



# Transformation and Upgrading of New Liberal Arts Professional Clusters Based on Modern Industrial Colleges

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**Abstract.** Based on the construction of modern industrial college, this paper deeply discusses the transformation and upgrading of the new liberal arts professional cluster, analyzes the construction of digital intelligence talent training ecosystem and the professional transformation and upgrading measures driven by the industrial college. Initially, the article highlights the pivotal role of modern industrial colleges in the transformation and upgrading of new liberal arts major clusters. Subsequently, it elaborates on constructing a digital talent cultivation ecosystem within the framework of modern industrial colleges, aiming to achieve integration among the talent chain, education chain, innovation chain, and industry chain. Lastly, it explores how industrial colleges can facilitate the transformation and upgrading of new liberal arts professional clusters. The aim of this study is to offer valuable references and insights for the transformation and upgrading of new liberal arts major clusters.

**Keywords:** Industrial College; New Liberal Arts; Professional Construction

## 1 Introduction

Amidst the waves of globalization and technological revolution, higher education is facing unprecedented opportunities and challenges. As a new form of educational organization, modern industrial colleges aim to cultivate high-quality talents that meet the needs of industrial development in the new era through deep integration of industry and education<sup>[1]</sup>. At the same time, the transformation and upgrading of new liberal arts professional clusters are becoming an important force driving the connotative development of higher education.

The background of modern industry college construction stems from the higher requirements for higher education put forward by economic and social development. With the rapid development of information technology, new industries and business forms emerge in an endless stream, and the traditional university education model has become difficult to fully adapt to the new demands of industrial development.

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Therefore, establishing modern industry colleges and promoting the integration of industry and education have become an important direction for the reform and development of higher education<sup>[2]</sup>. Through deep cooperation with enterprises, modern industry colleges optimize the allocation of educational and industrial resources, cultivate high-quality talents with innovative spirit and practical ability, and provide strong talent support for industrial development. The transformation, upgrading, innovation, and practice of the new liberal arts professional cluster is an educational innovation model closely related to the construction of modern industry colleges. The new liberal arts professional cluster is market demand-oriented, integrating and optimizing liberal arts professional resources to form a professional cluster with distinct characteristics of the times and industrial features. This cluster development model helps to enhance the comprehensive strength and influence of liberal arts majors and promote the deep integration of liberal arts education and industrial development.

This article takes Dalian Neusoft University of Information as an example to elaborate on the practical achievements in promoting the transformation and upgrading of the new liberal arts professional clusters based on modern industry colleges (UFIDA Digital Intelligence Industry College). UFIDA Digital Intelligence Industry College was established in 2022 by Dalian Neusoft University of Information in collaboration with UFIDA Network Technology Co., Ltd. and its key member enterprises. In 2023, it was approved as a modern industry college of ordinary universities in Liaoning Province. As an important representative of the new liberal arts professional clusters, the Department of E-commerce and Supply Chain Management closely follows the development trend of modern industries, emphasizes interdisciplinary integration, actively explores the path of professional transformation and upgrading, and provides strong talent support for industrial development. Through the research and practical exploration in this article, it can further promote the deep integration of higher education and industrial development, making positive contributions to cultivating more high-quality talents that meet the needs of the new era.

## **2 Construction of Digital Intelligence Talent Training Ecosystem Based on Modern Industrial College**

Driven by the new round of scientific and technological revolution and industrial reform, digital intelligence has become an important engine to promote economic and social development. As an innovative platform for the in-depth integration of higher education and industry, the College of modern industry is playing an increasingly important role in cultivating digital intelligence talents. The construction of the new liberal arts digital intelligence talent training ecosystem based on the College of modern industry aims to optimize the education chain, activate the innovation chain and service industry chain, realize the "four chains" integrated development mechanism, and provide strong talent support for regional economic and social development.

### **2.1 Taking the Talent Chain as the General Traction, Build a New Liberal Arts Digital Intelligence Talent Training System**

As the core of the digital intelligence talent cultivation ecosystem, the construction of talent chain should closely focus on the actual needs of regional economic and social development. In the setting of professional talent training objectives, fully consider the industrial development trend and future career needs, and ensure that talent training is highly consistent with social needs. At the same time, a new liberal arts specialty cluster of "data + intelligence" has been constructed to explore the formulation of digital intelligence talent training scheme and curriculum system for each specialty, pay attention to the organic combination of theory and practice, and strengthen the cultivation of students' innovative ability and practical ability.

