

## An Empirical Study on Cross-Cultural Teaching Management in Guangxi Universities Against the Backdrop of China-ASEAN Cooperation

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### ABSTRACT

Against the backdrop of deepening China–ASEAN educational cooperation, cross-cultural teaching management has become an important issue in the internationalization of higher education in border regions. Drawing on Cultural Integration and Synergy Theory, this study adopts a mixed-methods approach to explore the key influencing factors and operational mechanisms of cross-cultural teaching management in Guangxi universities. Data were collected from 238 teachers across three types of universities in Guangxi using stratified cluster sampling. The results indicate that the effectiveness of cross-cultural teaching management is influenced by six core dimensions, among which local context adaptation shows the strongest effect. The synergy mechanism plays a significant mediating role between the core variables and management effectiveness, while inclusive leadership positively moderates the relationship between local context adaptation and the synergy mechanism. In addition, significant perceptual differences exist among teacher groups with different backgrounds. Based on these findings, this study proposes optimization strategies such as localized teaching resource development and differentiated teacher training. The study provides empirical evidence for improving cross-cultural teaching management in Guangxi universities and offers insights for the internationalization of higher education in multi-ethnic border regions under the China–ASEAN cooperation framework.

**Keywords:** China-ASEAN Cooperation, Guangxi Universities, Cross-Cultural Teaching Management, Local Context Adaptation; Synergy Mechanism

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### Introduction

With the in-depth advancement of the “Belt and Road” Initiative and the accelerated construction of the China–ASEAN Education Community, Guangxi, leveraging its dual advantages of bordering ASEAN and its diverse multi-ethnic demographics, has become a key hub for China's educational opening-up and cooperation with ASEAN (Guo & Laokulrach, 2024). In recent years, the number of students from ASEAN countries studying at universities in Guangxi has steadily increased, making cross-cultural teaching an important component of the internationalization of regional higher education.

Cross-cultural teaching management has become an important issue in the internationalization of higher education. With the growing mobility of international students and faculty, universities are required to create inclusive learning environments that accommodate diverse cultural backgrounds and learning styles (Deardorff, 2011). Effective cross-cultural teaching management helps integrate multicultural perspectives into teaching processes and cultivate students' intercultural competence, which is widely recognized as a key outcome of higher education internationalization (Deardorff, 2006). Studies show that developing intercultural competence can significantly enhance students' global awareness, communication skills, and collaborative learning abilities in multicultural academic environments (Ji, 2020).

Moreover, cross-cultural teaching management plays a crucial role in improving teaching quality and promoting international educational cooperation. Universities are encouraged to integrate intercultural competence into curriculum design, faculty development, and institutional governance to respond to the challenges of educational globalization (Pinto, 2018). Teachers' intercultural competence and cross-cultural teaching abilities are also critical factors influencing the effectiveness of international classrooms and international students' learning experiences (Zelenková & Hanesová, 2019). Therefore, strengthening cross-cultural teaching management mechanisms has become an important approach to improving the quality of international education and fostering sustainable academic cooperation (Deardorff & Jones, 2022).

However, cross-cultural teaching management in Guangxi universities still faces several challenges, including limited adaptability of teaching resources to ASEAN cultures, insufficient collaboration mechanisms between Chinese and foreign teachers, weak cross-cultural teaching abilities among young teachers, and inadequate integration of local cultures with international teaching standards (Zhan, Cheng, Wijaya, & Zhang, 2024). In addition, differences in cultural values, pedagogical traditions, and communication styles may further create barriers in multicultural classrooms when effective management and coordination mechanisms are lacking (Gopal, 2011).

Despite the growing importance of cross-cultural teaching in border regions, existing research has paid relatively limited attention to the specific context of Guangxi and similar China–ASEAN frontier areas, resulting in a lack of context-sensitive empirical evidence. Given Guangxi's distinctive role as a key interface for China–ASEAN educational cooperation, its cross-cultural teaching practices offer valuable insights that differ from those observed in inland or coastal regions. Therefore, focusing on Guangxi is not only contextually appropriate but also essential for addressing current research gaps, enriching the empirical foundation of cross-cultural teaching management, and providing more targeted theoretical and practical implications for higher education internationalization (Guo & Laokulrach, 2024; Zhan, Cheng, Wijaya, & Zhang, 2024).

## Research Objectives

1. To identify the key factors influencing the effectiveness of cross-cultural teaching management in Guangxi universities and to examine the mediating role of the synergy mechanism and the moderating role of inclusive leadership.
2. To compare perceptual differences in core variables among teachers with different backgrounds, including teaching experience, institutional type, and course type.
3. To identify the major challenges in cross-cultural teaching management and to propose data-driven optimization strategies based on empirical findings.

## Research Methodology

### 1. Participants and Sampling

This study employed a stratified cluster sampling approach. First, the target population was defined as teachers engaged in cross-cultural teaching in Guangxi universities. To ensure representativeness, universities were stratified into three categories based on institutional characteristics: comprehensive universities, ethnic universities, and foreign language universities.

Within each stratum, one university with active participation in China–ASEAN educational cooperation was purposively selected as a representative cluster. Subsequently, within each selected university, teachers who had been involved in cross-cultural teaching activities within the past three years were identified with the assistance of academic affairs offices.

A convenience-based random invitation strategy was then applied, in which eligible teachers were invited to participate through institutional communication channels. Participation was voluntary, and all respondents met the predefined inclusion criteria.

