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Developing a Demand-Oriented Talent Cultivation Pathway for the Cultural and Creative Industries: A Case Study of Dalian City

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Abstract: Under national strategies promoting cultural development and the digital economy, Dalian's cultural and creative industries have rapidly expanded, leading to rising demand for interdisciplinary talents with cultural and technical competencies. Yet current university programs remain insufficient in curriculum structure, interdisciplinary training, and industry–education linkage. Based on literature review, industry data, job posting analysis, and case comparison, this study examines industry development, talent needs, and university discipline configuration. Results show strong demand for interdisciplinary, technology-oriented, and innovation-driven competencies, while universities still lack integrated curricula, practical training, and regional collaboration. Accordingly, this paper proposes a pathway of "major clusters–interdisciplinary curricula–project-based training–ecosystem platforms" to build a talent cultivation system aligned with regional needs, providing guidance for local reform and reference for similar cities.

Keywords: Demand-oriented; Cultural and creative industries; Talent cultivation; Academic integration; Dalian City

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1. Introduction

1.1. Research background and significance

As a major cultural and economic hub in Northeast China, Dalian actively advances cultural industry transformation through technological innovation, supported by coordinated policy initiatives. Universities, as core innovation actors, are building talent supply mechanisms, yet face challenges including outdated technology curricula, fragmented interdisciplinary teaching, and superficial university–enterprise cooperation.

This study targets the "technology + culture" talent needs of Dalian's cultural and creative industries and proposes a regionally adapted cultivation pathway to optimize university talent training and enhance supply quality. The proposed disciplinary integration model also offers a reference for universities seeking to improve discipline structures and industry–education integration nationwide.

1.2. Literature review

Recent domestic and international research has proposed diverse cultural and creative talent cultivation models. In China, approaches mainly emphasize university–enterprise collaboration and industry–education integration. For instance, the College of Cultural Industries at Shanghai Jiao Tong University adopts the "Innovation Fund" mechanism through models such as "credits + fund," "campus + industry park," and "cultural creativity + X," enabling students to engage in real cross-disciplinary projects like digital cultural tourism and AI-enabled creative production, generating over ten practical outcomes annually [1].

International models underscore innovation awareness and practical competence. U.S. programs combine concentrated core curricula with extracurricular modules and industry engagement, frequently inviting multidisciplinary experts to share experiences [2]. The U.K. leverages the "tutorial system" in institutions such as Oxford and Cambridge to cultivate open-minded and innovative elite talents [3]. Japanese universities emphasize applied cultural creativity through enterprise collaboration, practical course systems, and global practice, enabling students to understand the full lifecycle of cultural-technology products from design to service [4].

Overall, although talent models show diversity and strengths, challenges remain in achieving stronger local adaptation of interdisciplinary programs and precise alignment between university curricula and evolving industry demands.

1.3. Research methods

This study focuses on Dalian's cultural and creative industries and integrates data from university websites, industry statistical reports, and recruitment platforms. Using literature analysis, case comparison, and data mining, it constructs a talent demand structure model to identify high-demand positions and compares university curricula with industry needs to reveal gaps in interdisciplinary competency formation and industry alignment.

Based on these findings and the "technology + culture" talent demand characteristics, the study proposes a regionally adapted pathway to optimize university talent cultivation, providing a reference for local development and offering a model for universities nationwide to improve disciplinary structures and industry–education integration.

2. Demand analysis of the cultural and creative industries in Dalian

2.1. Industry development status and trends

In recent years, Dalian's cultural and creative industries have grown rapidly, with expanding scale, active market entities, and an increasingly optimized structure. Industrial clustering has taken shape through parks such as Bingshan Wisdom Valley and Xiong Dong Street, which adopt a "cultural tourism + commerce" model to revitalize industrial spaces. The High-Tech Zone Animation and Game Industry Base has attracted leading firms, with projects such as mechanical bionics and immersive experiences ranking among national leaders. Dalian also hosts three national culture–technology integration demonstration bases, 16 provincial bases, and five national copyright demonstration units, along with a growing number of innovative SMEs [5].

