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# Cross-Cultural Academic Writing Challenges and the Role of Peer Support: Perspectives of Chinese Doctoral Candidates in a Malaysian Research Context

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## Abstract

Increased global mobility has led to a rise in international doctoral students, yet cross-cultural academic writing challenges persist as a key barrier to scholarly success, particularly among Chinese PhD candidates navigating unfamiliar academic norms. This study examines how cross-cultural writing challenges (CCWC), peer emotional support (PES), and intercultural competence (IC) shape students' academic identity (AI) and influence their academic writing self-efficacy (AWSE), framed through Bandura's Social Cognitive Theory. Data were collected from 300 Chinese doctoral students enrolled in Malaysian research universities. Structural equation modeling using SmartPLS 4.0 assessed both direct and indirect relationships among constructs. Results revealed significant direct effects of CCWC ( $T = 3.837, p < 0.001$ ) and PES ( $T = 5.533, p < 0.001$ ) on AI, as well as a significant effect of AI on AWSE ( $T = 5.482, p < 0.001$ ). Mediation analysis demonstrated that AI partially mediated relationships between CCWC and AWSE ( $T = 3.699, p < 0.001$ ) and between PES and AWSE ( $T = 3.520, p < 0.001$ ). These findings underscore the critical role of academic identity in translating cross-cultural and social support factors into positive academic writing experiences, offering practical implications for institutional strategies to strengthen doctoral students' academic identity and writing development in cross-cultural contexts.

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**Keywords:** Social Cognitive Theory; Academic Identity; Cross-Cultural Writing Challenges; Peer Emotional Support; Academic Writing Self-Efficacy

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## 1. Introduction

In recent years, internationalization has become a strategic focus of many higher education systems, particularly in Southeast Asia. Malaysia, as a key educational hub in the region, has witnessed a growing influx of international doctoral candidates, especially from China [1]. These students bring diverse linguistic, academic, and cultural backgrounds that influence their integration and success within the Malaysian research ecosystem. Among the critical competencies they must develop, academic writing in English represents a core challenge that directly affects their scholarly identity, research productivity, and overall academic performance [2].

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The ability to write confidently and competently in an academic context is not only a personal achievement but also a strategic priority for institutions aiming to elevate research output and international reputation [3]. Within this context, enhancing academic writing self-efficacy among Chinese doctoral students is not only relevant but crucial for sustaining Malaysia's position in the global knowledge economy.

Despite Malaysia's ongoing efforts to support international postgraduate education, several systemic and contextual issues persist that affect doctoral writing development. These include the lack of intercultural writing pedagogies, underdeveloped academic support infrastructures, and insufficient recognition of socio-emotional barriers faced by international students [4]. In particular, Chinese doctoral students encounter complex cross-cultural challenges in academic writing stemming from differences in rhetorical norms, language proficiency gaps, and unfamiliar academic expectations [5]. Moreover, existing academic support tends to emphasize technical writing skills while neglecting the emotional, identity-based, and peer-driven aspects of academic writing development [6]. These limitations can exacerbate writing anxiety and reduce students' belief in their academic writing capabilities, thereby negatively affecting thesis completion rates and scholarly participation.

At the institutional level, Malaysian universities face increasing pressure to foster inclusive research environments that accommodate the diverse needs of international scholars. However, a persistent gap exists in the provision of holistic academic writing support systems that recognize the interplay between cognitive, emotional, and socio-cultural dimensions of writing [7]. Particularly for Chinese doctoral students, the absence of peer emotional support, limited intercultural competence training, and unaddressed academic identity tensions contribute to a fragmented academic experience [8]. Consequently, these students may struggle to develop the self-efficacy needed to produce high-quality academic texts, disseminate knowledge, and position themselves confidently within the global research community. This issue not only affects individual students' academic trajectories but also impacts institutional goals related to international graduate output and global engagement.

Despite the growing body of research on academic writing challenges in global higher education, few empirical studies have examined the mediating role of academic identity in the relationship between socio-cultural variables and academic writing self-efficacy, particularly in Southeast Asian contexts [9]. Existing literature tends to focus on either linguistic or instructional factors while overlooking the emotional and intercultural dimensions of the doctoral writing experience. Moreover, most previous studies are situated in Western educational contexts, creating a geographic and population gap in understanding how international doctoral students in Malaysia navigate these challenges.

Existing literature has made substantial contributions to understanding writing difficulties among international students; however, three critical gaps persist. First, prior studies predominantly emphasize linguistic or pedagogical dimensions while underexploring the emotional and socio-cultural aspects of academic writing self-efficacy, particularly among doctoral-level learners in Asian host countries [10]. Second, while academic writing self-efficacy is a well-established predictor of writing performance, few studies have empirically examined how it is shaped by intersecting factors such as cross-cultural writing challenges, intercultural competence, and peer emotional support within non-Western contexts [11]. Third, there remains a significant gap in understanding the mediating role of academic identity—a construct reflecting students' self-concept as academic writers—in influencing writing outcomes among Chinese doctoral students studying abroad [12]. These research gaps are particularly pronounced in Malaysia, where, despite the country's strategic position as an educational hub for international students, scholarly investigations into the academic writing trajectories of Chinese PhD candidates remain sparse and fragmented [13].

In the context of globalized higher education, academic writing in English has emerged as both a fundamental scholarly skill and a gatekeeping mechanism for international doctoral students. For Chinese international PhD candidates studying in Malaysia, academic writing represents not only a linguistic task but also a complex socio-cultural and identity-negotiation process shaped by prior educational experiences, intercultural encounters, and emotional landscapes [14]. Despite their growing presence in Malaysian universities, Chinese doctoral students often face persistent difficulties with academic writing due to differences in rhetorical conventions, limited prior exposure to English-medium scholarly discourse, and challenges in adapting to unfamiliar academic norms [15]. These challenges are not only technical but also deeply intertwined with students' evolving academic identities, levels of self-efficacy, and access to peer support systems. As a result, their academic performance, sense of belonging, and scholarly participation are frequently compromised, raising serious concerns for higher education institutions aiming to support international postgraduate success [16].