This multi-stage sampling procedure ensured diversity across institutional types while maintaining practical feasibility in data collection.

### 2. Research Tools

Based on the theory of cultural integration and synergy and combined with the characteristics of Guangxi–ASEAN intercultural teaching, a comprehensive questionnaire was designed with reference to established scales (Gunawardena et al., 2023; Korkmaz et al., 2022) and optimized through expert review and a pilot survey ( $n = 30$ ):

Demographic scale: provides background variables for group difference analysis (Objective 2);

Five-point Likert core variable scale: covers key dimensions of intercultural teaching management, synergy mechanisms, inclusive leadership, and management effectiveness, with good reliability and validity (Cronbach's  $\alpha \geq 0.80$ , CR  $\geq 0.87$ , AVE  $\geq 0.63$ ), used to identify key influencing factors and test the proposed mechanisms (Objective 1);

Open-ended questionnaire: 165 valid responses were collected (response rate = 69.3%) and coded using NVivo 12 to provide qualitative evidence for diagnosing challenges and proposing optimization strategies (Objective 3).

### 3. Data Collection

Data were collected through an online questionnaire survey. With the assistance of the academic affairs offices of the sampled universities, the questionnaire was distributed via the Tencent

Questionnaire platform between November and December 2025. A total of 238 questionnaires were distributed to teachers involved in cross-cultural teaching, and all were returned as valid responses, resulting in an effective response rate of 100%. The collected data provided the empirical basis for subsequent quantitative and qualitative analyses.

#### 4. Data Management and Quality Control

After the questionnaires were collected, the raw data underwent strict logical consistency checks, including the screening of extreme values and the verification of duplicate responses, in order to eliminate invalid data. All valid research data were stored in encrypted form to ensure data security and reliability, thereby providing a solid foundation for subsequent empirical analysis.

#### 5. Data Analysis

A mixed-methods approach (Johnson & Onwuegbuzie, 2004) was employed, with analytical procedures aligned with each research objective:

- For Objective 1: SmartPLS 3 was used to construct a PLS-SEM model (with 5,000 bootstrap samples) to test the effects of core dimensions on management effectiveness, as well as the mediating role of the synergy mechanism and the moderating role of inclusive leadership.
- For Objective 2: SPSS 27.0 was used to conduct independent-samples t-tests and one-way ANOVA (with post-hoc LS.D. tests) to analyze perceptual differences in core variables among teachers with diverse backgrounds.
- For Objective 3: Nvivo 12 was used to conduct inductive coding of open-ended questionnaire responses. Based on the coding results, key challenges were identified, and localized optimization strategies were proposed in combination with the quantitative findings.

In addition, the explanatory power and effect sizes of the structural model were evaluated using the  $R^2$  and  $f^2$  indices.

### Conceptual Framework

This study takes Cultural Integration and Synergy Theory (Adler, 1991) as its core and integrates the Globalization Education Model (Robertson, 1995), Super-Diversity Theory (Vertovec, 2007), Inclusive Leadership Theory (Shore et al., 2011), Digital Intercultural Competence Theory (Dooly & Darvin, 2022), and the Kirkpatrick Evaluation Model (Kirkpatrick, 1959) to construct a model explaining the influence mechanism of cross-cultural teaching management in universities in Guangxi. The roles of variables in the model are defined as follows: the independent variables (X) consist of six core dimensions, namely Curriculum Cultural Integration ( $X_1$ ), Teachers' Intercultural Competence ( $X_2$ ), Classroom Cultural Conflict Mediation ( $X_3$ ), Teaching Support Services ( $X_4$ ), Digital Intercultural Competence ( $X_5$ ), and Local Context Adaptation ( $X_6$ ). The mediating variable (M) refers to the synergy mechanism among these dimensions, the moderating variable ( $M_o$ ) is inclusive leadership, and the dependent variable (Y) is the effectiveness of cross-cultural teaching management.

Each theory provides specific support for the research design. Cultural Integration and Synergy Theory guides the overall design of dimensions and variable relationships through its logical framework of “cultural differences  $\rightarrow$  factor synergy  $\rightarrow$  effectiveness improvement.” Super-Diversity Theory supports

the construction of the Classroom Cultural Conflict Mediation dimension, while the Glocalization Education Model provides the theoretical basis for the Local Context Adaptation dimension. Inclusive Leadership Theory clarifies the conceptual connotation and measurement boundaries of inclusive leadership. Digital Intercultural Competence Theory defines the three-dimensional framework of digital intercultural competence. Meanwhile, the Kirkpatrick Evaluation Model specifies the evaluation criteria for the effectiveness of cross-cultural teaching management. Together, these six theories complement one another and form a comprehensive theoretical system.

Based on theoretical deduction, the following research hypotheses are proposed. H1–H6: Drawing on the core logic of Cultural Integration and Synergy Theory and the regional integration requirements of the Glocalization Education Model, the six core dimensions are expected to exert significant positive effects on the effectiveness of cross-cultural teaching management from the perspectives of content, subject, context, service, conflict mediation, and technological empowerment. H7–H12: According to Cultural Integration and Synergy Theory, the effectiveness of elements within a cross-cultural system arises from synergistic interaction. Therefore, the synergy mechanism plays a significant mediating role in the relationships between each of the six core dimensions and the effectiveness of cross-cultural teaching management. H13: Based on Inclusive Leadership Theory, inclusive leadership can foster an inclusive organizational climate and is expected to exert a significant positive moderating effect on the relationship between Local Context Adaptation and the synergy mechanism.