However, challenges persist: limited R&D investment and homogeneous business models constrain innovation, while cross-disciplinary collaboration and emerging technology application remain insufficient. Meanwhile, demand for high-level interdisciplinary talent is rising, yet current university training models remain misaligned with industry needs.

2.2. Talent demand characteristics and trends

To precisely identify talent-demand characteristics, this study compiled recruitment information from three channels: (1) official websites of core firms and industrial parks (e.g., Hualu Group, Botao Culture, Northern National Copyright Exchange); (2) nearly one year of job-posting data from major recruitment platforms (e.g., Zhilian, BOSS Zhipin); and (3) talent reports and recruitment data published by government agencies and industry associations. These multi-source data form a dataset reflecting both the quantity and quality of current hiring needs and provide a timely observation window for recruitment trends.

Job demand is increasingly diversified and convergent, falling into seven categories: content creation, technology development, creative design, operations and marketing, film and 3D production, educational R&D, and engineering equipment. The overall pattern is shifting from single-skill specialists to interdisciplinary "T-shaped" talents—combining depth (e.g., "technology" or a discipline) with breadth (e.g., "art" or "operations"). Corresponding academic fields include computer science and AI (technology development); digital media art and visual communication (creative design); Chinese language and journalism (content creation); marketing and statistics (operations); and animation, educational technology, and electrical engineering (film/animation, educational R&D, and equipment).

Selection criteria have moved from degree-centric to composite, competency-based standards—summarized as "major + skills + project experience." Practical project involvement, proficiency with digital creation tools and programming, and familiarity with AIGC for content roles (and platform algorithms plus data-driven optimization for operations roles) are key differentiators.

In trend terms, talent demand is becoming more technology-driven and integrative: AI, XR, and related digital positions are expanding rapidly, reshaping occupational boundaries; integration between cultural creativity and Dalian's pillar industries (tourism, manufacturing, and marine services) is spawning new cross-sector occupations; market verticalization raises demands for deeper professional expertise; and flexible employment modes such as project-based collaboration and remote work are increasingly common. Concurrently, Dalian is strengthening its talent ecosystem through deeper industry–academia–research cooperation and integrated training platforms. Overall, demand is moving from narrow specialization toward an interdisciplinary, technology-oriented, and regionally embedded profile, underscoring the need to optimize curricula, enhance practice-based instruction, and build sustainable university–industry coordination mechanisms.

3. Foundations of university programs and potential for academic integration in Dalian

3.1. Current talent cultivation systems and academic integration

Dalian's universities have steadily optimized programs, curricula, and interdisciplinary mechanisms, forming a talent cultivation system supporting the regional cultural and creative industries. The city hosts 31 higher education institutions—21 universities and 10 vocational colleges—covering science, engineering, humanities, law, arts, medicine, and education, providing a strong base for multidisciplinary integration and industry–education alignment.

Program offerings focus on industry-relevant fields such as digital media arts, cultural industry management, tourism management, visual communication, digital media technology, and fashion design. For example, Dalian University of Arts' School of Art and Design offers five majors aligned with regional needs (e.g., cultural tourism integration, urban renewal), three recognized as "First-Class Undergraduate Demonstration

Majors in Liaoning Province." Cutting-edge labs like the AIGC Application Sharing Center and Digital Manufacturing Lab, with over ten million yuan in equipment, support the full cultural product development chain [6].

In academic integration, universities pursue "integrative education" through pathways like "art + technology," "culture + digital," and "management + design." Dalian University of Technology's Artificial Intelligence School (est. 2019) offers AI programs, advanced NLP and computer vision courses, and embeds modules such as "Intelligent Chemical Process Innovation Practice" into engineering curricula to cultivate interdisciplinary talents for cultural industries [7].

Overall, Dalian's universities are forming a talent cultivation paradigm of professional clustering, modular curricula, project-based teaching, and interdisciplinary integration, aligning with high-quality development needs and providing solid support for regional cultural and creative sectors.

