



Analysis on the Paths to Promote Interdisciplinary Development in Universities in the AI Era

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Abstract. The rapid development of AI has blurred traditional disciplinary boundaries, and interdisciplinary integration has become the core approach to tackling major scientific challenges, upgrading industries and cultivating innovative talents. Promoting university interdisciplinarity is essential to meet national strategic needs and achieve high-quality development [1]. Combining domestic disciplinary practices and AI application trends, this paper explores effective paths from four dimensions: policy guidance, platform construction, mechanism innovation and effectiveness closed-loop, to provide references for high-quality disciplinary development in higher education.

Keywords: Artificial Intelligence, World-Class Universities, Interdisciplinary development.

1 Introduction

1.1 Empowerment of Top-level Design at the National Strategic Level

The Outline of Plan for Building China into a Leading Country in Education (2024-2035) proposes to advance AI-enabled educational reform and build a large-scale AI education model, clarifying the strategic orientation of technology-driven educational development. The Opinions on Accelerating the Digital Transformation of Education further promote the in-depth integration of AI and discipline construction, and delineates the practical path for interdisciplinary development in universities. National policies not only highlight the construction priorities of basic disciplines, emerging disciplines, and interdisciplinary disciplines but also emphasize the leading role of national strategic needs in discipline establishment, compelling universities to closely integrate interdisciplinary development with major national projects and regional industrial development. Universities should take the initiative to adjust their discipline layout for strategic emerging industries such as artificial intelligence and quantum information, cultivate cross-field interdisciplinary research directions, and realize the resonance between discipline construction and national development [2].

1.2 Implementation and Institutional Guarantee at the University Level

As the main entity of interdisciplinary development, universities should translate national strategies into specific institutional designs and resource allocation plans, and take interdisciplinarity as the core engine of the ‘Double First-Class Initiative’. It is necessary to build a dual-track mechanism that combines top-down strategic layout and bottom-up innovative breakthroughs. On the one hand, universities can formulate interdisciplinary construction plans, set up special funds and optimize resource allocation to consolidate institutional support for interdisciplinary development. On the other hand, scholars’ research autonomy should be respected to encourage interdisciplinary research oriented to academic interests and market demands. In addition, universities need to rebuild an evaluation system adapted to interdisciplinary development, break the barriers of traditional disciplinary evaluation, include interdisciplinary achievements and collaborative contributions into evaluation indicators, and stimulate the endogenous motivation of scholars to participate in interdisciplinary research.

2 Platform Foundation: AI-enabled Integration of Interdisciplinary Resources

2.1 Constructing Basic Support for Multi-dimensional Data Fusion

Data is the core element of AI empowering interdisciplinary development. The primary task of universities is to break through data silos, realize the global integration of academic resources, connect to the university data center, and import academic achievement data such as papers, patents, projects, and awards on the premise of strictly complying with data security, so as to consolidate the data foundation for interdisciplinary analysis^[3].

Data integration should focus on standardization and accuracy: ensure data quality by defining fields, standardizing formats, and establishing verification mechanisms; connect with high-level paper catalogs, discipline classification, and assessment index systems to realize classified and graded management of data. The platform can link project, patent, and journal databases to comprehensively capture scholars’ research achievements and provide support for interdisciplinary analysis and accurate profiling. AI technology deeply unlocks the value of data: by constructing discipline-specific large models and strengthening model training, it realizes keyword extraction of academic achievements and discipline classification matching, mines potential interdisciplinary points from massive data, and provides a data-driven decision-making basis for interdisciplinary layout.

2.2 Building a Comprehensive Interdisciplinary Service System

Based on solid data foundation and mature AI technology, universities can build a multi-functional and precise interdisciplinary service platform to form a full-chain service system. The platform covers academic achievement management to realize

visualized hierarchical management and standardized export of achievements, interdisciplinary center to intelligently recommend potential research directions and matching fields with the support of AI, accurate scholar profiling to construct dynamic research portraits for interdisciplinary cooperation, academic social center to realize efficient matching of scholars, policy document distribution to capture national and industrial policies in real time, as well as intelligent decision-making service to provide data support for disciplinary layout and resource allocation.

2.3 Promoting Platform Construction and Optimization in Phases

Platform construction follows the principle of phased implementation and iterative optimization, divided into a foundation period and an improvement period:

Foundation period: complete framework construction, standardized data processing, and preliminary training of discipline-specific large models, and implement core functions such as academic achievement management and accurate scholar profiling;

Improvement period: optimize functions such as academic social interaction, interdisciplinary analysis, policy distribution, and intelligent decision-making, and form a complete service system.

A normalized feedback mechanism should be established for platform operation to collect opinions from teachers and students on function design, operation experience, and data accuracy, and continuously iterate and optimize the platform. At the same time, draw on the experience of universities such as Xi'an Jiaotong University and Zhejiang University, and customize functions according to the disciplinary characteristics of the university: science and engineering universities strengthen interdisciplinary services for technological research and development, and liberal arts universities highlight the integration of humanities and social sciences with other disciplines.

3 Mechanism Breakthrough: Building a Borderless Collaborative Ecosystem

3.1 Breaking Organizational Barriers and Promoting the Formation of Interdisciplinary Teams

The core of interdisciplinarity lies in human collaboration, and the traditional department-based management is the main obstacle to interdisciplinary cooperation. Universities need to break organizational barriers through mechanism innovation, and the internal academic social cycle built by the interdisciplinary resource platform is an effective way to break such barriers ^[4].

