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Difficulties and Countermeasures for the Optimization and Transformation of Disciplines and Specialties in Local Application-Oriented Universities

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Abstract: Against the backdrop of high-quality development of higher education and the strategic goal of building a leading country in education, local application-oriented universities, as core vehicles for serving regional economic and social development and cultivating application-oriented talents, find the optimization and transformation of their disciplines and specialties to be an inevitable pathway to align with national educational reform directives and meet the demands of industrial upgrading. In recent years, China has issued a series of intensive policies for the adjustment and optimization of disciplines and specialties, providing clear guidance for the transformation of local universities. However, constrained by multiple factors such as uneven resource endowments, misconceptions in development philosophies, and rigid institutional mechanisms, local application-oriented universities still face numerous practical difficulties in discipline and specialty layout, depth of industry-education integration, faculty development, and dynamic adjustment mechanisms. Based on the orientation of national top-level policies, this paper reviews the historical context of discipline and specialty optimization and transformation in local application-oriented universities, deeply analyzes the core pain points and prominent difficulties in the current reform process, and further proposes targeted and actionable optimization strategies from key dimensions such as positioning calibration, mechanism improvement, resource integration, and evaluation reform. The aim is to help local application-oriented universities break through development bottlenecks, build a discipline and specialty system that meets regional needs and features distinctive characteristics, and comprehensively enhance the quality of talent cultivation and the capacity for social service.

Keywords: Local application-oriented universities; optimization of disciplines and specialties; transformation development; policy guidance; integration of industry and education

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1. Introduction

China's higher education has steadily entered a new stage of universalized and high-quality development. As the mainstay of the higher education system, local application-oriented universities account for more than half of the total number of regular higher education institutions nationwide, shouldering the important missions of supporting regional industrial upgrading, facilitating rural revitalization, and promoting the modernization of grassroots governance. With the accelerated evolution of the new round of technological revolution and industrial transformation, traditional industries are rapidly upgrading and transforming, while strategic emerging industries are booming. Society's demand for application-oriented and technical-skilled talents is becoming increasingly urgent. This, in turn, compels local universities to break the shackles of

traditional discipline and specialty layouts and accelerate the optimization of disciplinary and specialty structures as well as the transformation of educational models. Against this backdrop, the central government has continuously issued a series of top-level design policies, constructing a comprehensive, multi-level, and systematic reform system for disciplinary and specialty adjustment, thereby providing clear policy guidance and action directives for the optimization and transformation of disciplines and specialties in local application-oriented universities. In February 2023, the Ministry of Education and four other departments jointly issued the Reform Plan for the Adjustment and Optimization of Discipline and Specialty Settings in General Higher Education, which clearly sets the goal of adjusting and optimizing approximately 20% of the discipline and specialty distribution points in higher education institutions by 2025. It resolutely calls for the elimination of disciplines and specialties that no longer meet the needs of economic and social development, focuses on the development of the "Four New" disciplines-New Engineering, New Medicine, New Agriculture, and New Liberal Arts-and promotes the deep integration of disciplines and specialties with industrial chains, innovation chains, and talent chains. At the same time, the plan strengthens the coordinating role of provincial education administrative departments, guiding local universities to base themselves on their own educational positioning and pursue distinctive and differentiated development paths. In January 2025, the Central Committee of the Communist Party of China and the State Council issued the Outline of the Plan for Building a Leading Country in Education (2024-2035), which further explicitly proposes promoting university reform and development by classification, precisely defining the educational positioning of applied universities, and establishing a scientific mechanism for classified management and classified evaluation. It calls for providing differentiated support in areas such as funding allocation, enrollment planning, and degree authorization, and encourages local universities to closely align with regional development needs to create clusters of distinctive and advantageous disciplines and specialties. In August 2025, the Central Leading Group on Education Work issued the Action Plan for the Adjustment and Optimization of Discipline and Major Settings in Higher Education (2025-2027). It aims to improve working mechanisms around key aspects such as supply-demand alignment, catalog management, classified development, evaluation and assessment, and incentive guidance. The plan deploys six major actions, including the optimization of existing disciplines and specialties and the incubation of emerging interdisciplinary fields. It requires universities to break down disciplinary barriers based on their own positioning and accelerate the iterative upgrading of teaching content and talent cultivation models.

