P-ISSN 2734-9748 • E-ISSN 2815-6471

VMOST Journal of Social Sciences and Humanities

AUGUST 2026 • VOLUME 68 NUMBER 2

VMOST JOURNAL OF SOCIAL SCIENCES AND HUMANITIES * AUGUST 2026 * VOLUME 68 NUMBER 2

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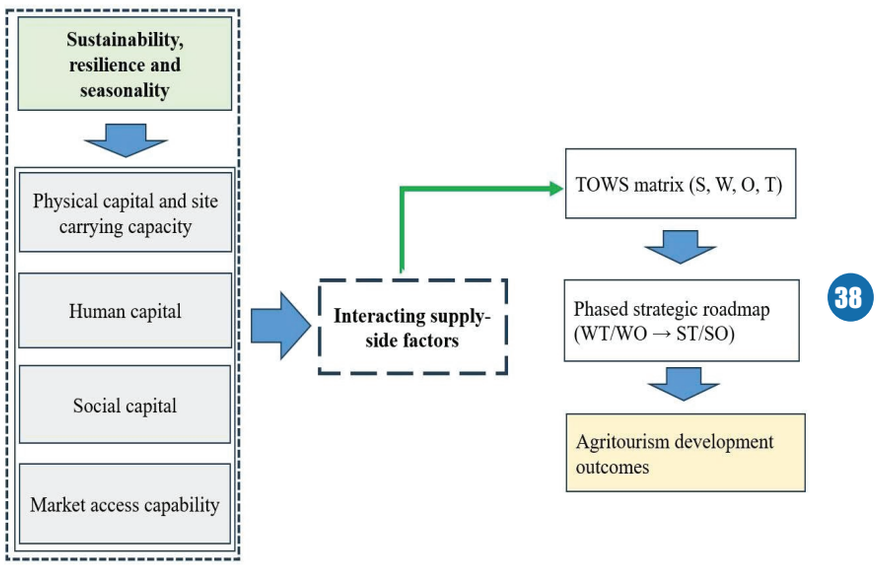
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Instructor-student interaction in online higher education: Comparing synchronous, asynchronous, and blended interaction at Can Tho University

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Received 11 January 2026; revised 18 March 2026; accepted 11 April 2026

Abstract:

This study examines the current state of instructor-student interaction in online learning at Can Tho University, a public comprehensive university in southern Vietnam, with a focus on three forms of interaction: synchronous interaction, asynchronous interaction, and blended interaction. The study adopts a quantitative, cross-sectional, descriptive-comparative survey design. Data were collected from 636 students and 57 instructors with prior experience in online or blended teaching and learning at Can Tho University. The analytical methods employed include descriptive statistics, independent-samples t-tests, one-way analysis of variance (ANOVA), and multiple linear regression analysis. Descriptive statistics were reported for both groups, whereas all inferential analyses were conducted using the student sample. The findings indicate that the level of interaction in online learning ranges from moderate to relatively high, with synchronous and blended interactions being evaluated more positively than asynchronous interaction. Gender does not result in statistically significant differences in interaction levels; however, academic performance and familiarity with online learning have significant effects on all three forms of interaction. Regression analysis further reveals that only synchronous interaction shows a statistically significant association with students' academic performance. This study provides empirical evidence within the context of Vietnamese higher education and offers practical implications for improving the effectiveness of online teaching and learning organisation.

Keywords: **asynchronous interaction, blended interaction, higher education, online learning interaction, synchronous interaction.**

Classification numbers: **1.3, 3.2, 3.3**

1. Introduction

The development of digital technologies and the ongoing digital transformation in higher education have accelerated the widespread implementation of online and blended learning formats. In this context, pedagogical interaction between instructors and students is widely regarded as a core factor determining learning quality, student engagement, and learning outcomes in online environments [1, 2]. A growing body of research indicates that interaction plays a role no less important than that of instructional content or technological platforms, while also contributing to the establishment of instructional presence and students' perceived academic support in online learning contexts [3-6].

In online higher education, instructor-student interaction is commonly classified into three main formats: synchronous interaction, asynchronous interaction, and blended interaction. Beyond student engagement and satisfaction, instructional interaction has been increasingly examined as a factor associated with academic performance in online higher education. Synchronous interaction, facilitated through real-time online meeting tools, enhances social presence, enables timely feedback, and supports active student participation [1, 7]. Empirical studies have shown that this form of interaction is positively associated with student engagement and learning outcomes, particularly in courses that require frequent communication and discussion [8]. By contrast, asynchronous interaction, implemented through learning management systems (LMS), discussion forums, email, and digital learning materials, offers greater flexibility and supports the development of students' self-regulated learning skills [2, 9]. However, the effectiveness of asynchronous interaction depends substantially on the level of instructional guidance and instructor feedback;

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when pedagogical structure and instructional presence are insufficient, student engagement may decline [3, 4, 10]. Consequently, recent studies have advocated blended interaction models that intentionally integrate synchronous and asynchronous activities to optimise learning experiences and support student engagement in higher education [11-13].

Prior research in Vietnamese higher education contexts indicates that lecturers' conceptions of online teaching are strongly shaped by established pedagogical orientations and sociocultural influences. U.N.T. Nguyen, et al. (2024) [14] demonstrated that, even in distance education courses, Vietnamese university lecturers tend to conceptualise online teaching through a teacher-centred lens, emphasising structured knowledge transmission, content control, and the guiding role of instructors - patterns partly rooted in Confucian heritage educational traditions. Complementing these findings, empirical evidence from Vietnamese tertiary online programmes suggests that while teaching presence has become increasingly emphasised to support student engagement and interaction, instructional practices often remain instructor-centric, reflecting both continuity and gradual pedagogical adaptation within the local educational context [15, 16]. Taken together, these contextual characteristics suggest that instructor-student interaction in Vietnamese online learning environments may operate differently from interaction patterns commonly reported in Western higher education systems.

In addition to international research, empirical evidence from Vietnam also underscores the important role of interaction in online learning. L.N. Hai, et al. (2021) [17] found that students' satisfaction with online learning was significantly influenced by the level of instructor-student interaction, particularly through direct communication and two-way feedback. Nevertheless, existing domestic studies have primarily focused on student satisfaction or learning experiences [18-19], while research simultaneously examining multiple interaction formats and comparing instructors' and students' perceptions remains limited. More broadly, despite the rapid expansion of research of online and blended learning interaction, existing empirical evidence remains disproportionately concentrated in Western and developed higher education contexts. Recent review and large-scale empirical studies indicate that much of the literature on online learning interaction, instructional presence, and learning outcomes has been conducted in North America, Europe, and other developed regions, while empirical research focusing on Southeast Asian and Vietnamese higher education contexts remains comparatively limited [4, 20]. This imbalance underscores the need for context-sensitive investigations that examine instructor-student interaction within underrepresented educational systems such as Vietnam.

In Vietnam, the COVID-19 pandemic accelerated the adoption of digital pedagogies across higher education institutions, compelling universities to rapidly implement online and blended learning models to ensure instructional continuity. Evidence from teacher education programmes indicates that this transition not only exposed challenges related to pedagogical adaptation and digital competencies among educators and learners, but also reinforced the necessity of sustaining online and blended learning approaches beyond the pandemic period [21]. As a result, understanding how different forms of instructor-student interaction function in online and blended learning environments has become a pressing practical concern for Vietnamese universities in the post-COVID-19 era. Despite the growing literature on interaction in online learning, several notable research gaps remain. *First*, most existing studies have been conducted in developed countries, whereas empirical evidence from higher education institutions in Vietnam is still scarce. *Second*, relatively few studies have simultaneously examined differences in perceptions of interaction between instructors and students. *Third*, the role of learner characteristics such as academic performance and familiarity with online learning in shaping instructor-student interaction has not yet been sufficiently clarified within a single research framework. Based on these identified gaps, the present study addresses the following research questions:

RQ1. Are there differences between instructors' and students' perceptions of synchronous, asynchronous, and blended interaction in online learning?

RQ2. Which student characteristics (gender, academic performance, and familiarity with online learning) influence the level of instructor-student interaction in online learning?

RQ3. How are synchronous, asynchronous, and blended interaction associated with students' academic performance?

Rather than seeking to produce entirely new theoretical claims, this study contributes context-sensitive empirical evidence from a Vietnamese higher education setting, where cultural expectations, institutional conditions, and pedagogical traditions may shape instructor-student interaction differently from patterns commonly reported in Western literature. By simultaneously comparing synchronous, asynchronous, and blended interaction modes and incorporating both student and instructor perspectives within a single institutional context, this

study offers nuanced insights into how established interaction mechanisms operate in an underrepresented educational environment.

2. Literature review

In online learning research, instructional interaction is commonly examined through participants' perceptions, as these perceptions shape engagement, participation, and learning behaviours. Instructor-student interaction is a key factor determining learning quality, student satisfaction, and academic outcomes in online and blended learning environments in higher education [2, 22]. Three main forms of interaction are commonly identified: synchronous interaction, asynchronous interaction, and blended interaction, each of which has distinct characteristics, roles, and implications for students' learning experiences [1, 12].

To provide stronger conceptual grounding for examining instructor-student interaction in online learning, this study draws on established interaction-oriented theoretical frameworks. Moore's Transactional Distance Theory posits that the psychological and communicative distance between instructors and learners is shaped by the interplay of dialogue, structure, and learner autonomy, with higher levels of dialogue reducing transactional distance and supporting learning outcomes [23]. From this perspective, synchronous interaction characterised by real-time communication and immediate feedback can reduce transactional distance more effectively than asynchronous formats, particularly in structured educational settings.

In addition, the Community of Inquiry (CoI) framework conceptualises effective online learning as the intersection of teaching presence, social presence, and cognitive presence [24]. Subsequent empirical research has demonstrated that teaching presence plays a critical role in facilitating meaningful interaction and sustaining student engagement in online learning environments [25]. In particular, instructional approaches that enable immediacy, visibility, and interactive dialogue features commonly associated with synchronous interaction have been found to support the development of teaching and social presence, thereby fostering conditions conducive to deeper cognitive engagement.

2.1. Synchronous interaction

Synchronous interaction occurs in real time through platforms such as Zoom and Google Meet, enabling direct communication and immediate feedback between instructors and students. This form of interaction enhances social presence, learning motivation, psychological support, and the creation of a positive learning environment [1, 26]. However, synchronous interaction is highly dependent on technological conditions and scheduling constraints, which may pose challenges for some students [27].

2.2. Asynchronous interaction

Asynchronous interaction takes place through discussion forums, LMS, email, and recorded video lectures, allowing students to engage in learning activities, exchange ideas, and receive feedback beyond scheduled class time. This form of interaction increases flexibility, supports self-directed learning, and is suitable for diverse student populations [2, 28]. Nevertheless, asynchronous interaction may reduce students' sense of connectedness if it is not complemented by additional interactive activities [29].

Recent studies highlight that the effectiveness of asynchronous online learning depends strongly on the pedagogical design of learning activities and the degree of instructional guidance provided to students. Research on the Southern Cross Model in Australia indicates that structured online learning modules incorporating interactivity, media richness, and constructive alignment can significantly enhance student engagement and academic performance [30]. Similarly, curriculum innovations emphasising guided learning pathways and active learning principles have been shown to support deeper engagement and the development of communities of inquiry in online higher education environments [31]. These findings suggest that asynchronous interaction can play an important role in supporting learning effectiveness when it is supported by clear instructional structure and responsive teaching practices.

2.3. Blended interaction

Blended interaction refers to the purposeful integration of synchronous and asynchronous interaction, leveraging the strengths of both formats to optimise learning effectiveness. This approach facilitates knowledge acquisition, sustains learning motivation, and supports the development of self-regulated learning and collaborative skills among students [11, 12, 32]. Previous studies emphasise the importance of clear course design, diverse learning activities, timely feedback, and the establishment of trusting instructor-student relationships in ensuring the effectiveness of blended interaction [2, 13].

In summary, the flexible integration of synchronous, asynchronous, and blended interaction, together with appropriate pedagogical design, constitutes a critical foundation for enhancing the quality and effectiveness of online learning in higher education institutions [1, 2, 12].

Beyond Western contexts, empirical studies from other Asian and developing higher education environments have also highlighted distinctive patterns

of online interaction and engagement. For example, a case study in an Indonesian university found that university students demonstrated higher engagement levels in synchronous online activities, as these settings enabled real-time interaction with instructors and peers, while asynchronous activities were still valuable but often required structured facilitation to support engagement [33]. Similarly, research with Chinese tertiary English as a foreign language (EFL) learners indicates that classroom interaction including learner-instructor and learner-content interaction is positively associated with students' perceptions of online learning quality and satisfaction, underscoring the role of interaction dynamics in shaping online learning experiences in non-Western contexts [34]. These findings suggest that culturally embedded expectations regarding instructional interaction and engagement may influence the relative effectiveness of different interaction modes, highlighting the need for context-sensitive empirical investigations in underrepresented higher education systems.

Although synchronous, asynchronous, and blended interaction have been widely examined in prior studies, existing research has often focused on one interaction mode in isolation. Comparatively fewer studies have examined these interaction modes within a single empirical framework, particularly in higher education contexts in developing countries. This suggests a need for comparative research that systematically examines similarities and differences across interaction modes.

3. Methods

This study is situated as an empirical case study conducted at a large public university in Vietnam, aiming to provide context-specific evidence on instructor-student interaction in online higher education.

3.1. Research design

This study employed a quantitative, cross-sectional, descriptive-comparative survey design. This design was appropriate for examining the level of instructor-student interaction in online learning, analysing differences according to learner characteristics, and comparing perceptions between instructors and students. The survey was conducted from September to November 2025, involving 636 students and 57 instructors who had prior experience in online or blended teaching and learning at Can Tho University.

3.2. Participants and sampling

The study participants included students and instructors with prior experience in online or blended teaching and learning at Can Tho University. A convenience sampling method was used, which was suitable given the research context. A total of 636 valid student questionnaires (Table 1) and 57 instructor questionnaires were included in the analysis. The student sample comprised undergraduate students from various academic disciplines, while data from instructors were collected to facilitate comparisons of perceptions regarding online interaction between the two groups. The sample size met the requirements for the statistical analyses employed in this study.

Table 1. Demographic characteristics of the respondents (students).

Survey information	Content	Quantity	Percentage (%)
Gender	Male	314	49.4
	Female	322	50.6
Academic performance	Low	2	0.3
	Average	30	4.7
	Good	169	26.6
	Very good	297	46.7
	Excellent	138	21.7
Familiarity with online learning	Low	21	3.3
	Moderate	318	50.0
	High	297	46.7

Source: Data collected by the authors.

Data were collected through an online questionnaire administered via Google Forms. The survey link was distributed to students and instructors who were accessible through institutional communication channels and had experience with online or blended courses. Participation was voluntary, and all valid responses received during the data collection period were included in the analysis. Due to the online and voluntary nature of the survey, the exact number of invitations distributed could not be determined; therefore, the study focused on maximising response completeness rather than calculating a response rate.

Although convenience sampling may limit the generalisability of the findings, this approach is widely used in educational research, particularly in studies of online learning contexts where participant accessibility and voluntary participation are essential considerations.

The study was conducted at Can Tho University, a large public university in the Mekong Delta region of Vietnam. As the data were collected from a single higher education institution, the findings should be interpreted with caution, and their generalisability to other institutional or national contexts may be limited.

3.3. Data collection instrument

Data were collected using a structured questionnaire consisting of two main sections. The first section gathered demographic and academic information, including gender, academic performance, and familiarity

with online learning. Students' academic performance was measured using self-reported cumulative grade point average (GPA) and subsequently categorised into five levels (low, average, good, very good, and excellent) for analytical purposes. This approach was adopted to facilitate group comparisons in the descriptive and comparative analyses, while the same variable was treated as a continuous outcome in the regression analysis examining the relationship between interaction types and academic performance.

The second section measured instructor-student interaction in online learning across three dimensions: synchronous interaction (3 observed items), asynchronous interaction (4 observed items), and blended interaction (3 observed items). All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Mean scores of the observed items were calculated to represent each interaction dimension in subsequent analyses.

The measurement items were developed based on established classifications of instructor-student interaction in online learning, distinguishing synchronous, asynchronous, and blended interaction as theoretically grounded and conceptually distinct dimensions. Content validity was ensured through careful adaptation of items from prior empirical studies and alignment with the research objectives. Given the clear theoretical foundations and the descriptive-comparative nature of the study, construct validity was addressed through internal consistency reliability rather than exploratory or confirmatory factor analysis. Cronbach's alpha coefficients for all interaction dimensions exceeded the acceptable threshold of 0.70, indicating satisfactory internal consistency.

3.4. Data analysis

Data were processed and analysed using SPSS software. Descriptive statistics were used to describe levels of synchronous, asynchronous, and blended interaction. Independent-samples t-tests and one-way analysis of variance (ANOVA) were conducted to examine differences in interaction levels according to learner characteristics. Multiple linear regression analysis was performed to examine the relationships between different forms of interaction and students' academic performance. The reliability of the measurement scales was assessed using Cronbach's alpha prior to conducting subsequent statistical analyses. The level of statistical significance was set at $p<0.05$.

Descriptive statistics were reported for both instructors and students to present their respective perceptions of instructor-student interaction. However, all inferential analyses, including independent-samples t-tests, one-way ANOVA, repeated-measures ANOVA, and multiple linear regression, were conducted using only the student dataset (n=636), as the study aimed to examine factors associated with students' academic performance.

3.5. Ethical considerations

The study adhered to ethical principles in social science research. Participants were informed of the research purpose and their right to refuse participation or withdraw at any time. All data were collected and analysed anonymously and were used solely for research purposes.

4. Results

In Table 2, the descriptive statistics indicate that the level of interaction between instructors and students in online learning ranged from moderate to high across all three interaction types. Cronbach's alpha values ranged from 0.820 to 0.925, indicating good to excellent internal consistency for all interaction scales.

Regarding synchronous interaction, students reported high levels of participation in live online sessions (M=4.11) and perceived timely instructor feedback during these sessions (M=3.96), whereas their proactive engagement in asking questions or sharing opinions remained at a moderate level (M=3.40). Instructors rated the timeliness of direct feedback during synchronous sessions more highly than students (M=4.16 compared to M=3.96).

For asynchronous interaction, both groups acknowledged the positive role of digital learning materials and instructor feedback delivered via the LMS (M>3.90). However, active engagement in discussion forums was reported to be relatively limited.

With respect to blended interaction, both students and instructors expressed positive perceptions of the effectiveness of integrating synchronous and asynchronous activities, with mean values ranging from 3.77 to 4.02.

Overall, the descriptive results suggest that instructor-student interaction in online learning at Can Tho University was perceived as moderate to high across all three interaction types. Synchronous and blended interactions were evaluated more positively than asynchronous interaction. Although there was a general convergence in perceptions between instructors and students, certain differences remained, particularly with regard to students' proactive participation. These findings provide a foundation for the comparative and regression analyses presented in the subsequent sections.

The descriptive statistics presented below include responses from both instructors and students. However, all subsequent inferential analyses reported in Tables 3-5 were conducted using the student sample (n=636) only.

Table 2. Descriptive statistics of instructor-student interaction by interaction type and participant group.

Item	Description	Students		Instructors		Cronbach's alpha
		Mean	*Std. deviation*	*Mean*	*Std. deviation*	
Synchronous interaction						
SI1	Students regularly attend live online classes (e.g., Zoom, Google Meet).	4.11	0.993	3.84	0.922	0.820
SI2	Students actively ask questions or share opinions during live online classes.	3.40	1.023	3.35	1.142	
SI3	The instructor provides direct and timely feedback during live online classes.	3.96	0.979	4.16	0.819	
Asynchronous interaction						
AI1	Students frequently communicate with instructors through discussion forums or the LMS.	3.36	1.062	3.32	1.055	0.889
AI2	Instructors upload videos, lectures, and materials that support effective self-study.	3.94	0.972	3.98	0.876	
AI3	Students receive feedback from instructors via email or the LMS.	3.95	0.986	3.91	0.872	
AI4	Students actively review recorded lectures or participate in forum discussions after class.	3.73	0.992	3.54	1.103	
Blended interaction						
BI1	Instructors effectively integrate live online classes (e.g., Zoom) with self-study activities on the LMS.	3.82	0.970	3.93	0.821	0.925
BI2	Students feel that blended learning helps them better understand the content and maintain learning motivation.	3.82	0.974	3.68	0.948	
BI3	Students can interact with instructors both during online classes and outside class via the LMS or email.	3.77	1.019	4.02	0.813	

Source: Data collected by the authors. Note: Synchronous interaction (SI); Asynchronous interaction (AI); Blended interaction (BI); Learning management system (LMS).

Table 3. Differences in synchronous, asynchronous, and blended interaction by student characteristics.

Independent variable	Dependent variable	Sig. (p-value)	Significant group differences (post-hoc)
Gender	SI	0.126	—
	AI	0.398	—
	BI	0.384	—
Academic performance (Low - Average - Good - Very good - Excellent)	SI	0.000	Excellent>Average, Good, Very good
	AI	0.000	Excellent>Low, Average, Good
	BI	0.001	Excellent>Average, Good; Very good>lower-performing groups (LSD)
Familiarity with online learning (Low - Moderate - High)	SI	0.000	High>Moderate>Low
	AI	0.000	High>Moderate>Low
	BI	0.000	High>Moderate>Low

Source: Data collected by the authors. Note: Synchronous interaction (SI); Asynchronous interaction (AI); Blended interaction (BI); Least significant difference (LSD).

The results in Table 3 indicate that gender did not produce statistically significant differences in synchronous, asynchronous, or blended instructor-student interaction in online learning. In contrast, academic performance and familiarity with online learning had significant effects on all three interaction types. Students with higher academic achievement and greater familiarity with online learning consistently reported higher levels of interaction than their counterparts. These findings provide an empirical basis for the subsequent regression analyses.

