

Research on the Reconstruction of the "Chinese Paradigm" for the Deep Integration of New Liberal Arts and Economics and Management Majors Education

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Abstract

This paper discusses the reconstruction of the deep integration model for Economics and Management Majors under the background of the new liberal arts in China. The study analyzes the connotation and characteristics of the new liberal arts, as well as the current situation and challenges of the integration of new liberal arts with Economics and Management Majors. Based on this, the paper proposes a deep integration model that includes curriculum system reform, the deepening of industry-education integration, and innovation in science-education integration. The article also explores implementation strategies and safeguard measures, including top-level design, the construction of teaching staff, clear positioning of participating entities, and the establishment of a quality evaluation system for the integration of new liberal arts. The research indicates that the deep integration of new liberal arts with Economics and Management Majors is of great significance for cultivating compound talents and promoting disciplinary innovation and development.

Keywords: New Liberal Arts; Economics and Management Majors; Deep Integration; Industry-Education Integration; Science-Education Integration

1. Introduction

The fourth industrial revolution is reshaping the global knowledge production system with a disruptive momentum (Lee et al., 2018). The exponential development of technologies such as artificial intelligence, big data, and blockchain is placing unprecedented pressure on the deconstruction of traditional talent cultivation models in Economics and Management Majors (George, 2024). Against this backdrop, the core dilemma faced by current business management

education is that the pace of disciplinary knowledge iteration lags behind the cycle of technological change, standardized talent cultivation is difficult to match the needs of industrial digital transformation, and the cognitive barriers formed by the traditional disciplinary system hinder the systematic resolution of complex economic issues (Balmer, 2006); the structural contradictions such as rigid disciplinary barriers, outdated technical tools, and virtualization of practical fields in Economics and Management disciplines, along with the traditional teaching model centered on the transmission of disciplinary knowledge, are no longer able to meet the urgent demand of the digital economy era for compound and innovative talents (Bobkova, Korobejnikova, Nelyubina, & Likhman, 2015).

In recent years, the curriculum reform of the world's top business schools has shown a significant turn towards the philosophy of technology (Lewis, 2018). The MIT Sloan School of Management has embedded machine learning into its corporate finance courses, and London Business School has introduced complex system simulations into its strategic management teaching (Stermann, 2014). These practices reveal that business management education is undergoing a paradigm shift from "technology application" to "technology cognition." The interdisciplinary "Climate Finance" project conducted by the Harvard Kennedy School, which successfully integrates environmental science, financial engineering, and public policy research methods, provides a referable paradigm for the integration of new liberal arts and business management (Andonova, 2022). The dissolution of disciplinary barriers is giving birth to new knowledge growth points. The Nobel Prize in Economics' recent continuous tilt towards behavioral science and complex science reflects a profound shift towards interdisciplinary integration in the research paradigm of economic management (Ren & Liu, 2024). The "big issue-oriented" research paradigm advocated by the new liberal arts is highly compatible with the complex issues facing the business management field, such as sustainable development and digital economy governance. In an algorithm-driven decision-making environment, business management talents not only need to master data analysis tools but also need to have the ability to make ethical judgments about algorithms and to anticipate technical risks.

In this revolution of educational paradigm, the introduction of the concept of new liberal arts has pointed out the direction for the reform of liberal arts education in China, and has also provided strategic opportunities for the innovative development and transformation of Economics and Management Majors (Zha, 2022). The deep integration of new liberal arts with Economics and Management Majors is, at its essence, a fundamental reconstruction of the mode of knowledge production, aiming to build a new cognitive framework and capability system that adapts to the digital civilization era (Li & Hu, 2024). As a field of study with strong practical application, business management faces the important task of achieving deep integration under the background of new liberal arts, and cultivating compound talents with interdisciplinary perspectives and innovative capabilities. This study aims to explore the models and paths for the deep integration of new liberal arts with Economics and Management Majors, providing theoretical references and practical guidance for promoting the innovative development of Economics and Management Majors.