### **2.2 Optimize the Education Chain and Realize the Docking of Disciplines, Specialties and Industries**

In terms of optimizing the education chain, we should pay attention to the integration of disciplines and the development of professional clusters. Based on the relevant policies for the construction of the National Institute of industry and TOPCARES education methodology, combined with the concept of enterprise digital intelligent management, the construction of the Institute of industry based on the deep integration of industry and education is implemented. Cooperate with enterprises to carry out customized talent training projects to achieve the precise connection between education content and industrial demand. On this basis, through the integration of liberal arts professional resources, a new liberal arts professional cluster with distinctive characteristics of the times and industry will be formed, which will help to improve the pertinence and effectiveness of talent training, form a unique digital talent training path, and realize the support of the education chain to the talent chain.

### **2.3 Activate the Innovation Chain and Enhance the Innovation of Talent Cultivation**

Driven by cooperative scientific research projects of industrial colleges, students are encouraged to participate in scientific research practice and technological research, which is helpful to cultivate innovation ability and problem-solving ability. At the same time, build a platform for students' innovation and entrepreneurship, provide resources such as entrepreneurship guidance and financial support, stimulate students' enthusiasm for innovation and entrepreneurship, and promote the transformation and application of innovation achievements. In addition, strengthening industry university research cooperation and promoting the transformation and application of scientific research achievements will help provide intellectual support for industrial development and promote industrial innovation and upgrading.

## **2.4 Serve the Industrial Chain and Realize the Benign Interaction Between Talent Cultivation and Industrial Development**

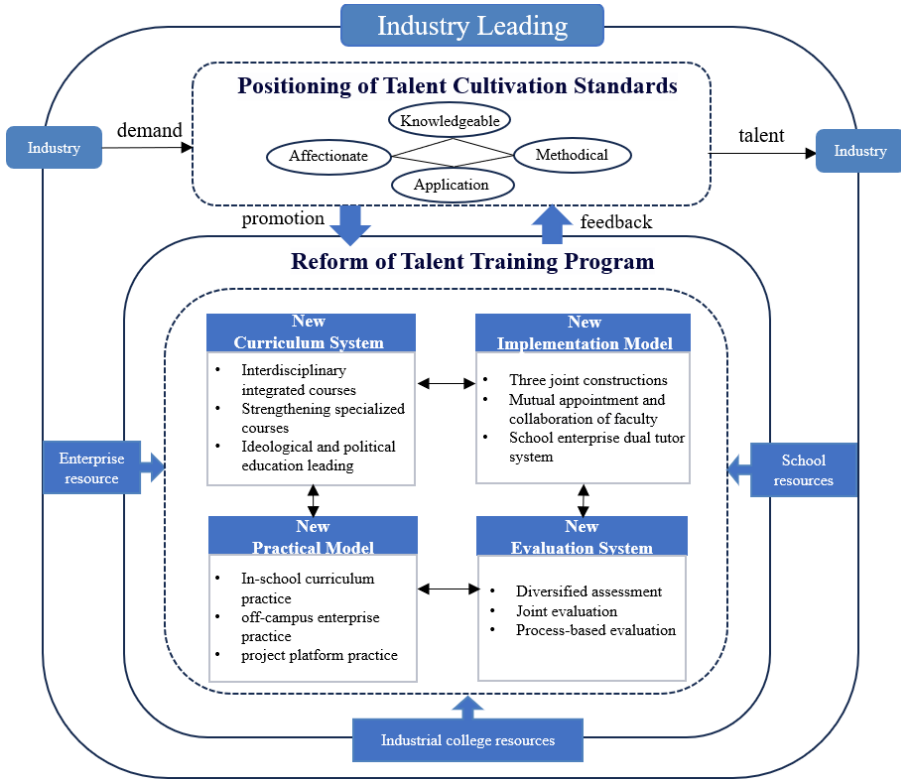
Through establishing close cooperation with relevant enterprises of the Institute of technology, we will jointly promote the in-depth integration of the cultivation of new liberal arts talents and industrial development. Through industry university research cooperation projects, joint construction of training bases, industry teacher training and other ways, it provides talent security and intellectual support for industrial development, and realizes the "five industries connection" of specialty, industry, employment, occupation and entrepreneurship<sup>[3]</sup>. At the same time, pay close attention to the industrial development trend, adjust the talent training strategy in time, and ensure that the talent training meets the needs of industrial development.

## **3 Main Contents of Transformation and Upgrading of New Liberal Arts Specialty Cluster Driven by Modern Industrial College**

### **3.1 Reconstruct the Orientation of Professional Talent Training**

Deeply understand and grasp the connotation and requirements of the new liberal arts, and integrate interdisciplinary, innovative, practical and other concepts into the whole process of the transformation and upgrading of the new liberal arts professional cluster. According to the social needs and industrial development trends, clarify the professional development orientation and objectives of the new liberal arts professional cluster. Based on the concepts of output orientation, student center, gender orientation, and collaborative education, an integrated professional construction workflow based on TOPCARES education and teaching concept is constructed to comprehensively guide professional construction<sup>[4]</sup>, as shown in Figure 1.