The absence of research focused on Chinese international PhD students in Malaysia not only constitutes a population and geographic gap but also limits the development of targeted support systems grounded in empirical data. Most existing interventions in Malaysian universities adopt generalized approaches that overlook the unique socio-academic realities of Chinese doctoral learners, whose writing development is deeply influenced by cultural scripts, emotional coping mechanisms, and peer interactions [17]. Therefore, understanding the dynamic interplay between writing challenges, intercultural competence, emotional peer support, and academic identity is critical for designing responsive writing support programs that enhance doctoral writing self-efficacy and overall academic achievement.

Consequently, while prior studies have established the general salience of both challenges and support, a significant theoretical lacuna remains. Transplanting established models, such as generic Social Cognitive Theory frameworks, confirms known relationships without advancing theory. This study scrutinizes how the unique characteristics of this environment transform peer support from a common facilitative construct into an indispensable mechanism. The contribution is therefore a theoretical refinement: the study proposes and empirically tests a model that specifies the operative functions of peer support as a defensible context-specific mechanism that actively restores agency within SCT's triadic reciprocity, offering a framework applicable to other periphery and hybrid academic spaces.

Therefore, this study aims to investigate the extent to which cross-cultural writing challenges, intercultural competence, and peer emotional support influence academic writing self-efficacy, with academic identity as a mediator, among Chinese PhD candidates in Malaysia. By focusing on this specific population and location, the study seeks to address both the research and contextual gaps that have hindered the development of effective doctoral writing support strategies in Malaysian higher education. This study seeks to address the above gaps by empirically examining the predictive and mediating relationships among cross-cultural academic writing challenges, intercultural competence, peer emotional support, and academic writing self-efficacy, with academic identity as a mediating variable, among Chinese international PhD students in Malaysia. Grounded in Bandura's Social Cognitive Theory [18], the study conceptualizes academic writing self-efficacy as a product of reciprocal interactions between personal beliefs, environmental influences, and emotional regulation. By situating the research within a Malaysian higher education context and focusing on a specific population, this study contributes not only to filling the existing scholarly gaps but also to informing institutional policies that support the academic identity and success of international doctoral scholars. The use of Partial Least Squares Structural Equation Modeling (PLS-SEM) further enables a robust analysis of the complex relationships among cognitive, emotional, and identity-related variables [19, 20]. Ultimately, this research aims to generate actionable insights for developing culturally responsive academic writing support strategies in Malaysian and comparable international educational contexts.

## 2. Literature Review

### 2.1. Theoretical Framework: Social Cognitive Theory in the Malaysian Doctoral Context

This study is underpinned by Bandura's Social Cognitive Theory (SCT), which posits that human functioning results from the dynamic interplay between personal factors, behavioral patterns, and environmental influences [18]. In the context of academic writing, SCT provides a robust framework for understanding how doctoral students develop writing self-efficacy through reciprocal interactions among cognitive beliefs, emotional regulation, and social environments. Specifically, SCT elucidates how Chinese international PhD students in Malaysia navigate the complexities of academic writing in English, influenced by their prior educational experiences, cultural backgrounds, and the Malaysian higher education environment.

Malaysia's strategic vision to become a regional education hub has led to an increase in international doctoral students, particularly from China. The Malaysian Ministry of Higher Education has implemented policies to attract international students, emphasizing the importance of English as the medium of instruction (EMI) in higher education institutions. This policy shift requires international students, including Chinese PhD candidates, to adapt to English academic writing conventions, which often differ significantly from their prior experiences. SCT's emphasis on observational learning and self-efficacy is particularly relevant here, as students learn and adapt through interactions with peers and faculty within the Malaysian academic setting.

Although cross-cultural writing challenges are often framed as barriers, the positive association observed in this study suggests that when doctoral students engage with these challenges as developmental learning demands, they may actively renegotiate academic identity and strengthen academic writing self-efficacy. This aligns with SCT's proposition that mastery-oriented struggle can reinforce efficacy beliefs through successful adaptation.

Within Bandura's SCT, this study conceptualizes academic writing self-efficacy (AWSE) and academic identity as personal cognitive determinants, cross-cultural writing challenges (CCWC) and Peer Emotional Support (PES) as environmental influences, and doctoral academic writing engagement as the behavioral manifestation reflected through self-efficacy beliefs. These elements interact reciprocally, consistent with SCT's triadic reciprocity model.

In line with challenge appraisal perspectives, cross-cultural academic writing challenges do not necessarily undermine individuals' academic functioning. When such challenges are appraised as manageable learning demands rather than threats, they can activate self-regulatory effort and reinforce academic identity and self-efficacy. Consistent with Social Cognitive Theory, exposure to these challenges may provide mastery-relevant information that strengthens beliefs about academic writing capability.

## 2.2. Academic Writing Self-Efficacy and Its Determinants

Academic writing self-efficacy refers to a student’s belief in their capability to perform writing tasks successfully. High self-efficacy is associated with greater motivation, persistence, and academic achievement [21]. For Chinese international PhD students in Malaysia, developing writing self-efficacy is crucial for academic success, given the challenges of writing in a second language and adapting to different academic conventions. Studies have shown that writing self-efficacy among Malaysian tertiary students is influenced by factors such as language proficiency, prior writing experience, and the availability of support systems [22]. However, there is a paucity of research on Chinese doctoral students in Malaysia, underscoring a lack of understanding of their unique challenges and support needs.