2. The Connotation and Characteristics of the New Liberal Arts

2.1. The Connotation of the New Liberal Arts

The concept of the new liberal arts was first proposed by the United States' Hiram College in 2017, with the aim of integrating new technologies into humanities and social science courses through disciplinary reorganization and the intersection of arts and sciences, to meet the demands of the global new technological revolution and economic development (Lu & Hu, 2020). In 2018, China officially introduced the concept of "new liberal arts" and explicitly proposed to develop new engineering, new medical, new agricultural, and new liberal arts, to enhance the service capacity and contribution level of education (Chen & Li, 2024). The new liberal arts represent both the continuation and innovation of traditional humanities disciplines, with its core focusing on the deep integration of humanities with social sciences, natural sciences, engineering technology, and other fields, forming a more inclusive and practical knowledge system. The new liberal arts not only pay attention to traditional humanities issues (such as culture, ethics, history, etc.) but also devote themselves to solving complex contemporary social problems (such as environmental crises, technological ethics, globalization, etc.). The proposal of the new liberal arts is a reflection and reconstruction of traditional humanities disciplines, aiming to break through disciplinary boundaries and promote the integration and innovation of knowledge (Geiger & Rothblatt, 2015).

2.2. The Core Characteristics of the New Liberal Arts

The core characteristics of the new liberal arts include: (1) Disciplinary reorganization and the intersection of arts and sciences. Integrating new technologies into traditional liberal arts courses to promote interdisciplinary crossover and deep integration. (2) Comprehensive interdisciplinary learning. Providing students with comprehensive interdisciplinary learning opportunities to cultivate applied and compound liberal arts talents. (3) Cultivation of innovative talents. Focusing on developing students' innovative thinking and practical abilities to meet the development needs of the new era (Li, & Hong, 2022).

3. The Current Status of the Integration and Development of New Liberal Arts and Economics and Management Majors

3.1. Preliminary Exploration of Interdisciplinary Integration

The deep integration of new liberal arts with Economics and Management Majors is an important trend in the current field of higher education. In the preliminary exploration of interdisciplinary integration, Chinese universities have made various attempts in curriculum systems, research directions, and talent cultivation models (Liu, 2024), as follows: (1) The construction of an interdisciplinary curriculum system. Universities have begun to break down traditional disciplinary barriers and design curriculum systems that integrate the characteristics of both fields: a fusion module of interdisciplinary core courses with elective courses. For example, Economics and Management Majors are attempting to integrate with data science, artificial intelligence, and other science and technology fields (Johnson, 2021). (2) The exploration of

interdisciplinary research directions. Universities have started to establish interdisciplinary research institutions, and through interdisciplinary academic salons, forums, and other activities, they promote the exchange between scholars of new liberal arts and business management, driving the integration of academic research (Newman, 2024). (3) The innovation of interdisciplinary talent cultivation models, such as dual degrees or joint training programs, interdisciplinary mentor teams, and personalized cultivation plans (Gao, Ji, Wang, & Yu, 2025). The combination of interdisciplinary practice and application, including the construction of interdisciplinary practice bases, interdisciplinary solutions to social problems, and interdisciplinary competitions and activities. Some universities have attempted to build a practical teaching system that integrates "curriculum crossover" with "disciplinary crossover," achieving a "multi-dimensional Synergy" model, and integrating resources from universities, enterprises, and industry associations (Fu et al., 2025).

3.2. Attempts at Reforming the Practical Teaching System

Under the context of deep integration between new liberal arts and Economics and Management Majors, attempts at reforming the practical teaching system have become an important trend (Riabovolyk, 2023). Management in the education system: global tendencies, reforming and innovations. This reform is not only to meet society's demand for compound and innovative talents but also to break down traditional disciplinary barriers and cultivate students' practical abilities and comprehensive qualities. Some universities have reconstructed their practical teaching systems through a "multi-dimensional Synergy" model (school-enterprise cooperation, integration of competition and teaching, etc.), proposing a practical framework of "course crossover + industry-education integration" (Guo, 2023). Some universities have reconstructed talent cultivation paths through the integration of competition and teaching, and industry-education integration, introducing lecture-based teaching, corporate thematic lectures, and other forms to enhance participation. Most institutions have strengthened practical orientation, improving students' application abilities through case teaching, corporate internships, and disciplinary competitions (Lu, 2021). At the same time, the promotion of project-based learning (PBL) is an important direction in current practical teaching reforms. By designing real, complex interdisciplinary projects and real corporate projects, students can combine new liberal arts and business management knowledge, or provide real business cases or projects to solve practical problems (Almulla, 2020). Some universities have also opened up "digital intelligence" courses, integrating data analysis tools with business practices.