Table 4. Comparison of students' perceptions across three interaction types

Interaction type	Mean	SD
Synchronous interaction (SI)	3.822	0.856
Asynchronous interaction (AI)	3.745	0.870
Blended interaction (BI)	3.804	0.921

Repeated-measures ANOVA (Greenhouse-Geisser): $F(1.91, 1212.73)=10.32$, $p<0.001$, partial $\eta^2=0.016$. Bonferroni post hoc: SI>AI ($p<0.001$); BI>AI ($p=0.001$); SI≈BI ($p=1.000$).

Before examining the predictive effects of the three interaction types on students' academic performance, a repeated-measures ANOVA was conducted to compare students' perceptions of synchronous interaction (SI), asynchronous interaction (AI), and blended interaction (BI). As presented in Table 4, Mauchly's test indicated that the assumption of sphericity was violated ($p<0.001$); therefore, the Greenhouse-Geisser correction was applied. The analysis revealed a statistically significant

difference among the three interaction types, $F(1.91, 1212.73)=10.32$, $p<0.001$, partial $\eta^2=0.016$. Bonferroni-adjusted pairwise comparisons indicated that synchronous interaction (M=3.82, SD=0.86) and blended interaction (M=3.80, SD=0.92) were both rated significantly higher than asynchronous interaction (M=3.75, SD=0.87) ($p<0.001$ and $p=0.001$, respectively), whereas no statistically significant difference was found between synchronous and blended interaction ($p=1.000$). These findings suggest that students perceived synchronous and blended interaction slightly more positively than asynchronous interaction, providing a descriptive basis for the subsequent regression analysis presented in Table 5.

Table 5. Multiple linear regression results predicting students' academic performance.

Model		Unstandardised coefficients		Standardised coefficients	t	Sig.
		B	*Std. Error*	*Beta*		
1	(Constant)	3.120	0.149		20.907	0.000
	SI	0.179	0.082	0.186	2.167	0.031
	AI	0.021	0.095	0.022	0.217	0.828
	BI	-0.009	0.081	-0.010	-0.106	0.916

Source: Data collected by the authors. Note: Synchronous interaction (SI); Asynchronous interaction (AI); Blended interaction (BI).

The results in Table 5 of the multiple linear regression analysis indicate that the research model is statistically significant overall ($F(3, 632)=8.51$, $p<0.001$), suggesting that only synchronous interaction is significantly associated with students' academic performance. The model explains approximately 3.9% of the variance in academic performance ($R^2=0.039$).

At the predictor level, SI shows a positive and statistically significant association with academic performance ($\beta=0.186$, $p=0.031$). By contrast, AI ($\beta=0.022$, $p=0.828$) and BI ($\beta=-0.010$, $p=0.916$) do not demonstrate statistically significant associations in the regression model.

Overall, the findings indicate that among the three interaction types examined, only synchronous interaction serves as a significant predictor of students' academic performance. These results provide an empirical basis for the subsequent discussion.

5. Discussion

The descriptive results indicate that the level of instructor-student interaction in online learning at Can Tho University ranges from moderate to moderately high across the three interaction types: synchronous, asynchronous, and blended interaction. Among these, synchronous and blended interaction were perceived more positively by both students and lecturers than asynchronous interaction. This finding is consistent with previous studies emphasising the importance of real-time interaction in enhancing teaching presence, perceived instructional support, and student engagement in online learning environments [1, 7]. In particular, in the Vietnamese higher education context, the stronger perception of synchronous and blended interaction may also be explained by prevailing pedagogical traditions that emphasise instructor guidance, real-time explanation, and direct academic support. Specifically, prior research indicates that online teaching practices in Vietnam continue to reflect instructor-centred orientations shaped by sociocultural expectations and institutional norms, which may heighten students' reliance on synchronous interaction for learning clarification and engagement [14, 20].

Notably, while lecturers tended to rate the organisation and responsiveness of interaction activities relatively highly, students reported lower levels of active participation, particularly in synchronous interaction. This discrepancy reflects a perception gap commonly reported in online learning research, where instructors evaluate interaction based on instructional design, whereas students' perceptions are more strongly shaped by their actual learning experiences [4, 7, 17]. More broadly, such perception gaps have been widely documented in online and emergency remote teaching contexts, where instructors often evaluate interaction based on instructional planning and facilitation efforts, while students' perceptions are more closely linked to their actual participation opportunities, feedback experiences, and cognitive engagement during learning activities [4, 5, 33]. Taken together, this divergence highlights the importance of examining both instructor and student perspectives when evaluating interaction quality in online learning environments.

Turning to learner characteristics, the comparative analysis indicates that gender does not produce statistically significant differences across the three interaction types. This finding suggests that, in the context of online learning at Can Tho University, instructor-student interaction is not substantially influenced by gender-related factors, aligning with trends reported in recent higher education studies [12]. By contrast, academic performance and familiarity with online learning have significant effects on students' interaction levels. Students with higher academic achievement and greater familiarity with online learning consistently demonstrate higher levels of interaction across synchronous, asynchronous, and blended formats. These findings reinforce existing arguments that academic competence, self-regulation,

and technological experience are critical factors in fostering engagement and interaction in online learning environments [2, 29]. The multiple linear regression analysis reveals that among the three interaction types examined, only synchronous interaction shows a positive and statistically significant association with students' academic performance. This result highlights the central role of real-time interaction, which enables timely feedback, cognitive support, and sustained learning motivation. Consistent with this interpretation, the finding is consistent with previous studies, particularly in educational contexts characterised by instructor-centred approaches and an emphasis on direct interaction, such as in Vietnam [1, 26].

The findings should also be interpreted within the regional context of the Mekong Delta, where Can Tho University serves as the largest higher education institution for students from many surrounding provinces. Although digital transformation has accelerated across Vietnamese higher education, disparities in internet infrastructure, device accessibility, and digital competencies remain evident among students from rural and remote areas. Such contextual factors may reduce the effectiveness of synchronous interaction because unstable internet connections, limited bandwidth, and varying levels of digital literacy can restrict students' ability to participate actively in real-time online sessions. Consequently, strengthening regional digital infrastructure and improving students' digital competencies should accompany pedagogical improvements in order to maximise the effectiveness of online interaction.

However, although the regression model was statistically significant, its explanatory power was relatively modest (R^2=0.039), indicating that instructor-student interaction accounted for only a limited proportion of the variance in academic performance. This finding suggests that academic achievement is a multidimensional outcome influenced by numerous factors beyond interaction alone, including learning motivation, self-regulated learning, prior academic ability, assessment practices, socioeconomic background, and digital learning competencies. Therefore, the present findings should be interpreted as evidence of a statistically significant but practically modest contribution of synchronous interaction rather than a strong predictor of academic performance.

This finding aligns with prior research indicating that academic outcomes in online and blended learning are influenced by a broader constellation of factors, including self-regulated learning strategies, learning motivation, prior academic ability, instructional design quality, and assessment practices [2, 7, 9]. Therefore, the present findings should be interpreted as highlighting the contributory - rather than determinant - role of interaction in academic performance.

In this context, although asynchronous and blended interaction do not demonstrate significant predictive effects in the regression model, the descriptive and comparative results suggest that these interaction types still play an important supportive role by facilitating flexible learning opportunities and maintaining student engagement. From a pedagogical perspective, this indicates that the effectiveness of asynchronous and blended interaction may depend more heavily on pedagogical design and the extent to which these activities are meaningfully integrated into course assessment. Previous studies suggest that asynchronous and blended interaction modes primarily support learning indirectly by fostering flexibility, sustained engagement, and opportunities for reflection, rather than producing immediate gains in academic performance as measured by GPA [11, 13]. Therefore, their effectiveness is highly contingent on pedagogical design, assessment alignment, and the extent of instructional scaffolding provided by instructors.

Based on these findings, improving the effectiveness of online learning at Can Tho University should not rely solely on increasing synchronous interaction. Instead, greater attention should be given to strengthening the pedagogical design of asynchronous learning activities, particularly through timely instructor feedback and clearer instructional guidance that help students navigate the learning process [31, 32]. At the same time, the purposeful design of asynchronous and blended activities, accompanied by timely feedback and clear pedagogical structure, may contribute to improving student participation and learning quality in online and blended learning models. Overall, these findings underscore the importance of aligning interaction design with students' academic readiness and online learning experience to enhance the effectiveness of online and blended instruction.

Finally, consistent with prior research on blended and online learning design, these findings suggest that institutions should prioritise well-structured synchronous interaction while simultaneously enhancing the pedagogical integration of asynchronous and blended activities through clear guidance, timely feedback, and alignment with assessment strategies [12, 30].

6. Conclusions

This study examined the levels and roles of instructor-student interaction in online learning at Can Tho University, focusing on three interaction types: synchronous, asynchronous, and blended interaction.

The findings indicate that overall interaction levels are moderate to moderately high, with synchronous and blended interaction being perceived more positively than asynchronous interaction.

Comparative analyses reveal that gender does not produce significant differences in interaction levels, whereas academic performance and familiarity with online learning significantly influence all three interaction types. In particular, students with higher academic achievement and greater experience with online learning consistently report higher levels of interaction.

The regression results further demonstrate that among the interaction types examined, only synchronous interaction is significantly associated with students' academic performance. This finding highlights the central role of real-time instructional interaction, timely feedback, and teaching presence in supporting learning outcomes in online higher education.

From a practical perspective, the findings suggest that improving the effectiveness of online learning at Can Tho University requires not only maintaining meaningful synchronous interaction but also strengthening the pedagogical design of asynchronous learning environments. In particular, providing timely feedback and clearer instructional guidance may help enhance student engagement and learning effectiveness in asynchronous settings. Academically, this study contributes empirical evidence from the Vietnamese higher education context, thereby extending existing discussions on effective pedagogical interaction in online and blended learning environments.

7. Limitations

Despite its contributions, this study has several limitations that should be acknowledged. *First*, the cross-sectional survey design limits the ability to draw causal inferences between instructor-student interaction and students' academic outcomes. *Second*, the data were collected from a single public university in Vietnam, which may constrain the generalisability of the findings to other institutional or cultural contexts. *Third*, while lecturers' responses were included to provide descriptive and contextual insights, the relatively small number of lecturer participants precluded more advanced inferential analyses for this group.

In addition, this study adopted a purely quantitative research design and did not incorporate qualitative data, such as open-ended responses or interviews, which may have provided richer contextual insights into students' and instructors' experiences particularly regarding why synchronous interaction was perceived as more effective in this setting. Future studies employing mixed-methods or qualitative approaches are therefore recommended to deepen understanding of the contextual and pedagogical mechanisms underlying instructor-student interaction in Vietnamese higher education.

Another limitation concerns the use of self-reported GPA, which is common in educational research where access to official academic records is restricted, and prior studies have shown acceptable consistency between self-reported and actual academic performance when anonymity is ensured. Nevertheless, the authors acknowledge that self-reported academic performance may be subject to reporting bias, which is addressed as a limitation of the study.

Finally, the model explained a modest proportion of variance in students' academic performance, suggesting that additional factors such as learning motivation, self-regulation, instructional design quality, or assessment practices may also play important roles and should be examined in future research.

CRediT author statement

Doan Thi Kieu My: Data collection, Writing & Editing; Hoang Thi Kim Lien, Nguyen Thi Bich Phuong, Nguyen Thi Thuan, Say Ha: Data collection.

ACKNOWLEDGEMENTS

This study was funded by Can Tho University, under grant number: T2025-102.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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Factors influencing students' intention to use E-Portfolios through perceived benefits: A case study at Van Lang University

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Received 20 January 2026; revised 13 May 2026; accepted 14 June 2026

Abstract:

This study aims to examine the factors influencing the intention to use electronic portfolios (E-Portfolios) among higher education students at Van Lang University (VLU). Drawing upon foundational technology acceptance theories, specifically the Information Systems Success Model and the Technology Acceptance Model (TAM), the research proposes a streamlined three-construct framework isolating system quality (SQ), perceived benefits (PEB), and intention to use (ITU). Data were collected through a cross-sectional survey from a diverse sample of 156 undergraduate students, graduate students, and alumni, and subsequently analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The empirical results reveal that SQ significantly and positively impacts PEB (β=0.755, *p*<0.001), and PEB robustly influences ITU (β=0.637, *p*<0.001). However, SQ does not have a direct statistically significant effect on ITU (β=−0.013, *p*>0.05). Instead, PEB fully mediates the relationship between SQ and ITU (β=0.482, *p*<0.001). These findings underscore that technical excellence acts as a hygiene factor, meaning it is a necessary but insufficient condition for E-Portfolio adoption. Ultimately, this study provides actionable insights for universities and developers, emphasising the need to translate technical capabilities into concrete academic and career-ready scenarios to foster sustained student engagement.

Keywords: **E-Portfolios, intention to use, perceived benefits, PLS-SEM, system quality**.

Classification numbers: **1.3, 3.2, 3.3**

1. Introduction

In the landscape of modern higher education, E-Portfolios have emerged as a powerful tool, providing learners with a comprehensive platform to integrate, organise, and showcase evidence of their learning competencies, soft skills, work experience, and personal achievements [1, 2]. Unlike traditional paper-based portfolios, E-Portfolios offer unlimited storage, ease of sharing, and seamless updates, thereby supporting learners in self-assessment, career development, and enhancing their competitiveness in the labour market [1, 3]. Numerous universities worldwide have integrated E-Portfolios into their curricula to actively support and enrich the overall learning experience [3, 4].

However, the successful implementation of a new technology depends not only on the availability of the tool but also on the level of acceptance and intention to use of the end users - in this case, the learners [5]. Despite the immense potential of E-Portfolios, if learners lack the intention or motivation to utilise them, the effectiveness of these tools will be significantly constrained [6, 7].

To address this issue, this study explores the key factors influencing the intention to use E-Portfolios among learners at VLU, focusing on the roles of SQ and PEB. Specifically, this research is driven by the following research questions (RQs):

RQ1: How does the SQ of the E-Portfolio application impact learners' PEB?

RQ2: How does PEB influence learners' ITU of the E-Portfolio?

RQ3: Does SQ exert a direct effect on the ITU, or is its influence fully mediated by PEB?

The distinctive contribution of this study lies in its streamlined three-construct framework (isolating SQ, PEB, and ITU), which is specifically designed to assess an educational technology during its critical early deployment stage. By providing a clear, empirical demonstration of a full mediation effect, this research proves that technical quality must be translated into cognitive value to drive adoption. These findings not only advance the theory of technology acceptance in education but also offer

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practical recommendations for VLU. Ultimately, these insights will assist the university in refining application quality and communication strategies, thereby fostering effective E-Portfolio adoption and supporting the holistic development of learners.

2. Literature review and hypotheses

2.1. Concepts of E-Portfolios

E-Portfolios are digital educational tools that have evolved from traditional paper-based portfolios. They leverage information technology to expand capabilities in storage, organisation, sharing, and reflection [1].

In simple terms, a portfolio is a collection of evidence gathered to demonstrate an individual's learning journey and abilities over time. When transitioned into a digital format, E-Portfolios act as collections of digitised products and achievements. These materials include evidence, resources, and accomplishments representing an individual, a group, or an organisation. These materials may include text, graphics, or multimedia elements stored on web platforms or other electronic media [1].

Furthermore, E-Portfolios serve as management tools for organising work created from various applications and controlling access to information [2]. Previous studies described E-Portfolios as digital adaptations of traditional paper portfolios [3]. They provide learners with repositories to collect and present their work, while also serving as mechanisms to document growth in professional knowledge and skills. It is also emphasised that E-Portfolios can be structured as online personal learning environments, supporting lifelong and life-wide learning [4].

At their core, E-Portfolios also encourage personal reflection on one's work, thereby creating meaningful learning experiences. This process helps learners document and track their learning, develop a holistic and coherent view of their educational experiences, and enhance self-awareness [1, 2].

In addition, E-Portfolios provide professional platforms for learners to showcase their skills and knowledge to potential employers and research supervisors. They can be used to demonstrate competencies and outcomes [3] by providing tools for documenting skills and capabilities [1].

In summary, E-Portfolios are purposeful digital tools used not only to collect academic achievements but also as spaces for reflection and the presentation of competencies, significantly contributing to the academic and professional development of learners.

2.2. Theoretical framework

To establish a robust theoretical framework for investigating the factors influencing the intention to use E-Portfolios, this study draws upon widely validated theories of technology acceptance and use.

2.2.1. Technology Acceptance Model (TAM)

The TAM [5] is one of the most extensively utilised models to explain user technology acceptance behaviour. TAM focuses on two core determinants:

Perceived usefulness (PU): The degree to which a person believes that using a particular system would enhance their job performance.

Perceived ease of use (PEOU): The degree to which a person believes that using a particular system would be free of effort.

According to TAM, PU and PEOU are the primary factors influencing a user's attitude toward system use, which in turn affects behavioural intention and, ultimately, actual usage behaviour [5]. TAM has been broadly applied across various fields, including education, to predict learners' intentions to adopt new learning technologies. In the context of this E-Portfolio research, the concept of PEB in our model is analogous to TAM's "PU", as it reflects the values and advantages learners expect to gain from using E-Portfolios [5].

2.2.2. DeLone and McLean information systems (IS) success model

The Information Systems Success Model (ISSM) [6] provides a comprehensive framework for evaluating the success of an information system. This model comprises factors such as SQ, information quality, and service quality, which lead to system use and user satisfaction, eventually resulting in net benefits.

In this study, the SQ of E-Portfolios is conceptualised based on foundational models [6]. SQ refers to the desirable technical characteristics of the information system itself, such as ease of use, functionality, reliability, flexibility, and responsiveness.

2.2.3. Unified theory of acceptance and use of technology (UTAUT)

The UTAUT is a synthesis model that integrates elements from eight leading technology acceptance models, including TAM [5, 7]. UTAUT explains up to 70% of the variance in technology usage intention and consists of four core constructs:

Performance expectancy: The degree to which an individual believes that using the system will help them

attain gains in job performance.

Effort expectancy: The degree of ease associated with the use of the system.

Social influence: The degree to which an individual perceives that important others believe they should use the new system.

Facilitating conditions: The degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system.

Our research model does not directly test all UTAUT constructs. However, concepts such as PEB share similarities with "performance expectancy" in UTAUT. This similarity emphasises the role of perceived advantages in driving technology usage intention [7].

These theories provide a solid foundation for a deeper understanding of the factors impacting E-Portfolio usage intention, facilitating the systematic development of the research model and hypothesis testing.

This study focuses on ITU rather than actual usage behaviour as the primary dependent variable. In technology acceptance research, behavioural intention is recognised as the most immediate and reliable predictor of actual behaviour. Furthermore, as the E-Portfolio system is currently in its deployment phase at VLU, measuring intention allows for a proactive assessment of student acceptance before full-scale long-term usage data is available. Our model systematically integrates the technical focus of the ISSM [6] with the user-centric cognitive evaluations of TAM [5] and UTAUT [7]. This integration suggests that SQ (a technical factor) must first be translated into PEB (a cognitive evaluation) to drive the final behavioural intention to adopt the technology.

2.3. Hypotheses development

Based on the aforementioned theoretical frameworks and previous empirical studies on technology acceptance, this research proposes a model consisting of three primary constructs: SQ, PEB and ITU [5-7]. The relationships between these constructs are operationalised into the following hypotheses:

2.3.1. System quality and perceived benefits

SQ is a core component of the ISSM [6]. This concept refers to the quality of the technical characteristics of the information system itself, including reliability, ease of use, functionality, flexibility, and performance [6]. A technically sound system facilitates user interaction and exploitation of its features. When users experience a high-quality system, they tend to perceive greater benefits and value from its usage [6].

In the context of E-Portfolios, an application with high SQ (user-friendly interface, fast loading speed, robust security, and stable storage) enables learners to easily perform tasks, manage documents, and interact with features [1, 2]. Consequently, learners can more clearly perceive the developmental benefits of E-Portfolios. These include the ability to share information, support project completion, track academic progress, and prepare job applications [3, 4]. This relationship is analogous to how PEOU in TAM can lead to PU, as an easy-to-use system is often viewed as high quality and therefore more useful [5].

Based on this argument, the following hypothesis is proposed:

H1: SQ of the E-Portfolio application has a positive impact on learners' PEB.

2.3.2. Perceived benefits and intention to use

PEB in this study reflects the degree to which learners believe that using an E-Portfolio will provide positive values and outcomes for their learning process, skill development, and career preparation [3, 4]. This concept is similar to "PU" in TAM [5] and "performance expectancy" in UTAUT [7]. Both theories assert that the perception of benefits or performance is the strongest predictor of the intention to adopt and use a technology [5, 7].

In the specific context of E-Portfolios, the relationship between perceived benefits and usage intention is particularly crucial because E-Portfolios require a higher level of cognitive engagement and long-term commitment than typical learning management systems. Learners must continuously reflect on their learning, curate artifacts, and update their achievements. Without a strong belief that these efforts will lead to tangible academic growth or career advantages (e.g., professional branding and employability), learners are unlikely to form a sustained intention to use the tool, regardless of its technical features [3, 4]. When learners believe that E-Portfolios help them learn more effectively or enhance career opportunities, they will be more motivated to actively use the application [2, 3].

Therefore, the following hypothesis is proposed:

H2: PEB of the E-Portfolio application has a positive impact on learners' ITU.

2.3.3. System quality and intention to use

The direct relationship between SQ and ITU has been explored in various technology acceptance models [6]. It has been reported that SQ is a factor that directly influences system use and user satisfaction, which indirectly leads to net benefits [6]. A high-quality system (fast, reliable, easy to operate) typically encourages users to interact with it more directly [6].

For E-Portfolio users, system quality acts as a hygiene factor or a technical enabler. Given that E-Portfolios involve storing sensitive personal data and high-resolution media artifacts, the security (SQ4) and stability (SQ6) of the platform are essential for building initial trust [6]. A technically sound system reduces user frustration and lowers the barrier to entry, theoretically fostering a direct intention to adopt the platform as a reliable workspace for their digital identity [8].

However, this relationship may not always be strongly direct, especially when other mediating factors are present. While some foundational studies, such as the ISSM [6], find a direct impact of SQ on usage, other empirical research in educational contexts suggests that this effect is predominantly mediated through users' cognitive evaluations like PEB [1, 5]. Nevertheless, according to foundational theory, a technically well-functioning system creates a positive initial impression and reduces potential barriers, thereby encouraging usage intention [5, 6].

