent with market demand, and fundamentally solve the problem of difficult employment for graduates and the shortage of high skilled talents in related industries ^[8].

3. Professional advantages and challenges faced

The landscape architecture major, the environmental design major, and the visual communication design major in the field of architecture all have the common characteristics of innovation, applicability, intersectionality, and comprehensiveness; Integrating knowledge from multiple fields such as technology, humanities, art, society, economy, management, ecology, and emphasizing the transformation of theory into practical production; The visualization level of teaching results is high, and the cycle of connecting with industry production and creating economic benefits is relatively short; Aligned with innovation-driven industries such as green development and digital economy, it has a wide range of employment directions, strong adaptability, and high operability for professional dynamic adjustment ^[9].

Despite the prominent professional advantages as the main research object, in the current era of increasingly fierce international competition around technological innovation and industrial revolution, and the continuous decline in demand in the real estate market, various industries are facing serious challenges such as transformation and adjustment, technological lag, and insufficient innovation; The civil engineering

and construction industries are facing industry challenges such as reduced projects, intensified competition, financial pressure, and worker shortages ^[10].

4. Solution measures

4.1. New architecture and new professional construction

Based on the experience and construction foundation of the school's landscape architecture, environmental design, visual communication, tourism management, network and new media and other related disciplines, and based on the national "high-quality development" and Yichang's development goals of "focusing on building a model city for the protection of the Yangtze River, and striving to create a livable, resilient and smart city," the school seizes the opportunity of transformation and upgrading, establish secondary college teaching units, and jointly apply for new majors with relevant high-quality enterprises. The school is preparing to establish the "Innovation Industry College" to promote the new mode of education in the new professional industry college and transform the traditional professional education concept.

4.2. Establishment of new systems and mechanisms

Through the construction of industrial colleges and dynamic adjustment of majors, the discipline construction will be fully integrated into the national innovation-driven development strategy, the construction of Hubei Province's 51020 modern industrial clusters, and the construction of Yichang as a model city for the protection of the Yangtze River. By integrating advantageous majors, adjusting teaching directions, weakening professional barriers, targeting local industries, and deepening the integration of industry and education, the school has established a "teaching, management, and construction integration system," "enrollment training employment" linkage mechanism, and talent cultivation dynamic adjustment mechanism for the high-quality development of architectural and design professional services in the school. The school will continuously improve the tracking and feedback mechanism for "students, teachers, enterprises, families, and society," continuously optimize and timely adjust the implementation path, and achieve sustainable "self-renewal" development of architectural and design professional clusters.

4.3. Exploration of new models and methods

Develop a new professional talent training plan for the Innovation Industry College and revise relevant existing professional talent training plans as the institutional basis for teaching reform and innovation, achieving a comprehensive connection between "theory-practice," "university-industry," and "training demand," fundamentally balancing the employment needs of enterprises and the job seeking intentions of graduates. A new model of cooperative teaching and curriculum construction can be formed based on "on-campus faculty + industry backbone" and "in-class theory + enterprise practice," give full play to the advantages of universities and industries, complement and integrate resources, promote the full participation of enterprises in discipline construction, promote the docking of course knowledge points with industry standards, technology research and development, production processes, project implementation and other links, create a new paradigm of modern teaching, and build high-quality demonstration courses for school-enterprise cooperation. The talents cultivated through dynamic adjustment and teaching reform, meeting the national strategic orientation and industry development needs, and leveraging the resource advantages of the Industrial College, can comprehensively promote the high-quality and full employment work of the university, ultimately leading by

example and promoting the deepening reform and discipline construction of other disciplines.