3.3. The Rise of Multi-party Collaborative Education Models

Chinese universities are strengthening their cooperation with governments and enterprises, such as establishing practice bases and carrying out school-enterprise joint projects. Some higher education institutions promote the cultivation of students' comprehensive abilities by completing innovation and entrepreneurship projects through interdisciplinary team collaboration (Lin, 2023). The multi-party collaborative education model is particularly prominent in the integration of new liberal arts and Economics and Management Majors: (1) School-enterprise cooperation: Universities and enterprises jointly design courses, conduct project research, or engage in practical teaching. For example, students in new liberal arts majors can participate in corporate

branding, cultural communication projects, while students in Economics and Management Majors can provide support to enterprises through data analysis, market research, and other means (Bian & Wang, 2021). (2) Government support: The government encourages in-depth cooperation between universities and enterprises to promote the integration of production, learning, and research through policy guidance and financial support. For instance, many local governments have set up special funds to support universities and local enterprises in carrying out research and practice in cultural industries, digital economy, and other fields (MA et al., 2022). (3) Participation of social organizations: Industry associations, non-profit organizations, and others have also begun to participate in talent cultivation, providing internship opportunities, lectures, or competitions and other resources to help students better understand social needs (Lee et al., 2025).

4. Problems in the Deep Integration of New Liberal Arts and Economics and Management Majors

4.1. Unclear Integration Paths and Lagging Curriculum Systems

Currently, the integration path between new liberal arts and Economics and Management Majors remains unclear. Most institutions are still at the stage of "course module patchwork," failing to achieve organic integration of knowledge and not forming a clear path for interdisciplinary talent cultivation (Sarina & Wardiah, 2019). The curriculum system lags behind industrial changes, with traditional courses still dominating and a lack of content in emerging fields such as blockchain economics and ESG management. The curriculum design lacks comprehensive interdisciplinary planning, resulting in insufficient understanding of interdisciplinary courses among teachers and students, which leads to repeated or disjointed course content. For example, courses that integrate arts and sciences often only combine economics with basic programming without achieving methodological penetration, thus, such integration often remains at the level of content superposition, lacking systematic design.

4.2. Imbalance in Interdisciplinary Teaching Staff

Teachers generally lack interdisciplinary backgrounds and industry practical experience, making it difficult to support the needs of deep integration. The teaching staff commonly faces the issue of "disciplinary singularity," with insufficient teaching abilities across fields. A survey shows that only 37% of business management teachers at a certain university have experience in data analysis or digital technology applications, leading to superficial case teaching and the application of new technologies (Huang, 2024). The reason for this is the lack of interdisciplinary learning, training, and support, which limits teachers' guidance capabilities in interdisciplinary teaching.

4.3. The "Shallow" Dilemma of Industry-Education Integration

In the current "School-enterprise cooperation" models for Economics and Management Majors in colleges and universities, many are limited to the construction of internship bases. The proportion of enterprises participating in curriculum design and sharing of teaching staff is insufficient, and the distribution of school resources is uneven. Practical projects often focus on

case analysis and simulated operations, which have a gap with real business scenarios, and the problem of uneven resource allocation is prominent. Some industry-education projects are actually "visiting-type practices," failing to establish a long-term collaborative mechanism. Issues such as the lagging update of experimental software and the superficiality of enterprise cooperation projects are prominent (Wang, et al., 2017). Interdisciplinary practical teaching requires abundant resource support, but some universities invest insufficiently in school-enterprise cooperation and the construction of practice bases, leading to limited practical opportunities for students. There is also an imperfect cooperation mechanism between universities and enterprises, low efficiency in resource integration, and a lack of awareness among some enterprises of the needs for interdisciplinary talents (Liu, 2024).

4.4. Homogenization and Ambiguity in Positioning

The construction of Economics and Management Majors in local colleges and universities tends to be homogenized and lacks regional characteristics (Zha, 2009). Some institutions have attempted to construct professional groups by leveraging regional industrial features (such as cultural tourism economy, digital trade), but the depth of characteristic integration is insufficient, and long-term planning is lacking. There is also a lack of positioning: (1) School positioning: For example, in the professional settings of most colleges and universities in China, Economics and Management Majors still focus on traditional business administration, failing to form differentiated positioning by combining regional industrial advantages, which puts local colleges' majors under the pressure of homogenized competition (Hou & Chen, 2014). (2) Students' cognition and adaptability issues: Students lack a clear understanding of the value of interdisciplinary integration and its impact on career development prospects. Some students have insufficient awareness of interdisciplinary integration, believing that the combination of new liberal arts and Economics and Management Majors is unnecessary or lacks prospects, leading to a lack of motivation to learn (Horn & Zweekhorst, 2022). (3) Social cognition and adaptability issues in the job market (Wu & Zhang, 2024). The model of interdisciplinary integration is still in the exploratory stage, and some employers have insufficient awareness of talents with interdisciplinary integration, leading to unclear demand in the job market for such talents. The social cognition and acceptance of these talents need to be improved.