The intensive rollout of national policies is centrally oriented toward promoting supply-side structural reform in higher education, with a focus on resolving prominent issues such as the disconnect between discipline and specialty offerings and social demands, severe homogenization in university operations, and the mismatch between talent cultivation quality and job market requirements. For local application-oriented universities, the optimization and transformation of disciplines and specialties is no longer a voluntary reform but a mandatory task - one that must be undertaken to comply with national policy requirements, serve local industrial needs, secure their own survival and development, and fulfill their educational mission. Only by closely adhering to national policy orientations, deeply rooting themselves in regional industrial realities, and resolutely breaking free from the constraints of traditional operational thinking can these universities find their proper positioning and highlight their distinct characteristics within the differentiated landscape of higher education, thereby achieving a dual enhancement in educational quality and social service capacity.

2. Practical Dilemmas in the Optimization and Transformation of Disciplines and Specialties in Local Application-Oriented Universities

2.1. Vague Institutional Positioning and Prominent Homogenization of Disciplines and Specialties

Currently, local application-oriented universities generally suffer from deviations in their institutional positioning and a lack of capacity to serve regional economic and social development [1]. Some of them blindly imitate the development models of research-oriented and comprehensive universities, neglecting their own applied nature and core mission of regional service. As a result, they exhibit tendencies such as blindly following trends and pursuing excessive comprehensiveness in the setup of disciplines and specialties [2]. On the one hand, some universities lack in-depth and systematic research on regional industrial structures and talent demands, and fail to adopt forward-looking planning. As a result, they offer a large number of traditional, low-threshold specialties, leading to an excessive concentration of similar major offerings and uncontrolled expansion of enrollment scales [3], ultimately causing a severe imbalance between talent supply and regional industrial needs. On the other hand, some universities neglect their own institutional foundations and resource endowments, blindly chasing emerging popular specialties. They hastily add new specialties without adequate support from qualified faculty, training platforms, or curriculum systems, resulting in superficial major development and an inability to build distinctive strengths [4]. Meanwhile, the repetition rate of disciplines among similar local application-oriented universities within the same province remains persistently high, with a lack of differentiated development paths [5,6]. This not only causes a serious waste of educational resources but also intensifies employment competition among graduates, making it difficult to meet the precise regional industrial demand for applied talents in specialized niche areas.

2.2. Rigid Dynamic Adjustment Mechanism of Academic Disciplines and Specialties: High Resistance to Reform

A sound dynamic adjustment mechanism is the core guarantee for promoting the optimization and transformation of academic disciplines and specialties. However, most local application-oriented universities have yet to establish a scientific and normalized system for academic discipline and major adjustment, and the advancement of reforms remains notably lagging and passive. First, the evaluation system for academic disciplines and specialties is insufficiently developed. The evaluation indicators overemphasize quantitative metrics such as the number of research achievements and institutional scale, while paying inadequate attention to core indicators such as talent cultivation quality, industry alignment, employment quality, and social service effectiveness. This makes it difficult to accurately identify inefficient and outdated specialties [7]. Second, the exit mechanism for specialties is unsound. Constrained by practical factors such as faculty placement, enrollment stability, and institutional reputation, universities often adopt flexible measures like limiting enrollment or postponing rectifications for specialties experiencing shrinking demand and declining quality, making it difficult to achieve complete major closures, suspensions, mergers, or conversions. As a result, the effectiveness of optimizing existing specialties is greatly diminished [8]. Third, the addition of new specialties lacks a collaborative demonstration and validation process with industry and enterprises, and preliminary research is insufficient. This leads to a disconnect between new specialties and industrial development needs, trapping institutions in a vicious cycle of "adding - falling behind - adding again." Furthermore, the adjustment of academic disciplines and specialties lacks overall planning and coordination at the provincial level, and universities have insufficient autonomy in making adjustments, which further constrains the efficiency and effectiveness of reform implementation.

2.3. Insufficient Industry-Education Integration: Disconnection between Academic Disciplines/Specialties and Industrial Demands

Industry-education integration and school-enterprise cooperation are the core pathways for discipline and specialty construction in local application-oriented universities, as well as key measures for improving the quality of talent cultivation. However, current school-enterprise cooperation in local application-oriented universities mostly remains at a superficial level, failing to achieve deep linkage and synchronized

resonance between discipline/specialty construction and industrial development [9,10]. On the one hand, the level of school-enterprise cooperation remains shallow, mostly taking the form of jointly establishing internship bases, offering short-term lectures, and implementing tailored training programs. A long-term mechanism for deep industry and enterprise participation in core areas such as program planning, curriculum design, textbook development, and practical teaching has yet to be established. Enterprises lack sufficient motivation and initiative to engage in education, making it difficult for them to play their main role in cultivating applied talents. On the other hand, discipline and specialty construction is slow to keep pace with industrial changes. The digital and intelligent transformation of traditional programs lags behind, course content remains outdated, teaching methods are conventional, and there is a serious disconnect from cutting-edge industry technologies and job-specific practical needs. As a result, it is difficult to achieve precise alignment between the talent training supply side and the industrial demand side [11,12]. Meanwhile, most universities lack high-level industry-education integration platforms that integrate teaching, practical training, research, and technical services. On-campus training equipment is not updated in a timely manner, and training content does not match job requirements, making it difficult to meet the core demands of cultivating the practical skills of applied talents.