From the above analysis, the following hypothesis is proposed:

H3: SQ of the E-Portfolio application has a positive impact on learners' ITU.

2.3.4. The mediating role of perceived benefits

Based on the developed relationships, it can be seen that PEB likely plays a mediating role in the relationship between SQ and ITU [6, 7]. A high-quality E-Portfolio system (SQ) helps users easily perceive the benefits it offers (PEB), and these PEB then directly drive the intention to use the application [5]. In other words, the technical quality of the E-Portfolio facilitates the exploration and perception of benefits. Consequently, this perception of benefits acts as the direct driver of usage behaviour [6, 8].

This mediating relationship is consistent with many technology acceptance studies where the technical characteristics of a system influence user perceptions (e.g., usefulness), which subsequently impact behavioural intention [5, 8].

Therefore, the following mediation hypothesis is proposed:

H4: PEB plays a mediating role in the relationship between the SQ of the E-Portfolio application and learners' ITU.

2.4. Proposed research model

Based on the theoretical framework and the developed research hypotheses, the proposed research model was constructed to examine the relationships between SQ, PEB and ITU E-Portfolio among learners and alumni at VLU (Fig. 1). The model hypothesizes that SQ exerts a positive influence on both PEB and ITU, while PEB is expected to positively impact ITU. Notably, this study emphasises testing the mediating role of PEB in the relationship between SQ and ITU.

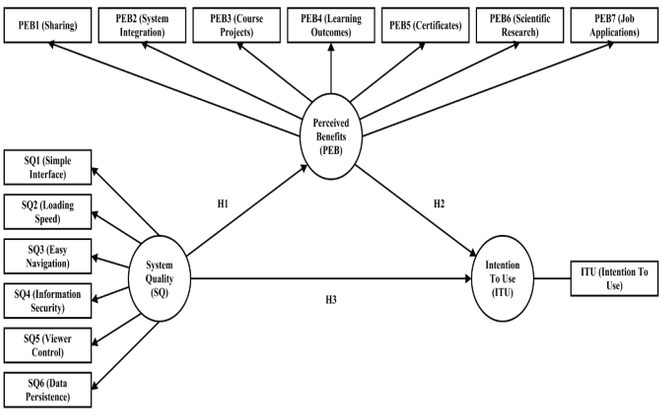


Fig. 1. Proposed research model. Source: Proposed by the author based on [5-7].

3. Methodology

3.1. Research design

This study was conducted using a quantitative approach with a cross-sectional survey design. The quantitative method was selected to test hypothesized causal relationships between factors in the model, specifically the impact of SQ and PEB on the ITU. A cross-sectional design allows for data collection from a target group at a single point in time, which is suitable for evaluating relationships between variables within the research context.

3.2. Data collection process

Participants: The survey targeted learners and alumni of VLU. Specifically, the sample encompasses diverse study levels, including undergraduate learners, graduate learners, and alumni. Selecting this varied group aims to gather a comprehensive perspective on E-Portfolio usage intentions and perceptions across different stages of the learners› experience at the university.

Sample size: The final sample of 156 valid responses is deemed sufficient for PLS-SEM analysis based on the widely used "10-times rule" [8]. According to this rule, the sample size should be at least ten times the maximum number of structural paths directed at a particular latent construct. In our model, the maximum number of paths directed at a construct is two (SQ and PEB pointing to ITU). Thus, a minimum of 20 samples would meet the basic requirement. With 156 samples, this study significantly exceeds the threshold. Although recent PLS-SEM guidelines increasingly advocate for formal

power analyses to determine optimal sample sizes, the current N=156 is adequate for this exploratory context. Nevertheless, future research should aim to expand the sample size to further enhance statistical power [8].

Data collection tool: Data were gathered through an online survey questionnaire. The questionnaire consists of two main parts:

Part 1: Demographic information: Collects basic participant information such as gender, education level (undergraduate, graduate, alumni), and faculty/major.

Part 2: Measurement scales: Includes questions evaluating the concepts of SQ, PEB, and ITU regarding E-Portfolios. Items were developed based on validated scales from previous studies and adjusted to fit the E-Portfolio context at VLU. All items were assessed on a five-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). Detailed survey items, along with their respective theoretical sources, are comprehensively listed in Table A1 of the Appendix.

Collection procedure: The questionnaire was distributed online via internal communication platforms and social media networks for VLU learners and alumni. Participation was entirely voluntary, and anonymity was guaranteed.

The demographic profiles of the 156 valid respondents are summarised in Table 1 below.

Table 1. Demographic characteristics of the survey sample (N=156).

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	70	44.87
	Female	86	55.13
	Total	156	100.00
Education level	Graduate	63	40.38
	Alumni	50	32.05
	Undergraduate	43	27.56
	Total	156	100.00

Source: Results based on questionnaire responses from July 2025.

The descriptive statistics indicate a relatively balanced distribution between male and female participants. Regarding education levels, graduate learners account for the largest proportion (40.38%), followed by alumni (32.05%) and undergraduate learners (27.56%). This diversity in educational backgrounds allows the study to capture insights from various groups with different experiences and requirements concerning E-Portfolios.

3.3. Data analysis method

The collected data were analysed using SmartPLS 3 software and the PLS-SEM technique. PLS-SEM was chosen for the following advantages:

First, suitability for complex research models with multiple latent variables and causal relationships.

Second, minimal requirements regarding the normal distribution of data.

Third, efficiency in handling small to medium sample sizes.

Fourth, particular suitability for exploratory research or when the primary goal is the prediction and explanation of variance (R^2).

The PLS-SEM analysis process involves two main stages:

3.3.1. Measurement model assessment

This stage evaluates the reliability and validity of the measurement constructs in the model:

Indicator reliability: Evaluated through outer loadings. An indicator is considered reliable when its outer loading is greater than 0.7. Indicators with loadings below 0.4 were considered for removal.

Construct reliability: Assessed using Cronbach's alpha (CA) and composite reliability (CR). These values should exceed 0.7 to ensure internal consistency among indicators within the same construct.

Convergent validity: Evaluated through average variance extracted (AVE). The AVE value must be greater than 0.5, indicating the construct explains at least 50% of the variance of its indicators.

Discriminant validity: Checked using the heterotrait-monotrait ratio (HTMT). The HTMT value should be less than 0.90 (or 0.85 in stricter cases). High HTMT values suggest constructs may overlap or measure the same concept. In this study, potential discriminant validity issues among the initial benefit-related constructs were resolved by merging them into a single, comprehensive concept: PEB. This consolidation ensures a more robust model and clearer discrimination between the system's technical quality and its perceived advantages.

3.3.2. Structural model assessment

Once the measurement model is validated, the structural model is assessed to test the hypotheses regarding causal relationships between latent variables using the following criteria:

Multicollinearity test: Evaluated using the variance inflation factor (VIF). A VIF value below 5 indicates no serious multicollinearity issues between independent variables [8].

Path coefficients evaluation: Path coefficients (β) represent the magnitude and direction of relationships between variables. Statistical significance is tested

using the bootstrapping technique (5000 sub-samples) to calculate T-statistics and P-values. A relationship is considered statistically significant when the P-value is less than 0.05 (T-statistics >1.96).

Effect size (f^2): The f^2 value measures the relative impact of a specific predictor construct on an endogenous construct. According to foundational guidelines [8], values f^2 of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively.

Coefficient of determination (R^2): R^2 indicates the percentage of the dependent variable's variance explained by independent variables in the model. Values of 0.25, 0.50, and 0.75 are classified as weak, moderate, and strong [8].

Predictive relevance (Q^2): The Stone-Geisser Q^2 value, obtained through the blindfolding procedure, is used to assess the model's predictive power. A $Q^2 \geq 0$ indicates that the model has predictive relevance for a particular endogenous construct [8].

Mediation analysis: The study uses specific indirect effects analysis to test the mediating role of PEB in the relationship between SQ and ITU. Similarly, the statistical significance of indirect effects is determined via P-values from bootstrapping results.

4. Results

4.1. Measurement model assessment

The measurement model was evaluated based on indicator reliability, construct reliability, convergent validity, and discriminant validity.

4.1.1. Indicator reliability

Table 2 presents the outer loadings of all indicators. After removing indicators with negative or excessively low loadings, all remaining indicators exhibited positive outer loadings. Most indicators have loadings greater than 0.7, indicating a high level of explanation for the constructs they measure. Some indicators with loadings between 0.5 and 0.7 (such as SQ1=0.689, PEB2=0.523, and PEB5=0.615) were retained as they significantly contribute to the conceptual content and do not compromise the overall reliability and validity of the constructs.

4.1.2. Construct reliability and convergent validity

Table 2 also provides the values for CA, CR, and AVE for each construct.

Table 2. Measurement model assessment results.

Construct	Indicator	Outer loadings	Cronbach's alpha	Composite reliability	Average variance extracted
SQ	SQ1	0.689	0.878	0.907	0.621
	SQ2	0.799			
	SQ3	0.772			
	SQ4	0.789			
	SQ5	0.905			
	SQ6	0.757			
PEB	PEB1	0.713	0.840	0.878	0.513
	PEB2	0.523			
	PEB3	0.835			
	PEB4	0.833			
	PEB5	0.615			
	PEB6	0.739			
	PEB7	0.705			
ITU	ITU	1.000	1.000	1.000	1.000

Source: SmartPLS analysis results based on survey data from July 2025.

The results indicate that all constructs in the model meet the requirements for reliability (both CA and CR are greater than 0.7) and convergent validity (AVE is greater than 0.5). This confirms the consistency and robust measurement capability of the scales for the research concepts.

4.1.3. Discriminant validity

Discriminant validity was assessed using the HTMT criterion, which indicates the degree of distinction between constructs. Table 3 presents the HTMT values.

Table 3. HTMT matrix.

Construct	SQ	ITU	PEB
SQ			
ITU	0.461		
PEB	0.808	0.661	

Source: SmartPLS analysis results based on survey data from July 2025.

The results show that all HTMT values are below the 0.85/0.90 threshold, confirming that the constructs in the model possess distinct discriminant validity; in other words, they measure independent concepts. Notably, the HTMT value between SQ and PEB has been significantly improved, ensuring the discriminant validity between these two concepts.

4.2. Structural model assessment

Once the measurement model was validated, the structural model was assessed to test the research hypotheses. Before evaluating the path coefficients, the model was checked for potential multicollinearity issues

using the VIF. As shown in Table 4, all inner VIF values ranged from 1.000 to 2.328, which are well below the conservative threshold of 3.3 or the standard threshold of 5.0. This confirms that multicollinearity among the independent variables does not bias the results of the structural model.

4.2.1. Path coefficients, hypothesis testing, and effect sizes

The evaluation of the structural model also involved analysing path coefficients (β), T-statistics, P-values, and effect sizes (f^2). Table 4 presents the comprehensive results.

Table 4. Hypothesis testing results.

Relationship	Path coefficient (β)	T-statistic	P	VIF	f^2	Conclusion
SQ → PEB (H1)	0.755	19.303	<0.001	1.000	1.328	Supported
PEB → ITU (H2)	0.637	4.322	<0.001	2.328	0.288	Supported
SQ → ITU (H3)	-0.013	0.071	0.472	2.328	0.000	Not Supported

Source: SmartPLS analysis results based on survey data from July 2025.

Hypothesis H1: SQ has a positive impact on PEB.

The results show a path coefficient of β=0.755 with p<0.001 and a T-statistic of 19.303. Notably, the effect size of SQ on PEB is 1.328, which is considered a large effect based on established statistical thresholds (f^2>0.35), confirming the substantial role of technical quality in shaping student perceptions. This indicates a strong, positive, and statistically significant relationship between SQ and PEB. Thus, H1 is supported, implying that as the quality of the E-Portfolio system improves, learners perceive greater potential benefits from its use.

Hypothesis H2: PEB has a positive impact on ITU.

The results show a path coefficient of β=0.637 with p<0.001 and a T-statistic of 4.322. The effect size for this path is f^2=0.288, representing a medium-to-large effect on usage intention. This demonstrates a strong, positive, and statistically significant relationship between PEB and ITU. Therefore, H2 is supported, meaning that when learners recognise more potential benefits from the E-Portfolios, their intention to use the application increases.

Hypothesis H3: SQ has a positive impact on ITU.

The results show a path coefficient of β=−0.013 with p=0.472 (p>0.05). The f^2 value for this path is <0.001, indicating a complete lack of direct impact. This indicates that there is no statistically significant direct relationship between SQ and the intention to use the E-Portfolios. Consequently, H3 is not supported, suggesting that the impact of SQ on ITU may be transmitted entirely through other mediating variables.

4.2.2. Coefficient of determination (R^2) and predictive relevance (Q^2)

The R^2 coefficient measures the proportion of variance in the dependent variable explained by the independent variables in the model. R^2 values can be classified as weak (0.25), moderate (0.50), or strong (0.75) [8]. Additionally, the Stone-Geisser Q^2 value, obtained through the blindfolding procedure, is used to assess the model's predictive relevance. A Q^2 value greater than zero indicates that the model has adequate predictive capability [8] (Table 5).

Table 5. Results of R^2 and Q^2

Construct	R^2	R^2 Adjusted	Q^2 (=1-SSE/SSO)
ITU	0.394	0.386	0.365
PEB	0.571	0.568	0.257

Source: SmartPLS analysis results based on survey data from July 2025.

ITU: The SQ and PEB constructs together explain 39.4% of the variance in ITU (R^2=0.394). This is a moderate and significant level of explanation, showing that the model has good predictive capability for the E-Portfolio usage intentions of VLU learners. With a Q^2 value of 0.365, the model demonstrates a solid predictive performance regarding the E-Portfolio usage intentions of VLU learners.

PEB: The SQ construct explains 57.1% of the variance in PEB (R^2=0.571). This is a moderate-to-strong and significant level of explanation, indicating that SQ is a very important predictor of PEB. The Q^2 value of 0.257 confirms the model's predictive relevance for this construct.

4.2.3. Specific indirect effects

Testing for indirect effects helps determine whether the mediator (PEB) transmits the impact from the independent variable (SQ) to the dependent variable (ITU) (Table 6).

Table 6. Specific indirect effects results.

Relationship	Indirect effect (β)	T-statistic	P	Conclusion
SQ → PEB → ITU (H4)	0.482	4.040	<0.001	Supported

Source: SmartPLS analysis results based on survey data from July 2025.

Hypothesis H4: PEB play a mediating role in the relationship between SQ and ITU.

The results show that the indirect effect of SQ on ITU through PEB is 0.482 with p<0.001. This indicates a statistically significant indirect effect from SQ to ITU through PEB. Therefore, H4 is supported, confirming that PEB serves as a critical mediating variable in this relationship. Combined with the lack of support for H3

(the direct effect SQ → ITU), this indicates that PEB plays a full mediation role. In other words, the quality of the E-Portfolio system influences learners' intention to use primarily by increasing their awareness of the benefits the E-Portfolios provide.

5. Discussion

The validation of the research model reveals that SQ and PEB collectively explain 39.4% of the variance in learners' usage intentions. This provides a robust framework for understanding E-Portfolio adoption at VLU. A unique theoretical contribution of this study is the empirical validation of this streamlined model. Unlike complex multi-variable frameworks, this focused approach clearly isolates the critical mechanisms at play during the early deployment phase of an educational tool. The most significant finding emerging from this design is the identification of a full mediation effect. While SQ serves as the foundational engine driving PEB (f^2=1.328), it does not directly influence ITU. This suggests that for university learners, technical excellence must be cognitively translated into perceived value before any actual adoption occurs.

The critical link between SQ and PEB (H1) is evidenced by a strong positive influence (β=0.755, p<0.001). This aligns perfectly with the ISSM [6]. This model posits that high-quality technical attributes are the primary catalysts for user gains. This finding is further consistent with previous research [2], which argued that a seamless digital interface is essential for learners to engage effectively with E-Portfolio features. In the specific context of VLU, the high f^2 value confirms that unless the system provides fast loading (SQ2) and easy navigation (SQ3), learners will struggle to recognize its academic utility. This supports the evolutionary view of the TAM [5], where technical ease of use serves as a direct gateway to perceived usefulness.

Furthermore, the confirmation of PEB as the primary driver of ITU (H2, β=0.637) reinforces the core tenets of both TAM [5] and UTAUT [7]. These frameworks identify the perception of utility as the most significant predictor of technology adoption. Our results echo previous findings [3], university learners are essentially pragmatic users motivated by real-world outcomes, such as efficient document sharing (PEB1) and career profiling (PEB7). Unlike general-purpose social media, an educational E-Portfolio is viewed as a competency certificate. Therefore, usage intention is not driven by the novelty of the platform but by its capacity to satisfy specific academic and professional goals.

Perhaps the most profound insight arises from the paradox of SQ and the subsequent full mediation effect (H3 and H4). The rejection of a direct path from SQ to ITU (H3) challenges foundational assumptions that technical ease directly translates to usage. These findings are built on the concept of SQ as a hygiene factor. They emphasise that a technically sound platform is a necessary, but not sufficient, condition for adoption. E-Portfolios are relatively effortful tools compared to passive, familiar learning management systems; they demand continuous curation and reflection. Therefore, learners must clearly perceive concrete academic and career advantages if they are to commit to sustained use. This pattern diverges from previous empirical work on general learning-technology adoption, where interface novelty often drives initial use. It underlines that for effort-intensive platforms, value-added outcomes are the ultimate deciding factor. The full mediation through PEB implies a sophisticated cognitive filter. Learners first evaluate how the system enhances their future before committing to its use.

6. Conclusions and recommendations

6.1. Conclusions

This study has successfully tested the model of factors influencing the intention to use E-Portfolios among learners at VLU, based on a theoretical framework developed from prominent technology acceptance models. The findings provide profound insights into the roles of SQ and PEB in shaping learners' intentions toward these digital tools.

Specifically, the research confirms that:

Firstly, SQ exerts a strong and positive impact on learners' PEB of E-Portfolios. This emphasises that a well-designed, stable E-Portfolio application with useful features enables learners to more readily recognize the value it offers.

Secondly, PEB serves as the most powerful predictor of the Intention to Use E-Portfolios. When learners believe that the application yields practical advantages for their academic performance, personal development, and career preparation, they exhibit a higher desire and intention to use it.

Notably, SQ does not have a statistically significant direct impact on ITU. Instead, the influence of SQ on usage intention is fully transmitted through PEB. This implies that a high-quality E-portfolio system is not sufficient on its own to directly drive usage intention; it must facilitate the users' recognition of specific benefits, which in turn fosters their intention to use the tool.

These results reinforce the perspective that, in the context of educational applications, focussing on enabling users to perceive and exploit the genuine values of technology is paramount.

6.2. Recommendations and practical implications

The empirical findings of this study offer a strategic roadmap for VLU and educational developers to foster sustainable technology adoption. The following recommendations are deeply rooted in the observed relationships between system quality, perceived benefits, and usage intention.

6.2.1. Enhancing system quality as a foundation for trust

While the results indicate that SQ does not directly drive ITU, its overwhelming influence on PEB (f^2=1.328) confirms that technical excellence is the non-negotiable prerequisite for user value. VLU must prioritise the optimisation of the user interface and overall experience (SQ1). Developers should move beyond basic functionality to create a student-centric ecosystem where navigation is intuitive (SQ3), and page responses are near-instantaneous (SQ2). A lag-free environment prevents frustration that often masks the potential benefits of the tool, ensuring that learners' first interaction with the E-Portfolio is positive and professional.

Beyond performance, the university must establish a privacy-first infrastructure to address concerns regarding data security (SQ4) and user control (SQ5). Learners are more likely to perceive E-Portfolios as beneficial if they feel in total command of their digital identity. Implementing a robust "viewer control" dashboard allows learners to selectively share specific artifacts - such as projects (PEB3) or transcripts (PEB4) - with designated mentors or recruiters. This sense of agency, coupled with a guarantee of data persistence (SQ6), transforms E-Portfolios from a mere mandatory requirement into a trusted lifelong digital vault.

6.2.2. Transforming perceived benefits into actionable success scenarios

Drawing a direct line from the empirical finding that PEB fully mediates the relationship between system quality and usage intention (β=0.482), it is evident that technical training alone will fail. Consequently, the university's communication strategy must shift fundamentally from describing software features to illustrating concrete life outcomes. VLU should initiate "career-ready scenarios" where E-Portfolios are positioned as a competitive advantage in the labour market. By organising mock interview sessions where learners use their digital portfolios to showcase verified certificates (PEB5) and cover letters (PEB7), the university provides a vivid demonstration of how organised document storage directly translates into professional employability. When learners see their peers successfully securing internships through these digital showcases, the PEB becomes a tangible reality.

Furthermore, the academic integration of E-portfolios should be framed as a "learning growth scenario" to maximise the sharing and integration benefits (PEB1, PEB2). Faculty members can play a pivotal role by designing "process-based" assignments where learners are rewarded for documenting the evolution of their course projects (PEB3) and scientific research (PEB6). By making E-Portfolios a mandatory reflection space, the university helps learners recognise that these tools are not just archives, but dynamic platforms for self-improvement. This shift in perception ensures that learners utilise the system not because they have to, but because they clearly see it as an essential partner in their educational journey.

6.2.3. Strategic integration into the Van Lang University digital ecosystem

To ensure long-term sustainability, E-Portfolios must be seamlessly woven into the broader VLU digital landscape, addressing the need for system integration (PEB2). The university should develop a "single sign-on" link between the E-Portfolio and the existing learning management system (LMS). This connectivity allows for a one-click transfer of high-quality assignments from a completed course directly into the student's permanent showcase. Such technical synergy reduces the effort required to maintain the portfolio, thereby reinforcing the perception that the system is both easy to use and highly valuable for academic continuity.