4.5. Lack of Evaluation Mechanisms and Incentives

The existing evaluation system still primarily focuses on theoretical examination scores, with a low proportion of indicators for interdisciplinary project outcomes and innovation capabilities, which suppresses the enthusiasm for integration reforms (Deng, & You, 2025). On one hand, the teaching evaluation system does not fully incorporate interdisciplinary integration indicators, leading to insufficient motivation for teachers to participate in curriculum reforms. On the other hand, the traditional evaluation system pays more attention to students' mastery of theoretical knowledge, with theoretical examinations still being the main form of student assessment, neglecting the cultivation of practical abilities and interdisciplinary comprehensive capabilities. In the process of integration with new liberal arts, the evaluation system lacks a design that targets interdisciplinary integration, making it difficult to comprehensively measure students' comprehensive abilities.

5. Reconstruction of the Deep Integration Model of New Liberal Arts and Business Management Disciplines

Under the background of new liberal arts, the deep integration of Economics and Management Majors has made phased progress, but it still faces core challenges such as curriculum integration, faculty optimization, resource matching, and lack of incentives. Combined with the three core characteristics of new liberal arts: disciplinary reorganization and the intersection of arts and sciences, comprehensive interdisciplinary learning, and the cultivation of innovative talents, future breakthroughs need to be achieved through dynamic curriculum system reconstruction (such as modular crossover course design), deepening industry-education integration (school-enterprise joint training), and innovative science-education integration (industry-academia-research collaborative education). The framework for the deep integration reconstruction of new liberal arts and Economics and Management Majors is shown in Figure 1.

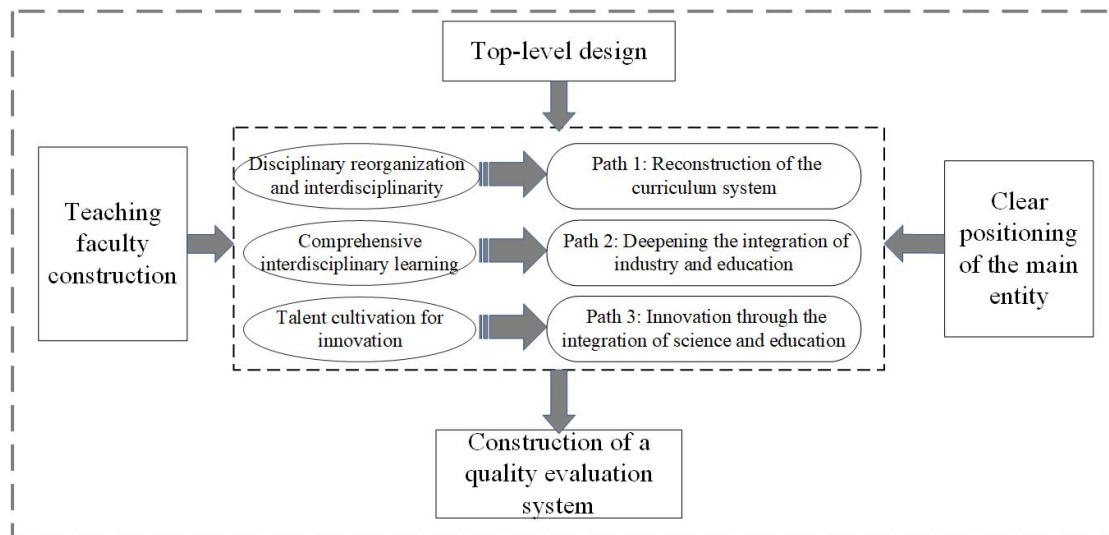


Figure 1. Reconstruction Plan for Deep Integration of the New Liberal Arts and Management and Economics Majors

5.1. Premise of Integration: Strengthening Top-level Design and Policy Support

Universities should formulate plans for the construction of new liberal arts, clarify the goals and paths for the deep integration of Economics and Management Majors, and provide necessary policy support and resource guarantees. At the same time, it is necessary to establish and improve the incentive mechanisms for interdisciplinary teaching and research, encouraging teachers to participate in interdisciplinary teaching and research activities. Universities should integrate internal and external resources, establish a platform for the sharing of interdisciplinary resources, and provide necessary resource support for deep integration. This can be achieved by establishing interdisciplinary laboratories, shared databases, and other means to promote the effective use and sharing of resources.