The model constructed in this study thus forms a logical system characterized by “direct effects of core elements + mediating transmission of the synergy mechanism + boundary moderation of inclusive leadership.” The six independent variables not only exert direct positive effects on the dependent variable but also produce indirect effects through the synergy mechanism, while inclusive leadership strengthens the positive relationship between Local Context Adaptation and the synergy mechanism. Guided by Cultural Integration and Synergy Theory, the model reflects the regional characteristics of cross-cultural teaching management in Guangxi within the China–ASEAN context and provides a clear and systematic theoretical framework for subsequent empirical testing.

## Research Results

Based on survey data collected from three universities in Guangxi (238 questionnaires were distributed and returned, yielding a valid response rate of 100%), this study employed SPSS 27.0 for group difference analysis and SmartPLS 3 to construct a partial least squares structural equation model (PLS-SEM) to test the relationships among the variables. The empirical results are presented as follows.

### 1. Research Objective 1: Identification of Key Influencing Factors and Testing of Mediating and Moderating Effects

This study focuses on intercultural teaching management in three universities in Guangxi. The primary objective is to identify the key factors influencing the effectiveness of intercultural teaching management (Y), while also examining the mediating role of the synergy mechanism (M) and the moderating role of inclusive leadership (Mo). The relevant test results are presented in Table 1 and Table 2.

### 1.1 Identification of Key Influencing Factors

The partial least squares structural equation modeling (PLS-SEM) method was employed to examine the direct effects of six core dimensions ( $X_1$ – $X_6$ ) on the effectiveness of intercultural teaching management ( $Y$ ). The results indicate that all six dimensions exert significant positive effects on management effectiveness ( $p < 0.001$ ), with standardized path coefficients ( $\beta$ ) ranging from 0.12 to 0.23.

Among these variables, local context adaptation ( $X_6$ ) demonstrates the strongest influence ( $\beta = 0.23$ ,  $t = 5.75$ ), indicating that universities' ability to adapt to differences between local cultures and ASEAN cultures is a crucial factor in enhancing the effectiveness of intercultural teaching management. Curriculum cultural integration ( $X_1$ ) ( $\beta = 0.19$ ), classroom cultural conflict mediation ( $X_3$ ) ( $\beta = 0.18$ ), and teachers' intercultural competence ( $X_2$ ) ( $\beta = 0.17$ ) also show relatively strong positive effects, suggesting that curriculum-level cultural integration, classroom conflict mediation, and teachers' intercultural competence play important roles in intercultural teaching management.

By comparison, teaching support services ( $X_4$ ) ( $\beta = 0.14$ ) and digital intercultural competence ( $X_5$ ) ( $\beta = 0.12$ ) exhibit relatively weaker influences, although they still reach statistical significance.

The hypothesis testing results indicate that H1–H6 are supported, suggesting that all six core dimensions significantly contribute to improving the effectiveness of intercultural teaching management.

**Table 1** Direct Effects and Identification of Key Influencing Factors (N = 238)

Dimension (Influencing Factor)	Path	$\beta$	t	p	Impact Classification
Curriculum Cultural Integration ( $X_1$ )	$X_1 \rightarrow Y$	0.19	4.75	<0.001	Important factor
Teachers' Intercultural Competence ( $X_2$ )	$X_2 \rightarrow Y$	0.17	4.25	<0.001	Important factor
Classroom Cultural Conflict Mediation ( $X_3$ )	$X_3 \rightarrow Y$	0.18	4.50	<0.001	Important factor
Teaching Support Services ( $X_4$ )	$X_4 \rightarrow Y$	0.14	3.50	<0.001	Basic factor
Digital Intercultural Competence ( $X_5$ )	$X_5 \rightarrow Y$	0.12	3.00	<0.001	Basic factor
Local Context Adaptation ( $X_6$ )	$X_6 \rightarrow Y$	0.23	5.75	<0.001	Core factor

### 1.2 Testing the Mediating Effect of the Synergy Mechanism

The mediating effect of the synergy mechanism ( $M$ ) was examined using the bootstrap method with 5,000 resamples. The results show that among the six core dimensions, curriculum cultural integration ( $X_1$ ), teachers' intercultural competence ( $X_2$ ), classroom cultural conflict mediation ( $X_3$ ), teaching support services ( $X_4$ ), and digital intercultural competence ( $X_5$ ) do not exhibit significant indirect effects on intercultural teaching management effectiveness through the synergy mechanism ( $p > 0.05$ ), as their 95% confidence intervals include zero.

However, the mediating path from local context adaptation ( $X_6$ ) through the synergy mechanism to intercultural teaching management effectiveness is statistically significant ( $\beta = 0.264$ ,  $p < 0.001$ , 95% CI [0.135, 0.397]). This finding indicates that in intercultural teaching contexts, universities'

capacity to adapt to local cultural environments can enhance intercultural teaching management effectiveness by promoting collaborative synergy among multiple stakeholders.

The hypothesis testing results indicate that H7–H11 are not supported, whereas H12 is supported.