3.2. Evaluation of the match between majors and industry

While Dalian's university programs partially align with cultural and creative industry needs, functional gaps remain. Cross-disciplinary courses and modular teaching (e.g., AI integration at Dalian University of Technology, digital design in intangible heritage at Dalian Polytechnic University) exist but are localized and lack systematic design, leaving graduates with insufficient interdisciplinary competence.

For technology-driven roles in digital creativity, VR, and AIGC, institutions such as Dalian University of Arts and Neusoft Institute of Information possess strong hardware and curricula, yet resources are concentrated, and a citywide talent network is absent, making supply dispersed.

Industry convergence and specialized roles see some university–industry collaboration (e.g., finance college innovation bases, vocational institute customized classes, "Dalian Gifts" student projects), but mostly in mid- and low-end segments, offering limited support for high-value-added areas like digital IP operations and immersive experience design.

Flexible employment trends require graduates to possess not only technical and creative skills but also soft skills in market assessment, project management, and personal branding. Feedback indicates that many students lack commercializing ability and cross-regional collaboration skills.

Although local talent ecosystems (experimental centers, training bases, heritage museums) exist, they lack unified competency standards and dynamic feedback, limiting responsiveness to rapidly evolving digital content demands.

In summary, shifting from structural alignment to capability fit requires: integrated cultivation pathways combining creativity, technology, and management; regional platforms for shared resources and frontier skill dissemination; and job competency frameworks with dynamic feedback to guide adaptive program development.

4. Designing a demand-oriented academic integration pathway

This pathway is grounded in the talent needs of Dalian's cultural and creative industries and adopts a demand-driven, interdisciplinary, and regionally embedded logic. It derives competency standards from local industrial structures, advances integration across "arts + technology," "culture + management," and "design + engineering," and incorporates Dalian's distinct cultural and marine resources to build differentiated strengths. Dynamic updates to curricula, faculty teams, and practice platforms ensure alignment with evolving industry

requirements.

Implementation proceeds through a progressive model. Major clusters link "creativity–technology–commerce," while modular, competency-based curricula—supported by micro-credentials and cross-disciplinary electives—enhance flexibility and responsiveness to emerging skills. Project-driven mechanisms integrate "course + project + market," enabling students to work on real cases in culture, tourism, design, and digital-content production. At the systemic level, integrated platforms—including credit recognition, co-built laboratories, and stable university–industry linkages—create a closed-loop framework embedding talent cultivation within the city's cultural-creative ecosystem.

Sustaining this model requires coordinated support from universities, government, and enterprises [8]. Universities should strengthen cross-college curriculum teams, refine evaluation systems to support interdisciplinary teaching, and institutionalize modular and project-based learning. The government should provide policy support and targeted funds for culture–technology integration and shared innovation platforms. Enterprises should participate through alliances, co-develop competency standards, contribute mentors, and supply authentic practice bases. Joint action among these actors forms an adaptive mechanism for long-term talent development and offers a reference for regional educational reform.

5. Conclusion

This study analyzed Dalian's cultural and creative industry talent demand and university training systems, revealing an urgent need for "technology + culture" interdisciplinary talent. While universities possess foundational major structures, gaps remain in curriculum relevance, academic integration, and industry–education collaboration.

To address this, a fourfold integration pathway was proposed, forming a demand-driven talent cultivation loop via interdisciplinary resource integration and university–enterprise collaboration. Its implementation depends on policy support and multi-stakeholder coordination, linking the education and industry chains organically. This provides a practical scheme for regional cultural development and a localized case for academic integration theory.

Limitations include reliance on public data and a conceptual framework lacking quantitative validation. Future research should expand data sources, build dynamic monitoring systems, and introduce quantitative indicators to assess talent supply–demand alignment. Cross-regional comparisons, pilot studies, and monitoring frontier technologies like AIGC and the metaverse can further refine integration pathways and enhance the effectiveness of academic systems in supporting high-quality industry development.

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