2.4. Imbalanced Faculty Structure and Insufficient Capacity for Engineering Practice Teaching

A high-quality applied teaching faculty is the core support for the optimization and transformation of disciplines and specialties. However, local application-oriented universities currently face prominent and acute problems, including an imbalanced faculty structure and weak practical teaching capacity [13]. In terms of faculty sources, most teachers join the university directly after graduation, lacking frontline work experience and practical operational experience in industries and enterprises. Their teaching tends to emphasize the inculcation of theoretical knowledge, and they have insufficient capacity to conduct hands-on, project-based teaching, making it difficult to effectively cultivate students' practical application abilities. In terms of faculty development, universities do not place enough emphasis on cultivating teachers' practical abilities. The incentive mechanisms for teachers to gain enterprise experience and participate in industry projects are inadequate, and support in terms of time and funding is insufficient, making it difficult for teachers to effectively improve their industry practice abilities [14,15]. In terms of faculty recruitment, constrained by factors such as salary, career development platforms, and geographical conditions, local application-oriented universities struggle to recruit senior technical talents or highly skilled part-time teachers from industries. The number and proportion of "double-qualified" teachers (those with both theoretical and practical expertise) are too low to meet the demands of cultivating applied and innovative talents [16-18]. Furthermore, there is an insufficient reserve of academic discipline leaders and a lack of leading talents who can guide disciplinary development and align with industrial needs, leading to slow progress in interdisciplinary integration and the upgrading and transformation of specialties.

2.5. Limited Educational Resources and Inadequate Support from the Safeguard System

The operating funds of local application-oriented universities mainly rely on local fiscal allocations, resulting in a single funding source and insufficient total funding, which makes it difficult to meet the rigid demands of optimizing and transforming disciplines and specialties [19-21]. Insufficient investment in key areas such as program development, procurement of training equipment, establishment of industry-education platforms, faculty training, and curriculum development leads to a lack of adequate financial support for the construction of emerging and distinctive programs, making it difficult to form core competitiveness. Meanwhile, there is a lack of systematic overall planning for discipline and specialty development. On-campus resources are scattered across various secondary departments, creating obvious resource barriers. The utilization rate of experimental and training equipment, research platforms, and faculty resources is low, making it difficult to form a cohesive force for discipline and specialty development. Furthermore, the

management system in some universities is relatively rigid and heavily bureaucratic. Discipline and specialty development lacks flexible management mechanisms and effective incentive policies. Teachers and administrators have low motivation and initiative to participate in reforms, making it difficult for various optimization measures to take effect, and the outcomes of reforms fall short of expectations [22,23].

2.6. Outdated Evaluation and Assessment System: Guiding Role Deviates from Applied Orientation

Currently, some local application-oriented universities still adhere to the evaluation and assessment systems of traditional academic universities. Whether in the evaluation of disciplines and specialties, the performance assessment of teachers, or the quality evaluation of talent cultivation, excessive emphasis is placed on academic indicators such as research papers, research grants, and academic degrees, while insufficient attention is given to core aspects such as the cultivation of applied and innovative talents, practical teaching, social services, and industry-education integration [24-26]. This misaligned evaluation system leads, on the one hand, to teachers falling into the misconception of "prioritizing research over teaching, and theory over practice," with little incentive to engage in program transformation or practical teaching reform, making it difficult to improve the quality of applied talent cultivation. On the other hand, it causes discipline and specialty construction to deviate from the applied orientation of the institutions, blindly pursuing higher levels of disciplinary research while neglecting the alignment between talent cultivation and regional industrial needs. This further exacerbates the disconnect between disciplines/specialties and industrial development, making it difficult to establish a correct evaluation orientation that supports the transformation and development of disciplines and specialties [27].