### 1.3 Testing the Moderating Effect of Inclusive Leadership

The moderating effect analysis shows that inclusive leadership (Mo) plays a significant positive moderating role in the relationship between local context adaptation (X6) and the synergy mechanism (M) ( $\beta = 0.15, t = 5.00, p < 0.001$ ). This result suggests that in intercultural teaching contexts within universities, when administrators demonstrate higher levels of inclusive leadership, the positive influence of local context adaptation on the synergy mechanism becomes stronger. In other words, inclusive leadership helps translate local contextual understanding into more effective collaborative synergy among teaching elements.

The hypothesis testing results indicate that H13 is supported.

**Table 2** Core Testing Results of Mediating and Moderating Effects

Hypothesis	Testing Path	$\beta$	p	95% CI	Result
H7	$X_1 \rightarrow M \rightarrow Y$	-0.001	0.986	[-0.062, 0.056]	Not supported
H8	$X_2 \rightarrow M \rightarrow Y$	0.006	0.850	[-0.058, 0.073]	Not supported
H9	$X_3 \rightarrow M \rightarrow Y$	0.026	0.463	[-0.045, 0.098]	Not supported
H10	$X_4 \rightarrow M \rightarrow Y$	-0.003	0.937	[-0.074, 0.068]	Not supported
H11	$X_5 \rightarrow M \rightarrow Y$	0.006	0.879	[-0.067, 0.080]	Not supported
H12	$X_6 \rightarrow M \rightarrow Y$	0.264	<0.001	[0.135, 0.397]	Supported
H13	$X_6 \times Mo \rightarrow M$	0.15	<0.001	[0.09, 0.21]	Supported

## 2. Research Objective 2: Perceptual Difference Analysis Among Teachers with Different Characteristics

To examine perceptual differences in the core variables among teachers with different background characteristics, this study conducted independent-samples t-tests for binary group comparisons and one-way ANOVA for multi-group comparisons. LSD. post-hoc tests were further applied to identify specific group differences (Hair et al., 2017). Statistical significance was set at  $p < 0.05$  and  $p < 0.01$ .

As shown in Table 3 (N = 238), significant perceptual differences were observed across several teacher characteristics, including teaching experience, teacher type, type of university, and course type. These findings indicate that teachers’ background characteristics are associated with variations in intercultural competence, cultural collaboration, and teaching management-related variables.

**Table 3** Perceived Differences in Core Variables Among Teachers with Different Background Characteristics (N = 238)

Teacher Background	Group	n	Core Variable (M ± S.D.)	Statistic	p	Core Conclusion
Teaching Experience	<5 years	63	Teachers' Intercultural Competence (X <sub>2</sub> ) = 3.42 ± 0.89	F = 3.62	<0.05	Teachers with 21+ years show significantly higher intercultural competence than those with less than 5 years
	6–10 years	65	X <sub>2</sub> = 3.68 ± 0.85			
	11–20 years	66	X <sub>2</sub> = 3.71 ± 0.82			
	≥21 years	44	X <sub>2</sub> = 3.95 ± 0.76			
Teacher Type	Chinese Teachers	226	Cultural Collaboration (sub-dimension) = 4.28 ± 0.55	t = 2.35	<0.05	Foreign teachers show significantly higher cultural collaboration and intercultural adaptation
	Foreign Teachers (ASEAN)	12	4.63 ± 0.42			
Type of University	University A	85	Foreign Teacher Allocation Ratio = 8.2% ± 2.1%	F = 3.89	<0.05	University A has the highest foreign teacher allocation, while University B shows the best local context adaptation
	University B	78	Local Context Adaptation (X <sub>6</sub> ) = 4.61 ± 0.43	F = 4.86	<0.01	
	University C	75	Management Effectiveness (Y) = 4.12 ± 0.49	F = 4.15	<0.01	
Course Type	Intercultural Communication	100	Digital Intercultural Competence (X <sub>5</sub> ) = 3.79 ± 0.81	F = 3.98	<0.01	Intercultural communication courses outperform professional courses on X <sub>5</sub> , X <sub>4</sub> , and Y
	Professional Courses	167	Teaching Support Services (X <sub>4</sub> ) = 3.15 ± 1.02	F = 3.56	<0.05	
	ASEAN Culture Introduction	78	Management Effectiveness (Y) = 4.32 ± 0.47	–	–	
	General Education	18	Local Context Adaptation (X <sub>6</sub> ) = 4.05 ± 0.56	F = 4.38	<0.01	

Note: Only statistically significant group differences are reported. Groups with non-significant results ( $p > 0.05$ ) are omitted to avoid redundancy. Mean (M) and standard deviation (S.D.) are reported only for the focal comparison groups. Because teachers may teach more than one type of course, the sample sizes of course categories may exceed the total number of respondents.

In addition to examining the significance of the path relationships, the explanatory power of the structural model was also evaluated.

The explanatory power of the model is presented in Table 4. The results indicate that the six dimensions explain 54% of the variance in intercultural teaching management effectiveness ( $R^2 = 0.54$ ). According to the evaluation criteria for PLS-SEM, the explanatory power of a structural model is commonly assessed using the coefficient of determination ( $R^2$ ), where values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory power, respectively (Hair et al., 2017). Therefore, the  $R^2$  value obtained in this study indicates a moderate level of explanatory power, suggesting that the model demonstrates satisfactory explanatory capability.