Finally, the university can foster a culture of achievement by gamifying the E-Portfolio experience. By introducing digital badges or "competency certifications" that automatically appear when a student uploads a new skill certificate (PEB5) or completes a research milestone (PEB6), VLU can trigger a continuous cycle of motivation. These small but meaningful digital rewards serve as constant reminders of the tool's utility, keeping the ITU high throughout the student's four-year tenure and beyond. This comprehensive approach ensures that technical quality and perceived value work in harmony to drive effective E-Portfolio adoption.

7. Limitations and future research

Despite its contributions, this study has certain limitations that provide avenues for future research.

Firstly, the sample size of 156 respondents, while statistically sufficient for PLS-SEM, is relatively modest and limited to a single institution (VLU) within the Vietnamese higher education context. This specific setting limits the generalisability of the findings to other types of institutions or different national contexts. Future studies should aim for larger, multi-institutional samples to enhance the external validity of the model.

Secondly, as all measures were collected via self-report questionnaires, the study may be subject to common method variance (CMV) and social desirability bias. While these are inherent limitations of cross-sectional survey designs, they suggest that learners might over-report their intentions. Future research could strengthen the findings by triangulating self-reported data with objective usage logs from the E-Portfolio system or incorporating qualitative insights through in-depth interviews.

Thirdly, the research model focused strictly on SQ and PEB to evaluate early-stage deployment. Future research could incorporate broader constructs from the UTAUT2 framework [9], such as "social influence" or "facilitating conditions" to provide a more holistic understanding.

Finally, future research should move toward evaluating E-Portfolios not just as standalone tools, but as integrated components of a comprehensive national digital learning ecosystem.

APPENDICES

Table A1. Questionnaire items used in the study.

Construct	Indicator	Survey statement	Source
SQ	SQ1	The E-Portfolio has a simple, intuitive, and easy-to-understand interface.	[6]
	SQ2	The system provides fast page loading speeds and smooth responsiveness.	[6]
	SQ3	It is easy to search for information and navigate within the system.	[6]
	SQ4	The application ensures high security for personal information and documents.	[6]
	SQ5	The system allows full control over who can view specific parts of the E-Portfolios.	[6]
	SQ6	The application guarantees data persistence (no loss of documents/data).	[6]
PEB	PEB1	Flexible sharing functions (public, private, or with specific individuals) are important.	[1, 5]
	PEB2	Integration with the university's existing systems (E-Learning, Portal) is essential.	[2, 3]
	PEB3	E-Portfolios are valuable for storing course projects, assignments, and practical products.	[3, 4]
	PEB4	The system is important for managing academic results and transcripts.	[1, 3]
	PEB5	Storing certificates (languages, soft skills, IT) in E-Portfolios is highly beneficial.	[1, 4]
	PEB6	E-Portfolios are suitable platforms for scientific research and graduation theses.	[3, 4]
	PEB7	The system effectively supports the storage of CVs and cover letters for job applications.	[4, 5]
ITU	ITU	I intend to use the E-Portfolios for my future academic and professional needs.	[5, 7]

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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Unfolding green innovation through green human resource management: The roles of green creativity and green transformational leadership

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Received 12 February 2026; revised 21 June 2026; accepted 11 July 2026

Abstract:

In the context of increasing environmental pressures and the growing importance of sustainable competitiveness, organisations are seeking strategic mechanisms to enhance green innovation (GI). This study investigates the relationships among green human resource management (GHRM), green creativity (GC), GI, and green transformational leadership (GTL). Drawing on the natural-resource-based view (NRBV) and social cognitive theory (SCT), the research develops and tests an integrated model explaining how organisational and psychological factors jointly foster GI outcomes. Data were collected from 339 managers and employees working in Vietnamese enterprises and analysed using partial least squares structural equation modelling (PLS-SEM) with SmartPLS. The findings indicate that GHRM significantly enhances both GC and GI. GC partially mediates the relationship between GHRM and GI, highlighting its role as an important internal mechanism translating HR practices into innovation outcomes. Finally, the results of the moderation analysis indicate that GTL significantly moderates the relationship between GHRM and GC. In addition, GTL positively moderates the relationship between GHRM and GI, strengthening the effectiveness of green HR practices under transformational leadership conditions. By integrating NRBV and SCT, this study extends the literature on green management by clarifying the multilevel mechanisms through which GHRM contributes to GI. The results offer important implications, suggesting that firms should combine green-oriented HR systems with transformational leadership behaviours to stimulate creativity and sustain competitive advantage.

Keywords: **green creativity, green human resource management, green innovation, green transformational leadership.**

Classification numbers: **1.4, 2.2, 7**

1. Introduction

Environmental concerns and sustainable practices have gained growing scholarly and managerial attention in recent decades [1]. Resource scarcity, environmentally conscious consumers, societal pressures, and stricter regulations are driving firms toward a more balanced approach to economic growth and environmental sustainability, prompting a shift from traditional management practices to environmentally friendly strategies to maintain competitiveness and long-term performance [2].

Within the sustainability agenda, sustainable development prioritises objectives such as emission reduction, energy efficiency, and material recycling. Achieving these goals increasingly depends on firms' capacity to innovate through environmental practices that support greener operations. In this regard, GI has been recognised as a critical mechanism through which firms reconcile environmental responsibility with competitive performance [3-5]. By encompassing green product, process, and managerial innovations, GI enables organisations to reduce environmental impacts and enhance energy efficiency [6]. Consequently, GI not only advances environmental protection but also strengthens corporate reputation and long-term organisational value [7]. Crucially, GC underpins the development of GI by generating novel and useful ideas that translate environmental intentions into sustainable outcomes [7, 8]. Amid the shift toward sustainability-oriented innovation, GHRM is a strategic approach for integrating environmental sustainability into organisational culture and practices [9]. GHRM comprises a bundle of HR practices through which organisations deliberately tackle environmental and ecological challenges [10, 11].

However, formal GHRM alone is insufficient to fully stimulate GC, highlighting the crucial role of leadership

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support [12, 13]. A recent systematic review on GI in the Vietnamese context emphasises the insufficient examination of mediating and moderating mechanisms in GI research, as most studies focus on simple linear relationships [14]. In the rapidly changing business environment, effective leadership is central to shaping organisations' strategic direction and navigating the present challenges of ecological governance [15, 16]. Effective leadership styles have been shown to positively shape individual and organisational learning outcomes, with transformational leadership promoting deep learning and core skill development [17]. Similarly, C.A. Ramus (2001) [18] highlights that supervisors' environmentally focused support is more effective in encouraging employee eco-initiatives than general managerial support. Therefore, by complementing HR systems, GTL helps articulate a clear environmental vision and motivates employees to achieve ecological goals [8], thereby strengthening GHRM effectiveness by fostering psychological support and shared environmental norms [19]. Together, GHRM and GTL create an enabling context in which GC and GI can thrive.

Research from Pakistan suggests that GTL's moderating role in the GHRM-GI relationship may be uneven, manifesting only through green ability rather than across all GHRM dimensions [20], indicating a nuanced and context-dependent interaction that warrants further investigation. Moreover, evidence on GTL's direct moderating role in the GHRM-GC relationship also remains limited, with prior research emphasising largely indirect mechanisms [21, 22]. Yet, both theoretically and empirically, the integrated mechanism linking GHRM, GC, and GI under the moderating influence of GTL remains insufficiently specified and tested. To address these gaps, this paper aims to answer the following research question (RQ):

RQ1: How does GHRM influence GC and GI in Vietnamese enterprises?

RQ2: Does GC mediate the relationship between GHRM and GI?

RQ3: How does GTL moderate the direct impacts of GHRM on both GC and GI?

Addressing these questions is particularly important in developing economies, where rapid economic growth often coexists with persistent environmental challenges and the limited diffusion of green initiatives [23, 24]. Vietnam offers a compelling empirical setting: as one of ASEAN's fastest-growing industrial economies, its GDP also expanded significantly. Despite strong government commitments, including a net-zero emissions pledge by 2050 at COP26 and ambitious renewable energy targets, environmental outcomes remain weak [25]. This underscores the need for Vietnamese firms to adopt proactive, internally driven sustainability strategies underpinned by strong leadership commitment and direction to foster GC and translate it into GI, thereby aligning economic growth with environmental responsibility.

Therefore, drawing on the NRBV and SCT, this study advances the sustainable HRM literature by developing an integrated framework that explains how and under what conditions GHRM translates into GI through GC and leadership influences [26-28]. Although SCT focuses on individual-level processes, this study leverages insights from Multilevel Theory to explain how individual cognitions and behaviours, through social interaction and coordination, emerge as collective capabilities and scale up to organisational outcomes [29]. Accordingly, SCT serves as the micro-foundation through which NRBV-based resources are translated into GC and firm-level GI outcomes [30], with the interaction between GHRM and GTL fostering a supportive organisational climate, thereby offering practical insights into how Vietnamese firms can leverage internal capabilities to reconcile economic and environmental objectives.

2. Literature review and hypotheses development

2.1. Green human resource management and green innovation

The NRBV extends the traditional RBV by integrating the natural environment into the analysis of firm resources and capabilities, emphasising environmentally oriented strategic capabilities as sources of competitive advantage [26, 31]. This competitive advantage is derived from three interrelated strategies: pollution prevention, product stewardship, and sustainable development, which integrate environmental protection with profitability [26, 32], and closely map onto the dimensions of GI [15, 33].

GI is commonly defined as product and process innovations that aim to reduce negative environmental impacts [34, 35]. However, this study conceptualises GI as comprising green product, process, and managerial innovation [36], with green managerial innovation providing the managerial foundation that supports and enables other GI through the effective adoption and operation of environmental management systems and tools [37].

Consistent with the NRBV, developing such capabilities and achieving GI require continuous improvement, stakeholder integration, and a shared vision [26, 33]. These are embedded in firms' human and leadership systems, relying on employees' skills, learning, and commitment, alongside managerial support for articulating and sustaining environmental goals

[11, 16, 30]. In this regard, GHRM functions as a strategic capability that mobilises firms' human capital to stimulate GI and strengthen competitive advantage [38], with additional evidence from Vietnam [39].

GHRM encompasses HR practices, including green recruitment and selection (GRS), green training and development (GT), green performance management (GP), green pay and rewards (GPR), and green employee involvement (GEI) [40, 41], through which organisations intentionally address environmental and ecological challenges [10, 11]. Through these practices, GHRM affects GI by fostering employees' environmental knowledge and skills through GT, stimulating their motivation to participate in environmental initiatives, and building an innovation-supportive climate that values employee involvement and idea sharing [42-44]. Innovation is more likely when organisations cultivate a work environment that encourages employees to generate new ideas, embrace change, and proactively explore opportunities [45].

Firms increasingly leverage HRM systems to meet environmental responsibilities and enhance GI [46]. They benefit from attracting and retaining employees who demonstrate strong environmental commitment and active engagement in green initiatives [10]. Such employees are more likely to engage in eco-friendly behaviours and create novel and useful ideas, which fosters GI, particularly in developing countries [42, 47]. Moreover, GEI enables employees to meaningfully apply their environmental knowledge and skills [48], while GP and GPR connect employee behaviours with organisational environmental goals, ultimately stimulating GI [39, 49]. Notably, recent evidence shows that GPR influences GI more strongly than other GHRM practices [50]. In Vietnam, research grounded in NRBV similarly confirms that GHRM significantly enhances GI among small and medium-sized enterprises in Ho Chi Minh City [51]. Taken together, these findings underscore GHRM as a strategic mechanism that strengthens firms' GI performance:

H1: GHRM positively affects GI.

2.2. Green human resource management and green creativity

Creativity refers to the generation of novel and useful ideas by an individual or a small team working together [52]. In organisational settings, creativity focuses on idea generation, whereas innovation involves the implementation of these ideas [53]. Extending this to the environmental domain, GC denotes the development of novel and useful ideas related to green products, services, processes, or practices, forming the ideational foundation for GI [8, 54]. Strategically, GC constitutes a critical component of organisational capability, as the development of new products serves as a growth engine for revenues, sales, and competitive advantage [55], as further reinforced by NRBV-based evidence [56].

However, the emergence of GC is not automatic. Creativity requires rethinking existing organisational policies, processes, and practices, and creative ideas are most likely to arise when employees receive strong co-worker feedback and support, as well as organisational encouragement [57]. Thus, in today's environmentally challenged business context, promoting GC has become increasingly essential for HRM [22].

GRS attracts and preferentially selects individuals with strong environmental awareness and alignment with the firm's green values [10, 55]. Such individuals are more likely to actively participate in GC, and their high environmental sensitivity enables organisations to adjust strategies in a timely manner in response to external environmental changes [58]. GT further enhances employees' environmental knowledge, awareness, and problem-recognition abilities, promoting proactive and voluntary participation in environmental activities [22, 59]. Through GEI, firms provide employees with autonomy and participatory platforms in environmental management, facilitating knowledge sharing and encouraging active engagement in GC [9]. Additionally, integrating green objectives and creativity criteria into GP and GPR, alongside constructive feedback, can enhance cognitive capabilities and promote GC by functioning as informational and enabling extrinsic motivators [60, 61].

Hence, we posit that GHRM creates supportive conditions, resources, and incentives that stimulate GC in Vietnam:

H2: GHRM positively affects GC.

2.3. Green human resource management, green creativity and green innovation

Creativity and innovation in the workplace have become increasingly critical to firms' performance and long-term success [53]. Innovation is rooted in creative ideas, as creativity at the individual and team levels initiates the innovation process [52]. Creativity enables firms to identify and exploit opportunities that enhance their innovative capacity [62].

In the green context, organisations strengthen GI outcomes by implementing creative green ideas in procedures, practices, or products [51]. From the NRBV perspective, sustainable competitive advantage arises from transforming conventional processes into environmentally sustainable solutions [26, 30]. Creativity is regarded as a key driver of innovative organisational solutions to environmental challenges, sustainable

products and processes that benefit both current and future generations [34, 62]. Moreover, growing customer demand for environmentally responsible practices intensifies firms' need to translate creative green ideas into sustainable innovations to enhance customer loyalty in the Vietnamese manufacturing context [7]. Ideas generated through GC, once operationalised in organisational processes, increase the likelihood of successful GI and competitive advantage [63].

GC also serves as a behavioural mechanism translating GHRM's cognitive and motivational effects into tangible outcomes, as evidenced by its mediating role between GHRM and sustainable development [9]. In this regard, without such creative engagement, the capacity of GHRM to drive sustainability may remain limited to policy compliance rather than enabling transformative change.

GHRM practices extend beyond operational adjustments by serving as strong psychological cues that influence employees' perceptions, attitudes, and subsequent green creative behaviours. As a result, employees who demonstrate GC are more inclined to generate environmentally friendly product ideas, reconfigure processes, and participate in eco-innovation activities, directly supporting organisational sustainability goals [13]. Evidence from Pakistan further supports this mechanism, showing that GHRM stimulates employees' green behavioural intentions and creativity by emphasising and rewarding pro-environmental behaviour, which leads to GI [64]. Therefore, we propose that:

H3: GC positively affects GI.

H4: GC mediates the relationship between GHRM and GI.

2.4. Green transformational leadership

The NRBV emphasises that long-term environmental strategies grounded in shared sustainability vision enable firms to build rare capabilities for competitiveness, especially in resource-constrained emerging markets [26]. Within this framework, GTL helps employees internalise a long-term sustainable environmental vision [30, 65]. Thus, this study views GTL as an intangible resource that fosters environmentally oriented capabilities and supports the attainment of sustained competitive advantage [15, 16, 33].

GTL describes leadership behaviours that inspire followers to pursue environmental objectives beyond expected performance standards [8]. Drawing on transformational leadership theory [66, 67], GTL comprises four dimensions: intellectual stimulation, individualised consideration, idealised influence (charisma), and inspirational motivation, reframed to advance environmental sustainability goals [19]. These dimensions are manifested through leaders' role modelling, the articulation of an inspiring green vision, the encouragement of critical thinking and innovation in environmental practices, and individualised support that fosters employees' environmental capabilities and value internalisation. Transformational leaders focus on increasing followers' intrinsic motivation, growth, and emotional support [67]. Therefore, they facilitate enduring changes and support followers' learning and development.

Accordingly, prior studies have predominantly examined GTL as an independent variable directly influencing GC [68, 69] and GI [11, 15]. Other streams of research highlight the moderating role of various leadership styles in the GHRM-GC relationship, including ethical leadership [70], spiritual leadership [1], and environmentally specific servant leadership [71]. However, despite emerging evidence that GTL moderates the indirect effects of GHRM on GC, the direct moderating role of GTL in the GHRM-GC relationship remains underexplored [21, 22].

Thus, to address this gap, we integrate SCT [27, 28] as a psychological perspective alongside the NRBV to explain more comprehensively how and why GTL moderates this relationship. In this theoretical framework, this study suggests that GTL serves as a multilevel integrative mechanism, linking the organisation's sustainable strategic orientation (NRBV) with individual-level factors in the SCT framework. This integration is theoretically appropriate because creativity is not a single outcome but a holistic configuration of social and psychological components [69].

Rejecting one-sided determinism, SCT advances a triadic model of reciprocal causation, wherein personal attributes, behavioural processes, and environmental conditions function as interdependent forces that jointly shape outcomes [27, 28]. From this perspective, individuals' learning and performance are influenced by observational learning, social modelling and regulated through self-efficacy and self-regulatory processes, rather than being driven solely by external factors. SCT therefore offers a micro-level explanation, emphasising that GC is shaped not only by formal HRM practices but also by leadership-driven social and psychological processes. To enrich the theoretical model, we also re-examine GTL's moderating role in the GHRM-GI relationship in a different institutional context, extending prior evidence from the Pakistan manufacturing sector to Vietnam across industries [20].

2.5. Interaction between green human resource management and green transformational leadership on green innovation and green creativity

According to SCT, employees do not merely comply with externally imposed standards but internalise behavioural norms through interaction with influential role models [27, 28], making leadership an important social cue in shaping pro-environmental motivation and conduct. Accordingly, when GHRM practices signal environmental expectations, GTL reinforces and legitimises these signals through role-modelling and social learning processes, ultimately strengthening their environmental moral commitment and self-efficacy [19, 72].

Reliance on formal GHRM mechanisms alone often leads to only partial integration of green employee engagement, making leadership role modelling crucial for complementing these practices to strengthen employee engagement across contexts (i.e., UK, Sweden, Germany). Within this perspective, GTL behaviours drive the adoption of environmentally oriented practices that enhance GI [20]. By embodying top management's environmental values, they shape how GHRM is interpreted and enacted. As top management's dedication and proactive stance toward environmental innovation provide the authority, resources, and legitimacy necessary to translate GHRM-driven employee engagement into tangible GI, especially green managerial innovation [73]. Besides, employees are more inclined to engage in environmental initiatives when supervisors adopt an open and participative communication style and managers actively involve employees across organisational levels regarding environmental issues [18, 43].

Through intellectual stimulation, GTL behaviours encourage employees to re-examine conventional processes, explore novel ideas, and generate creative solutions to environmental challenges [8, 74] by trusting their environmental abilities and acknowledging contributions [11]. In addition, by providing individualised consideration, they address followers' unique needs and offer coaching and feedback that promote environmental learning and creativity, and set high performance expectations that encourage followers to approach tasks creatively [21, 68]. Their charisma and inspirational motivation cultivate enthusiasm, articulate shared environmental goals, and raise employees' commitment to sustainability [69]. Consequently, GTL, aligned with GHRM, fosters a supportive psychological climate that enhances employees' engagement, GC, and GI.

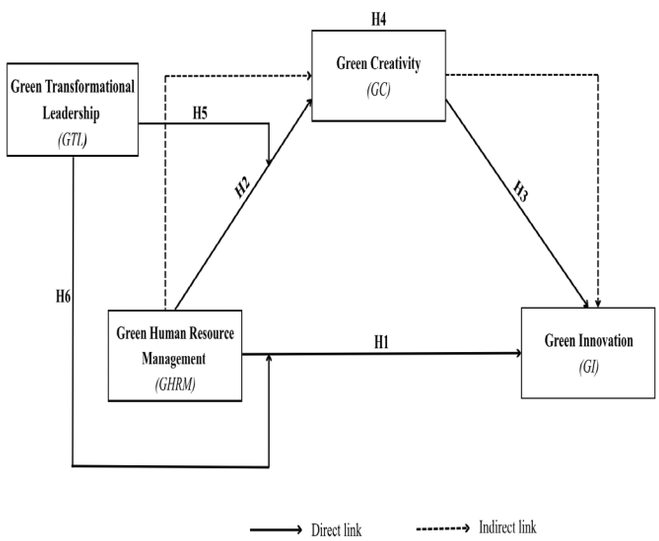
This supportive climate is particularly important for creativity. Since a supportive and rewarding environment is essential for fostering motivation toward creative idea generation [75], psychological safety enables risk-taking [76], and without environmental support, creative potential may remain unexpressed even among capable individuals [77]. Accordingly, supervisory support and facilitator competence are key to creating such climates [13]. Thus, these arguments suggest that GTL does not operate in isolation but interacts synergistically with GHRM to strengthen both GI and GC. Specifically, GTL moderates the GHRM-GC relationship by reinforcing green self-efficacy, intrinsic motivation, and a psychologically supportive environment for creativity, while simultaneously moderating the GHRM-GI relationship by legitimising environmental values, enhancing social learning, and guiding a green strategic vision. Accordingly, based on the integrated theoretical framework of NRBV and SCT, this study proposes the following hypotheses:

H5: GTL positively moderates the relationship between GHRM and GC.

H6: GTL positively moderates the relationship between GHRM and GI.

Based on the above theoretical arguments, the proposed research model is illustrated in Fig. 1.

Fig. 1. Proposed research model.



Source: The author's proposal.

3. Research methodology

3.1. Sampling and data collection

To empirically test the proposed model examining GHRM's effects on GI, with GC as a mediator and GTL as a moderator, this study adopts a quantitative research approach using a structured questionnaire as the primary data collection instrument. Data were

collected from employees and managers working in firms across multiple organisations in Northern Vietnam. A non-probability convenience sampling method was employed to ensure accessibility, flexibility, and efficiency in data collection. Following questionnaire development, an online survey was administered. Questionnaire items were adapted from established scales and translated into Vietnamese using back-translation to ensure equivalence and contextual appropriateness. Prior to the official survey, a pilot test was conducted with a small group to assess the clarity and reliability of the measurement items.

