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Research on the Evaluation Mechanism of the Construction of Yunnan's Applied Frontier Universities from the Perspective of Area and Country Studies

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Abstract: This paper investigates the development and evaluation mechanisms of applied frontier universities in Yunnan Province, focusing on the intersection of regional characteristics and national strategic priorities. Taking five representative applied frontier universities as case studies, the research first maps their current status, including institutional capacities, academic offerings, and resource allocation. It then analyzes the key challenges these institutions face, such as limited interdisciplinary integration, insufficient industry collaboration, and constraints in addressing cross-border educational and research demands. Building on this analysis, the study proposes optimization strategies aimed at enhancing institutional evaluation frameworks, aligning university development with regional economic and social needs, and improving cross-border service efficiency. By integrating area studies and country-specific development perspectives, the paper offers a comprehensive framework that can inform policy decisions, guide institutional reforms, and provide practical insights for strengthening the role of applied frontier universities in regional innovation and development.

Keywords: evaluation mechanism; undergraduate universities; Yunnan's applied frontier universities

1. Introduction

Currently, the Ministry of Education of the People's Republic of China is actively encouraging undergraduate institutions to accelerate their transformation toward application-oriented development. Chinese higher education is experiencing profound structural changes, with growing societal and policy attention focused on the reform and modernization of universities. In Yunnan Province, five public undergraduate institutions—Honghe University, Baoshan University, Puer University, Wenshan University, and West Yunnan University—serve as key educational entities in the border regions. These universities occupy strategic locations along China's "Belt and Road Initiative," positioning them as critical nodes for regional development, cross-border cooperation, and international exchange [1].

This study focuses on these public frontier universities in Yunnan and proposes a systematic evaluation framework grounded in Area and Country Studies [2]. The framework revolves around three core dimensions: applicability, emphasizing the alignment of academic programs and research with local economic and social needs; locality, highlighting the universities' integration with regional culture, resources, and community development; and openness, reflecting their capacity for cross-border collaboration, international engagement, and adaptive innovation. Using these dimensions, the study analyzes the current status of frontier universities, identifies key challenges in their development—such as limited interdisciplinary integration, insufficient

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industry collaboration, and resource constraints-and explores region-specific strategies to enhance their institutional capacity and societal impact [3].

The concept of applied frontier universities is both innovative and exploratory. Traditionally, the term "frontier" referred to border areas or city gates, but its meaning has evolved with global multipolarization and cultural diversification to signify regions of strategic and developmental importance. Frontier universities, therefore, are defined as higher education institutions situated in border prefectures, possessing unique characteristics that extend beyond conventional universities. These include a heightened capacity for international exchange, responsiveness to cross-border needs, and strategic regional engagement. Positioned at critical nodes of national development initiatives, applied frontier universities naturally emerge as institutions tasked not only with delivering education but also with driving regional innovation, promoting socio-economic development, and strengthening cross-border connectivity. Their construction and optimization are thus both a strategic necessity and an innovative model for higher education reform in China's frontier regions.

2. Practical needs for the construction of Yunnan's applied frontier universities

2.1. Needs for the talent adaptation

Yunnan Province, as a strategic gateway connecting China with South and Southeast Asia, plays a pivotal role in national and regional development strategies. The successful implementation of these strategies requires not only policy support but also a diverse and highly skilled workforce capable of addressing complex cross-border challenges. These talents must possess deep knowledge of regional socio-economic conditions, mastery of international norms and regulations, professional expertise in key industries, and strong cross-cultural communication and problem-solving skills [4]. Applied frontier universities in Yunnan are uniquely positioned to meet these demands by cultivating graduates who integrate language proficiency, industry-specific competencies, and practical application skills into a cohesive framework. Such a talent cultivation system ensures that students are prepared to engage effectively with both domestic and international stakeholders, contribute to regional development initiatives, and support China's broader strategic goals. Additionally, the universities can serve as incubators for interdisciplinary knowledge, fostering collaborations across sectors and equipping graduates to respond dynamically to evolving economic and cultural contexts [5].