3. Implementation Strategies for the Optimization and Transformation of Disciplines and Specialties in Local Application-Oriented Universities

3.1. Calibrate Institutional Positioning and Establish a Distinctive Disciplinary and Specialty Layout

Local application-oriented universities must stay true to their original applied mission, accurately calibrate their institutional positioning, deeply root themselves in the realities of regional economic and social development, reject the pitfalls of homogenized and comprehensive school-running models, and, based on their own institutional foundations and resource endowments, build a disciplinary and specialty system that is "regionally aligned, strategically focused, and distinctly characterized" [28,29]. On the one hand, they should establish a normalized mechanism for regional industrial research, collaborate with local governments, industry associations, and leading enterprises to accurately assess the development trends of regional pillar industries, strategic emerging industries, and future industries. They should systematically map out the list of industrial talent demands, align disciplines and specialties with key regional industrial chains, prioritize the development of urgently needed programs such as intelligent manufacturing, modern agriculture, modern service industries, and the digital economy, accelerate the upgrading and transformation of traditional advantageous programs, and gradually reduce or phase out outdated specialties with shrinking demand and low quality. On the other hand, they should adhere to a differentiated development strategy, actively avoid redundant construction similar to that of peer institutions, concentrate resources on building one or two advantageous disciplinary clusters that fit regional characteristics, leverage leading disciplines to drive the coordinated development of related programs, form school-running features characterized by "uniqueness and excellence," and continuously enhance the core competitiveness of their disciplines and specialties.

3.2. Refine the Dynamic Adjustment Mechanism to Improve the Quality and Efficiency of Disciplines and Specialties

Closely following the national policy requirements for discipline and specialty adjustment, establish a full-chain, normalized dynamic adjustment mechanism encompassing "early warning-rectification-exit-addition" to break the rigid pattern of discipline and specialty development and promote quality and efficiency improvement. First, establish a diversified discipline and specialty evaluation system focused on core indicators such as industry alignment, talent cultivation quality, employment quality, faculty level, school-running conditions, and social service effectiveness. Conduct annual self-assessments and periodic evaluations, issuing timely warnings and setting rectification deadlines for inefficient specialties. Second, improve the specialty exit mechanism by developing scientifically sound plans for faculty redeployment and student transfer, addressing concerns about reform. For specialties that fail to improve after rectification and persistently show low educational quality, resolutely suspend enrollment or discontinue them, achieving precise optimization of existing specialties. Third, optimize the approval process for new specialties, establish a school-enterprise collaborative demonstration mechanism, and strictly control the entry threshold for new specialties to ensure they align with industrial development needs and have adequate school-running conditions. Fourth, proactively align with provincial-level overall planning for disciplines and specialties, actively seek policy support, make full use of institutional autonomy in adjustments, and enhance the flexibility and timeliness with which disciplines and specialties respond to market demands.

3.3. Deepen Industry-Education Integration and Build School-Enterprise Collaborative Education Platforms

Taking deep industry-education integration as the core lever, break down the barriers between universities and industry enterprises, establish a new pattern of school-enterprise collaborative education, and achieve a seamless connection between disciplines/specialties and industrial demands. On the one hand, establish a long-term mechanism for in-depth school-enterprise cooperation, set up a program construction committee with the participation of industry and enterprise experts, who will be fully involved in core areas such as specialty planning, curriculum design, talent cultivation plan formulation, and teaching evaluation, promoting the full integration of real enterprise projects, job standards, and cutting-edge technologies throughout the entire teaching process. On the other hand, accelerate the construction of modern industrial colleges and specialized industrial colleges, integrate resources from both universities and enterprises, jointly build high-level industry-education integration training platforms that integrate teaching, practical training, research, technical services, and teacher training, promptly update on-campus training equipment, and enhance the hardware level of practical teaching. At the same time, deeply advance curriculum system reform, guided by job competency demands, eliminate outdated courses, jointly develop school-enterprise cooperation teaching materials with enterprises, promote project-based, case-based, and hands-on teaching, accelerate the digital and intelligent transformation of traditional programs, and promote the connotative development of disciplines and specialties to keep pace with the pace of industrial iteration.