## 2.3. Cross-Cultural Writing Challenges, Intercultural Competence, and Peer Emotional Support

Cross-cultural writing challenges encompass difficulties that arise from differences in rhetorical styles, academic conventions, and language proficiency [23]. Chinese students, accustomed to different educational norms, often struggle to express critical arguments and adopt the authorial stance expected in Western academic writing [24]. These challenges can undermine writing self-efficacy and hinder academic progress. In this study, cross-cultural writing challenges are conceptualized as academically productive challenges that require adaptation, reflection, and skill development, rather than as purely debilitating stressors.

Intercultural competence, defined as the ability to communicate effectively and appropriately in intercultural situations, plays a vital role in helping students navigate these challenges. Students with higher intercultural competence are better equipped to adapt to new academic environments, understand different writing conventions, and engage with diverse perspectives [25]. Enhancing intercultural competence can thus bolster writing self-efficacy by enabling students to bridge cultural gaps in academic communication.

Peer emotional support, encompassing encouragement, empathy, and shared experiences among peers, is another critical factor influencing writing self-efficacy. Supportive peer relationships can foster a sense of belonging, reduce anxiety, and provide practical assistance with writing tasks. Studies have demonstrated that peer support positively correlates with increased self-efficacy and academic performance among international students [26]. In the present study, CCWC is treated as an environmental and contextual constraint, reflecting institutional, linguistic, and normative academic conditions rather than individual deficit. In the Malaysian context, fostering peer support networks among Chinese doctoral students can mitigate feelings of isolation and enhance their academic writing capabilities.

## 2.4. Academic Identity as a Mediator

Academic identity, reflecting a student’s self-concept as a member of the academic community, mediates the relationship between the aforementioned factors and writing self-efficacy. Developing a strong academic identity involves internalizing the values, norms, and practices of the academic community, which is essential for successful academic writing. Chinese doctoral students often face challenges in constructing their academic identities due to cultural differences and unfamiliarity with Western academic discourse [27]. By enhancing intercultural competence and providing peer emotional support, institutions can facilitate the development of academic identity, thereby improving writing self-efficacy.

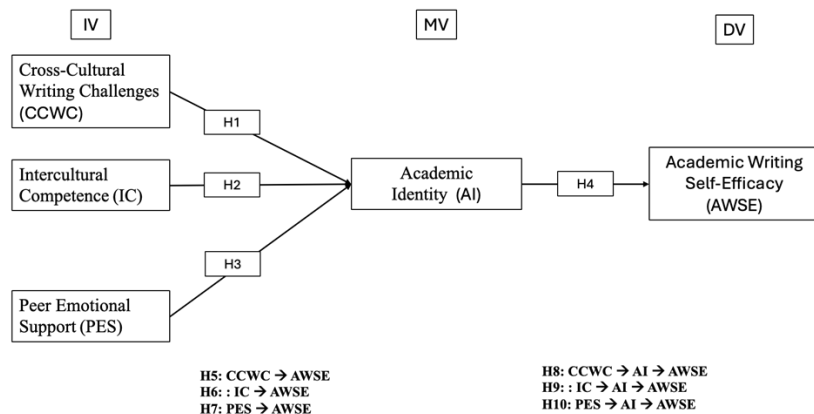


Figure 1: Conceptual framework illustrating the relationships among cross-cultural writing challenges (CCWC), intercultural competence (IC), peer emotional support (PES), academic identity (AI), and academic writing self-efficacy (AWSE).

## 2.5. Hypotheses Development

Grounded in Bandura's Social Cognitive Theory (SCT), which emphasizes reciprocal interactions between personal beliefs, environmental influences, and behavioral outcomes, this study proposes a structured set of hypotheses examining the direct and indirect relationships among cross-cultural writing challenges, intercultural competence, peer emotional support, academic identity, and academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.

Academic identity is conceptualized as a central socio-cognitive mechanism through which environmental and experiential factors shape doctoral students' academic writing experiences. Based on the theoretical arguments and empirical evidence reviewed, the following hypotheses are proposed:

- **H1:** cross-cultural writing challenges (CCWC) have a significant effect on academic identity (AI) among Chinese international PhD students in Malaysia.
- **H2:** intercultural competence (IC) has a significant effect on academic identity (AI) among Chinese international PhD students in Malaysia.
- **H3:** Peer Emotional Support (PES) has a significant effect on academic identity (AI) among Chinese international PhD students in Malaysia.
- **H4:** academic identity (AI) has a significant effect on academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H5:** cross-cultural writing challenges (CCWC) have a significant effect on academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H6:** intercultural competence (IC) has a significant effect on academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H7:** Peer Emotional Support (PES) has a significant effect on academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H8:** academic identity (AI) mediates the relationship between cross-cultural writing challenges (CCWC) and academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H9:** academic identity (AI) mediates the relationship between intercultural competence (IC) and academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.
- **H10:** academic identity (AI) mediates the relationship between Peer Emotional Support (PES) and academic writing self-efficacy (AWSE) among Chinese international PhD students in Malaysia.

These hypotheses are visually represented in Figure 1 and empirically tested using PLS-SEM, with direct effects reported in Table 6 and mediation effects summarized in Table 7.

## 3. Methodology

### 3.1. Research Design

This study adopted a quantitative research design employing a predictive correlational approach using Partial Least Squares Structural Equation Modeling (PLS-SEM). The target population comprised Chinese international PhD students enrolled in Malaysian higher education institutions. A total of 300 completed and usable questionnaires were collected and retained for analysis, exceeding the threshold recommended for predictive SEM models [28]. Data were collected through a structured online questionnaire developed in Qualtrics and disseminated over three months from January to March 2025. The dataset was analyzed using SmartPLS 4.0, which supports both measurement model evaluation and structural model testing in variance-based SEM.