Driven by industry development, the talent cultivation standards for the new liberal arts professional cluster, featuring "sentiment, knowledge, methodology, and application skills" have been established. This orientation stems from industrial demands, aiming to actively channel talents into industries. Based on these standards, reforms in talent cultivation for the new liberal arts professional cluster are being promoted. By embedding industrial resources, enterprise resources, and school resources, we can unlock the potential for professional transformation and upgrading, and establish a new curriculum system, new implementation model, new practice mode and new evaluation system.



**Fig. 1.** construction path of transformation and upgrading of new liberal arts specialty driven by industrial college

### 3.2 Reconstruct the Curriculum System

In the construction of the curriculum system, disciplinary barriers have been broken down [5]. Based on the symbiosis theory, the basic principle of constructing the curriculum group for the new liberal arts professional cluster is "aligning with the industrial chain job groups while integrating disciplines and majors," thereby forming a logical framework for curriculum group construction featuring "inter-group synergy + intra-group symbiosis." In response to the characteristics of the professional cluster and the needs of modern industrial academies, the curriculum system for the new liberal arts professional cluster has been reconstructed and optimized, with the curriculum design concept illustrated in Figure 2. Firstly, cooperation with industry associations and leading enterprises has been strengthened to achieve joint curriculum development, joint customized classes, and joint experimental and training platforms. Secondly, the curriculum has been optimized by introducing interdisciplinary courses and practical projects, implementing a segmented system of objectives such as "values + knowledge + skills," and jointly determining the path of transformation and upgrading by both schools and enterprises, thereby forming a comprehensive and innovative professional

curriculum system that effectively enhances students' comprehensive literacy and innovation capabilities [6]. The development and construction of interdisciplinary courses under the guidance of ideological and political education have been strengthened to break down disciplinary barriers and focus on refining and strengthening professional courses. Finally, the proportion of practical training courses in the training program has been increased to truly achieve school-enterprise collaboration, industry-education integration, and promote cross-disciplinary, cross-industry, cross-barrier, and cross-border diversified talent cultivation models.

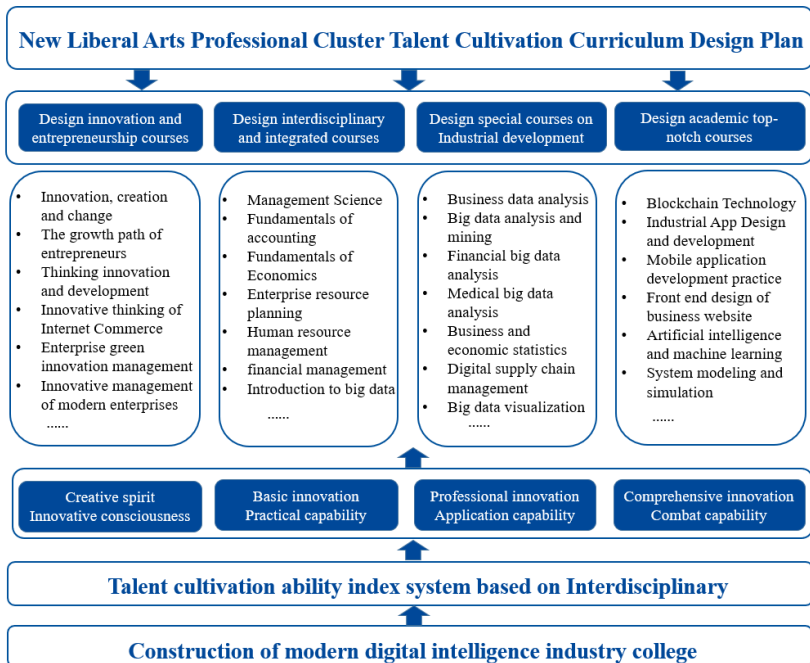


Fig. 2. curriculum design scheme for talent cultivation of new liberal arts specialty cluster

### 3.3 Enhancing the Cultivation Effect of New Liberal Arts Professional Cluster Talents Based on the "Four Chains Integration" Development Mechanism

Guided by relevant national policies, this paper explores the "data + intelligence" new liberal arts professional talent cultivation method featuring deep integration of industry, scientific research, and teaching [7], based on the enterprise's digital and intelligent management philosophy and the TOPCARES educational methodology. Driven by the construction of modern digital intelligence industry academies with deep integration of industry and academia, we aim to achieve the convergence of curriculum content with technological development, the alignment of teaching processes with production processes, and the integration of talent cultivation with industrial demands through integrating research findings into textbooks, integrating technological development into teaching, incorporating enterprise teams into classrooms, transforming innovation platforms into competition resources, converting engineering projects into practical

training topics, and jointly establishing customized classes and experimental training platforms with enterprises. This will lead to the deep integration and collaborative interaction of the education chain, innovation chain, industrial chain, and talent chain, thereby enhancing the cultivation effect of new liberal arts talents.