**Table 4** Structural Model Explanatory Power and Effect Size

Dependent Variable	$R^2$	Adjusted $R^2$	$f^2$ (Effect Size)
Cross-Cultural Teaching Management Effectiveness	0.54	0.54	0.15

Note:  $R^2$  indicates the variance explained by the structural model.

### 3. Research Objective 3: Core Challenge Diagnosis and Optimization Suggestions (Quantitative-Qualitative Integrated Analysis)

#### 3.1 Diagnosis of Core Challenges: Based on Quantitative Data and Qualitative Coding Results

The reliability of the qualitative coding was evaluated using the criterion proposed by Landis & Koch (1977), whereby a Kappa value of  $\geq 0.75$  indicates good coding consistency. In this study, the Kappa value for the coding of open-ended questionnaire responses reached 0.86, indicating a high level of coding reliability.

In addition, a frequency ratio of  $\geq 15\%$  was defined as the threshold for identifying core difficulties or major suggestions, in order to ensure the representativeness of the qualitative findings.

By integrating quantitative results (dimensions with relatively low mean values) and qualitative coding of open-ended questionnaire responses (165 valid responses), the core challenges in cross-cultural teaching management and teachers' optimization suggestions were systematically summarized (see Table 5). Three major challenges were identified:

(1) Insufficient adaptation of teaching resources. The mean value for teaching support services was 3.24, indicating a relatively low level. In addition, 47.3% of teachers reported a shortage of localized teaching cases and ASEAN minority-language textbooks.

(2) Weak digital intercultural competence. The mean value of digital intercultural competence was 3.53, while the VR/AR application subdimension scored 3.21. Furthermore, 19.4% of teachers reported difficulties in applying digital teaching technologies.

(3) Uneven implementation of the synergy mechanism. Although the mean value of the synergy mechanism is relatively high ( $M = 4.35$ ), this does not necessarily indicate effective implementation in practice. A proportion of teachers (23.0%) still reported issues such as information fragmentation between departments and the absence of university-enterprise collaboration. These findings suggest that the synergy mechanism is not uniformly implemented across institutions, and that underlying structural and coordination challenges continue to limit its practical effectiveness.

**Table 5** Coding Statistics of Core Difficulties and Optimization Suggestions from Open Questionnaires  
(N=165)

Category	Specific Dimensions	Mention Times	Proportion	Quantitative Data Support
Core Difficulties	Teaching resource shortage (localization/multilingual/digital)	78	47.3%	Teaching support services: 3.24 (dedicated personnel support: 2.98)
	Teaching adaptation dilemmas caused by cultural differences	65	39.4%	Classroom conflict mediation: 3.72 (moderate)
	Barriers in language communication and stratified teaching	42	25.5%	Conflict prevention sub-dimension of teachers' intercultural competence: 3.24
	Lack of synergy mechanism (department/Chinese-foreign teachers/university-enterprise)	38	23.0%	Synergy mechanism: 4.35, with insufficient inter-departmental synergy feedback
	Insufficient application ability of digital teaching technologies	32	19.4%	VR/AR application sub-dimension of digital intercultural competence: 3.21
	Unclear policy support and service processes	25	15.2%	-
	Lack of cross-cultural teaching models for engineering majors	23	13.9%	-
	Optimization Suggestions	Construct localized cross-cultural teaching resource database	85	51.5%
Improve the digital teaching technology support system		52	31.5%	-
Establish stratified teaching and cultural adaptation mechanism		48	29.1%	-
Build a multi-subject synergy support mechanism		45	27.3%	-
Clarify policy support processes and service system		36	21.8%	-
Develop cross-cultural teaching models for engineering majors		31	18.8%	-
Strengthen the integration of Guangxi characteristic culture into teaching		28	17.0%	-

These findings provide a direct empirical basis for the subsequent development of targeted optimization strategies, ensuring that the proposed recommendations are closely aligned with the actual challenges identified in the data.

### 3.2 Regionally Adaptive Optimization Suggestions

(1) Develop a localized digital resource database. Co-develop the Guangxi–ASEAN Cross-Cultural Teaching Resource Database in collaboration with regional universities, incorporating border trade cases and bilingual materials related to Zhuang culture. The database should aim to achieve a coverage rate of  $\geq 60\%$  for engineering-related cases by 2027 and be made freely accessible to universities in the region.

(2) Implement stratified digital competence training. Provide specialized VR/AR application training ( $\geq 20$  instructional hours per year) for teachers with less than five years of teaching experience. In addition, establish a digital teaching mentoring mechanism pairing Chinese and international teachers.

(3) Strengthen the multi-stakeholder synergy mechanism. Establish a joint working group involving the International Affairs Office, the Academic Affairs Office, and industry partners, and incorporate the development and transformation of local context–adapted resources into the synergy assessment system with a weight of  $\geq 20\%$ .

(4) Formulate differentiated support strategies. Establish ASEAN enterprise internship bases for foreign-language universities, introduce a “Guangxi Characteristic Culture” module in general education courses, and provide cross-cultural teaching model templates for engineering faculty.