5.2. Path of Integration: The "Three-Dimensional Reconstruction" Chinese Paradigm

5.2.1. Course System Reconstruction

(1) Curriculum System Reform. Business management programs should universally incorporate technology courses such as Python, big data analysis, machine learning, and blockchain. For instance, the Financial Technology major at the Central University of Finance and Economics integrates programming with finance, while the School of Economics and Management at Tsinghua University offers a course in "Business Data Analysis." Some universities have launched dual-degree programs that combine economics with computer science and management with artificial intelligence, or established interdisciplinary directions such as "Digital Economics" and "Intelligent Supply Chain Management" to engage in interdisciplinary modular design.

(2) Innovation in Teaching Methods. Utilizing technology-driven teaching models that employ virtual simulations (such as financial trading simulation platforms) and case databases (like Wind and CSMAR) for empirical teaching, with some courses incorporating natural language processing tools to assist in business decision analysis. Engaging in project-based learning (PBL) in collaboration with enterprises for digital transformation projects, such as optimizing the supply chain for JD.com and designing financial risk control models for Ant Group.

(3) Expansion of Research Fields. Firstly, there is a rise in computational social science. Business and management research extensively adopts methods such as big data analysis (e.g., using social media sentiment indices to predict stock markets), Agent-Based Modeling (ABM) simulations (e.g., simulating supply chain disruptions during a pandemic), and natural language processing (NLP analysis of policy texts). Secondly, there are emerging interdisciplinary fields. These include the integration of behavioral economics with neuroscience (neuromarketing), the application of blockchain in supply chain finance, and ESG data analysis.

5.2.2. Deepening Industry-Education Integration

In the process of implementation, industry-education integration needs to be deepened in multiple aspects such as joint training, practical teaching, and organizational models (Feng, 2025, April). (1) School-enterprise joint education mechanism. Universities and enterprises should jointly develop training programs and carry out activities such as customized training and on-the-job internships. The curriculum system needs to be redesigned based on industrial needs, with a modular approach that integrates basic courses, specialized courses, and practical courses. Promote blended teaching, strengthen practical teaching, integrate innovation and entrepreneurship education with comprehensive quality education. (2) Optimization of the practical teaching system. Practical teaching is an important carrier of industry-education integration, and a multi-level practical platform needs to be constructed, including on-campus training bases, school-enterprise joint laboratories, and enterprise internships. For example, the "school-enterprise co-construction of practice bases" model can be used to implement real project teaching by introducing real projects from enterprises into the teaching process. Examples include "Cultural and Creative Product Design and Market Promotion" and "Cultural IP Operation and

Commercialization," which help students learn and practice in real scenarios. (3) Innovation in the organizational model of industry-education integration. This can be achieved through the establishment of a "dual mentorship" system (campus mentors + enterprise mentors) and "project-based learning" to provide students with comprehensive guidance and support. (4) Resource support. This includes teacher resources, practical facilities, and financial guarantees. It is necessary to strengthen school-enterprise collaboration, integrate enterprise educational resources, and provide support for the educational process. Through industry-education integration, students can grasp real industry needs and vocational skills.

5.2.3. Innovation in Science-Education Integration

One of the core features of new liberal arts is the cultivation of innovative talents, and therefore, innovation in science-education integration should be achieved in the deep integration of new liberal arts with business management disciplines. The main measures include: (1) Development of cutting-edge courses. Integrating the latest scientific research findings and technological advancements into the content of business management courses to ensure the frontier and innovativeness of teaching content. For example, the latest research findings in fields such as artificial intelligence and quantum computing can be integrated into relevant courses. Develop interdisciplinary courses based on the latest scientific research findings to cultivate students' comprehensive qualities. (2) Student participation in scientific research projects. Encourage students to participate in scientific research projects led by teachers or enterprises, provide special funding support, and cultivate their scientific research capabilities and innovative awareness. The integration of production, learning, and research promotes the transformation of scientific and technological achievements and applies research findings to teaching practice, promoting the deep integration of education and science and technology. (3) Openness and sharing of research platforms. Establish interdisciplinary research centers and disciplinary teams to promote cooperation and exchanges between different disciplines and drive the in-depth development of scientific research (Reuver & Zuiderwijk, 2022). Open university laboratories to students and teachers, providing advanced research equipment and technical support to promote the conduct of scientific research activities.