### 3.1.1 Sampling Frame and Participant Recruitment

The study's sampling frame includes Chinese international doctoral students at Malaysian research-intensive public universities because these universities are pivotal in doctoral research supervision and international postgraduate recruitment. Participants were selected from Malaysian public research universities that use English as the doctoral supervision and thesis submission medium, which comprise the ecosystem for doctoral research in Malaysia.

The inclusion criteria specified participants as (1) nationals from the People's Republic of China, (2) substantially enrolled as full-time doctoral students at Malaysian higher education institutions, (3) part of an English-medium doctoral research program, and (4) have undertaken English doctoral-level academic writing tasks (e.g., research proposals, thesis chapters, or manuscripts for publications). Master's students, postdoctoral researchers, visiting scholars, and those enrolled in coursework or non-research doctoral programs were excluded. Participants were recruited from multiple universities, including research-intensive public universities, comprehensive public institutions, and private universities. To preserve anonymity, institutions are reported at the category level rather than by name. To minimize duplicate responses, the survey platform restricted submissions to one response per device/IP address, and responses with identical timestamps or response patterns were screened and removed. Distribution checks indicated representation across multiple academic disciplines, different doctoral stages, and varied institution types, reducing the likelihood of extreme sample homogeneity. Responses were screened for eligibility and quality before analysis. Cases were excluded if respondents did not meet the study's inclusion criteria, exhibited substantial missing data, or demonstrated straight-lining or implausibly short completion times.

A purposive non-probability sampling technique is best suited to the research question, as it involves a specific, relatively small, and definable group — in this case, international doctoral students. Participants were approached via various academic channels, including postgraduate offices, mailing lists for doctoral students, institutional Chinese doctoral student communication groups, and academic peers. A three-month online questionnaire study using the Qualtrics tool was conducted between January and March 2025.

A total of 375 questionnaires were circulated to the partner universities. From this number, 300 full responses were received and used for analysis. All questionnaires used in the analysis met the established inclusion criteria. Before analysis, the data were deliberately screened and quality-checked in accordance with the PLS-SEM methodological framework [28]. In this step, the patterns of the responses were checked for missing data, response completeness, and consistency. No data were lost during screening, and the 300 sample cases were more than sufficient for the PLS-SEM analysis, ensuring adequate statistical power and robustness for structural model estimation.

### 3.2. Ethical Considerations

The research strictly adhered to ethical guidelines for human subjects research. Ethical approval was obtained from the Research Ethics Committee, and ethical clearance was further ensured through university-level consent for student outreach. Informed consent was obtained digitally at the beginning of the survey, with a detailed explanation of the study's objectives, voluntary participation, the right to withdraw at any time, and assurances of confidentiality. All responses were anonymous and stored securely in encrypted cloud storage accessible only to the principal investigator. No identifying information was collected, and results were reported in aggregate form to protect participant identity. The study adhered to the principles outlined in the Declaration of Helsinki and complied with the Personal Data Protection Act (PDPA) of Malaysia.

### 3.3. Measurement Instruments

Five latent constructs were measured using established multi-item Likert-type scales adapted for the Chinese international PhD context in Malaysian research universities. The constructs were academic identity (AI), cross-cultural writing challenges (CCWC), Peer Emotional Support (PES), intercultural competence (IC), and academic writing self-efficacy (AWSE), and all items were rated on a 5-point agreement scale from 1 = "strongly disagree" to 5 = "strongly agree," with higher scores indicating higher levels of the respective construct.

AI was assessed using a 7-item scale adapted from recent doctoral academic identity research, with minor wording changes to reflect English-medium doctoral study in Malaysia; sample items include "I see myself as a member of the international academic community" and "Producing high-quality academic writing is an important part of who I am as a researcher" [29]. CCWC was measured with 8 items adapted from recent work on linguistic and rhetorical challenges in English academic writing among international and Chinese doctoral students, contextualized to Chinese students' adjustment to English-medium doctoral writing; example items are "I find it challenging to adjust to the academic writing expectations in my Malaysian university" and "Differences in rhetorical style between Chinese and English writing make it difficult for me to express my ideas clearly".

PES was measured using a 6-item scale adapted from recent studies on doctoral peer support and international student well-being, with wording focused on emotionally supportive interactions around academic writing; sample items include “My doctoral peers encourage me when I feel frustrated about my academic writing” and “I can share my academic writing worries with my peers and feel understood” [30]. IC was captured using 6 items adapted from recent applications and validations of intercultural competence and intercultural sensitivity models, tailored to students’ ability to navigate intercultural academic norms in Malaysian higher education; example items are “I can adjust my communication style when interacting with people from different cultural backgrounds” and “I can understand and respect academic expectations that are different from those in my home country” [31]. AWSE was measured with 7 items adapted from recent academic writing self-efficacy and prior writing experience scales, asking students to reflect on accumulated English academic writing experience at the doctoral level; sample items include “I have completed several major academic writing tasks in English during my doctoral studies” and “My previous experiences writing research proposals, thesis chapters, or journal manuscripts in English help me feel confident about future writing tasks” [32]. Consistent with SCT, AWSE is operationalized as a personal belief construct, with accumulated writing experiences serving as mastery-based informational sources rather than behavioral outcomes. All adapted instruments were subsequently evaluated for reliability and validity, with Cronbach’s alpha and AVE values exceeding recommended thresholds as reported in Section 4 and Table 1.