## Discussions

This study examines cross-cultural teaching management in universities in Guangxi within the context of China–ASEAN educational cooperation. Using a mixed-methods approach that combines structural equation modeling with coding of open-ended questionnaire responses, the study investigates the key mechanisms influencing the effectiveness of cross-cultural teaching management. The findings indicate that local context adaptation, synergy mechanisms, and inclusive leadership play significant roles in improving cross-cultural teaching management effectiveness. However, it is important to note that the effectiveness of the synergy mechanism is not uniformly realized in practice. Despite its relatively high overall evaluation, evidence from the results suggests that its implementation remains uneven, with persistent challenges in cross-departmental coordination and university–enterprise collaboration. In addition, significant perceptual differences were observed among different groups of teachers across several dimensions. These findings provide new empirical evidence for understanding cross-cultural teaching management in universities located in ethnically diverse border regions.

### 1. Local Context Adaptation as the Core Driver of Cross-Cultural Teaching Management

The results show that local context adaptation exerts the strongest influence on the effectiveness of cross-cultural teaching management. This suggests that, in the context of the growing internationalization of higher education, effective cross-cultural teaching management depends not only on internationalization policies and global educational concepts but also on careful consideration of the socio-cultural environments in which universities operate.

As an important gateway for China–ASEAN cooperation, Guangxi is characterized by both ethnic diversity and strong regional collaboration. In this context, cross-cultural teaching management involves not only interactions among different national cultures but also the integration of ethnic cultural resources and regional cooperation needs. Simply transplanting internationalized teaching models

without adapting them to local cultural contexts and regional demands may limit the effectiveness of cross-cultural teaching management.

This finding aligns with Robertson's (1995) theory of glocalization, which emphasizes the interaction between global and local forces. In the process of higher education internationalization, universities must balance global educational standards with local cultural environments. Recent studies also suggest that effective internationalization increasingly relies on regional strategies that integrate local cultural resources with regional development needs (Guillén-Yparrea & Ramírez-Montoya, 2023; Goh et al., 2024). In the context of Guangxi universities, incorporating ASEAN cultural elements, ethnic cultural resources, and regional cooperation cases into curricula and teaching practices represents an important pathway for enhancing cross-cultural teaching management.

## **2. “Conditional Synergy”: A Contextual Extension of Cultural Integration and Synergy Theory**

The findings further indicate that the synergy mechanism plays a significant mediating role between the six core dimensions and the effectiveness of cross-cultural teaching management. Among these relationships, the mediating effect of synergy is particularly pronounced in the pathway involving local context adaptation.

This finding provides a contextual extension of Adler's (1991) Cultural Integration and Synergy Theory, which posits that synergy in multicultural environments enables the integration of diverse cultural strengths and enhances organizational performance. However, the present study suggests that within university cross-cultural teaching contexts, synergy does not occur automatically but instead exhibits strong contextual dependence. Only when teaching management practices effectively adapt to local cultural contexts and regional cooperation environments can synergy among different teaching elements be fully realized.

Recent studies on internationalized higher education also indicate that cross-cultural collaboration depends not only on individual intercultural competence but also on institutional coordination and resource integration (De Hei et al., 2020). Within cross-cultural teaching management systems, coordination among curriculum design, teacher collaboration, teaching resources, and classroom management forms the foundation for achieving synergistic outcomes. Therefore, the concept of “conditional synergy” proposed in this study contributes to a deeper understanding of the conditions under which cultural synergy operates.

## **3. The Moderating Role of Inclusive Leadership in Cross-Cultural Teaching Management**

The results further indicate that inclusive leadership positively moderates the relationship between local context adaptation and the synergy mechanism, highlighting the importance of leadership styles in cross-cultural teaching management systems.

Inclusive leadership emphasizes respect for diversity, encouragement of participation, and open communication (Shore et al., 2011). In cross-cultural teaching environments, teachers often differ in cultural backgrounds and disciplinary traditions. Without inclusive leadership, cultural differences may lead to communication barriers; in contrast, inclusive leadership fosters an open organizational climate that facilitates collaboration and knowledge sharing among teachers from diverse backgrounds.

The findings suggest that even when universities establish policies to promote local context adaptation, the effectiveness of these policies may remain limited without supportive leadership. In institutions where inclusive leadership is stronger, local context adaptation is more likely to translate into effective synergy mechanisms, thereby improving overall cross-cultural teaching management effectiveness. Related research also indicates that inclusive institutional environments can promote intercultural collaboration and pedagogical innovation among faculty members (Kalogerogianni, 2025). Consequently, universities should cultivate leadership practices that support multicultural cooperation when promoting cross-cultural teaching management.

#### **4. Explaining Teacher Group Differences from a Super-Diversity Perspective**

The t-test and one-way ANOVA results reveal significant perceptual differences among teachers with different teaching experience, teacher types, institutional types, and course types. These findings can be interpreted through the lens of super-diversity theory proposed by Vertovec (2007).

Super-diversity suggests that diversity in contemporary societies extends beyond nationality or ethnicity to include factors such as educational background, professional experience, and institutional context. In higher education institutions, these dimensions jointly shape complex patterns of organizational diversity.

The study finds that teachers with more teaching experience demonstrate higher levels of intercultural competence, suggesting that such competence often develops through long-term teaching practice and international engagement. Previous research also indicates that participation in internationalized teaching activities contributes significantly to the development of teachers' intercultural competence (Guo & Laokulrach, 2024). Moreover, foreign teachers report higher levels of cultural collaboration than local teachers, reflecting differences in communication styles and collaborative practices.