In line with methodological recommendations for PLS-SEM, the adequacy of the sample size was evaluated using the widely accepted "5-10 times rule" [78]. The final valid sample size of N=339 observations was therefore deemed sufficient and appropriate for subsequent PLS-SEM analysis.

3.2. Measurement of the constructs

The questionnaire consisted of observed variables measuring each construct in the proposed research model and employed a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Specifically, the GHRM construct was measured using 19 observed variables adapted from G. Tang, et al. (2017) [40]. The GTL and GC constructs comprised six observed variables, respectively, adopted from Y.S. Chen (2013) [8]. Finally, the GI construct was measured using nine observed variables adapted from Y. Zhang, et al. (2020) [36].

3.3. Data analysis

This study employs PLS-SEM to assess the proposed research framework and to empirically test the hypothesised relationships using the collected data [79].

Following data collection, SmartPLS 4 software was used to perform model estimation. The analysis process involved a two-stage evaluation procedure, first assessing the measurement model and then the structural model. Measurement model reliability was evaluated using Cronbach's alpha and composite reliability (CR) indicators, while construct validity was assessed through tests of convergent and discriminant validity.

The structural model was analysed to examine the hypothesised relationships. A bootstrapping procedure with 339 resamples was applied to estimate the statistical significance of the path coefficients, enabling the evaluation of hypothesis support and the strength of relationships among the latent constructs.

4. Results

4.1. Measurement model

Table 1. Results of factor loadings, reliability analysis and convergent validity.

Construct	Item	Factor loading	Cronbach's alpha	Composite reliability (CR)	AVE (Construct level)	VIF
GHRM	GHRM1	0.714	0.941	0.947	0.529	2.789
	GHRM2	0.68				2.755
	GHRM3	0.72				2.6
	GHRM4	0.674				2.944
	GHRM5	0.747				3.589
	GHRM6	0.73				3.534
	GHRM7	0.756				3.352
	GHRM8	0.671				2.453
	GHRM9	0.733				2.985
	GHRM10	0.702				2.652
	GHRM14	0.804				3.347
	GHRM15	0.779				3.32
	GHRM16	0.715				2.363
	GHRM17	0.761				3.128
	GHRM18	0.72				2.518
	GHRM19	0.714				2.635
GI	GI1	0.824	0.924	0.938	0.654	2.974
	GI2	0.874				3.338
	GI3	0.806				2.809
	GI4	0.823				3.125
	GI5	0.745				2.33
	GI6	0.714				2.078
	GI7	0.84				3.354
	GI8	0.832				2.821
	GI9	0.824				2.974
GTL	GTL1	0.806	0.912	0.931	0.693	1.961
	GTL2	0.852				2.803
	GTL3	0.855				3.375
	GTL4	0.822				2.794
	GTL5	0.82				2.582
	GTL6	0.839				3.822
GC	GC1	0.802	0.917	0.935	0.708	2.257
	GC2	0.853				3.664
	GC3	0.83				2.526
	GC4	0.763				1.937
	GC5	0.907				4.135
	GC6	0.884				4.12

*: GHRM: green human resource management, GC: green creativity, GI: green innovation, GTL: green transformational leadership.

The measurement model was evaluated by examining the internal consistency, reliability, and convergent validity of the latent constructs, including GHRM, GC, GI, and GTL. Internal consistency reliability was assessed using Cronbach's alpha and CR, while convergent validity was evaluated based on the average variance extracted (AVE).

The results reported in Table 1 correspond to the second estimation of the measurement model. During the initial assessment, GHRM11, GHRM12, and GHRM13 exhibited outer loadings below the acceptable threshold of 0.60 and were therefore removed. The model was subsequently re-estimated using the remaining 16 GHRM indicators. As shown in Table 1, all constructs demonstrate strong internal consistency reliability. Specifically, Cronbach's alpha values range from 0.912 to 0.941, exceeding the recommended threshold of 0.70 [79]. Similarly, CR values range from 0.931 to 0.947 and are well above the minimum acceptable level of 0.70, indicating a high degree of reliability across all constructs [80].

With regard to convergent validity, all AVE values exceed the recommended threshold of 0.50. Specifically, the AVE values are 0.529 for GHRM, 0.654 for GI, 0.693 for GTL and 0.708 for GC, indicating that each construct explains more than half of the variance of its respective indicators. In addition, the retained indicator loadings range from 0.671 to 0.907, remaining above the minimum acceptable threshold. Taken together, these results confirm satisfactory convergent validity and support the retention of all indicators in the re-estimated measurement model.

To examine potential multicollinearity among the measurement indicators, the outer variance inflation factor (VIF) values were assessed. According to established guidelines, VIF values below 5 indicate the absence of serious multicollinearity issues [78]. As presented in Table 1, all outer VIF values range from 1.937 to 4.135, remaining below the recommended threshold. Although several indicators exhibit relatively higher VIF values (GC5=4.135; GC6=4.120; GTL6=3.822), these values are still within acceptable limits. Therefore, multicollinearity among the indicators is not a concern, and the measurement model is statistically appropriate for further analysis.

4.2. Structural model

Table 2. Collinearity assessment results.

	GC	GI
GC		1.216
GHRM	1.571	1.715
GI		
GTL	1.63	1.719

*: GHRM: green human resource management, GC: green creativity, GI: green innovation, GTL: green transformational leadership.

Prior to testing the structural relationships, collinearity among the predictor constructs was examined using inner VIF values (Table 2). All inner VIF values range from 1.216 to 1.719, which is well below the recommended threshold of 5 [78]. These results indicate that multicollinearity is not a concern in the structural model, ensuring that the estimated path coefficients are not biased by collinearity issues.

Table 3. Coefficient of determination (R^2) and adjusted R^2 values.

	R^2	R^2Adjusted
GC	0.178	0.170
GI	0.411	0.404

*: GC: green creativity, GI: green innovation.

The explanatory power of the model was evaluated using the coefficient of determination (R^2) for the endogenous constructs (Table 3). The result for GC (R^2=0.178; adjusted R^2=0.170) indicates that 17.8% of the variance in GC is explained by its antecedents. This level of explanatory power can be considered weak to moderate.

In contrast, the result for GI (R^2=0.411; adjusted R^2=0.404) indicates that the model explains 41.1% of the variance in GI. According to commonly accepted benchmarks, this reflects a moderate level of explanatory power, demonstrating that the proposed model has satisfactory explanatory capability for GI outcomes.

Table 4. Effect size (f^2) values for the structural model.

	GC	GI
GC		0.215
GHRM	0.092	0.059
GTL x GHRM => GI		0.13
GTL x GHRM => GC	0.051	
GTL	0.055	0.094

*: GHRM: green human resource management, GC: green creativity, GI: green innovation, GTL: green transformational leadership.

To further assess the relative impact of each exogenous construct on the endogenous variables, effect size (f^2) values were examined (Table 4). The results indicate that GC has a medium effect on GI (f^2=0.215), highlighting the important role of GC in driving GI.

The effects of GHRM on GC (f^2=0.092) and GI (f^2=0.059) are classified as small, suggesting that although GHRM contributes to both outcomes, its independent influence remains relatively modest. Similarly, the interaction effect of GTL and GHRM on GC has a small effect size (f^2=0.051), while the interaction effect on GI is stronger but remains below the conventional threshold for a medium effect (f^2=0.130). In addition, GTL exhibits small effect sizes on both GC (f^2=0.055) and GI (f^2=0.094).

Table 5. Heterotrait-Monotrait (HTMT) ratio of correlations.

	GC	GHRM	GI	GTL
GC				
GHRM	0.35			
GI	0.582	0.335		
GTL	0.319	0.556	0.37	

*: GHRM: green human resource management, GC: green creativity, GI: green innovation, GTL: green transformational leadership.

Although discriminant validity is primarily assessed within the measurement model, the HTMT ratio was further examined to ensure that the structural relationships among constructs are not confounded by conceptual overlap. As shown in Table 5, all HTMT values among the core constructs (GHRM, GC, GI, and GTL) are well below the conservative threshold of 0.85, with the highest value being 0.582 between GC and GI. These results confirm that discriminant validity is adequately established, supporting the robustness of the structural model estimates.

4.3. Results

Table 6. Path coefficients and hypothesis testing results.

Hypothesis	Effects	β	t-value	p-value
H1	GHRM => GI	0.244	3.266	0.001
H2	GHRM => GC	0.344	5.083	< 0.001
H3	GC => GI	0.392	6.012	< 0.001
H4	GHRM => GC => GI	0.135	3.578	< 0.001
H5	GTL x GHRM => GC	0.146	2.258	0.024
H6	GTL x GHRM => GI	0.201	4.111	< 0.001

*: GHRM: green human resource management, GC: green creativity, GI: green innovation, GTL: green transformational leadership.

The results of the structural model analysis provide support for the proposed direct relationships among the core constructs. Specifically, H1, which examines the direct effect of GHRM on GI, is supported. The path coefficient from GHRM to GI is positive and statistically significant (β=0.244, t=3.266, p=0.001), indicating that the adoption of GHRM contributes positively to firms' GI outcomes. Regarding H2, the findings confirm that GHRM has a positive and significant effect on GC (β=0.344, t=5.083, p<0.001), providing strong empirical evidence that GHRM enhances employees' GC. The results also support H3, which posits a positive relationship between GC and GI. The path coefficient from GC to GI is positive and highly significant (β=0.392, t=6.012, p<0.001), suggesting that higher levels of GC among employees play a critical role in driving GI within organisations.

Furthermore, GC partially mediates the relationship between GHRM and GI. The indirect effect of GHRM on GI through GC is positive and statistically significant (β=0.135, t=3.578, p<0.001), thereby supporting H4. As the direct effect of GHRM on GI remains statistically significant, GC is identified as a partial mediator.

Finally, the results of the moderation analysis indicate that GTL significantly moderates the relationship between GHRM and GC. The interaction effect is positive and statistically significant (H5: β=0.146; t=2.258; p=0.024), supporting H5. In addition, GTL also significantly moderates the relationship between GHRM and GI. The interaction term exhibits a positive and statistically significant effect (H6: β=0.201; t=4.111; p<0.001), indicating that the positive impact of GHRM on GI becomes stronger under higher levels of GTL. Therefore, H6 is supported.

5. Discussion

This study examines the relationships among GHRM, GI, and GC, while also investigating the moderating role of GTL. The results confirm significant positive relationships, showing that GHRM strongly influences both GC and GI. Specifically, GHRM affects GC mainly at the micro-psychological level by enhancing employees' environmental awareness, intrinsic capabilities, and problem-identification ability through supportive recruitment, training, and feedback practices that encourage green creative engagement [58, 61]. By contrast, the impact of GHRM on GI is more salient at the macro-strategic level. Grounded in the NRBV, GHRM not only develops human capital but also contributes to sustainable competitive advantage by enabling organisations to transform green ideas into green product, process, and managerial innovations [26, 38, 46]. This indicates that GHRM simultaneously supports both the ideation and implementation stages of innovation through distinct underlying mechanisms.

Moreover, the study reinforces W. Song, et al. (2018) [81] by confirming the positive effect of GC on GI. This finding is theoretically grounded, as GC represents a critical ideation stage that forms the foundation for firms' innovation capability [53]. In addition, GC is confirmed as a partial mediator between GHRM and GI, indicating that GHRM enhances GI by shaping employees' green awareness, attitudes, and creative behaviours, thereby improving ecological efficiency and proactive innovation activities [13]. This mechanism is particularly salient in developing countries, where technological and financial constraints make GI heavily dependent on employee creativity, with GHRM serving as a key enabling foundation [9].

While these relationships are statistically significant, the relatively small effect sizes and modest explanatory power for GC suggest that GHRM represents only one component within a broader system influencing green outcomes. This is consistent with the inherently complex

and multidimensional nature of GC and GI, which are shaped not only by organisational practices but also by individual characteristics, team dynamics, and external pressures such as market demand and environmental regulation [82]. Moreover, in the Vietnamese context, GHRM practices are often implemented in a formal or symbolic manner to meet external expectations, rather than being deeply embedded in daily organisational routines. As a result, their direct impact on GI remains limited. Instead, GHRM tends to exert a more gradual and indirect influence by shaping employees' awareness, attitudes, and behaviours over time, which are then translated into innovation outcomes through GC [83]. Therefore, GHRM should be understood as an enabling mechanism that supports, rather than solely drives, GC and GI, particularly in developing-country contexts, where a multitude of economic and socio-cultural constraints often render the comprehensive adoption of green practices highly challenging and amplify the influence of external factors [6].

Regarding GTL, the findings confirm its positive moderating effect on the GHRM-GI relationship, consistent with F.H. Awan, et al. (2023) [20]. By extending this evidence to the Vietnamese context, the study demonstrates that GTL strengthens the effectiveness of GHRM in promoting GI across emerging economies.

Extending prior research on the indirect role, this study provides empirical evidence of the direct moderating role of GTL in the GHRM-GC relationship [21, 22]. Drawing on SCT, GTL functions as a role-modelling mechanism that enhances employees' self-efficacy and intrinsic motivation through observational learning and self-regulation [27, 28]. By fostering a supportive psychological climate characterised by engagement and psychological safety, GTL facilitates the translation of GHRM into GI and GC outcomes, particularly in developing-country contexts with high power distance and strong leadership influence [69, 78, 84].

5.1. Theoretical contributions

First, this study advances the literature by explicitly distinguishing between the micro-psychological and macro-strategic mechanisms through which GHRM influences green outcomes. While prior research has generally treated GHRM as a homogeneous driver, our findings demonstrate that it simultaneously shapes idea generation (GC) and innovation implementation (GI) through fundamentally different pathways.

Second, the study identifies the underlying mechanisms and boundary conditions through which GHRM generates positive outcomes for GI, particularly through the influence of GC and GTL. GC plays a partial mediating role in the GHRM-GI relationship, especially in developing countries where innovation relies heavily on employees' creativity. The role of GTL in amplifying the effects of GHRM on both GC and GI is reaffirmed through the integration of NRBV and SCT.

Third, by focusing on a developing-country context, this study provides context-specific insights into how GI is fostered under resource constraints, highlighting the heightened importance of employee creativity as a strategic asset.

5.2. Practical implications

Based on the empirical findings, this study offers several practical implications for organisations.

First, organisations should strengthen GTL to maximise the effectiveness of GHRM in promoting GC and GI. Since the findings indicate that GTL enhances the positive influence of GHRM, firms should place greater emphasis on cultivating leaders who actively communicate environmental values, encourage employees' participation in sustainability initiatives, and support experimentation with environmentally friendly practices. Developing green leadership capabilities can therefore improve the implementation of GHRM and create conditions that foster employees' green behaviours and innovation.

Second, organisations should ensure that GHRM is implemented consistently and aligned with broader sustainability objectives. Rather than treating environmental initiatives as isolated activities, firms should integrate green values into core HR practices, including GP, employee development, and reward systems. Such alignment helps reinforce employees' environmental commitment, enhances GC, and ultimately contributes to stronger GI.

Third, given the significant role of GC in driving GI, organisations should create supportive mechanisms that encourage employees to generate, share, and develop green ideas. Providing opportunities for employees to participate in environmental initiatives, recognising valuable contributions, and facilitating the transformation of creative ideas into practical improvements can strengthen organisational innovation capabilities and increase the likelihood that green ideas produce tangible outcomes.

Finally, organisations should foster a supportive organisational climate that encourages continuous learning, collaboration, and experimentation with environmentally sustainable practices. This implication is particularly relevant for Vietnamese enterprises, where resource constraints may limit large-scale environmental investments. By embedding sustainability into everyday organisational practices and encouraging employees' active involvement, firms can gradually strengthen GC and GI, thereby improving their long-term environmental performance and competitiveness.

5.3. Limitations and future research

Despite its contributions, this study has several limitations that should be acknowledged.

First, the data were collected mainly from organisations in Northern Vietnam, which may limit the generalisability of the findings. Future research should include other regions of Vietnam or conduct cross-regional and cross-cultural comparisons to enhance external validity.

Second, this study employed a cross-sectional, limiting causal inference and the ability to capture the cross-level relationships proposed in the theoretical framework. Although GC is conceptualised at the individual level while GHRM and GI operate at the organisational level, the empirical analysis was simplified to a single-level model due to the complexity of the framework and the study's primary focus on the moderating role of GTL. As suggested by D. Tofighi, et al. (2013) [85], future studies should adopt longitudinal and multilevel approaches, such as multilevel structural equation modelling, to better examine these cross-level mechanisms.

Third, GC is a complex construct that may be influenced by various individual, organisational, and contextual factors beyond those included in this model. Future research could incorporate additional antecedents, such as organisational culture, psychological empowerment, environmental knowledge, green climate, or leadership styles, to provide a more comprehensive understanding of the drivers of GC and GI.

Fourth, the use of self-reported data from a single source may introduce common method bias despite the procedural remedies applied. Future studies are encouraged to collect data from multiple sources or apply temporal separation techniques to reduce this risk.

Finally, the use of convenience sampling may reduce sample representativeness and introduce sampling bias. Future research should employ probability sampling techniques to improve the generalisability of the findings.

CRediT author statement

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COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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TOWS matrix in agritourism development: A comprehensive strategic study in the former Quang Binh province

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Received 27 October 2025; revised 13 April 2026; accepted 12 May 2026

***Abstract*:**

This study develops a phased, resilience-oriented strategic framework for agritourism development in the former Quang Binh province, Vietnam, using evidence collected before the 2025 administrative reorganisation. Adopting a qualitative case-study design, the study applies a TOWS matrix to supply-side evidence from semi-structured, in-depth interviews with 13 agritourism owners/managers and four local officials. The data were analysed across five dimensions: physical capital and site carrying capacity; human capital; social capital; market access capability; and sustainability, resilience, and seasonality. The findings reveal a central tension: abundant agricultural and cultural resources and strong community cohesion coexist with weak inter-business linkages, limited tourism and marketing capabilities, restricted access to capital and technology, pronounced seasonality, and high exposure to natural hazards. The TOWS analysis proposes a phased roadmap that prioritises defensive and capability-building measures Strengths - Weaknesses - Threats/Weaknesses - Opportunities (WT/WO), followed by resilience-oriented adaptation Strengths - Threats (ST), product diversification, destination branding, and market expansion Opportunities (SO). The study contributes to agritourism research by highlighting the gap between community cohesion and formal business cooperation and by integrating resilience and seasonality into strategic planning. The framework may also support policymakers and practitioners in strengthening agritourism capabilities, collaboration, and sustainable market development in comparable resource-constrained destinations.

Keywords: **agritourism, Quang Binh province, resilience, seasonality, strategic planning, TOWS matrix.**

Classification numbers: **2.1, 2.2**

1. Introduction

Agritourism has emerged in Vietnam as a key strategy for promoting rural sustainability, generating income, and preserving local cultural values [1, 2]. Contemporary agritourism models, built around authentic farm-based experiences, organic production, local cuisine, and connections with ecotourism, are attracting an increasing number of visitors and creating new livelihood opportunities, including for women and low-income households [3-7]. By providing employment, supplementary income, and contributing to rural economic restructuring, agritourism is recognised as an important driver of local socio-economic development [8, 9]. In particular, the integration of "One commune one product" (OCOP) products with rural tourism has diversified tourism offerings, from speciality foods to place-based cultural experiences, thereby enhancing the attractiveness of many Vietnamese destinations [10, 11]. Moreover, the integration of agriculture and tourism not only promotes economic growth but also supports environmental protection and the preservation of rural cultural identities [1, 2, 7, 12]. Recent studies emphasise that social and economic conditions, such as community involvement, production capacity, human resources, infrastructure, and digital market access, play a decisive role in shaping agritourism development. E-commerce platforms help farmers access information and expand product distribution channels, while investment in transport and tourism-related services (restaurants, accommodation, and rest stops) enhances accessibility and the visitor experience [13]. In the context of rural economic restructuring and the global expansion of agritourism, it has therefore become urgent to move beyond spontaneous, fragmented initiatives and to systematically analyse internal supply-side factors, particularly infrastructure, institutional capacity, and community social capital, as the basis for designing sustainable agritourism development models.

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Empirically, agritourism development at the selected sites in Bo Trach and Le Thuy districts of the former Quang Binh province remained fragmented. Fieldwork was conducted from February to April 2024, before Vietnam's 2025 administrative reorganisation; thus, "the former Quang Binh province" denotes the pre-2025 administrative setting of the study sites rather than province-wide coverage. Despite rich natural and cultural resources, local operators faced infrastructure deficits, limited tourism and marketing capabilities, and high vulnerability to natural hazards. This study conceptualises the resulting tension as an "agritourism paradox": strong community cohesion and interpersonal trust coexist with weak horizontal business linkages, limiting collective value chains, joint marketing, and coordinated resilience planning. Although prior research highlights community participation, this coexistence remains underexamined. However, a significant gap in current research is that these factors are often analysed in isolation, merely listed in impact factor analyses, or examined only within policies developed using the traditional Strengths, Weaknesses, Opportunities, and Threats (SWOT) matrix [8, 14-16]. Existing research still rarely integrates these factors into a staged strategic framework that provides a sequential, prioritised roadmap for development. This gap poses a challenge for policymakers and agritourism enterprises in emerging, resource-constrained destinations, which often lack practical guidance on which interventions to prioritise for maximum impact. Moreover, resilience and other development-related factors are usually treated as contextual conditions rather than as core elements of strategic design.

This study expands the theoretical frontiers of strategic analysis by integrating the TOWS matrix into a resilience-oriented supply management framework, an aspect that has often been overlooked in previous agritourism studies. Instead of applying this matrix as a descriptive tool for the current situation, the study proposes a new methodological approach: arranging strategies into a series of adaptive responses to external shocks. Its primary objective is to identify and analyse the factors shaping agritourism development in the former Quang Binh province and to develop a comprehensive strategic framework for optimising resource use and promoting sustainable agritourism growth. In doing so, this study repositions TOWS from a simple diagnostic tool to a powerful planning tool, specifically tailored for destinations with high environmental risks. The research aims to answer three research questions:

• RQ1. What concrete supply-side constraints and enabling conditions shape agritourism development in the former Quang Binh province?