2.2. Needs for technical innovation in Yunnan's industrial optimization

Yunnan is currently undergoing a critical phase of industrial restructuring and upgrading, with particular emphasis on agriculture, health and tourism, and the digital economy. These industries require not only cutting-edge technologies but also a new generation of application-oriented professionals capable of driving innovation. For instance, traditional agricultural sectors such as coffee and tea are transitioning from basic processing to high-value deep processing while targeting international markets, particularly in Southeast Asia. This transformation demands talents who are proficient in green cultivation techniques, advanced processing technologies, product quality management, consumer market analysis, and cross-border e-commerce operations. Applied frontier universities are expected to bridge the gap between academia and industry by developing interdisciplinary programs that combine technical knowledge, entrepreneurial skills, and international market literacy. By doing so, these universities can foster innovation ecosystems that support industrial transformation, enhance regional competitiveness, and enable sustainable economic growth that aligns with both domestic needs and international opportunities [6].

2.3. Needs for regional cultural exchange and people-to-people connectivity

Yunnan shares geographical proximity, historical connections, and cultural similarities with neighboring Southeast Asian countries, offering a natural advantage for promoting cross-border cultural exchanges. However, current efforts are often limited in scope, focusing primarily on festivals, folk performances, or short-term activities, and lack mechanisms for sustained cultural interaction and mutual understanding. Moreover, there is a significant shortage of professional talents who can serve as effective mediators of cultural exchange, bridging gaps in language, customs, and societal norms. Applied frontier universities can play a central role in addressing these challenges by establishing structured academic and cultural exchange platforms, organizing joint research and training programs, and facilitating long-term student mobility initiatives. By fostering deeper intercultural understanding and knowledge sharing, these institutions not only enhance regional cohesion but also contribute to stable diplomatic and economic relationships. Furthermore, cultivating cultural exchange specialists strengthens Yunnan's soft power in the region, providing human capital capable of promoting mutual learning, trust-building, and collaboration across borders [7].

2.4. Needs for coordinated development of Yunnan's higher education

The combined enrollment of the five frontier universities in Yunnan exceeds 70,000 undergraduates, representing a substantial portion of the province's higher education population. This positions these institutions as key actors in regional educational development. Nonetheless, higher education in Yunnan faces persistent structural challenges, including regional disparities, uneven quality distribution, and a predominance of traditional, theory-focused institutions. High-quality educational resources are concentrated in central urban areas such as Kunming, whereas border regions contend with limited institutional capacity and lower educational quality. Consequently, the demand for graduates with practical skills, applied knowledge, and regionally informed perspectives far exceeds the supply. The development of applied frontier universities addresses these gaps by aligning educational objectives with regional strategic needs, promoting the cultivation of applied talents, and enhancing the overall coordination and equity of higher education across the province. In addition, these universities can act as hubs for research and innovation, linking local communities, industries, and governments, and serving as catalysts for regional development, cross-border cooperation, and sustainable socio-economic growth. By integrating localized curriculum design, interdisciplinary learning, and applied research, frontier universities can create an ecosystem that simultaneously meets educational, industrial, and cultural needs, establishing a model for balanced and forward-looking higher education development in border regions.

3. Construction of an evaluation mechanism for the development of Yunnan's applied frontier universities

3.1. Analysis of the key elements of the evaluation mechanism

As an emerging model within higher education, applied frontier universities are still in the exploratory stage of development, and their evaluation mechanisms remain under construction. Establishing a rigorous and scientific evaluation system is essential not only for ensuring alignment with the fundamental principles and laws governing higher education but also for capturing the unique characteristics that define these institutions. Such a mechanism must reflect their application-oriented mission, emphasize responsiveness to regional economic and social needs, and recognize the strategic significance of their border locations. Beyond conventional metrics of academic performance, research output, and faculty credentials, the evaluation framework should incorporate indicators of practical impact, cross-border engagement, and cultural integration. It should assess how effectively universities cultivate interdisciplinary talents,