Differences across course types also emerge. Teachers of intercultural communication courses report higher levels of digital intercultural competence and greater utilization of teaching support services than teachers of professional courses. This suggests that cross-cultural teaching practices remain unevenly developed across disciplines. Existing studies indicate that different disciplines have distinct needs in intercultural competence development and therefore require discipline-specific teaching strategies (Hussain, Nshom, & Lin, 2025).

#### **5. Challenges in Cross-Cultural Teaching Management in Regional Universities**

By integrating quantitative and qualitative findings, this study identifies three major challenges facing cross-cultural teaching management in Guangxi universities.

First, the localization of teaching resources remains insufficient. Some teachers reported a lack of teaching materials and case studies related to ASEAN cooperation, indicating that internationalization policies have not yet been fully translated into practical teaching resources.

Second, teachers' digital intercultural competence still requires improvement. With the growing importance of online collaboration and virtual exchange, digital technologies have become key tools for cross-cultural teaching. However, some teachers still encounter difficulties in effectively applying these technologies. Research has shown that digital competence is increasingly intertwined with intercultural competence in digital learning environments (De Soriano, Montoro, & Colón, 2024).

Third, the development of cross-cultural teaching remains uneven across disciplines. Current cross-cultural teaching practices are concentrated mainly in language and cultural courses, whereas engineering and technical disciplines still lack systematic models for integrating intercultural competence into professional education. Therefore, universities need to promote the integration of cross-cultural teaching across different academic disciplines.

## 6. Research Contributions

This study makes several theoretical contributions to the field of cross-cultural teaching management.

First, it extends Cultural Integration and Synergy Theory (Adler, 1991) by introducing the concept of conditional synergy, emphasizing that synergy mechanisms in university cross-cultural teaching management are strongly context-dependent.

Second, the study incorporates glocalization theory (Robertson, 1995) into research on cross-cultural teaching management and confirms the critical role of local context adaptation in the internationalization of regional universities.

Third, by applying super-diversity theory (Vertovec, 2007) to analyze differences among teacher groups, the study highlights the influence of teaching experience, disciplinary background, and course type on cross-cultural teaching management, thereby extending the application of this theory in higher education research.

In addition, the findings provide several practical implications for universities. Institutions should place greater emphasis on local context adaptation by incorporating regional culture and China–ASEAN cooperation cases into curricula and teaching resources. Universities should also strengthen teachers' intercultural and digital competencies to support online collaboration and virtual exchange. Furthermore, institutional mechanisms that promote synergy—such as cross-departmental collaboration platforms and resource-sharing systems—should be developed to improve coordination among curriculum design, teacher collaboration, and teaching support. Finally, university leaders should adopt inclusive leadership practices and encourage the development of cross-cultural teaching models tailored to different academic disciplines.

## Originality and Body of Knowledge

This study offers three original contributions to intercultural teaching management in the China–ASEAN context (see Figure 1 for an illustration):

1. Theoretical Integration: By synthesizing Adler's (1991) concept of cultural synergy with Robertson's (1995) theory of glocalization, this study identifies local context adaptation as a core driver in multi-ethnic border regions, thereby bridging the traditional divide between universalism and particularism.

2. Practical Innovation: The study identifies a critical gap in engineering education and proposes a discipline-sensitive approach that integrates localized adaptation, differentiated support, and institutional collaboration, offering actionable pathways for technical fields where cultural integration remains underdeveloped.