3.4. Optimize Faculty Structure and Enhance the Competence of Double-Qualified Teachers

Focusing on the demand for cultivating applied and innovative talents, build a team of double-qualified teachers with a solid theoretical foundation and outstanding practical abilities, providing solid talent support for the optimization and transformation of disciplines and specialties [30]. First, improve the faculty recruitment mechanism by breaking away from a single-minded emphasis on academic degrees, relaxing restrictions on recruiting industry professionals, and focusing on bringing in senior engineers, highly skilled talents, and industry-leading professionals from enterprises as full-time or part-time teachers to strengthen the capacity for practical teaching. Second, establish a sound mechanism for enhancing teachers' practical abilities, create a normalized system for teachers to gain experience in enterprises, ensure the time and funding needed for teachers to engage in industry practice, incorporate practical ability and outcomes of

school-enterprise cooperation into the teacher performance evaluation system, and encourage teachers to deeply participate in enterprise technology development and project problem-solving, thereby continuously improving their hands-on teaching capabilities. Third, strengthen the cultivation of discipline leaders by leveraging school-enterprise cooperation platforms, selecting key teachers for advanced study and training at leading industry enterprises and high-level universities, and cultivating a group of leading talents who can guide the development of disciplines and specialties and align with industrial needs. Fourth, establish a two-way exchange mechanism between school and enterprise faculty, invite enterprise experts to teach on campus and guide practical training, and promote on-campus teachers to go deep into enterprises to provide technical services, achieving complementary sharing of faculty resources between university and enterprise.

3.5. Integrate Multiple Educational Resources and Strengthen the Transformation Support System

Expand the channels for obtaining educational funding, integrate high-quality resources both inside and outside the university, and establish a comprehensive, multi-level support system for discipline and specialty development, thereby providing strong support for the optimization and transformation of disciplines and specialties. On the one hand, actively seek special funding support from local fiscal authorities, proactively align with local industrial development projects, broaden funding channels through social training, technical services, school-enterprise cooperation, and other means, and increase investment in distinctive specialties, urgently needed specialties, and industry-education integration platforms. On the other hand, break down the resource barriers between secondary departments within the university, coordinate and integrate resources such as experimental and training equipment, research platforms, and faculty, optimize resource allocation, improve resource utilization efficiency, and avoid redundant construction [31,32]. At the same time, deepen the reform of the university management system, streamline administration and delegate power, grant secondary schools greater autonomy in discipline and specialty development, improve incentive mechanisms, directly link the outcomes of discipline and specialty optimization and transformation with departmental assessments and individual performance, fully stimulate the motivation and initiative of all faculty and students to participate in reforms, and ensure that various optimization measures are effectively implemented.

3.6. Reform the Evaluation and Assessment System to Strengthen the Applied Orientation of University Operation

Abandon the evaluation model of traditional academic universities, and establish a diversified evaluation and assessment system that aligns with the positioning of application-oriented universities, fully leveraging the guiding role of evaluation to steer discipline and specialty development back toward its applied essence. In terms of discipline and specialty evaluation, reduce the weight of indicators such as research papers and the number of research grants, and focus on core aspects including the alignment of programs with industries, the quality of talent cultivation, employment quality, the effectiveness of industry-education integration, and social service capacity [33]. In terms of teacher performance assessment, establish an evaluation system that equally emphasizes teaching, research, practice, and service, incorporating practical teaching, school-enterprise cooperation, textbook development, technical services, and student competition guidance into the assessment scope, and highlight the weight of applied teaching outcomes. In terms of talent cultivation evaluation, establish a quality evaluation mechanism with joint participation from schools and enterprises, taking students' practical skills, professional competencies, job readiness, and enterprise satisfaction as core evaluation indicators, thereby driving reform of the talent cultivation model and ensuring that discipline and specialty development always remains closely aligned with the applied orientation of the institution.

4. Conclusions

The optimization and transformation of disciplines and specialties in local application-oriented universities is a long-term, complex, and systematic endeavor. It is not only an important political task aligned with the national higher education reform and the implementation of the strategy to build a strong education system, but also an inevitable choice for local universities to secure their own survival and development, improve educational quality, and serve regional economic and social development. Currently, under the strong guidance of a series of national policies, the transformation of disciplines and specialties in local application-oriented universities is facing significant development opportunities. However, it is also confronted with multiple practical difficulties, such as vague institutional positioning, rigid systems and mechanisms, weak faculty capacity, and insufficient resource guarantees. Only by staying true to their original applied mission, deeply rooting themselves in regional development realities, adopting a problem-oriented approach to break down reform barriers, using demand as a guide to optimize the layout of disciplines and specialties, leveraging industry-education integration as a lever to improve talent cultivation quality, and relying on institutional and mechanistic reforms as a guarantee to invigorate university operations, can local application-oriented universities steadily advance the optimization and upgrading of their disciplines and specialties, resolve the issue of homogenized school-running, cultivate more high-quality applied talents that closely meet regional industrial needs, and ultimately achieve simultaneous improvements in educational quality and social service capacity, thereby demonstrating the responsibility and commitment of local universities in the high-quality development of higher education.

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