drive local industry innovation, facilitate international cooperation, and promote social and cultural development within border regions. By doing so, the evaluation system can provide both a diagnostic and a guiding function, helping frontier universities optimize their resource allocation, enhance institutional capabilities, and advance their contribution to regional development and national strategic initiatives. Moreover, a well-designed evaluation mechanism can foster continuous improvement, encourage adaptive innovation, and establish applied frontier universities as sustainable models for higher education that balance academic rigor with social relevance and regional responsibility (As shown in Table 1).

Table 1. Key Elements of the Evaluation Mechanism.

Key Elements	Core Positioning	Specific Indicators
Applicability (Functional Element)	Cultivating high-quality application-oriented and technical skilled talents serving local areas and industries.	Construction of application-oriented programs Talent cultivation models Construction of practical teaching and resources
Locality (Regional Element)	Based on local regional advantages, proactively integrating into local development.	Integration of industry and education Construction of disciplines and programs with local characteristics Local talent supply Local scientific research services Local collaborative participation
Openness (Characteristic Element)	Relying on the geographical advantages of border gateways, promoting international educational exchanges and cooperation, and cultivating international talents.	Cultivation of international talents International educational cooperation International faculty and research exchanges International service capabilities

The core of the evaluation mechanism for the construction of Yunnan's applied border gateway universities should center on three interrelated and mutually reinforcing indicators: applicability, locality, and openness. Table 1 presents the key elements of this evaluation framework as explored in this study. Applicability refers to the universities' capacity to cultivate high-quality, application-oriented, and technically skilled talents who can directly serve local industries, address regional development needs, and respond effectively to practical challenges. Locality emphasizes leveraging the universities' geographical positioning and resource endowments, encouraging institutions to actively integrate into local development processes, support regional economic growth, and contribute knowledge and expertise aligned with the socio-economic priorities of surrounding communities. Openness highlights the role of universities in utilizing their border locations to facilitate international educational exchanges, cross-border cooperation, and the development of globally competent talents. This dimension fosters academic collaboration, cultural interaction, and the ability to operate within a broader international context. Collectively, these three dimensions form a comprehensive evaluation framework that balances academic rigor with practical relevance, regional engagement, and global connectivity, providing a structured basis for assessing institutional performance, guiding strategic development, and enhancing the overall impact of applied frontier universities.

3.2. Analysis of the current status of construction of Yunnan's applied frontier universities

As shown in Table 2, the five frontier universities in Yunnan each exhibit distinctive characteristics in terms of geographical location, founding year, neighboring countries,

and institutional orientation. These similarities and differences not only shape the specific construction paths of each university with respect to applicability, locality, and openness, but also provide a basis for identifying both shared challenges and unique institutional issues. The diversity in location and historical development influences how universities integrate with local industries, engage in cross-border cooperation, and design curricula tailored to regional needs. Meanwhile, variations in institutional orientation and resource endowments affect the scope and depth of talent cultivation, research initiatives, and international collaborations. By systematically analyzing these factors, it becomes possible to develop nuanced strategies that enhance the practical impact of each university, strengthen their role in regional development, and inform a more generalized understanding of the construction and optimization of applied frontier universities in border areas.

Table 2. Basic Information of Five Border Gateway Universities in Yunnan Province.