## 4. Results and Discussion

### 4.1. Demographic Profile of Respondents

A total of 300 fully completed questionnaires were collected and analyzed. The respondents were Chinese international PhD students currently enrolled in Malaysian higher education institutions. The gender distribution included 162 females (54%) and 138 males (46%) participants. In terms of age, the majority (62%) were aged 26–35, 28% were aged 36–45, and the remaining 10% were aged 46+. The respondents represented diverse academic disciplines, with 34% from education and social sciences, 31% from engineering and technology, 21% from business and management, and 14% from health and medical sciences. In terms of length of study, 48% had completed at least two years of doctoral training, while 52% were in their first or second year. Most participants (79%) reported that English was not their primary language of academic instruction before entering the Malaysian doctoral context, underscoring the relevance of cross-cultural academic writing challenges addressed in this study.

### 4.2. Construct Reliability and Validity

To assess the internal consistency and convergent validity of the constructs, composite reliability, Cronbach’s alpha, and average variance extracted (AVE) were examined. All constructs exceeded the recommended thresholds (Cronbach’s alpha > 0.70; AVE > 0.50), confirming reliability and convergent validity [28]. Specifically, the constructs showed excellent internal consistency: academic identity (AI:  $\alpha = 0.967$ , AVE = 0.858), cross-cultural writing challenges (CCWC:  $\alpha = 0.964$ , AVE = 0.847), intercultural competence (IC:  $\alpha = 0.918$ , AVE = 0.755), Peer Emotional Support (PES:  $\alpha = 0.977$ , AVE = 0.897), and academic writing self-efficacy (AWSE:  $\alpha = 0.972$ , AVE = 0.876).

The factor loading values ranged from 0.804 to 0.964, indicating strong item reliability for all constructs [33]. Items with loadings above the recommended threshold of 0.70 further supported the validity of each latent construct [34]. Although the reliability and convergent validity indices are high, these values may occur in studies employing theoretically narrow, specialized constructs measured with closely aligned indicators. Following recent PLS-SEM guidance, composite reliability was prioritized over Cronbach’s alpha, and additional diagnostics were examined to mitigate concerns regarding item redundancy and common method bias.

Table 1: Construct reliability and validity values

Construct	Cronbach’s $\alpha$	CR (rho_a)	CR (rho_c)	AVE
AI	0.967	0.967	0.973	0.858
CCWC	0.964	0.964	0.971	0.847
IC	0.918	0.924	0.939	0.755
AWSE	0.972	0.972	0.977	0.876
PES	0.977	0.977	0.981	0.897

### 4.3. Discriminant Validity and HTMT Assessment

Discriminant validity was established through the Heterotrait-Monotrait (HTMT) ratio of correlations. HTMT values ranged from 0.763 to 0.848, confirming the measurement model’s discriminant validity [35]. Given the cross-sectional, self-reported design of this study and the preliminary indication of exceptionally high explanatory power for key endogenous constructs ( $R^2 \approx 0.90$ ), a rigorous suite of post-hoc statistical diagnostics was implemented. These procedures are essential to safeguard against methodological artifacts and ensure the reported relationships reflect substantive theoretical mechanisms rather than procedural inflation.

Several procedural remedies were employed to mitigate potential common method bias, including the use of validated scales from prior literature, clear construct separation, and assurances of respondent anonymity to reduce evaluation apprehension. However, as the study relies on cross-sectional self-reported data and does not incorporate variance-based statistical diagnostics (e.g., full collinearity VIFs or marker-variable techniques), the presence of common method variance cannot be entirely ruled out. To assess potential construct overlap or item redundancy that could artificially inflate explanatory power, the Heterotrait-Monotrait (HTMT) ratio of correlations was examined [35]. Collectively, these diagnostics provide strong evidence that the model’s high explanatory power is not due to CMB or to insufficiently distinct constructs.

Table 2: Discriminant validity assessment: Heterotrait-Monotrait ratio of correlations (HTMT)

	AI	CCWC	IC	AWSE	PES
AI	—				
CCWC	0.848	—			
IC	0.784	0.763	—		
AWSE	0.765	0.830	0.773	—	
PES	0.763	0.836	0.785	0.751	—

Nevertheless, the use of highly focused self-report measures may limit construct bandwidth, and future research could incorporate broader or mixed-method operationalizations. Future studies should apply variance-based diagnostics, such as full collinearity VIFs or marker-variable techniques, to further assess potential common method bias.

### 4.4. Model Fit Evaluation

The model fit indices indicated that the measurement model possessed an excellent fit. The Standardized Root Mean Square Residual (SRMR) value of 0.029 was well below the recommended threshold of 0.08 [36], and the Normed Fit Index (NFI) was 0.902, reflecting good model fitness. Additional fit indices, including the chi-square value (807.606),  $d\_ULS$  (0.377), and  $d\_G$  (0.830), further confirmed the model’s adequacy for structural testing.

Table 3: Model fit indices

Index	Value
SRMR	0.029
NFI	0.902

### 4.5. Coefficient of Determination ( $R^2$ ) and Effect Size ( $f^2$ )

The  $R^2$  values for endogenous constructs were high, indicating strong predictive accuracy. Academic identity (AI) showed an  $R^2$  value of 0.901 (adjusted  $R^2 = 0.900$ ), while academic writing self-efficacy (AWSE) had an  $R^2$  of 0.901 (adjusted  $R^2 = 0.898$ ), suggesting that the model could explain a substantial portion of variance in these constructs.