5.3. Foundation for Integration: Strengthening the Cultivation of Teachers' Interdisciplinary Capabilities

Advancing the construction of teaching staff and enhancing their capabilities is key to deep integration (Zhao & Shi, 2024). Universities should strengthen the construction of interdisciplinary teaching staff, recruit outstanding talents with interdisciplinary backgrounds, and at the same time, strengthen the training of existing teachers to improve their interdisciplinary teaching and research abilities. (1) Constructing an Interdisciplinary Knowledge System. Teachers need to master the core knowledge and research methods of new liberal arts and business management disciplines through systematic study. This can be achieved through the following means: conducting interdisciplinary course training to help teachers understand the basic theories and practical methods of other disciplines; establishing a "dual-discipline" teaching staff training mechanism to encourage teachers to pursue interdisciplinary further education or joint training; developing interdisciplinary teaching materials and resources to provide references

for teachers' learning and teaching. (2) Enhancing Interdisciplinary Teaching Abilities. Teachers' interdisciplinary teaching abilities directly affect the effectiveness of disciplinary integration. Specific measures include: conducting case-based interdisciplinary teaching training to help teachers master the methods of interdisciplinary course design; holding interdisciplinary teaching observation and discussion activities to promote experience exchange among teachers. (3) Strengthening Practical and Application Abilities. Teachers need to enhance their interdisciplinary teaching abilities through practical activities. Specific measures include: organizing teachers to participate in interdisciplinary research projects to improve their practical abilities; establishing school-enterprise cooperation platforms to promote collaboration between teachers and enterprises and understand industrial needs; conducting interdisciplinary teaching practice activities, such as interdisciplinary course design competitions and teaching achievement exhibitions. (4) Establishing incentive mechanisms for interdisciplinary teaching, such as incorporating interdisciplinary teaching achievements into the teacher evaluation system, holding interdisciplinary teaching practice activities like interdisciplinary course design competitions and teaching achievement exhibitions, and encouraging teachers to participate in interdisciplinary course design and teaching.

5.4. Support for Integration: Clear Positioning of Participating Entities

(1) Enhancing Students' Interdisciplinary Cognition and Adaptability. Universities should strengthen interdisciplinary cognition education for students, helping them recognize the value and career development prospects of interdisciplinary integration through lectures, promotional materials, and other forms. Through career planning courses or counseling, help students clarify their career development directions in interdisciplinary integration. By showcasing successful cases of interdisciplinary integration talents, stimulate students' interest and confidence in learning. Design interesting and challenging interdisciplinary courses to enhance the learning experience and participation of students.

(2) Promoting Social Cognition and Adaptability in the Job Market. Universities should strengthen communication with society, promoting the cognition and acceptance of interdisciplinary integration talents through publicity, forums, and other forms. Through research on fields such as cultural industries and the digital economy, clarify the market demand for interdisciplinary integration talents. Share the successful experiences of alumni with society to demonstrate the value of interdisciplinary integration talents. Collaborate with employers in the job market promotion, promoting the employment prospects and competitive advantages of interdisciplinary integration talents.

5.5. Guarantee for Integration: Building a Multi-dimensional Evaluation System

(1) Evaluation of Students' Interdisciplinary Abilities. Universities should design a multi-dimensional fusion quality evaluation system to comprehensively measure students' interdisciplinary abilities, including theoretical knowledge, practical skills, teamwork abilities (Carmichael, 2024). In the process of formative assessment during the implementation of courses, students are dynamically evaluated through various forms such as classroom performance and project progress. Multi-party evaluation methods are introduced, including assessments from

teachers, enterprise mentors, and student self-evaluations, to ensure the comprehensiveness and objectivity of the evaluation. Students' practical achievements, such as project reports and practical works, serve as important bases for evaluation, examining the practical application of their interdisciplinary abilities.

(2) Evaluation of the Effectiveness and Quality of Deep Integration Models. Universities should establish a scientific quality evaluation system, incorporating interdisciplinary teaching and research achievements into the evaluation indicators to encourage teachers and students to participate in interdisciplinary activities. At the same time, an effective feedback mechanism should be established to timely adjust and optimize the strategies and measures of deep integration.

6. Conclusion

The deep integration of new liberal arts with Economics and Management Majors is a significant direction for the reform of higher education in China in the new era. It is a complex systematic project that not only requires comprehensive reforms in curriculum systems, industry-education integration, and science-education integration by universities but also necessitates supportive measures such as strengthening top-level design, promoting the construction of teaching staff, building quality evaluation systems, enhancing student cognition, and advancing social cognition to effectively promote the in-depth development of interdisciplinary integration in Economics and Management Majors. This will not only help cultivate business management professionals with greater innovation and practical abilities but also provide stronger talent support for social and economic development. In the future, as the interdisciplinary integration model continues to improve and expand, the reform of new liberal arts integration models will play an even greater role in the field of higher education.