On the one hand, set up physical institutions such as interdisciplinary research centers and interdisciplinary research institutes as incubators for interdisciplinarity. These institutions break the boundaries of schools and departments, integrate scholars around interdisciplinary directions such as AI and communication and quantum in-

formation and computer based on platform data, carry out centralized research, and allocate special funds and venues to ensure team collaboration.

On the other hand, encourage scholars to spontaneously form interdisciplinary teams based on project needs. The platform reduces the cost of team formation through intelligent matching of research directions, academic achievements, and cooperation willingness; establish an interest distribution mechanism for interdisciplinary teams, clarify the equity rules of achievement authorship, fund allocation, and assessment and evaluation, and resolve conflicts of interest in collaboration.

3.2 Improving Resource Allocation and Incentive Mechanisms

Resource allocation is an important guarantee for interdisciplinarity: universities need to establish a resource allocation mechanism suitable for interdisciplinary disciplines, set up special funds for interdisciplinarity, and support interdisciplinary research, platform construction, academic exchanges, and other work. The incentive mechanism is the key to stimulating participation enthusiasm: optimize the assessment and evaluation system, incorporate interdisciplinary achievements and collaborative contributions into indicators, and give preferences in professional title evaluation and performance distribution; grant additional rewards to high-level interdisciplinary papers, major projects, and scientific and technological achievements, and take interdisciplinary participation as the core content of assessment. The interdisciplinary platform can identify active scholars and young talents through the intelligent decision-making function, provide targeted resource support, and form a virtuous circle of ‘encouraging advanced models and driving the overall development’.

3.3 Deepening Industry-University-Research Collaboration to Expand Interdisciplinary Application Scenarios

The value of interdisciplinarity is ultimately reflected in serving social development. Universities need to deepen industry-university-research collaboration, integrate interdisciplinary research with industrial needs, expand application scenarios, and realize the two-way empowerment of academic innovation and industrial development [5]. Firstly, build interdisciplinary research and development platforms with enterprises and research institutes, form interdisciplinary teams of ‘scholars & enterprise engineers’ around key technologies in fields such as intelligent manufacturing, biomedicine, and digital economy, and accelerate the transformation of scientific and technological achievements. Secondly, connect enterprise technical needs through the platform to provide concrete research scenarios for scholars, carry out customized research, and improve the pertinence and effectiveness of interdisciplinary research. Thirdly, strengthen cooperation with domestic and foreign universities and research institutes, broaden the international vision of interdisciplinarity, and promote the integration of academic ideas through academic conferences, joint training, joint research centers, and other means.

4 Effectiveness Closed-loop: Dynamically Optimizing the Interdisciplinary Development Path

4.1 Establishing a Multi-dimensional Effectiveness Evaluation System

Universities need to build a scientific, diversified, and balanced effectiveness evaluation system for interdisciplinarity to provide a basis for optimization and adjustment. The evaluation system covers academic value and social value, short-term effectiveness and long-term development.

Academic value: the number of interdisciplinary directions, the quality of interdisciplinary achievements, the scale of interdisciplinary talent training, etc.

Social value: achievement transformation rate, contribution to industrial services, the number of major projects and awards, etc.

AI technology is fully applied in the evaluation process. Through platform data collection and analysis, combined with expert review, teacher and student evaluation, and enterprise feedback, quantitative evaluation and qualitative analysis are combined to fully reflect the construction effect.

4.2 Dynamic Optimization Based on Evaluation Results

Taking the closed-loop mechanism of ‘evaluation-feedback-optimization’ as the core, adjust the construction strategy and resource allocation according to the evaluation results: increase investment in advantageous fields to consolidate their position; improve mechanisms and optimize services in a targeted manner for shortcomings such as low collaboration efficiency and poor achievement transformation. For example, in view of the high cost of interdisciplinary communication, optimize the academic social function and add collaboration tools; in view of insufficient achievement transformation, strengthen industry-university-research collaboration and broaden transformation channels.

At the same time, rely on the platform to monitor discipline dynamics, research hotspots, and industrial needs in real time, and adjust the interdisciplinary layout with the help of the intelligent decision-making function to realize dynamic adaptation and precise iteration.

4.3 Building a Sustainable Interdisciplinary Ecosystem

The long-term development of interdisciplinarity requires building a sustainable ecosystem coordinated by policies, platforms, mechanisms, and culture:

Cultivate an interdisciplinary academic culture: hold interdisciplinary forums and salons, publicize successful cases, and create an open, inclusive, and collaborative academic atmosphere.

Strengthen talent echelon construction: introduce high-level interdisciplinary talents, carry out interdisciplinary training for in-service talents, and build an innovative echelon with a reasonable structure.

Gather multi-party forces: link the government, enterprises, and research institutes to form a co-construction and sharing interdisciplinary ecosystem.

5 Conclusion

AI technology brings new opportunities for interdisciplinary development in universities, promoting interdisciplinarity from ‘spontaneous exploration’ to ‘targeted implementation’ and from ‘individual collaboration’ to ‘ecological co-construction’. Universities should take national strategies as guidance and AI technology as support, and build a comprehensive interdisciplinary development system through policy guidance, platform foundation, mechanism innovation, and effectiveness closed-loop.

In the future, with the iteration of AI technology and the improvement of university governance capacity, interdisciplinarity will develop in a diversified, precise, and efficient direction. Universities should continue to deepen reform, break barriers, and integrate resources, so that interdisciplinarity will become the core engine for cultivating innovative talents, producing major achievements, and serving national strategies, and contribute to building a powerful country in education and achieving high-level self-reliance in science and technology.

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