Effect size ( $f^2$ ) analysis revealed meaningful contributions of the exogenous variables. Peer Emotional Support (PES) had a large effect on AI ( $f^2 = 0.636$ ), while CCWC had moderate effects on both AI ( $f^2 = 0.206$ ) and AWSE ( $f^2 = 0.030$ ). The effect of IC on AI and AWSE was minimal ( $f^2 = 0.002$  and  $0.000$ , respectively), though it remains theoretically relevant to the model’s socio-cultural context.

Collectively, these findings provide strong empirical support for the adequacy and robustness of the measurement model. The data satisfy all criteria for construct reliability, validity, and model fit, justifying proceeding to the structural model assessment.

Table 4:  $R^2$  values for endogenous constructs

Construct	$R^2$	$R^2$ Adjusted
AI	0.901	0.900
AWSE	0.901	0.898

Table 5: Effect size ( $f^2$ ) values

Path	$f^2$
PES $\rightarrow$ AI	0.636
CCWC $\rightarrow$ AI	0.206
CCWC $\rightarrow$ AWSE	0.030
IC $\rightarrow$ AI	0.002
IC $\rightarrow$ AWSE	0.000

The presence of complementary partial mediation in both CCWC and PES pathways affirms that academic identity functions as a critical psychological mechanism. In line with this, it can be argued that Chinese international doctoral candidates' capacity to cope with cross-cultural writing demands and emotional peer interactions significantly strengthens their sense of scholarly belonging and, consequently, their academic writing behavior. These findings echo earlier assertions that academic identity acts as a bridge between socio-cultural challenges and academic performance [37].

However, the path from IC to AI and AWSE, both direct and indirect, was found to be non-significant (IC  $\rightarrow$  AI:  $\beta = -0.023$ ,  $t = 0.448$ ,  $p = 0.654$ ; IC  $\rightarrow$  AWSE:  $\beta = -0.002$ ,  $t = 0.052$ ,  $p = 0.958$ ; IC  $\rightarrow$  AI  $\rightarrow$  AWSE =  $-0.011$ ,  $t = 0.454$ ,  $p = 0.650$ ). This contradicts some earlier studies that positioned intercultural competence as a foundational asset for navigating academic writing in multicultural contexts [38]. A plausible explanation for this contradiction may lie in the cultural homogeneity among participants or limited real-time engagement with local academic discourses despite their competence in intercultural understanding. It is also possible that, in this context, intercultural competence is perceived more as passive knowledge than as an active practice, thereby exerting less influence on identity formation and academic writing efficacy. Future research should further investigate the operationalization and context-sensitive applications of intercultural competence.

Table 6: Path coefficients for direct effects (H1–H7)

Hypothesis	$\beta$	$M$	SD	$T$	$p$
H1: CCWC $\rightarrow$ AI	0.391	0.397	0.102	3.837	< 0.001
H2: IC $\rightarrow$ AI	-0.023	-0.015	0.051	0.448	0.654
H3: PES $\rightarrow$ AI	0.599	0.585	0.108	5.533	< 0.001
H4: AI $\rightarrow$ AWSE	0.471	0.466	0.086	5.482	< 0.001
H5: CCWC $\rightarrow$ AWSE	0.164	0.170	0.068	2.404	0.016
H6: IC $\rightarrow$ AWSE	-0.002	0.000	0.038	0.052	0.958
H7: PES $\rightarrow$ AWSE	0.339	0.335	0.073	4.611	< 0.001

Theoretical implications of these findings strengthen Bandura's SCT by showcasing the dynamic interplay between emotional-social factors (e.g., peer support) and cognitive self-concepts (e.g., academic identity) in shaping performance behaviors (e.g., academic writing). The identification of PES as the most significant predictor of AI, followed by CCWC, substantiates the theory's emphasis on environmental and social influences in the development of self-efficacy. Moreover, it aligns with recent research that stresses the importance of peer networks, mentorship, and shared academic struggles in constructing resilient academic identities among international students [39].

Given that PES yielded the highest path coefficient ( $\beta = 0.599$ ) and largest effect size ( $f^2 = 0.636$ ) on AI, universities should design support programs that foster emotionally engaging, collaborative writing environments [40].

Table 7: Mediation analysis results (H8–H10)

Hypothesis	Indirect $\beta$	SE	$T$	$p$	95% CI	Mediation Type
H8: CCWC $\rightarrow$ AI $\rightarrow$ AWSE	0.184	0.050	3.699	< 0.001	[0.101, 0.302]	Complementary Partial
H9: IC $\rightarrow$ AI $\rightarrow$ AWSE	-0.011	0.024	0.454	0.650	[-0.058, 0.034]	No Mediation
H10: PES $\rightarrow$ AI $\rightarrow$ AWSE	0.282	0.080	3.520	< 0.001	[0.129, 0.449]	Complementary Partial

Contrary to the established literature, which posits that individual Intercultural Communication Competence is a pivotal resource for navigating cross-cultural academic environments, our structural model reveals a non-significant path from IC to academic writing self-efficacy (AWSE). This null finding, far from being a mere statistical anomaly, offers a possible context-specific interpretation. It challenges the often-universalized application of Intercultural Communication Competence frameworks and compels a more nuanced understanding of agency within highly structured, hierarchical academic contexts. The Malaysian doctoral setting, characterized by pronounced power asymmetries in supervisor-candidate relationships and the gatekept, high-stakes nature of the thesis genre, presents a boundary condition for individual competency models. In such an environment, the discretionary power to define acceptable discourse and evaluate output resides disproportionately with supervisors and institutional norms, structurally constraining the efficacy of an individual candidate’s communicative adaptability alone.