### **3.4 Strengthening Faculty Construction and Refining Evaluation and Feedback Mechanisms**

In terms of faculty construction, this paper advocates for the establishment of a corporate mentor database, aimed at recruiting seasoned industry experts and leaders as part-time faculty or guest professors. This approach aims to enrich teaching content and practical guidance for students, ensuring their education stays closely aligned with industry frontiers. Additionally, it proposes the formulation of a mutual appointment and collaboration framework for faculty development. This framework encourages bidirectional exchanges between academic faculty and corporate mentors from industrial academies, enabling them to mutually hold teaching or research positions and collaboratively undertake research projects and teaching activities. This strategy integrates the latest industry trends and technologies into the curriculum, thereby enhancing both teaching standards and research capabilities.

Concerning evaluation and feedback mechanisms, this paper proposes implementing a joint evaluation model that involves both school and corporate mentors. By integrating corporate mentors into the evaluation system, students' academic performance, practical abilities, graduation projects, and overall quality are assessed in a more holistic and objective manner, mirroring their actual situations and market demands with greater accuracy. This not only fosters stronger cooperation and communication between schools and enterprises but also deepens mutual understanding of each other's needs and expectations. Furthermore, the evaluation outcomes serve as fundamental inputs for optimizing and transforming strategies, propelling continuous professional growth and development. It also contributes to the effective alignment of professions, occupations, industries, employment, and entrepreneurship within the talent cultivation system, thereby achieving the horizontal "five-industry integration."

## **4 Conclusions**

Through an in-depth analysis of the innovation and practice of new liberal arts discipline clusters under the backdrop of modern industrial colleges, this paper demonstrates feasible pathways and effective methods for their transformation and upgrading. Driven by modern industrial colleges, comprehensive innovations have been achieved in curriculum design, practical teaching, and faculty development by constructing an intelligent talent cultivation ecosystem. Concurrently, the deep involvement of industrial colleges has facilitated the transformation and upgrading of the department, making it more responsive to market demands and industry trends. These experiences and practices hold significant enlightenment and reference value for other new liberal arts discipline clusters. In the future, as technology continues to advance and industries

continually evolve, the transformation and upgrading of new liberal arts discipline clusters will become an ongoing process. Therefore, there is a need for continuous exploration and innovation to adapt to the development of the times and societal needs, fostering the cultivation of more high-quality talents with innovative spirits and practical abilities.

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## References

1. Li, T. J. (2024). Exploration of Innovative Nurturing Practices in Industrial College of Vocational Institutions. *Region - Educational Research and Reviews*, 6, 120. DOI: 10.32629/rerr.v6i6.2231.
2. Khanna, A., Agarwal, A., & Maheshwari, P. (2018). University-industry collaboration: A new way of educating future generations of engineers in India. In *2018 Advances in Science and Engineering Technology International Conferences, Dubai, Sharjah, Abu Dhabi, United Arab Emirates*, 1-6. DOI: 10.1109/ICASET.2018.8376929.
3. Cao, Y. J., Li, S. S., & Zhu, J. (2022). Constructing the "Five-in-One" Talent Cultivation Mode in Vocational Industrial Colleges Based on "Five Integrations". *Education and Vocation*, 2:36-40. DOI: 10.13615/j.cnki.1004-3985.2022.02.005.
4. Wen, T. (2010). The Exploration and Practice of Integrated Talents Nurturing Model Based on TOPCARES-CDIO. *Computer Education*, 11:23-29. DOI: 10.16512/j.cnki.jsjy.2010.11.005.
5. Gasmı, H., & Bouras, A. (2017). Ontology Based Education/Industry Collaboration Modeling: Opportunities and Challenges. In *2017 7th World Engineering Education Forum (WEEF), Kuala Lumpur, Malaysia*, 677-682. DOI: 10.1109/WEEF.2017.8467137.
6. Zeng, J., Wen, J., Cai, B., & Xiao, Q. (2024). Research on Collaborative Innovation Ability Training of Software Engineering Talents Based on the Industry-Education Integration. In *2024 IEEE International Conference on Software Services Engineering (SSE), Shenzhen, China*, 236-242. DOI: 10.1109/SSE62657.2024.00044.
7. Truong, T., Dung, T. (2024). The Application of Information Technology in Teaching at University and College Levels in the Context of the Fourth Industrial Revolution. *European Journal of Applied Science, Engineering and Technology*, 2, 66-73. DOI:10.59324/ejaset.2024.2(4).03.



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