University Name	Location	Founding Year	Bordering Country/Countries	School-running Orientation
Honghe University	Honghe city	2003	Vietnam	Regional, international local application-oriented university
Baoshan University	Baoshan city	2009	Myanmar	Local, application-oriented border gateway university
Pu'er University	Puer city	2012	Myanmar, Laos, Vietnam	Local, regional, application-oriented, international university
Wenshan University	Wenshan city	2009	Vietnam	Local, ethnic, international, application-oriented university
West Yunnan University	Lincang city	2015	Myanmar	Local, application-oriented, open, international university

Significant progress has been made in the construction of application-oriented programs at Yunnan's frontier universities; however, their overall institutional strength and influence remain limited. Honghe University, for example, has continuously optimized its program offerings and established three international laboratories in collaboration with Vietnamese universities, focusing on areas such as characteristic agriculture, biomedicine, and new material industries. West Yunnan University has introduced new majors, including Unmanned Aerial Vehicle System Engineering and New Media Art, to meet emerging regional and global demands. Wenshan University has incorporated applied practices, such as the cultivation and utilization of pseudo-ginseng, into its Plant Science and Technology curriculum. Despite these advances, these universities still lag behind first-class domestic institutions in terms of program influence, depth of disciplinary construction, and the integration of industry and academia.

In the realm of scientific research and community service, Pu'er University exemplifies the frontier universities' efforts. It has established the Laos Research Center and the Pu'er Institute of Green Economic Development, focusing on local characteristic agricultural products such as avocado and potato. The conversion rate of related research outcomes into patents has reached approximately 16%, reflecting a growing capacity for applied innovation. Regarding talent supply, the employment rate of graduates who remain in Yunnan has consistently exceeded 80%, with Pu'er University graduates demonstrating an average local employment rate of 83.21% over the past three years and a retention rate in Pu'er itself of about 41.39%. Despite these achievements, frontier

universities' contributions remain concentrated in specific industries, and the broader societal impact and transformative capacity of their services are still limited.

All five universities pursue an open education strategy to varying degrees. Honghe University was the first institution in Yunnan to offer overseas programs in Vietnam, maintaining the broadest range of partnerships and hosting the largest number of Vietnamese students. Pu'er University has implemented a targeted strategy for the Lancang-Mekong Basin, enrolling 450 international students over the past five years—among them a significant proportion from Laos—and sending over 1,100 students abroad for exchanges. It has also conducted five joint student training programs with South and Southeast Asian universities and hosted four Lancang-Mekong Educational Cooperation Forums. Similarly, Baoshan University, Wenshan University, and West Yunnan University have made notable progress in international cooperation, foreign student recruitment, and teacher-student exchanges. Nonetheless, much of this cooperation remains confined to traditional fields such as language, culture, and conventional industries, with a lack of internationally influential research initiatives. Additionally, the forms of cooperation tend to be simple, focusing primarily on short-term exchanges and student mobility, resulting in limited impact beyond partner institutions or specific regions and low recognition within the broader international higher education community.

4. Countermeasures for the construction of Yunnan's applied frontier universities from the perspective of area and country studies

4.1. Align with Regional Industrial Needs and Strengthen Institutional Support

As pivotal institutions serving regional economic and social development, the construction of frontier universities in Yunnan must be closely aligned with the strategic objectives of initiatives such as the Bangladesh-China-India-Myanmar Economic Corridor and the Greater Mekong Subregion cooperation. Strengthening support for these universities is critical for enhancing their development, regional influence, and cross-border functionality. Firstly, distinct development orientations should be assigned to each institution to prevent duplication and homogeneous development. For example, Honghe University could prioritize collaboration with Vietnam, while Pu'er University focuses on Laos and the Lancang-Mekong Basin. Wenshan University might emphasize biomedical and health sectors along the Vietnam border, whereas West Yunnan University and Baoshan University could concentrate on partnerships with Myanmar. Such targeted orientations ensure that each university leverages its geographical advantages and specialization, contributing effectively to regional strategic needs.

Additionally, these universities should collaboratively establish an "Alliance for the Construction and Development of Yunnan's Applied Frontier Universities," creating a platform to secure national-level funding and policy support. This alliance would facilitate shared access to high-quality international educational resources, allowing for faculty exchanges, co-developed curricula, joint research initiatives, and the pooling of academic infrastructure. By coordinating development strategies and sharing resources, the alliance can enhance institutional efficiency, strengthen cross-border collaboration, and accelerate the overall quality and impact of frontier universities in Yunnan.