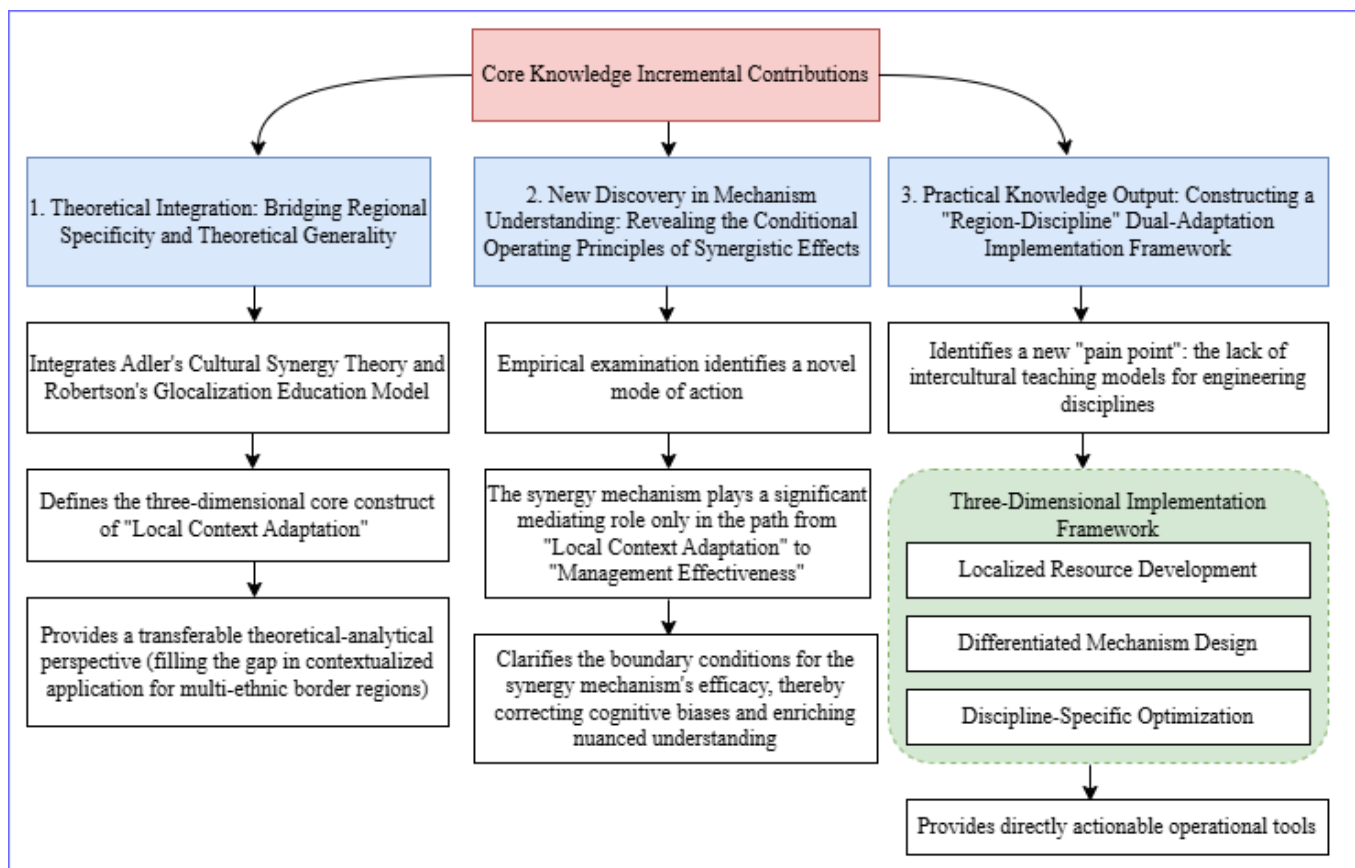


Figure 1 Schematic Diagram of Core Knowledge Contributions

Conclusions

Drawing on cultural integration and synergy theory, this mixed-methods study analyzes data from 238 teachers across three universities in Guangxi. The findings indicate that local context adaptation serves as the primary driver of intercultural teaching management effectiveness, while the synergy mechanism plays a selective mediating role and inclusive leadership exerts a positive moderating effect.

The analysis further identifies significant perceptual differences among teacher groups and reveals several structural challenges, including insufficient localization of teaching resources and limited institutional support for digital competence development.

By situating the findings within the China–ASEAN educational cooperation context, this study extends the application of cultural integration and synergy theory to cross-border higher education environments and provides practical recommendations for improving intercultural teaching management in Guangxi universities.

Future research may expand the sample scope, adopt longitudinal research designs, and incorporate multi-stakeholder perspectives in order to further explore the dynamic mechanisms underlying regional educational cooperation.

## Recommendations

### 1. Policy Formulation Recommendations

Based on the qualitative feedback collected from participants, several key areas for improvement in cross-cultural teaching management were identified.

First, there is a need to strengthen institutional support systems, particularly in terms of teaching resources, administrative coordination, and policy guidance, to better facilitate cross-cultural teaching practices.

Second, enhancing teachers' intercultural competence remains a priority. Targeted professional development programs, including intercultural communication training and context-specific pedagogical workshops, should be systematically implemented.

Third, participants highlighted the importance of improving classroom-level management strategies, especially in addressing cultural misunderstandings, language barriers, and diverse learning expectations.

Fourth, the integration of digital tools and platforms should be further promoted to support cross-cultural interaction and resource accessibility in teaching and learning processes.

Finally, a more inclusive and flexible management approach is recommended, encouraging collaboration among stakeholders and fostering a supportive environment for both teachers and international students.

These recommendations reflect common concerns shared by participants and provide practical directions for optimizing cross-cultural teaching management in the context of China–ASEAN educational cooperation.

### 2. Future Research Recommendations

#### 2.1 Expand the Research Object Scope and Enrich Research Contexts

Future studies should expand the research sample to include different types of higher education institutions in Guangxi, including higher vocational colleges, ASEAN-funded educational institutions operating in China, and China–ASEAN cooperative education programs. The sample size should also be broadened to include teachers from diverse disciplinary backgrounds and levels of teaching experience. Comparative analyses across different institutional types and cooperative education programs may further enhance the generalizability of the research findings.

#### 2.2 Adopt Diversified Research Designs and Deepen the Exploration of Dynamic Mechanisms

Building upon the existing cross-sectional data, future research may incorporate longitudinal research designs combined with qualitative methods such as in-depth interviews, classroom observations, and case studies. Such approaches would allow scholars to track the dynamic evolution of core variables, including synergy mechanisms and local context adaptation.

In addition, representative universities may be selected for multi-dimensional case studies in order to reveal the internal operational logic and evolutionary patterns of intercultural teaching management in greater depth.

#### 2.3 Expand Multi-dimensional Research Perspectives and Refine Professional Classification

Future research should move beyond a single teacher-centered perspective by incorporating multiple stakeholders, including ASEAN international students, teaching administrators, and university–

industry partners. A collaborative research framework that integrates these perspectives would enable a more comprehensive understanding of intercultural teaching management.

Given the current lack of mature intercultural teaching models in engineering disciplines, future studies may focus on engineering-oriented universities and core engineering programs. Through pilot testing and iterative optimization, discipline-specific intercultural teaching models adapted to engineering education contexts could be developed, thereby providing targeted guidance for different academic fields.

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