• RQ2. How can the coexistence of strong community cohesion and weak inter-business cooperation be interpreted in an emerging agritourism destination?

• RQ3. How can a resilience-oriented TOWS framework translate these conditions into a phased strategic roadmap for agritourism development?

The study adopts a supply-side perspective, drawing on semi-structured, in-depth interviews with agritourism managers, owners, and local officials responsible for policy and regulatory support. The findings are expected to advance theoretical understanding of agritourism development and offer practical guidance on policies and strategies for other regions with similar agritourism potential, both within the country and globally.

2. Literature review and analytical framework

To evaluate agritourism destinations, this study develops a framework that combines five supply-side dimensions: physical, social, human capital, market access, and sustainable resilience. These factors go beyond a typical literature review by providing structured criteria to assess both internal capabilities and external adaptability. This systematic approach directly applies the TOWS matrix, shifting the research focus from simple description to a resilience-oriented strategic planning framework.

2.1. Analytical dimensions of agritourism development

2.1.1. Physical capital and site carrying capacity

Physical capital, a core factor in economic development and business management research, includes tangible assets such as equipment, machinery, infrastructure, and other assets with economic value [17]. For agritourism businesses with limited resources, a lack of capital creates difficulties in investing in infrastructure and expanding services, which, in turn, affects their ability to attract tourists [1, 18]. The development of agritourism businesses, such as homestays, requires substantial investment in both physical capital and financial resources [19]. In addition to financial resources, agritourism products depend on appropriate infrastructure that facilitates development and attracts tourists. Factors such as abundant agricultural resources, scenic beauty, diverse agricultural products, and local cultural ties are crucial for the development of agritourism [20]. The transportation system, infrastructure, and service quality enhance the experience, fostering tourists' satisfaction and loyalty [21]. Within this study, site carrying capacity is considered in relation to the adequacy of transport, infrastructure, and service facilities, which shape a site's ability to accommodate visitors effectively [17]. Technical infrastructure is considered one of the key factors

influencing agritourism development, as it supports service delivery and enhances destination accessibility [1]. Similarly, investments in infrastructure and resource development have also been emphasised to ensure connectivity and convenience for tourists [17].

2.1.2. Social capital

Social capital refers to the relationships, networks, and factors such as trust, cooperation, and community norms that enable individuals or groups to achieve economic and social benefits [22]. Social capital significantly influences development motivation, cooperation capacity, and community participation, particularly in the context of developing agritourism [17]. Local participation is crucial in connecting tourism with the community, creating unique cultural experiences, and providing accommodation services. Integrating local culture with agricultural production creates attractive tourism products that enhance the value of tourists' experiences [7]. Cooperation between businesses, households, and local authorities helps develop diverse tourism products and optimise resources. Furthermore, government support enhances businesses' capacity, enabling them to access preferential policies and develop sustainable services [23]. Another aspect of human capital in agritourism is the building of social networks and relationships within the local community. Strong social capital helps mobilise resources and promote cooperation among stakeholders, thereby supporting the development of agritourism [18, 24].

2.1.3. Human capital

Human resource development supports the improvement of marketing strategies and the management of agritourism activities. Previous studies have shown that education and training programs in rural areas often lead to higher agricultural productivity and improved agritourism experiences, thereby promoting sustainable growth [13, 25]. Human capital is defined as the collection of knowledge, skills, experience, and abilities possessed by an individual or group, which in turn creates economic and social value [22]. A skilled labour force provides better services, contributing to enhanced tourist experiences [26]. On the other hand, management and business skills help households and businesses develop sustainable strategies, optimise resources, and increase profits [22, 27]. Human resource quality, particularly service competence and agritourism knowledge, plays a crucial role in shaping tourists' experiences. Training local communities further contributes to the development of a professional service workforce capable of effectively meeting tourists' needs [21, 28].

2.1.4. Market access capability

Market access refers to the ability of products and services provided by businesses and producers to reach end consumers. This involves not only the distribution of goods but also factors such as market information, geographical proximity, government support services, and product quality [29]. The connection between agricultural producers and tourism businesses can create more diverse and attractive tourism products, thus attracting tourists. When local agricultural products are easily accessible to the market through tourism businesses, tourists have the opportunity to experience the production process firsthand and enjoy the products directly at the source [4]. Additionally, the demand for sustainable tourism and unique cultural experiences, along with direct market access from the community to tourism, will add value and enhance the quality of the experience [30].

2.1.5. Sustainability, resilience and seasonality

The sustainability and resilience of agritourism are key factors for its long-term development, impacting both economic viability and environmental integrity [31]. Agritourism accommodations that prioritise local agricultural products and sustainable practices enhance resilience in the face of global competition. Sustainability in agritourism encompasses environmental, economic, and social aspects without harming local land or ecosystems [32]. The resilience of agritourism farms is also related to the diversification of services, including accommodation and tourism activities, which significantly contribute to the farms' resilience in mountainous regions [33, 34]. Additionally, diversifying farming methods can provide supplementary income, helping to mitigate economic instability. Seasonal fluctuations in agricultural activities and visitor demand can also affect revenue stability and operational continuity. Sustainable agritourism activities can turn crises into growth opportunities. During the COVID-19 pandemic, many agritourism businesses adapted by shifting to direct sales to consumers, demonstrating their flexibility and innovation [35]. Building networks and fostering relationships among agritourism operators is crucial for sharing information and distributing resources, thereby strengthening resilience.

2.2. TOWS-based framework

The strategic roadmap derived from the TOWS matrix may also be interpreted as reflecting coordination challenges within a complex multi-actor system. Recent research on computational and evolutionary game models in the energy and clean production sectors indicates that cooperative and competitive strategies can develop endogenously under resource and environmental constraints [36, 37]. These approaches highlight the

co-evolution of cooperation and competition under resource constraints, which aligns with the context of agritourism development, as viewed in this study as the result of cooperation within competition among local factors. Based on the literature reviewed above, this study does not treat the theoretical section as a formal causal theory, but as an analytical framework for qualitative inquiry. Our approach is conceptually aligned with that perspective in interpreting agritourism development as arising from strategic interactions and cooperation in competition among heterogeneous actors [38].

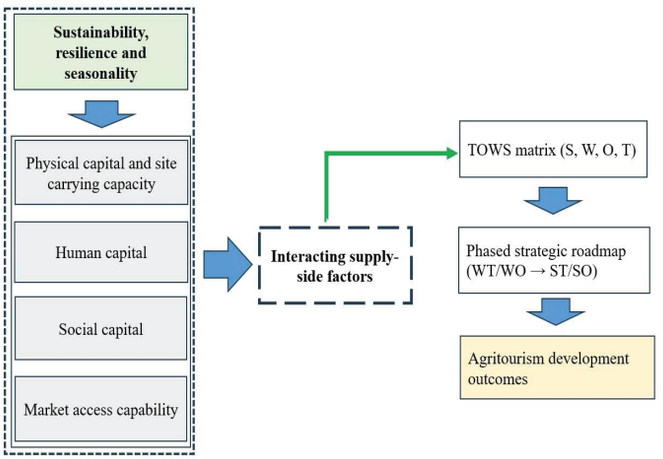


Fig. 1. Conceptual framework for a TOWS-based approach to agritourism development. Source(s): Author's own creation/work. Note: WO (Overcoming), WT (Defensive), ST (Resilience-oriented), and SO (Offensive).

Five dimensions were used to organise the interview guide and coding process: physical capital, including site carrying capacity; human capital; social capital; market access capability; and sustainability and resilience, including seasonality and climate-related disruptions. These dimensions capture the principal resource, coordination, market, operational, and adaptive conditions shaping agritourism development in emerging destinations. Fig. 1 summarises how these dimensions are linked to the TOWS procedure. Empirical evidence from interviews and field observations was first coded into internal strengths and weaknesses and external opportunities and threats; these themes were then synthesised into phased strategic options (WT, WO, ST, and SO).

3. Research methods

3.1. Characteristics of the research area

The empirical setting comprised purposively selected agritourism sites in Bo Trach and Le Thuy districts, which were administratively part of Quang Binh province at the time of fieldwork. Despite possessing abundant agricultural resources and a distinctive cultural heritage, agritourism development in the study area remains fragmented and constrained by shortages of capital, technology, and tourism-related skills. As one of Vietnam's disaster-prone regions, the area requires a strategic approach that integrates resilience with sustainability. Although located along the North-South transport corridor, its relative distance from major regional transport hubs, such as Phu Bai and Vinh airports, creates accessibility barriers by increasing travel time and costs for visitors. These characteristics make the former Quang Binh Province a suitable empirical setting for developing a systematic and resilience-oriented agritourism strategy.

3.2. Research design, sampling, and data collection

This study adopts a qualitative case study design to examine how supply-side conditions shape agritourism development in the former Quang Binh province [39]. The significance of these factors was interpreted based on their thematic salience, consistency across interviews, and perceived influence on agritourism development and sustainability. To achieve this goal, the primary data collection method is semi-structured, in-depth interviews, employing purposive sampling to enable deep, multidimensional exploration through a flexible set of open-ended questions focused on relevant topics [27]. Following the research approach of Patton [40], the study sample was purposively selected to optimise contextual diversity and data depth. It comprises participants with over two years of experience, distributed across key study sites in this area and representing both business and state management perspectives. This method has proven effective in exploring detailed, complex issues that can only be revealed through direct exchange [41, 42]. The main participants include agritourism managers and owners, as well as local officials directly involved in operating agritourism models. The sample size was determined based on the principle of data saturation, whereby interviews were ceased when the collected data began to repeat, and no new information emerged [43]. In this study, saturation was observed after the 13th interview with agritourism managers/owners, as themes began to repeat without yielding novel insights. This finding aligns with methodological recommendations in qualitative research, which suggest that a sample of this size is generally sufficient to achieve thematic saturation in relatively homogeneous groups [44]. This approach provided adequate depth while avoiding redundancy. The interview questions were developed through a theoretical overview and field observations in the area, focusing on factors influencing agritourism development. Drawing on the theoretical framework and expert consultations, the semi-structured questionnaire focuses

on interviewees' profiles, key capitals (physical, human, and social), market access, and sustainable adaptive capacity. Before conducting the interviews, the research team also carried out four-day observation trips to compare the actual context with interview data and consulted five experts (including researchers, lecturers, and policy management officers) to gain deeper insights and refine the research tools.

The research process was conducted in two stages. First, the semi-structured interview guide was reviewed and pilot-tested with five purposively selected experts. The experts had at least three years of relevant professional experience and expertise in tourism, agritourism, agriculture, community development, cultural conservation, or local tourism policy. They were also involved in research, teaching, tourism management, or policy formulation. Their feedback was used to improve the clarity, relevance, sequencing, and contextual appropriateness of the interview questions. These experts were not included in the main study sample. Second, formal interviews were conducted with two purposively selected participant groups. Agritourism owners/managers were eligible if they were directly involved in operating an agritourism establishment and had at least two years of relevant experience. Local officials were selected for their involvement in tourism, agriculture, or local economic development, and for their knowledge of local policies and development priorities. The final sample comprised 13 agritourism owners or managers and four local officials. Interviews with owners/managers continued until the later interviews yielded no substantively new themes (Table 1).

Table 1. Sample characteristics.

Group	Informant type	Number of informants	Informant code
G1	Agritourism managers or owners	13	M01, M02, M03, M04, M05, M06, M07, M08, M09, M10, M11, M12, M13
G2	Local officials	4	L01, L02, L03, L04
Total		17	

Source(s): Author's own creation/work.

The authors, academic tourism experts unaffiliated with site management, adopted measures to minimise subjective bias. These included strict adherence to a single semi-structured guide for all interviews and a consensus-based approach to data analysis, in which coding discrepancies were resolved through frequent group discussions and consultations. All interview content was transcribed with participants' consent, and participants were given the opportunity to verify the accuracy of their interview transcripts or summaries before analysis. To protect participants' privacy and identities, all personally identifiable information was anonymised during data processing and presentation. The coding process combined deductive methods, based on the theoretical framework of adaptive resources and capacities, with inductive methods to identify new elements from practice. To ensure reliability, two researchers independently coded the data and discussed their findings to reach a consensus on the codebook. The data were then manually synthesised using systematic comparison matrices, resulting in five core themes and sub-themes that reflect the specificities of the local context.

4. Research results

4.1. Demographic characteristics

Table 2. Demographic profile (N=17).

No.	Characteristics	Category	Frequency	Percent (%)
1	Sex	Male	10	58.82
		Female	7	41.18
2	Age (years)	<35	2	11.76
		35-45	9	52.94
		>45	6	35.29
3	Education	High school and vocational college	5	29.41
		University	9	52.94
		Postgraduate	3	17.65
4	Seniority (years)	<3	4	23.53
		3-5	8	47.06
		>5	5	29.41
5	Job Position	Manager	4	23.53
		Owner	9	52.94
		Local official	4	23.53

Source: Author's own creation/work.

Table 2 shows that the interview sample is predominantly male (58.82%), aged between 35 and 45 (52.94%), and has three to five years of work experience (47.06%). The proportion of individuals under 35 years of age is low (11.76%), and 29.41% have completed only high school or vocational college. The majority are owners (52.94%) and hold a university degree (52.94%). The sample reflected a range of demographic and professional backgrounds, although most participants were aged 35-45, held a university degree, and had three to five years of relevant experience. This profile provided perspectives from participants with practical involvement in agritourism operations and local governance.

4.2. Factors affecting the development of agritourism

The results of the analysis in Table 3 present the factors that directly influence the development of agritourism, as identified from participants' responses. These factors offer valuable insights into the challenges, opportunities, and barriers associated with its development.

The results indicate that participants possess a profound understanding of the roles and strategies associated with factors such as access to capital, technological innovation, local policies, infrastructure development, and community involvement. However, limited access, external factors, and difficulties in securing capital and management capacity are affecting agritourism development. The research results reveal a significant gap between awareness and implementation capacity. Specifically, many interviewees recognised the importance of workforce training (M01-M04), yet a shortage of skilled labour in tourism emerged as a recurring concern across the interviews (M04, M06, M08). Similarly, awareness of sustainable development and environmental protection was consistently expressed, but the ability to invest in green technologies and recover from natural disasters remained constrained by high costs (M04; M07-M13). Seasonal fluctuations in agricultural activities and visitor demand also contributed to unstable revenue and disrupted operational continuity (M03, L02). This indicates that agritourism operators recognise the necessary steps to improve quality and promote sustainable growth, but are held back by financial and human resource constraints (L01-L04). Conversely, material resource barriers have been identified as a major factor affecting development. Difficulties in accessing investment capital emerged as a common concern across interviews, resulting in inadequate infrastructure and equipment (M03-M07, M13). Limited infrastructure and service capacity also restricted the number of visitors that establishments could accommodate without compromising service quality or environmental conditions (M07, L01-L04). This situation directly constrains the provision of high-quality services and the quality of the tourist experience, ultimately reducing establishments' competitiveness. Additionally, limited proximity to major regional airports hampers accessibility, exacerbating structural weaknesses in physical infrastructure and market penetration for agritourism providers (M05, M11, L01, L03). Furthermore, strong relationships with the government and close community connections emerged as important advantages across the interviews, particularly in helping establishments access information and support programmes. Conversely, interviewees pointed to complex administrative procedures and weak coordination and cooperation among businesses as key obstacles that reduce effectiveness and limit opportunities for collective growth (M03, M09, M13). This reveals a paradox: while there is a vertical connection (with the government), the horizontal linkages (among businesses) remain weak. A major issue is the strategic weakness in market access capabilities. The interviews also revealed a recurring weakness in market access, as many establishments still lacked a well-organised and effective marketing strategy and continued to rely heavily on traditional word-of-mouth promotion. Although interviewees generally recognised the importance of social media, the use of online marketing

Table 3. Factors affecting the development of agritourism in the former Quang Binh province.

No.	Factor	Advantages	Difficulties	Impact on the development of agritourism
1	Physical capital and site carrying capacity	Some establishments have invested in modern technology and upgraded their infrastructure, improving service efficiency	Difficulties in accessing investment capital, infrastructure, and equipment remain. Limited visitor-handling capacity, particularly in relation to access, parking, sanitation, accommodation, and service facilities	Hinders the provision of high-quality services and the enhancement of the tourist experience
2	Human capital	Some establishments have recognised the importance of workforce training and invested in it, improving service quality. There is an abundant labor force with experience in agricultural production activities	Lack of skilled labor in tourism, limited communication, and customer service skills. Not formally trained through accredited courses	Limits the ability to serve tourists, impacting their satisfaction and experience
3	Social capital	Good relationships with the government and strong community connections help in accessing information and support programs	Complex and prolonged administrative procedures, limited cooperation between establishments	Creates development opportunities, but administrative procedures and lack of cooperation reduce effectiveness and investment opportunities
4	Market access capability	Some establishments have used word-of-mouth channels and are clearly aware of the importance of promotion on social media platforms. Some have online tour booking channels	Lack of effective marketing strategies, relying on word-of-mouth, and limited use of online marketing	Creates opportunities to develop new markets, helping agritourism establishments reach a more diverse customer base, enhance brand recognition, and increase product value on digital platforms. This, in turn, drives revenue growth, improves service quality, and contributes to the sustainable development of agritourism
5	Sustainability, resilience and seasonality	The natural environment and pristine ecosystems are core assets, and some establishments have adopted environmentally friendly technologies	The investment cost in environmentally friendly technologies is high, and the ability to recover from natural disasters is limited. Seasonal fluctuations in agricultural activities and visitor demand result in unstable revenue and weather-dependent operations	Although environmental protection is a priority, the risks posed by natural disasters and the high investment costs present significant challenges to achieving sustainable development

Source: Author's own creation/work.

remained limited. This promotional gap constrains agritourism products' ability to reach broader domestic and international markets, despite their potential (M04, M06, M11). The analysis indicates that agritourism development in the former Quang Binh province has significant potential but is impeded by numerous barriers related to capital, technology, and recovery solutions.

Research indicates that resilience depends on a combination of resources rather than a single factor. Practice shows that adaptive capacity and management skills (human capital) can optimise performance even with limited infrastructure (physical capital). Conversely, a lack of management capacity diminishes the effectiveness of physical investments. Therefore, the simultaneous integration of different types of capital is crucial to responding to fluctuations.

4.3. Strategic groups derived from the TOWS matrix

The findings derived from the TOWS matrix provide a systematic basis for formulating strategic orientations for agritourism in the former Quang Binh province through the alignment of internal capabilities and constraints with external opportunities and environmental pressures. The analysis identifies four principal strategic orientations: WO (Overcoming), WT (Defensive), ST (Resilience-oriented), and SO (Offensive). As illustrated in Table 4, these orientations are organised into a sequential strategic roadmap that reflects different stages of agritourism development. The initial stage emphasises WT strategies, which aim to minimise existing vulnerabilities and mitigate potential external risks. This is followed by WO strategies designed to address internal limitations while taking advantage of favourable external conditions. The subsequent implementation of ST strategies seeks to strengthen adaptive capacity and enhance resilience in response to changing environmental and market pressures. Finally, SO strategies represent a more proactive growth orientation, whereby existing strengths are leveraged to facilitate market expansion, product diversification, and the enhancement of the long-term competitiveness and sustainability of the agritourism sector. The results indicate that the WO strategy group promotes a foundational approach, utilising opportunities from government support policies (O2) and cooperation trends (O3) to address inherent weaknesses in capital, human resources, and business linkages. Conversely, the WT (Defensive) strategy group advocates the most basic solutions, considering limited internal resources and the effects of natural factors such as storms, floods, climate change, and other extreme weather conditions. These include strengthening initial linkages (WT1) and standardising core operating procedures (WT2), reflecting a bottom-up development approach that requires consensus and trust from Small and Medium-sized Enterprises (SMEs) towards the government. Businesses must also develop contingency plans and prepare for changes caused by natural factors (T1) and resource shortages (W1, W2, T3). The ST strategy group shifts its focus to developing "resilient-adaptive" agritourism models that utilise indigenous resources and promote community cohesion to tackle climate-related threats. Finally, the SO strategy group represents the ideal development goal by creating distinctive agritourism products based on local agricultural and cultural resources, anticipating evolving market trends and the increasing demand for authentic, experience-based, and sustainable tourism. This demonstrates that these four strategic groups outline the roadmap for agritourism development at each stage in the former Quang Binh province.

5. Discussion

5.1. Capability-building and resilience: Insights from the TOWS analysis

The TOWS analysis and synthesis reveal that agritourism development in resource-limited contexts within this research area follows a necessary evolutionary trajectory rather than simultaneous expansion (Table 4). This strategic structure suggests that the accumulation of internal capabilities is a crucial prerequisite for successful external market penetration. Specifically, the prominence of WO strategies implies that emerging destinations must first leverage institutional support and collaborative networks to address structural shortages in capital and skills. Without strengthening this foundation, aggressive market expansion efforts may not be sustainable. The findings of this study support prior evidence on inefficiencies in resource sharing in emerging tourism destinations [45]. Furthermore, while local communities exhibit strong consensus on cultural values, entrepreneurial activity is constrained by a local competitive mentality and a perceived risk of unequal returns. This contradiction is not unique; it reflects a common feature of transitional rural economies in which traditional social institutions have not yet adapted to the demands of a market economy. This study extends previous findings by showing that the main barrier lies not in stakeholders' unwillingness to cooperate, but in the lack of bridging organizations that facilitate coordination among them [46]. The absence of effective cooperatives or shared digital platforms has kept collaborative efforts at a spontaneous and non-commercial level, suggesting that future policy interventions should shift their focus from merely providing physical capital to creating institutionalised collaborative spaces. This approach aligns with studies on the development of agritourism in developing countries, which identify the lack of capital (W2) and human resource skills (W1) as the greatest barriers [47-49]. Therefore, the proposal for training programmes and preferential credit packages (WO1) is not only a temporary solution but also a step towards addressing capital issues. This result highlights the strategy of establishing (WO2) to address the lack of business linkages (W3), a strategy supported by previous studies, which suggest that

cooperation in business and shared support groups is crucial for the growth of small enterprises [50, 51]. One significant finding of this study is that the WO strategy addresses the paradox of agritourism, where social capital and community connections are strengths, yet business linkages are lacking.