4.2. Innovate Distinctive Talent Cultivation Models and Develop Regional Cross-Border Program Clusters

In talent development, frontier universities should adopt a cross-border integration and practice-oriented approach. Joint training programs with universities in neighboring countries such as Laos, Vietnam, and Myanmar can provide students with immersive international experience, cross-cultural communication skills, and applied professional knowledge. Furthermore, the establishment of regional cross-border distinctive program clusters can consolidate professional strengths across institutions, aligning educational

offerings with the economic development needs of the Bangladesh-China-India-Myanmar Economic Corridor and the Greater Mekong Subregion.

For instance, a program cluster focused on "Plateau Characteristic Agriculture and Green Economy," led by Pu'er University, Honghe University, and Wenshan University, could integrate agricultural technology research with partner universities in neighboring countries. This initiative would cultivate talents proficient in green agricultural practices, innovative agribusiness solutions, and cross-border market adaptation, directly supporting sustainable development goals in the Lancang-Mekong Basin. By integrating applied research, practical training, and international collaboration, these clusters can become platforms for fostering specialized talents capable of addressing complex regional challenges and promoting local economic transformation.

4.3. Expand International Cooperation and Build the Cooperative Brand Influence of Yunnan's Frontier Universities

To elevate the international profile and influence of frontier universities, Yunnan's institutions should strategically expand the dimensions of international cooperation, focusing on three key areas: cooperation fields, cooperation models, and brand communication. By broadening cooperation fields, universities can move beyond traditional language and cultural exchanges to engage in industry-specific collaboration, applied research, and joint innovation projects with partner institutions in neighboring countries. Industrial collaboration should target the development needs of cross-border distinctive sectors, promoting university-industry integration and establishing mechanisms for research, application, and commercial transfer. Research and innovation cooperation should address common regional challenges, facilitate high-level joint research projects, and result in co-published academic outputs that enhance the academic influence and discourse power of Yunnan's frontier universities in the field of area and country studies.

Innovative cooperation models are also essential. By leveraging the unique strengths of each institution, universities can develop bilateral and multilateral educational partnerships that ensure sustainability, continuity, and tangible outcomes. Such models should include long-term faculty exchanges, joint laboratories, collaborative curriculum design, and shared technology platforms to maximize the impact of international cooperation.

Finally, strengthening brand communication is critical to establishing a recognizable international identity. Each university should actively promote its achievements and collaborative projects through multiple channels, including academic publications, international conferences, and digital platforms. By showcasing successes in talent cultivation, research, and cross-border cooperation, these universities can gradually build a cooperative brand recognized both regionally and internationally, attracting high-quality partners, students, and resources while reinforcing their strategic role in regional development and cross-border engagement.

5. Conclusion

An evaluation mechanism specifically designed for the development characteristics of frontier universities can provide an objective and systematic assessment of each institution's effectiveness in program construction, cross-border engagement, and contribution to local development. By identifying both strengths and areas for improvement, such a mechanism enables universities to optimize their resource allocation, enhance interdisciplinary integration, and strengthen the practical impact of their educational and research activities. Looking ahead, it is essential for these institutions to continuously align their development strategies with evolving regional industrial dynamics, emerging economic opportunities, and the changing landscape of international cooperation. Refining and expanding the evaluation indicator system will allow for more

precise measurement of performance across multiple dimensions, including talent cultivation, technological innovation, cross-border collaboration, and regional empowerment. Ultimately, a robust and adaptive evaluation framework can drive Yunnan's applied frontier universities to enhance their strategic role in promoting regional development, fostering sustainable economic growth, and contributing to China's broader objectives of cross-border integration, international cooperation, and socio-economic modernization. By doing so, these universities will not only consolidate their position as key educational and research hubs in border regions but also become exemplary models for the development of application-oriented higher education institutions in frontier areas.

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