5. Construction content and implementation steps

5.1. Research and analysis

- (1) Actively study the relevant policies and documents of the country on revitalizing the country through science and education, prioritizing employment, driving innovation, and constructing industrial colleges, correctly understand and implement the goals and requirements of cultivating talents with innovative spirit and practical ability in the new stage of socialist development, and use them as the policy basis for the construction of industrial colleges and dynamic adjustment of majors.
- (2) Conduct market research, enterprise visits, and questionnaire surveys in the fields of digital industry, tourism planning, beautiful rural construction, landscape engineering construction, interactive design, and new media technology; Summarize and analyze the school's scale of operation, training characteristics, existing majors, advantageous disciplines, development opportunities, enrollment policies, employment status, talent cultivation, and limiting factors internally, forming a data foundation for the construction of industrial colleges and dynamic adjustment of majors.
- (3) Conduct visits and research on industrial colleges that have been established, enrolled, and operated in various universities in China. Through visits, discussions, and exchanges, learn from mature experiences in the construction, operation, teaching, and management of industrial colleges, and provide reference cases for the construction of industrial colleges and dynamic adjustments of majors in the university.

5.2. New professional construction

- (1) Based on the design major of "Visual Communication and Environmental Design" that has been running in the college for many years, and the accumulated disciplinary advantages of architecture and civil engineering majors such as "Landscape Architecture, Civil Engineering, and Engineering Management," as well as emerging majors such as "Network and New Media," which focuses on and develop industries that meet the needs of the times, such as digital economy, urban renewal, and beautiful rural areas. The school plans to apply for specialized majors such as "Digital Media Art Design" and "Village and Town Construction and Management" to cultivate and transport digital twin technology talents, virtual simulation 3D special effects talents, rural planning and construction management talents, urban community renewal and governance talents, and new media technology talents.
- (2) Based on the knowledge structure interaction and integration of the existing "Tourism Management" major and interdisciplinary advantage major "Landscape Architecture" in the institute, relying on the construction goals and resource advantages of Yichang as a world tourist city, a civilized model city, and an ecologically livable city, combined with the digital economy industry, the school focuses on cultural tourism planning and cultural creative industries, and plan to apply for specialized majors such as "Smart Scenic Area Development and Management" and "Forest Ecotourism and Health Care" to cultivate and transport talents in scenic area renewal design, cultural tourism planning and creative design, ecological health care and natural education services.
- (3) Grasp the characteristics of the times and social needs, and pay attention to the issue of aging.

Fully leverage the advantages of design studies, promote the application of age-friendly design results, utilize the teaching facilities and infrastructure of the university, actively cooperate with local governments and enterprises, jointly establish a senior university, and actively assume social responsibility; At the same time, it also opens up a new way for our school to self-raise development and construction funds. In the later stage, the school can apply for and establish the “Smart Health Elderly Care Service and Management” major according to the actual situation, providing a better communication platform for the elderly and youth, and promoting the construction of a harmonious society and a harmonious campus.

5.3. Architecture construction

- (1) Based on the market demand for “integrating innovative design talents” and the industry development trend of “digitalization, intelligence, and greening,” with the connotation of “interdependence, practical application, and interdisciplinary” of talent training objectives and teaching content, relying on the existing advantageous majors of the college, integrating undergraduate majors such as landscape architecture, environmental design, visual communication, and newly applied majors, and building a “Digital Design College (under the Innovation Industry College),” further introducing talents based on the existing faculty team, forming an interdisciplinary dual teacher team integrating engineering, design, economics, and media studies.
- (2) In the process of running the school, actively leverage the industry talent resources, efficient management experience, internship and employment channels of enterprises, as well as the disciplinary construction advantages, educational teaching experience, and scientific research capabilities of universities, comprehensively achieve complementary advantages, resource integration, industry education integration, and science education integration, and gradually promote successful experiences in construction and development. Through multiple channels, dynamically adjust and integrate innovation for all majors in the school, serve local economic development and industry employment needs, promote the construction of a linkage development mechanism between higher education and industrial clusters in the school, and provide a replicable and promotable new model for disciplinary construction and talent cultivation in local application-oriented universities.