Establishing an association is a solution for transforming social capital into economic capital, thereby supporting the development of agritourism in the former Quang Binh province. On the other hand, the WT (Defensive) strategy group proposes the most basic solutions, considering the limited internal resources and the impact of natural factors such as storms, floods, climate change, and extreme weather. These require linkages (WT1) and the standardisation of basic operational processes (WT2), reflecting a bottom-up development approach that requires unity and trust from small and medium-sized business households to the government. Enterprises need to have contingency plans and be prepared for changes caused by natural factors (T1) and resource shortages (W1, W2, T3). Once the internal foundation has been strengthened, more aggressive and proactive strategies can be effective. A highlight of this study is that the ST strategy group makes a novel contribution by emphasising resilience as a strategic pillar. Instead of viewing climate change (T1) as merely a threat, the ST1 strategy proposes using strengths in indigenous resources (S1) and community cohesion (S3) to build adaptive agricultural models and promote a "resilient-adaptive" destination. Previous studies have demonstrated the power of the community in agritourism development, highlighting its role in management and support in agritourism activities [6, 7]. This approach goes beyond traditional analyses and aligns with new research directions in sustainable tourism, emphasising the importance of integrating resilience and risk management into business strategies [50-52].

The former Quang Binh province is one of the provinces in Vietnam most affected by natural disasters [53]. The research results suggest a potential impact on destination development, in which communities and nature work together to transform weaknesses into strengths, creating attractive and distinctive destinations. Finally, the SO (Offensive) strategy group represents the ideal target for development. The strategy of developing specific products based on agricultural resources (S1) and culture (S3) to anticipate market trends (O1) is consistent with previous research findings on agritourism experiences, emphasising authentic experiences, immersion in nature, and the development of unique tourism products from indigenous

Table 4. TOWS matrix strategy for developing agritourism in the former Quang Binh province.

	Strengths - S	**Weaknesses - W**
External	**S1:** Rich and distinctive agricultural resources. **S2:** Local government support and facilitation. **S3**: Diverse local culture and a close-knit community.	W1: Lack of skilled labour with expertise in tourism. W2: Difficulties in accessing capital and modern technology. W3: Lack of cooperation and linkages between business establishments. W4: Limited infrastructure and relative remoteness from major regional airports (Phu Bai, Vinh), which increases travel time and costs for visitors.
External		
Opportunities - O	**SO Strategy (Offensive)**	**WO Strategy (Overcoming)**
O1: Growth of ecotourism and agritourism experiences. O2: Stronger support from government policies and infrastructure investment. O3: Strengthened community connections and cooperation.	SO1: *Develop distinctive, high-quality agritourism products.* Combine agricultural resources (S1) and local culture (S3) to create unique experience tours (e.g., organic farms, farm-to-table culinary tours, and farming experiences) to capitalise on the trend of experiential tourism (O1). SO2: *Build a unified brand and strong communication strategy.* Leverage government support (S2) to create the "Quang Binh Agritourism" brand, widely promote community-based tourism models (S3) to attract investment and tourists (O2, O3).	WO1: *Enhance capacity and modernise infrastructure*. Leverage support from government policies (O2) to offer training and skill-building programs for local workers in tourism (addressing W1). Develop preferential credit programs to help households and businesses easily access capital for technology and infrastructure investment (addressing W2, W4). WO2: *Establish an Agritourism Association/Network*. Take advantage of collaboration opportunities (O3) and government support (O2) to form a joint organisation that promotes linkages, shares experiences, creates shared tour routes, and addresses the lack of cooperation (W3).
Threats - T	**ST Strategy (Resilience-oriented)**	**WT Strategy (Defensive)**
T1: Climate change and natural disasters are becoming increasingly complex. T2: Lack of an effective marketing strategy makes it difficult to access large markets. T3: Limited funding and technology for environmental protection. T4: Lack of a recovery strategy after crises and natural disasters.	ST1: *Build a sustainable and resilient agritourism model.* Leverage local resources (S1) and community engagement (S3) to develop agricultural models that adapt to climate change (e.g., drought-resistant and flood-tolerant crops). Create communication stories about the community's resilience and efforts to protect the environment to attract eco-conscious tourists (addressing T1, T3). ST2: *Diversify products and markets.* Utilise cultural diversity (S3) and government support (S2) to develop tourism products that are not weather-dependent (e.g., culinary tourism, traditional crafts, cultural workshops) to minimise risks from natural disasters (T1) and differentiate in the market (T2).	WT1: *Build core capacity and small-scale linkages.* Focus on addressing basic weaknesses by starting with small linkages. Establishments can organise internal training sessions together (addressing W1), share resources and equipment (addressing W2), and create a small joint fund for emergency responses to natural disaster risks (addressing T1, T4). WT2: *Standardise processes and strengthen risk management.* Develop basic operational procedures for customer service and environmental sanitation. Create simple disaster prevention plans at the grassroots level, while also requesting technical support from the government to enhance response capabilities and environmental protection (addressing W1, W4, and responding to T3, T4).

Source: Author's own creation/work.

culture, local cuisine, and organic farm experiences [3, 53-54]. However, compared to developed tourist destinations, new agritourism destinations in the former Quang Binh province are still limited in terms of capacity, connectivity, and professional tourism resources, which are major weaknesses of agritourism establishments (W1, W3). These constraints may intensify during peak periods, when visitor demand places additional pressure on infrastructure and service capacity, whereas low-season demand may lead to unstable revenue and operational disruptions. Therefore, the SO strategy cannot be implemented independently but must result from an internal consolidation process among other strategic groups. To develop long-term and sustainable agritourism destinations in such a resource-limited and seasonal context, a phased approach is essential. This journey must begin with enhancing business competitiveness and improving the quality of local services through resource optimisation and strengthened management. Additionally, priority should be given to establishing effective linkages, particularly in community-based tourism, fostering public-private partnerships, expanding markets, and connecting with organisations and associations. Such linkages can support coordinated seasonal product development, marketing, and visitor-flow management. These supporting strategies provide a solid foundation for market penetration while establishing mechanisms for preserving natural resources and cultural heritage. Integrating capability building, seasonal adaptation, market development, and resource protection may provide a useful basis for strengthening the resilience, adaptability, and sustainability of the agritourism system.

5.2. Theoretical contributions

This research contributes new theoretical insights to agritourism and rural development, centred on three core perspectives

Firstly, this study goes beyond the traditional SWOT analysis method by contributing a phased strategic framework. Instead of listing individual strategies, the study develops a growth roadmap, from strengthening the foundation and defence (WT, WO) to offence and market expansion (ST, SO). This model is suitable for tourism destinations with limited resources, especially in the early stages of development, as it helps optimise resources and minimise the risks associated with fragmented development.

Secondly, the study highlights resilience as a core strategic factor rather than merely a barrier. In the context of this research, which frequently faces natural disasters and climate change, this study contributes by integrating a recovery strategy into the TOWS matrix alongside the challenge (T4), transforming it into an opportunity within the ST strategy and suggesting the creation of a distinctive and attractive destination image. This finding offers a new perspective, moving beyond traditional analyses that typically focus on resources, capital, markets, and human resources in agritourism [55].

Thirdly, the study identifies an important paradox in emerging agritourism destinations: the juxtaposition of strong community cohesion with weak business cooperation. Findings indicate that limited inter-business collaboration contributes to fragmented development and weak integration across destinations. Specifically, interviews revealed that, despite a strong sense of community, the lack of formal cooperation mechanisms, such as trade associations or joint marketing initiatives, has hindered the formation of a cohesive agritourism network. To address this issue, this study proposes institutionalisation strategies for cooperation, including promoting public-private partnerships and creating of platforms for business networking.

5.3. Practical contributions

Beyond the practical boundaries of this research context, the proposed TOWS matrix offers a flexible strategic planning model for diverse agritourism ecosystems. Its reliance on generalised core supply factors including physical, human, and social capital, market access, and resilience ensures its relevance across various domestic and international contexts. In Vietnam, the framework is tailored to regions by focusing on policy opportunities (e.g., OCOP) and addressing environmental threats to overcome infrastructure and workforce constraints [10, 56]. On a global level, the model is applicable to developing economies, emphasising ST strategies to address instability, and to European contexts such as Romania and Poland, where it aligns SO strategies with innovation and sustainability [31, 57]. Ultimately, scalability challenges are mitigated through pilot testing and iterative qualitative assessments.

This finding implies that the resilience of agritourism units in climate-sensitive areas requires a shift from passive response to strategic adaptation. A key issue to address is the restructuring of business models to decouple revenue from fluctuations in pure agricultural production through value-added activities, such as workshops and on-site retail. In addition to upgrading physical infrastructure to withstand natural disasters, businesses must incorporate sustainable practices into their operations to achieve ecological balance. Moreover, long-term sustainability is secured by institutionalising community support networks and establishing specialised financial safety measures. Currently, successful adaptation models worldwide provide valuable lessons regarding resilience. Research by C. Valdivia, et al. [52] in the Andean highlands of Bolivia demonstrates that integrating service diversification is a crucial mechanism for mitigating climate risks and preserving ecological capital. Meanwhile, cooperatives have served as intermediaries to promote post-hurricane recovery through regenerative farming practices. Research has shown that

a well-coordinated recovery strategy is a prerequisite for advancing sustainable agritourism. Given the critical need for such a coordinated strategy, we offer the following managerial and policy implications to guide the sustainable transition of the local agritourism ecosystem.

Firstly, policymakers and local authorities should adopt a phased approach to optimise economic development interventions. The priority strategy should focus on strengthening the internal capacities of economic entities (human and financial capital). Only once a solid foundation is established should policies shift to the phase of market expansion and integration.

Secondly, for business owners, the shift from a competitive mindset to a cooperative development approach is key to promoting sustainability. Instead of focusing solely on individual benefits, businesses should recognise that cooperation will create shared value and expand development opportunities. This study suggests that addressing limitations in market access capability requires adopting an integrated marketing communications strategy focused on online presence. Businesses should shift from a siloed approach to consistent brand management, utilising multimedia content and online review platforms to engage with the market and establish a collaborative destination marketing mechanism. Through a centralised digital platform, cross-promotion efforts among stakeholders will help form tourism value chains that transform individual products into synchronised experiential journeys, thereby effectively attracting both domestic and international customer segments.

Thirdly, for the local community, it is essential to leverage collective strength to actively participate in environmental protection efforts and develop risk-prevention plans. Resilience should become an integral part of the local tourism identity and the destination's unique appeal.

6. Conclusions and future research directions

6.1. Conclusions

This study develops a systematic strategic roadmap based on the TOWS matrix to harness the potential of agritourism in the former Quang Binh province and other emerging tourism destinations. By thoroughly analysing supply-side factors, the study confirms that agritourism development is governed by a paradox: abundant potential in resources and culture, coupled with strong community ties, is constrained by foundational weaknesses in capital, human resources, and marketing capabilities. The key contribution of this study is the proposal of a phased strategic framework that moves away from fragmented thinking. Rather than relying on isolated solutions, the study supports a logical progression from development and internal capacity building, creating a foundation for expansion and breakthrough phases to ultimately establish a sustainable and distinctive agritourism destination. With resilience and adaptation as its core factors, this model is suitable for local contexts with limited resources and significant vulnerability to crises, natural disasters, and climate change.

This research emphasises the importance of linkages, the formation of intersectoral associations, and cooperation as core strategies for policymakers, tourism business owners, and local communities. These contributions are not only valuable from a theoretical standpoint but also offer practical implications, helping other regions apply the agritourism model towards sustainability. Although developed from empirical data, the research findings provide a TOWS strategic roadmap that may extend beyond the scope of a single case study. Organised around core supply variables and a sequential transition from defence (WT/WO) to offence (ST/SO), this analytical framework is a versatile mechanism adaptable to larger agritourism ecosystems. Specifically, in destinations with abundant resources and strong institutional capacity, the initial stage can be condensed, enabling a reallocation of resources towards product specialisation, innovation, and the coordination of regional clusters. Consequently, this model should be viewed as a transfer template with a fixed overall structure, while specific actions should be tailored to the development level and governance context of each locality.

6.2. Limitations of the study and future research directions

Firstly, the study focuses on the former Quang Binh province, so the findings may not fully reflect other agritourism destinations. In particular, the study reflects the pre-2025 administrative context at the time of data collection. Future research should revisit the area under the new administrative structure and compare it with other regions to assess the proposed strategic roadmap's broader applicability.

Secondly, the study primarily relied on in-depth interviews with 17 purposively selected participants, including 13 agritourism owners/managers and four local officials. While the interviews provided detailed contextual insights, the relatively limited sample size and predominantly supply-side focus may not fully reflect the perspectives of all relevant stakeholder groups. The findings should therefore be interpreted within the specific study context. Future research could broaden both the sample size and composition to include tourists, local residents, farmers not engaged in tourism, and tourism intermediaries.

Thirdly, this study has several methodological limitations. Relying on qualitative data introduces subjectivity into interpretation, and the sample's homogeneity, which focuses mainly on management, limits the generalisability

of the results. The absence of quantitative surveys also restricts data triangulation. Future research should adopt mixed-methods approaches to enhance empirical reliability, incorporate diverse stakeholder perspectives (e.g., tourists, local authorities), and conduct comparative analyses across regions at varying levels of development to identify universal success factors. Additionally, future studies should employ a mixed-methods approach to statistically validate qualitative findings on business resilience and collaboration strategies and use cluster analysis to compare regions with varying development levels and identify key success drivers.

Fourthly, applying resilience modelling (e.g., system dynamics or agent-based modelling) is recommended to simulate adaptive behaviours under environmental and economic volatility, offering a predictive framework for sustainability in vulnerable contexts.

CRediT author statement

Thi Thao Do: Conceptualisation, Methodology, Writing original draft; Minh Thuy Mai Thi: Formal analysis, Methodology, Writing, Reviewing & Editing.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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Review of the impact of digital transformation on accounting information systems

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Received 6 November 2025; revised 18 June 2026; accepted 19 June 2026

Abstract:

This study systematises the theoretical foundations regarding the impact of digital transformation on accounting information systems (AIS) in business operations. The study applies the Narrative Review method to systematise and integrate research findings and discussions into a theoretical framework. The compilation focuses on the multidimensional interaction between the components of digital transformation (DT) and the components of AIS. The research findings indicate that "digital applications" have an impact on accounting software and accounting data, "standardise business processes and digital ecosystems" affect accounting processes, "improve digital competencies and skills of employees" affect accounting human resources, and "security and privacy" affect internal controls and accounting data. The study proposes a theoretical framework for researching the impact of digital transformation in business activities on AIS. In general, it suggests several directions to improve AIS in the context of digital transformation, including emphasising the strengthening of technology application elements, process standardisation, and digital ecosystems. In addition, it is necessary to enhance security and privacy in internal control and accounting data in the context of digital transformation.

Keywords: **accounting, accounting information systems, digital transformation.**

Classification numbers: **2.2, 2.3**

1. Introduction

In the context of rapidly advancing DT across various fields worldwide, businesses are compelled to modify their operating models, organisational structures, and management processes to enhance competitiveness. An AIS is a central component of an organisation's information system, serving business management activities by collecting, processing, and providing financial and accounting information to support the management decision-making process [1, 2]. AIS also undergo a process of development, change and update to better suit the new business model in the context of digital transformation [3]. Therefore, AIS needs to be continuously upgraded and improved to meet the new needs of businesses implementing digital transformation in their activities.

Digital transformation creates innovations in AIS, especially in the business sector, thereby motivating its upgrading to meet the new needs of corporate management activities [2]. In particular, when businesses transition to a digital operating model, AIS needs to be integrated with other management systems, such as enterprise resource planning (ERP) and customer relationship management (CRM), to ensure interoperability and real-time feedback for management decisions. However, the improvement of AIS also faces many difficulties when it comes to upgrading infrastructure, strengthening accounting capacity to adapt to the digital context, and ensuring transparency and accuracy of output information [4].

Recently, many studies have focused on assessing the role of information technology in accounting [5], research on digital transformation on internal control [6]. This indicates a significant level of interest in assessing the impacts of DT on AIS in the current context. However, there remains limited research

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adopting a multidimensional approach to examining the effects of DT on AIS through the interaction between DT components and the components of AIS. Therefore, this study synthesises the theoretical foundations related to the impacts of DT in business activities on AIS in order to develop a comprehensive theoretical framework for further empirical research in this field in Vietnam.

2. Subjects and methodology

This study collected articles from Google Scholar and SemanticScholar.org related to AIS and factors affecting AIS in the context of digital transformation in business. A systems approach was used to synthesise theories of factors affecting digital transformation, including environmental, organisational, and technological factors. The study systematises the theory of the influence of DT in business activities on AIS to approach according to the content of DT and build a research model that demonstrates the systematic correlation between DT and AIS. The research question is how does the DT in business impact on AIS through the multidimensional correlation of elements of DT and AIS?

The study applies the Narrative Review method to systematise and integrate research findings and discussions into a theoretical framework. The compilation focuses on the multidimensional interaction between the components of DT and the components of AIS.

The process of building this theoretical framework was carried out through the following methodical steps:

B1. Identifying the core components of DT: The author synthesises findings from scientific articles to identify four main components of DT that affect businesses: technology application (cloud, AI, blockchain), process optimisation and digital ecosystem, security and privacy, and digital capacity improvement for the human resource team.

B2. Systematisation of the structure of AIS: The theoretical framework inherits the modern management perspective, establishing AIS consisting of five interacting components: human resources, accounting processes, software, data and internal control.

B3. Review of research implications in published articles: By synthesising previous research, the study discusses the multidimensional impact of DT on the components of AIS.

B4. Proposal for a further research framework: The final outcome is a synthesised theoretical framework on the impact of DT on the components of AIS.

Criteria for summarising previous research related to the impact of DT on AIS are shown in Table 1. The study selected research works over a period of about 10 years (from 2015-2025). The search content focuses on the fields of AIS, DT of business activities, and the impact of DT on the components of AIS. Information was gathered from reliable sources such as Google Scholar, SemanticScholar.org. Keywords such as “Digital transformation”, “Accounting information system”, etc., were employed to find scientific articles in English or Vietnamese, excluding non-economic/accounting articles or unedited seminar reports. Subsequently, research articles are grouped according to the content of the research results. Fig. 1 shows a roadmap for searching and synthesising documents by content.

Table 1. Criteria for summarising research works related to the impact of digital transformation on accounting information system.

Criteria	Content
Database	Google Scholar, SemanticScholar.org
Keywords	“Digital transformation”, “AIS”, “Accounting information system”...
Selection criteria	Peer-reviewed, English/Vietnamese, 2015-2025
Exclusion criteria	Non-economic/accounting articles, unedited seminar reports

Source: Author’s synthesis (2025).

The scope of study changed through the period, including:

Stage 1: 2015-2018: Foundational study based on assessments of the quality of AIS [7, 8] and the functions of accountant in software systems operation [9], studies on Big Data applications in auditing and its practical [10], structural components of modern AIS integrated with IT infrastructure [11], and literature reviews on digitalisation in accounting [5].

Stage 2: 2019-2023: Frameworks for assessing enterprise digital transformation capabilities [12]; research on the application of blockchain in AIS [13, 14]; user satisfaction of AIS [15]; and assessments of DT in accounting practices in Vietnam [16].

Stage 3: 2024-2025: Research on updated digital skills for the accounting and finance profession [17, 18]; studies on the impact of DT on internal control effectiveness and corporate governance [19-21].

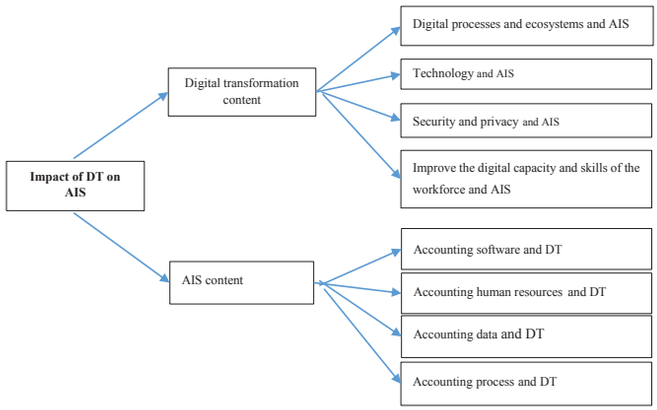


Fig. 1. Conceptual map of the literature synthesis on DT and AIS. Source: Author's synthesis (2025).

A total of 86 research articles related to DT and AIS were initially identified from Google Scholar and Semantic Scholar databases during the period 2015-2025 using keywords related to DT and AIS. The study aimed to collect the maximum possible number of open-access research articles with full-text access. After removing duplicated publications (14 research articles), conference abstracts, non-peer-reviewed papers, and studies not directly related to accounting or business management (6 research articles), 66 research articles were retained for reference.

The literature review process was conducted in three stages: Step 1, the studies were screened based on relevance to the research topic using predefined inclusion and exclusion criteria. Step 2, the selected articles were coded according to major content, including technology application, process optimisation, security and privacy, digital ecosystem, workforce digital competencies, and AIS components. Step 3, the articles were carefully reviewed, with a focus on research findings demonstrating the impact of DT on AIS.

The proposed framework is developed based on the systems theory. From the systems theory viewpoint, AIS is considered an integrated system in which technology, processes, human resources, data, and internal controls interact to produce organisational information outputs [11]. Therefore, changes in DT components are expected to generate interconnected effects across AIS components rather than isolated impacts.