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Conflict of interest

The authors declare no conflict of interest.

References

- Almulla, M. A. (2020). The effectiveness of the project-based learning (PBL) approach as a way to engage students in learning. *Sage Open*, 10(3), 2158244020938702.
- Andonova, L. B., Faul, M. V., & Piselli, D. (2022). Partnerships for sustainability in contemporary global governance: Pathways to effectiveness (p. 308). Taylor & Francis
- Balmer, R. T. 2006. Converging Technologies in Higher Education. *Annals of the New York Academy of Sciences*, 1093(1): 74–83.
- Bian, F., & Wang, X. (2021). School enterprise cooperation mechanism based on improved decision tree algorithm. *Journal of Intelligent & Fuzzy Systems*, 40(4), 5995-6005.
- Bobkova, E. Yu., Korobejnikova, E. V., Nelyubina, E. G., & Likhman, V. A. (2015). Pedagogical Problems of Effective Training of Specialists in International Virtualization of Economic Industry. *Mediterranean Journal of Social Sciences*, 6(3), 17-24.
- Carmichael, T. S. (2024). Evaluating interdisciplinary education. In *Handbook of Interdisciplinary Teaching and Administration* (pp. 227-244). Edward Elgar Publishing.
- Chen, Y., & Li, H. (2024). Exploring the Construction Ideas for a First-Class Undergraduate Major in Finance Under the Background of New Liberal Arts. *Education*, 3(4), 86-92.
- De Reuver, M., Ofe, H., Agahari, W., Abbas, A. E., & Zuiderwijk, A. (2022, December). The openness of data platforms: A research agenda. In *Proceedings of the 1st International Workshop on Data Economy* (pp. 34-41).
- Deng, D., Sun, F., Liu, Y., & You, S. (2025, September). Research on the Optimization of Industry-Education Integration Curriculum System for Landscape Architecture under the Background of New Engineering. In *Proceedings of the 2025 9th International Seminar on Education, Management and Social Sciences (ISEMSS 2025)* (p. 352). Springer Nature.
- Feng, L. (2025, April). Design and Reform of Industry-Education Integration in. In *Proceedings of the 2024 3rd International Conference on Educational Science and Social Culture (ESSC 2024)* (Vol. 914, p. 132). Springer Nature.
- Fu, S., Dong, F., Chen, R., Shen, D., Zhang, J., et al. 2025. Multi-Dimensional Training Optimization for Efficient Federated Synergy Learning. *IEEE Transactions on Mobile Computing*, 24(7), 6243–6258.
- Full article: Reform and practice of the interdisciplinary competency cultivation model based on the German economic engineering talent training. n.d.
<https://www.tandfonline.com/doi/full/10.1080/2331186X.2025.2580073>, December 1, 2025.
- Gao, X., Ji, X., Wang, R., & Yu, J. 2025. The effect of artificial intelligence on energy transition: Evidence from China. *Energy Economics*, 147, 108568.
- Geiger, R. L., Rothblatt, S., Melin, C., Kleinman, D. L., Moses, Y., Woodward, K., ... & Williams, J. J. (2015). A new deal for the humanities: Liberal arts and the future of public higher education. Rutgers University Press.
- George, A. S. (2024). The evolution of economic models: From knowledge to intuition and optimization. *Partners Universal Multidisciplinary Research Journal*, 1(2), 1-25.
- Guo, Z. (2023). Evaluation on the Prospects of School Enterprise Cooperation and the Integration of Industry and Education in Vocational Education in the 5G Era. *The Frontiers of Society, Science and Technology*, 5(13), 63-70.