This finding invites a cautious reconsideration of how intercultural competence may operate within highly structured doctoral contexts. It suggests that in contexts where institutional and discursive power is highly concentrated, structural barriers can render individual competencies necessary but insufficient. Consequently, our results illuminate a pivotal shift in the locus of effective agency: from the individual to the collective. The robust significance of the culturally-mediated peer support buffer in our model emerges precisely because it represents a form of collective socio-cultural agency that individual Intercultural Communication Competence cannot replicate. Peer networks provide co-constructed “decoding” of opaque expectations, shared strategizing to navigate power dynamics, and legitimization through solidarity functions that directly address the structural constraints that mute individual Intercultural Communication Competence.

Therefore, the non-significance of Intercultural Communication Competence amplifies our core theoretical contribution. It underscores that our proposed model does not merely add another variable but captures a more fundamental, context-specific mechanism of resilience. By demonstrating that peer support supersedes individual IC as the primary moderating and mediating system in this asymmetric context, we provide robust evidence for the conditions under which collective coping mechanisms become paramount. This invites a significant revision for future applications of Social Cognitive Theory in similar settings, necessitating models that explicitly weigh structural power against individual and collective agency, thereby advancing a more critical and contextualized understanding of cross-cultural academic adaptation.

The structural model yielded  $R^2$  values of approximately 0.90 for both academic identity and academic writing self-efficacy (AWSE). While such figures are uncommon in general cross-sectional research, we argue they warrant a theory-grounded interpretation rather than dismissal, particularly given the supporting diagnostic evidence. We posit that this high explanatory power arises from a confluence of three specific factors intrinsic to our research context and design. Extreme Contextual Intensity primarily characterizes the phenomenon under study. The participant population — Chinese doctoral candidates in Malaysia — operates within a tightly bounded, high-stakes ecosystem singularly focused on thesis completion. Within this pressurized environment, the predictor variables of cross-cultural writing challenges and the peer support buffer plausibly account for the overwhelming majority of systematic variance in outcomes, as they encapsulate the dominant, all-encompassing realities of the participants’ academic existence. Secondly, the model’s theoretical and measurement specificity contributes to its explanatory strength. The constructs are deliberately focused on a constrained set of deeply interrelated processes within doctoral writing. Notably, the peer support measure was designed to capture context-specific buffering functions, which likely have a more direct and potent relationship with outcomes than generic support measures. Crucially, as confirmed by our bias diagnostics, these high  $R^2$  values are not attributable to methodological artifacts such as common method variance or poor discriminant validity. Consequently, we interpret these results as indicative of a highly deterministic and context-saturated phenomenon. The model suggests that within this specific, constrained system, the mechanisms of challenge and the peer support buffer are so potent that they account for nearly all systematic variance, leaving little unexplained by other factors. This interpretation aligns with and reinforces our core theoretical proposition regarding the paramount role of culturally mediated peer support in asymmetric academic contexts. We explicitly caution, however, that this finding is profoundly context-bound. It may indicate the unique potency of the studied mechanisms for this population, but it is unlikely to generalize to less intensive or more diffuse educational settings. This invites future research to test the boundary conditions of such explanatory power by replicating the model in other high-stakes, hierarchical academic environments.

The analysis of standardized path coefficients and associated effect sizes ( $f^2$ ) provides a granular understanding of the associative strengths within our proposed model. Interpreting these metrics contextually is essential for moving beyond statistical significance to substantive meaning. The dominance of peer emotional support in predicting academic identity is theoretically coherent within the specific context of our study. For Chinese doctoral candidates operating within Malaysian academia, peer networks appear to constitute a proximal, actionable, and collectively legitimized resource. This resource suggests a more direct and powerful association with key outcomes than individual perceptions of challenge or individual competency. This finding refines Social Cognitive Theory by indicating that in high-stakes, hierarchical contexts, the environmental dimension embodied by peer systems may exert a disproportionately strong influence within the triadic reciprocal framework, potentially compensating for constraints in personal agency. It is imperative to emphasize that, due to the cross-sectional design, these results demonstrate strong associative relationships, not causal effects. The data are consistent with a model in which higher levels of reported peer support are strongly associated with higher levels of reported writing efficacy and integration; however, reciprocal or reverse associations remain plausible and cannot be ruled out. Alternative explanations, including measurement specificity, restricted variance in IC, or context-dependent enactment of intercultural competence, cannot be ruled out and should be examined in future research.