5.4. Mechanism construction

- (1) Based on the concept of integrating industry and education in universities and industries, promote the deep integration of innovative industrial chains and practical talent chains
Seizing the opportunity of the era, in the new situation of the transformation and upgrading of colleges and deepening teaching reform, the school will further break through the limitations of traditional closed classroom teaching, actively change the current situation of higher education lagging behind the trend of industry technology development, take the construction of industrial colleges as the starting point, integrate various social resources, focus on the construction goals of Yichang tourism development, ecological construction, scientific and technological innovation, and Hubei Province’s 51020 modern industrial clusters, actively build an industry education integration and collaborative education model that meets the strategic development needs of regional emerging industries, and actively assist in “talent retention in Yichang.”
- (2) Prioritize employment and serve the local community, achieving a perfect balance between industry

employment needs and graduates' abilities and qualities

With the development of the times and the transformation of industries, some traditional industries are gradually declining, while some emerging industries are beginning to emerge. The production methods and technologies are undergoing disruptive changes, and new quality productivity in various industries is gradually forming. The demand for market talents has undergone subtle changes, and the mismatch between the talent literacy of universities and the employment needs of industries has fundamentally led to an imbalance in the supply and demand of graduates' "employment difficulties" and enterprises' "labor shortages." If universities cannot grasp the development of the times and industries to quickly adjust their professional structure and training direction, students will need a longer time to learn and adapt to changes in market demand after graduation. Therefore, universities, especially local applied universities, are guided by the goals of "serving high-quality development" and "serving local economic construction." Through school-enterprise cooperation, deepening reforms, timely adjusting the direction of talent cultivation, improving the quality of talents in the new era, building industrial colleges, and driving dynamic adjustments in various disciplines are inevitable ways.

- (3) With the goal of cultivating innovative practical application abilities, optimize the allocation of teaching resources between universities and enterprises

In addition to anchoring the construction direction and optimizing the professional settings, efforts should be made to enhance students' innovative and practical abilities in the process of training. It is necessary to use the industrial college as a platform, cooperate with both schools and enterprises and establish a teaching team with a reasonable structure and complementary resources. Promote the interdisciplinary integration of "engineering, art, economics, agriculture, and management," introduce advanced technology, industry standards, and enterprise resources, significantly update the curriculum system and teaching methods, deepen the reform of heuristic and inquiry-based teaching methods and the comprehensive reform of cooperative, task-based, and project-based practical teaching models, and carry out immersive real-life, practical, and on-site teaching through enterprise production training or virtual simulation, comprehensively enhance students' practical and hands-on abilities, effectively improve students' intuitive understanding of industries and their ability to solve engineering problems.

- (4) Adapting to the changes of the times and shouldering the mission of rejuvenating the country as our responsibility, the school will establish a long-term mechanism for dynamically adjusting professional settings

Developing disciplines that serve the major strategic needs of the country, focusing on the forefront of world science, key technological fields, and the inheritance and promotion of excellent Chinese culture, paying attention to the unique resources and development positioning of universities and their surrounding cities, focusing on emerging industries and innovation-driven industries, through interactive design, immersive cultural tourism, intelligent construction, green development, and professional deep integration, cultivating applied talents needed for the development of the times and local construction. Adhere to the guidance of market demand and industry trends, actively leverage the advantages of industry colleges and school-enterprise cooperation, and ensure the long-term dynamic adjustment of "discipline settings, enrollment scale, training direction, teaching focus, and employment channels" through institutional and institutional arrangements, endowing universities and disciplines with the ability to "self-renewal and adapt to changes."

5.5. Sustainable construction

Through multiple channels such as teaching achievements and evaluation, analysis of enrollment and employment data, tracking feedback from employers, and social recognition questionnaire surveys, a comprehensive evaluation of the operation and dynamic adjustment of majors in industrial colleges is conducted, to continuously self-verify, revise, adjust, and update, and achieve sustainable construction.

6. Conclusion

Disciplinary majors are the core pillars of the higher education system and the fundamental platform for talent cultivation. The structure and quality of disciplinary majors directly affect the effectiveness of moral education in universities and the ability of higher education to serve the high-quality development of the economy and society. Local applied universities should accurately grasp the pulse of the times, shoulder the responsibility of higher education, fully, accurately, and comprehensively implement the new development concept, face the forefront of world science and technology, the main battlefield of the economy, major national needs, and people's health ^[11], actively promote teaching and education to actively adapt to economic and social development, deepen the supply side reform of disciplines and majors, comprehensively improve the quality and core competitiveness of talent cultivation, build a higher education system that serves high-quality development, and promote high-quality employment for college students ^[12-15].