- Horn, A., Urias, E., & Zweekhorst, M. B. M. (2022). Epistemic stability and epistemic adaptability: interdisciplinary knowledge integration competencies for complex sustainability issues. *Sustainability Science*, 17(5), 1959-1976.
- Hou, J., Michaud, C., Li, Z., Dong, Z., Sun, B., Zhang, J., ... & Chen, L. (2014). Transformation of the education of health professionals in China: progress and challenges. *The Lancet*, 384(9945), 819-827.
- Huang Xinning. Research on the Integration Strategy of Artificial Intelligence and College Foreign Language Teaching from an Interdisciplinary Perspective[J]. *Journal of Taiyuan City Vocational and Technical College*, 2024, (11): 86-88.
- Jiajing, F., Zhiwei, Y., & Qin, D. (2025). Reform and practice of the interdisciplinary competency cultivation model based on the German economic engineering talent training. *Cogent Education*, 12(1), 2580073.
- Johnson, M., Jain, R., Brennan-Tonetta, P., Swartz, E., Silver, D., Paolini, J., ... & Hill, C. (2021). Impact of big data and artificial intelligence on industry: developing a workforce roadmap for a data driven economy. *Global Journal of Flexible Systems Management*, 22(3), 197-217.
- Lee, C. W., Liu, P. T., Thy, Y. H., & Peng, C. L. (2025). Sustainable Open Innovation Model for Cultivating Global Talent: The Case of Non-Profit Organizations and University Alliances. *Sustainability*, 17(11), 5094.
- Lee, M., Yun, J. J., Pyka, A., Won, D., Kodama, F., et al. 2018. How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(3), 21.
- Li, X., & Hu, Y. (2024). Research on Top-Level Drivers and Grassroots Practices in the Construction of New Liberal Arts in China. *Frontiers in Educational Research*, 7(11), 156-163.
- Li, C. J., & Hong, L. X. (2022). The new era of liberal arts: Tailoring practical education for international economics and trade. *Research Journal of Education and Allied Studies*, 10(3), 11-20.
- Lin, M. (2023). Research on Higher Education Management and the Cultivation of Innovation and Entrepreneurship Abilities in University Students. *Academic Journal of Management and Social Sciences*, 5(3), 63-66.
- Liu, Y. (2024). Research on the Talent Cultivation Model of Interdisciplinary Integration in Art and Design. *The Educational Review, USA*, 8(4), 506-510.
- Lu, H., & Hu, T. (2020). The Reconstruction of Higher Law Education Curriculum System in the Context of New Liberal Arts*, 765–770. Presented at the 4th International Conference on Culture, Education and Economic Development of Modern Society (ICCESE 2020), Atlantis Press.
- Lu, H. F. (2021). Enhancing university student employability through practical experiential learning in the sport industry: An industry-academia cooperation case from Taiwan. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 28, 100301.

- Ma, S., Huo, P., Li, W., Li, Y., Li, L., & Su, C. (2022). Study on the Integration of Industry and Education through Deep Cooperation between Government, Industry, Universities and Enterprises. *Integration*, 1(1), 1-7.
- Newman, J. (2024). Promoting interdisciplinary research collaboration: A systematic review, a critical literature review, and a pathway forward. *Social Epistemology*, 38(2), 135-151.
- Ren, X., & Liu, L. (2024). Research on Art and Design Education in the Context of New Liberal Arts. *Journal of Arts and Cultural Studies*, 3(1): 1-13.
- Riabovolyk, T. (2023). Management in the education system: global tendencies, reforming and innovations. *Zenodo*, 518-530.
- Sarina, M. K., & Wardiah, D. (2019). Module Development The Utilization Of Patchwork Fabric As Teaching Materials Crafts On The Subjects Of Craft And Entrepreneurship For High School Students. *International Journal Of Scientific & Technology Research*, 8(5):124-130.
- Sterman, J. (2014). Interactive web-based simulations for strategy and sustainability: the MIT Sloan LearningEdge management flight simulators, Part I. *System Dynamics Review*, 30(1-2), 89-121.
- Sustainable Open Innovation Model for Cultivating Global Talent: The Case of Non-Profit Organizations and University Alliances. n.d. <https://www.mdpi.com/2071-1050/17/11/5094>, December 1, 2025.
- Wang, S., Shen, G., Jiang, S., Xu, H., Li, M., Wang, Z., ... & Yu, Y. (2017). Nutrient status of vitamin D among Chinese children. *Nutrients*, 9(4), 319.
- Wu, C., & Zhang, L. (2024). The Relationship Between College Students' Employment Psychology and Social Adaptability. *Journal of Modern Education and Culture*, 1(4), 1-7.
- Zha, Q. (2022). How should liberal arts education evolve in the twenty first century? An exploration of universities in China and beyond1. *Educational Philosophy and Theory*, 54(12), 2082-2096.
- Zha, Q. (2009). Diversification or homogenization: How governments and markets have combined to (re) shape Chinese higher education in its recent massification process. *Higher education*, 58(1), 41-58.
- Zhao, Y., Zhao, M., & Shi, F. (2024). Integrating moral education and educational information technology: A strategic approach to enhance rural teacher training in universities. *Journal of the Knowledge Economy*, 15(3), 15053-15093.

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