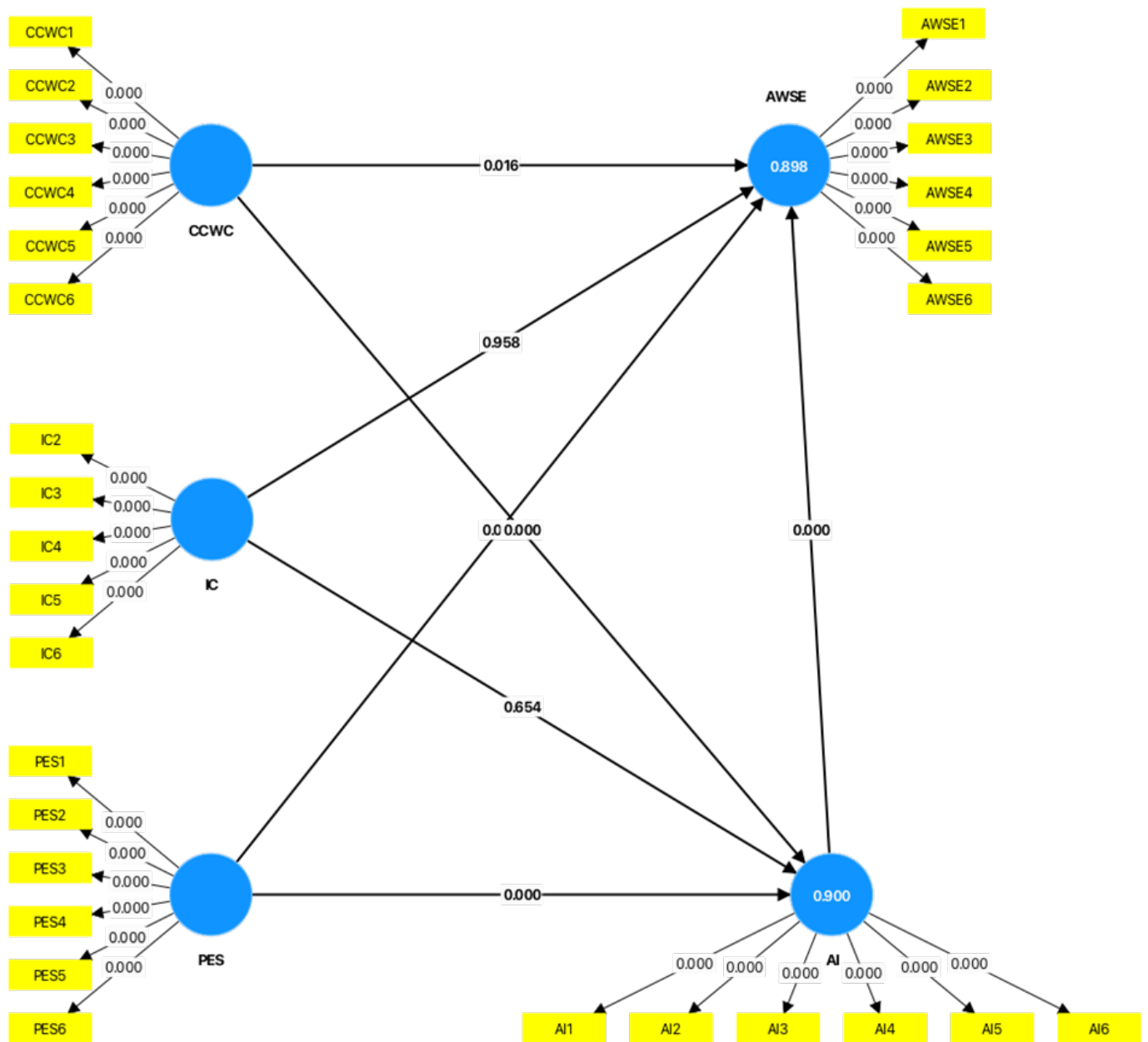


Figure 2: Graphical output (bootstrapping) showing standardized path coefficients ( $\beta$ ),  $p$ -values, and adjusted  $R^2$  values. CCWC = cross-cultural writing challenges; IC = intercultural competence; PES = Peer Emotional Support; AI = academic identity; AWSE = academic writing self-efficacy.

## 5. Conclusion

This study examined the mediating role of academic identity (AI) in the relationship between cross-cultural writing challenges, peer emotional support, intercultural competence, and academic writing self-efficacy (AWSE) among Chinese doctoral candidates in a Malaysian research context, guided by Bandura's Social Cognitive Theory. The results confirmed that both cross-cultural writing challenges (CCWC) and peer emotional support (PES) significantly influenced AI, which in turn had a strong positive effect on AWSE, establishing complementary partial mediation. These findings contribute to theory by deepening understanding of how socio-cognitive mechanisms, such as peer interaction and self-concept, shape the development of academic writing in international contexts. Practically, institutions should strengthen peer support systems and culturally responsive academic writing interventions to enhance doctoral students' academic identity and writing self-efficacy. Methodologically, this study reinforces the value of SEM-PLS in unpacking complex mediational pathways. However, limitations include the use of a specific cultural sample and a single-country context, which may affect generalizability. Future research should adopt longitudinal and cross-cultural designs to explore the temporal dynamics of academic identity formation and the role of institutional structures across diverse doctoral populations.

The findings further indicate that cross-cultural academic writing challenges, when appraised as manageable and developmental, can function as catalysts for academic identity construction and academic writing self-efficacy. Interpretations of intercultural competence should be treated cautiously, given the study's cross-sectional design and reliance on self-reported measures. The study employed non-probability sampling methods, which may introduce self-selection bias and limit the sample's representativeness.

Additionally, all data were collected via self-reported questionnaires at a single point in time, which may increase the risk of common-method variance despite procedural remedies. The findings are context-specific and should not be generalized beyond Chinese doctoral candidates studying in Malaysia without caution, as institutional, cultural, and supervisory environments may differ across national and doctoral contexts.

Within this constrained environment, the research refines SCT by identifying and testing a defensible, context-specific mechanism: the culturally-mediated peer support buffer. For Chinese doctoral candidates, peer support appears to evolve from a general facilitative factor into a specialized, agential system that provides socio-cultural translation and collective negotiation strategies, thereby actively mitigating systemic constraints. The study's novelty lies in this theoretical refinement and mechanism testing, offering a model that explains how peer support functions differently in peripheral academic contexts, thereby extending SCT's explanatory power beyond stable, symmetrical environments.

## Author Contributions

**Zhao Yue:** Conceptualization, Methodology, Data Collection, Formal Analysis, Writing – Original Draft. **Seng Yue Wong:** Supervision, Writing – Review and Editing. **Kenny Cheah Soon Lee:** Supervision, Writing – Review and Editing.

## Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

## Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## AI Disclosure Statement

AI-assisted tools were used solely for language editing and clarity enhancement. All analyses, interpretations, and conclusions remain the sole responsibility of the authors.

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## Ethics Approval and Consent

Ethical approval was obtained from the Research Ethics Committee of Universiti Malaya. All participants provided informed consent before participation. The study was conducted in accordance with the Declaration of Helsinki and the Personal Data Protection Act (PDPA) of Malaysia.

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