Funding

2023 Education Science Planning Project of Hubei Province, "Research on the Dynamic Adjustment Mechanism and Optimization Path of Architecture and Design Majors in Applied Undergraduate Universities" (Project No.: 2023GB119); 2023 Philosophy and Social Sciences Research Project of Hubei Provincial Department of Education (Project No.: 23Z634); 2023 Hubei Provincial Undergraduate Teaching Reform Research Project, "Research on the Construction and Teaching Reform of 'Energy saving and Environmental Protection' Landscape Architecture Major under the Background of National Strategic Emerging Industry Development" (Project No. 2023584)

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Raise High the Great Banner of Socialism with Chinese Characteristics and Unite and Strive for the Comprehensive Construction of a Socialist Modernized Country, 2022, viewed October 25, 2022, https://www.gov.cn/xinwen/2022-10/25/content_5721685.htm.
- [2] Notice of the General Office of the Ministry of Education and the General Office of the Ministry of Industry and Information Technology on Issuing the "Guidelines for the Construction of Modern Industrial Colleges (Trial)" (Jiao Gao Ting Han [2020] No. 16), viewed August 28, 2020, https://www.gov.cn/zhengce/zhengceku/2020-08/28/content_5538105.htm.

- [3] Notice from the Ministry of Education and Five Other Departments on the Issuance of the “Reform Plan for Adjusting and Optimizing the Setting of Disciplines and Majors in General Higher Education” (Jiao Gao [2023] No. 1), viewed April 4, 2023, https://www.gov.cn/zhengce/zhengceku/2023-04/04/content_5750018.htm.
- [4] Yuan Y, Zhang Y, Zhou H, et al., 2021, Construction and Practice of Dynamic Adjustment Mechanism for Majors in Local Universities. *New Curriculum Teaching (Electronic Version)*, 2021(7): 184–185.
- [5] Zhang P, Li K, Wang P, et al., 2020, Exploration and Practice of Strengthening the Construction of Professional Connotation Through Multiple Measures. *Education and Teaching Forum*, 2020(25): 263–264.
- [6] Tian X, 2018, Dynamic Adjustment of Disciplines and Majors in Higher Education Institutions: Models, Challenges, and Integration Improvement. *Higher Education Management*, 12(6): 44–50.
- [7] Du X, Song Q, Bi Q, 2021, Research on the Construction of Dynamic Adjustment Mechanism for University Majors. *University*, 2021(2): 30–31.
- [8] Zheng W, 2020, Research on the Dynamic Adjustment Mechanism of Major Optimization in Higher Education Institutions Under the Background of “New Engineering” Construction. *Rural Economy and Technology*, 31(10): 357–358.
- [9] Li N, 2020, Research on the Dynamic Adjustment Mechanism of Majors in Applied Universities Guided by Social Needs. *Journal of Liaoning University of Science and Technology*, 22(2): 102–104.
- [10] Jin N, 2018, Leading the Construction of a Strong Higher Education Country in the New Era Through Reform. *Journal of National Institute of Education Administration*, 2018(1): 3–7.
- [11] Facing the Forefront of World Technology, the Main Battlefield of the Economy, Major National Needs, and People’s Lives and Health, Continuously Advancing Towards the Breadth and Depth of Science and Technology, viewed September 12, 2020, <http://m.people.cn/n4/2020/0912/c204850-14416545.html>.
- [12] Lv S, Chen G, 2024, Deepening the Supply Side Reform of Disciplines and Majors. *Guangming Daily*, March 5, 2024, 11.
- [13] Peng S, 2024, Research on the Contradictory Issues in the Supply Side Reform of Discipline and Professional Talents in Higher Education Institutions Under the Result-Oriented Approach. *Employment and Security*, 2024(1): 155–158.
- [14] Jin H, 2024, The Evolution Trend and Driving Mechanism of Dynamic Adjustment in Engineering Major. *Higher Engineering Education Research*, 2024(1): 65–72.
- [15] Zhang Y, Yan X, 2021, The Difficulties and Solutions for Dynamic Adjustment of Majors in Chinese Universities. *Jiangsu Higher Education*, 2021(9): 43–52.

Publisher’s note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.