3. Results

3.1. Accounting information system

An AIS is an essential component of the overall structure of an enterprise information system, which has the function of collecting, processing, storing, and providing financial and non-financial information for the management decision-making process [7]. An AIS consists of three parts: (1) Inputs: quantification of business events in the form of currency and recording them in accounting records; (2) Process: Processing data in the books and making accounting reports; (3) Output: Disclosure of financial statements, through which accountants provide information to users inside and outside the business, thereby providing them with the necessary information for supporting their decision-making [21]. Inheriting previous views, AIS has additional internal control elements to ensure honesty and reasonableness, information security and data security [22]. With the development of information technology to support accounting work, the perspective of the components of AIS is developed from the perspective of combining accounting processes and technology, including components: people, processes, software, data, information technology infrastructure and internal control [23, 24]. Table 2 shows the review of components of the AIS in an enterprise.

Table 2. Components of an accounting information system in an enterprise.

Element	Content
Accounting professionals	Professionals who may need to use an organisation's accounting information system include accountants, business analysts, consultants, managers, auditors, and chief financial officers.
Accounting process	Techniques and methods used to collect, retain, retrieve, and process data.
Software	Computer software is used to store, retrieve, process, and analyse a business's financial data.
Accounting data	Quantify business events in the form of currency and record them in accounting books. Store data necessary for the processes of collecting, processing and providing information in the form of a system of documents, accounting books, and accounting reports in AIS
IT infrastructure	Only hardware devices are required to operate the system. The majority of these devices are tools that businesses are forced to have, including computers, storage devices, printers, servers, routers, and possibly backup power supplies.
Internal control	Control the process of collecting, processing and providing accounting information, ensuring truthful, useful and confidential information.

Source: Compiled by the author from T.A. Elsharif (2019) [11].

3.2. Digital transformation in business activities

Scholars study DT from many different perspectives, depending on the focus of the research as well as the context in which the technology is applied [25]. DT in business activities is the use of digital technologies to develop a number of new digital business models, thereby helping to create and capture more value for

businesses [26]. The study by R.U. Attah, et al. (2024) [27] argued that DT consists of four core components: (i) the application of data-driven decision-making; (ii) process automation; (iii) advanced analytics integration; and (iv) building a digital ecosystem. DT is a process of strategic and comprehensive integration of digital technologies to reshape business models, improve efficiency, improve customer experience, and drive innovation to achieve competitiveness and sustainable growth in the digital era. DT is not only associated with technology, but also a comprehensive restructuring of business models, organisational culture, and how businesses create value. The content of DT activities includes digital technology application, business process change, security and privacy, and adaptation management [28]. From the above perspectives, it can be seen that the key aspects emphasised in business DT include: Digital technology application [29], process optimisation [11], security and privacy [29] and building a digital ecosystem [28], flexible governance, improving digital competencies and skills of the workforce [28].

Table 3. Application of digital technology.

Technology	Support to improve accounting information system efficiency	References
Artificial intelligence	Artificial intelligence is a field of computer science that focuses on developing systems that are capable of performing tasks that require human intelligence. AI is often applied in automation, robotics, virtual assistants, predictive analytics, and recommendation systems.	[31]
Blockchain	Blockchain is a technology in which data is stored in blocks linked together in a chain, secured by encryption algorithms and consensus mechanisms.	[13, 14]
Big data and data analytics	Big data refers to a set of data that has a very large volume, a fast generation rate, and structural diversity that exceeds the processing power of traditional tools. Data analytics is a set of technologies that use statistical methods, machine learning, and mathematical models to analyse data, support decision-making, and forecast trends.	[10]
Cloud computing	The model provides IT resources (infrastructure, platforms, software, services) through the internet instead of requiring installation and direct operation on a computer or physical server at the enterprise.	[32]
Internet of Things	IoT is a network of physical devices connected to the internet, allowing data to be collected, exchanged and analysed on the network.	[33]

Source: Author's synthesis (2025).

3.2.1. Application of digital technology

Digital technology applications are an important platform, including the application of cloud computing, big data, artificial intelligence, Internet of Things, big data analytics, blockchain, etc., to improve processes, enhance data collection and analysis, and enhance the performance of business operations [29, 30] (Table 3).

3.2.2. Process optimisation and the digital ecosystem

In the context of DT, organisations adapt or replace traditional processes with more efficient digitalisation processes, incorporating automation, data analytics, and flexible supply chains [28]. M. Kozina (2019) [12] developed a scale to evaluate DT capacity from the perspective of business process management of enterprises (Table 4). Specifically, the scale divides the responsiveness of process management in the context of business transformation into five stages: Initiation, reaction, identification, management, and excellence. The set of criteria is evaluated through 3 aspects: management activities, methods, tools and process optimisation.

Digital transformation cannot succeed if it is based solely on individual efforts [28]. R.U. Attah, et al. (2024) [27] argued that building a digital ecosystem focuses on connecting businesses with customers, partners, and stakeholders through digital platforms, thereby expanding value and promoting collaborative innovation in the context of DT. Building a digital ecosystem is of great significance in the process of comprehensive DT of business activities of enterprises.

Table 4. Process management assessment in digital transformation.

Stage	Initiation (1)	Reactions (2)	Identified (3)	Managed (4)	Excellent (5)
Governance	Business process management has not been established. The processes are neither integrated nor documented.	Business process management is partially established. Key business processes are integrated.	Business process management is established primarily. Business processes are integrated in almost all departments of the company.	Business process management is fully established. Processes are integrated and documented.	Business process management is integrated across the company and supports digital transformation initiatives.
Methods & tools	There are no process management methods and tools.	Methodologies and tools support process management at a partial level.	Methods & tools support process management at a major level.	Methodologies & tools fully support process management.	Methodologies and tools for business process management are mandatory for all digital transformation initiatives.
Process optimisation	There is no measure to evaluate the efficiency of the process. There is no process optimisation	Processes are partially monitored for optimisation	The processes are monitored primarily for optimisation	Fully monitored processes for optimisation	Processes are monitored quantitatively and optimised. The conversion (optimisation) focuses on quality standards.

Source: M. Kozina (2019) [12].

Table 5. Impact of digital transformation on the accounting information system.

Digital transformation	AIS	Impacts	References
Application of digital technology (cloud, AI, blockchain)	Software and data	Applying cloud computing, AI, and blockchain to automate data collection, processing, and storage	[4]
	Data governance	Automated data classification, security, and compliance monitoring	[36]
	Audit	Technology changes audit methods, from traditional audits to data-driven audits, enhancing transparency and compliance with accounting laws	[37]
Business process optimisation and digital ecosystem	Process	Replace manual ledger entries with automated processes and real-time integration with ERP systems.	[8, 38]
	Customer relationship	Modern AIS is not closed internally but expands integration with the external ecosystem	[38]
Improving digital competencies and skills of the workforce	Accountant	Require personnel to improve their technological capabilities and adapt to strategic consulting roles instead of pure note-taking.	[3]
Security and privacy	Internal control	Enhance transparency, auditability, and compliance with security regulations through digital tools.	[12]
Security and privacy	Accounting data	Increase data storage and maintenance capabilities	[39]
	Legal compliance	Stricter requirements on the level of legal compliance in accounting and transparency of corporate financial activities	[40]

Source: Author's synthesis (2025).

3.2.3. Security and privacy

This is a key factor when businesses exploit digital technology, because data security and compliance with relevant regulations become essential conditions to ensure the trust of customers and partners [29]. DT in business operations has introduced new requirements on customer privacy and data security issues [26]. Data protection and compliance with relevant regulations have become an essential part of the DT process.

3.2.4. Improving the digital capacity and skills of the workforce

Digital transformation in the business sector has created a number of changes in the process of handling financial and non-financial operations. M.J.A. Gonçalves, et al. (2022) [34] said that in order to implement DT in business activities, it is necessary to promote the need for skill sets, which are "the ability to use and master technology" and "communication skills". In addition, S. Zhang, et al. (2025) [17] also believed that "the ability to analyse data and insights", as well as "respond to new regulations", are skills that are needed in the context of DT. Therefore, activities to improve the capacity and skills of the workforce become a part of DT in the business activities of enterprises [3].

3.3. Impact of digital transformation on accounting information systems in business activities

Digital transformation of business activities affects AIS through the following aspects: Application of digital technology [3], Business process optimisation [4], Security and privacy [35], Digital ecosystem [27], and Improving digital competencies and skills of the workforce [9]. Based on the screening of relevant studies, Table 5 summarises the effects of DT components on each component of AIS.

3.3.1. Application of digital technology impacts on accounting software and accounting data

Digital technology has supported the development of accounting software, such as Blockchain applications on e-invoice software, applications of cloud computing technology, running software on web platforms, and banking connection services on accounting software [41]. Even so, H.T.H. Hanh (2018) [15] pointed out that there are still many businesses that have not implemented the application of accounting software, such as 7.2% of enterprises still use Excel, and only about 13% of enterprises invest in overall management software, such as ERP software [42] indicated that: The level of DT in accounting is also slow in enterprises, especially enterprises in the agricultural sector (Fig. 2).

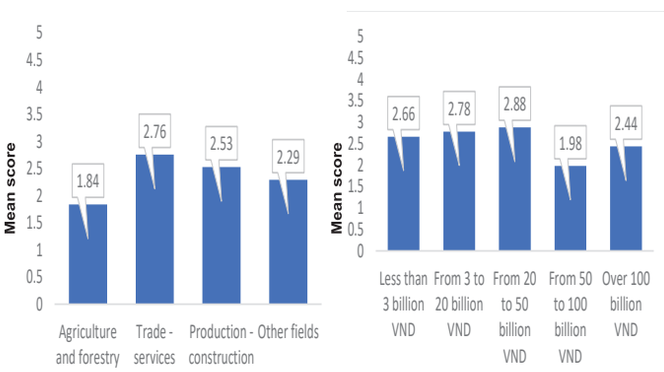


Fig. 2. Assessing the level of application of digital transformation in accounting of enterprises in Vietnam (5-point scale). Source: N.T.H. Duyen, et al. (2023) [16].

The limitation of technology application creates difficulties in improving the performance of AIS [25]. Digital technology comprehensively affects the contents of data collection, information processing, accounting information, internal control and information storage. In terms of data collection, the application of digital technology, especially IoT and Big Data, helps accounting data to be collected automatically and continuously updated, replacing the traditional manual data entry. This enhances the timeliness, accuracy, and comprehensiveness of accounting data [2]. At the same time, digital technology facilitates the integration of accounting processing systems with other management activities such as human resources, sales, and supply chains, contributing to the formation of a synchronous data collection system across the enterprise.

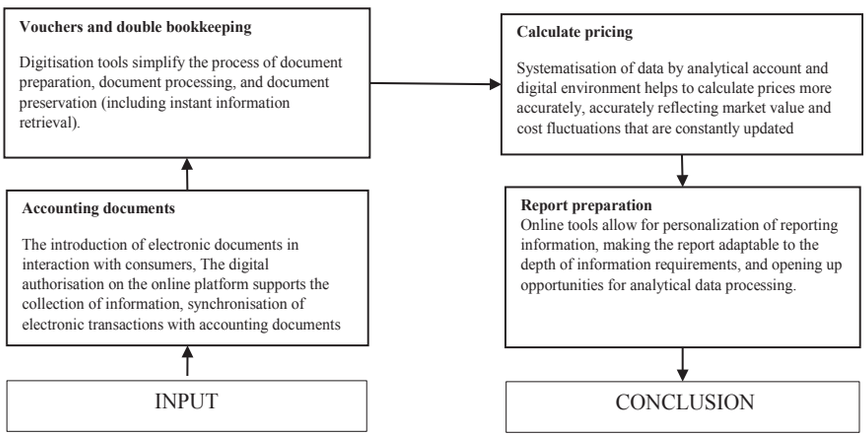


Fig. 3. Impact of digital transformation on accounting processes. Source: Developed from L. Chyzhevska, et al. (2021) [33].

The application of digital technology provides AIS with technologies such as artificial intelligence, combined with big data technology and data analysis, to create the ability to analyse and process large and complex data. These technologies help shorten processing time, reduce errors, and improve analytical efficiency [43]. Digitised analytics tools make accounting information visual and enhance the ability to communicate information [31] and improve the quality of consumer services [44]. The application of cloud computing technology and digital storage systems enables accounting data to be managed centrally and flexibly, while limiting traditional paper-based storage. In addition, digital technologies allow for remote access, rapid data backup, and recovery, facilitating internal audits and monitoring [45].

The application of blockchain technology, advanced encryption solutions, and multi-factor authentication tools has strengthened internal control mechanisms, minimising fraud and errors [13, 14]. Digital technology also supports businesses to track and monitor user activity in the system, thereby improving transparency and ensuring the security of accounting data [3].

3.3.2. The impact of business process optimisation on accounting processes

Figure 3 shows the impact of DT on accounting processes. Business processes have changed in the context of DT, such as the application of e-invoices, online transactions, e-commerce and digital payment platforms replacing traditional documents, increasing the volume and diversity of accounting data [45]. As a result, accounting data reflects business operations more closely, but at the same time, it also requires the system to standardise the process of integrating data from various sources. Business process change integrates with various management systems within the enterprise, such as human resource management, sales, and supply chain. This helps ensure that accounting data and information are no longer separate, but become a synchronous part of the data and information system of the whole business [25]. The change in business processes according to the trend of optimising operational efficiency, reducing paper documents and increasing electronic archiving has created a transformation of a number of accounting documents that are created, transmitted and stored entirely on digital platforms [45].

Digital transformation has improved accounting processes in the direction of automating the process of transacting, ordering, paying and issuing invoices and other accounting documents, which helps bring electronic documents into interaction with consumers [2]. Therefore, AIS's input data, such as sales orders and e-invoices, are recorded, and information is retrieved instantly. According to T.A. Elsharif (2019) [11], the digitisation process helps "transform the way accounting documents are created, processed, and stored, from manual to electronic, increasing the timeliness and reliability of accounting information". Online tools enable personalisation of reporting information, making reports adaptable to the depth of information requirements, and opening up opportunities for analytical data processing [2].

3.3.3. The impact of security and privacy on accounting data and internal control

Accounting data contains a lot of sensitive information, such as contracts, invoices, financial transactions, and customer information. In a digital business environment, this data is vulnerable to cyberattacks, leading to the risk of leakage, loss, or unauthorized alteration. This, in turn, drives the development of solutions such as data encryption, access management, and security process standardisation, in order to maintain the integrity and reliability of accounting data [10]. This affects the design of storage systems that strictly comply with data security standards such as periodic backups, access decentralisation, traceability monitoring, and the application of data recovery mechanisms in the event of an incident. At the same time, regulations on protecting customer privacy in the context of digital business activities also place a responsibility on businesses to comply with international laws and standards on data security [45]. Security and privacy influence the design of internal control solutions, such as the adoption of blockchain technologies, advanced encryption, access management, and monitoring of user activity to prevent fraud and errors [41, 44, 46], updating new security solutions to ensure AIS maintains transparency, trust, and information security [28, 35].

Digital transformation enhances the backup and recovery of accounting data through cloud service providers, helping to increase the availability and continuity of accounting data [16] for business decision-making. Cloud hosting facilitates advanced analytics (fraud detection, forecasting), but also requires data quality governance, privacy, and data usage ethics. Due to the responsibility to secure and share information between businesses and suppliers, accounting data requires encryption, access control, monitoring and periodic audits. DT also increases security and data security risks if governance is weak (misconfiguration, granting permissions too broadly, exposing security keys) [46]. It can be seen that DT brings both advantages and new challenges to accounting data, especially data security.

H. Mo (2023) [46] found that DT has a positive impact on improving the quality of internal control of enterprises. T.A. Elsharif (2019) [11] pointed out that the application of blockchain technology in accounting helps to preserve data and reduce the risk of financial fraud, and T. Zhao, et al. (2023) [21] showed that the impact of DT on internal control efficiency is even more pronounced for technology enterprises and manufacturing enterprises. In Vietnam, businesses deploy popular digital technology applications in the field of information and communication, such as Gmail, Zalo, and Messenger applications. These applications are convenient for communication at the enterprise, but make it difficult to monitor and operate [47]. Thus, DT not only creates new advantages in internal control, but at the same time also creates new risks of difficulty in supervision with many activities.

3.3.4. The impact of improving digital capabilities and workforce skills on accountants

Training is an important component in upgrading the quality of system users. The research of W.H. DeLone, et al. (2003) [7] emphasised the role of trained users in optimising system performance. N. Gorla, et al. (2010) [8] stated that the professional capacity and ability to use information technology of accounting staff directly affect the quality of the system and output information. I. Zybery, et al. (2014) [9] also stated that the first thing that needs to be done when applying an AIS or a new system is to train personnel for the operation of that system. Improving the digital capacity and skills of the workforce plays an important role in training accounting human resources to meet the requirements of digital business. O. Meraghni, et al. (2021) [3] believed that members in charge of AIS need to develop a system to meet the DT process, in which one of the key contents is to diversify the skills for AIS staff. New skills for accounting staff in the context of DT include data analysis, system design, operation, and information control skills [25]. The trend of training to improve digital competencies and accounting skills related to digital skills, such as using data analysis tools such as Python, VBA, SQL, Java, Microsoft Access, etc. [20].

Digital transformation poses new challenges for accounting human resources, such as changing processes and skills; therefore, if accountants are adequately trained and professionally developed, they can more easily adapt to technological innovation, and business processes will become faster and more efficient. In the DT context, the role of accountants has shifted from the role of bookkeeping and reporting to a new role as consultants and strategic consultants [48]. Therefore, many studies on AIS in Vietnam indicate that the quality of accounting personnel remains limited and has not yet met practical requirements [41]. The research of H.T.H. Hanh (2018) [15] pointed out that only about 15.1% of enterprises have more than 10 accountants, while the majority of enterprises employ fewer than 10 accountants. Due to the small scale of enterprises, accounting human resources are limited. V.T.T. Binh, et al. (2022) [49] also stated that the limited quality of human resources has an impact

on the development of AIS in Vietnam, especially in the context of the current rapid and strong DT.

4. Proposing a framework for analysing and researching accounting information systems in the context of digital transformation

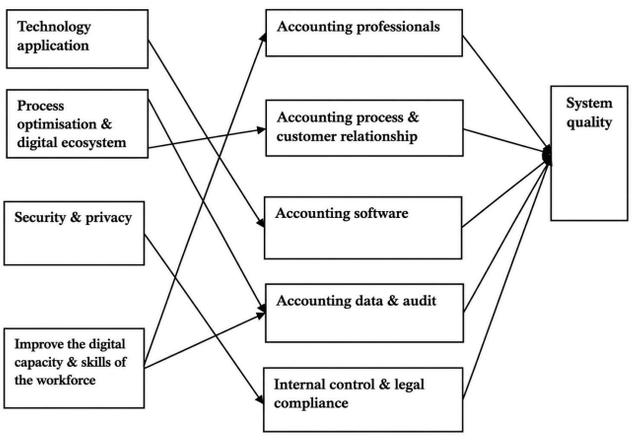


Fig. 4. Theoretical framework for researching accounting information systems in the context of digital transformation in business activities. Source: Author's synthesis (2025).

Figure 4 provides a diagram that illustrates a theoretical framework for researching AIS in the DT context, highlighting the causal relationships between technological drivers and system outcomes. On the left, foundational factors such as technology application, process optimisation & digital ecosystem, security & privacy, and improve the digital capacity & skills of the workforce serve as the primary independent variables. These drivers influence a set of core mediating components, including accounting professionals, accounting process & customer relationship, accounting software, accounting data & audit, and internal control & legal compliance. Ultimately, all these elements converge toward the final goal of "System quality", which acts as the dependent variable in this research model. Overall, this framework provides a structured approach to understanding how digital transformation impacts the efficiency and reliability of accounting systems.

5. Conclusions and recommendations

The results of the review of relevant research show the multidimensional impacts of DT on AIS. This synthesis helps to address a large gap in the current literature that often separates components related to DT and its impact on AIS. Thereby, the multi-layered interaction model illustrating the influence of DT on AIS represents a new trend in assessing the impact of DT on AIS, thereby affecting the quality of the system and the quality of information.

Digital transformation in business activities is becoming an inevitable trend in production and business activities. The completion of AIS is not only a technical requirement but also an important strategy to improve the management capacity, operational efficiency and competitiveness of enterprises. The results of the literature review show that the contents of DT have an impact on AIS in terms of digital technology application, business process optimisation, security and privacy, digital ecosystem, improving digital capacity and skills of the workforce. DT brings positive benefits but also new challenges for AIS through the impact on AIS components such as accounting personnel, processes, software, accounting data and internal controls.

Therefore, businesses need to carefully implement AIS in the context of digital business activities, such as considering issues of strengthening the capacity of accounting personnel, perfecting accounting processes, strengthening the application of accounting software and focussing on data security and internal control issues. In Vietnam, technologies and digital ecosystems in businesses are still limited, especially in small-sized businesses, and the DT process stays at a low stage. The components of DT have not been comprehensively upgraded; therefore, the DT process to improve the efficiency of the AIS should not only focus on technology, but also be accompanied by restructuring the internal control process, as well as synchronising transactions in the digital ecosystem to optimise AIS. In particular, it emphasises new problems in relation to AIS in the DT context, including issues related to security and privacy.

The article is based on an overview of previous research works to explore the theoretical framework of the interaction between DT and AIS; therefore, the study suggests the possibility of conducting future empirical studies for businesses in Vietnam. The study could not provide a comprehensive synthesis of the impact of DT on AIS, as access to relevant research publications was limited and not fully up to date. Therefore, further studies are needed to provide a more comprehensive understanding of the impact of DT on AIS.

CRediT author statement

Le Thanh Ha: Content and results of research, discussion, Reviewing and Editing; Nguyen Van Pho: Data collection and Synthesis, Reviewing and Editing; Mac Dinh Tuan: Data collection and Synthesis.

COMPETING INTERESTS

The authors declare that there is no conflict of interest concerning the publication of this paper.

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Cultural resistance to digital transformation in Vietnamese higher education: Barriers and strategic responses

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Received 22 February 2025; revised 28 June 2025; accepted 2 July 2025

Abstract:

Digital transformation in higher education is essential for enhancing teaching quality, administrative efficiency and institutional competitiveness. However, in Vietnam, cultural resistance poses a significant challenge, delaying the adoption of digital technologies in academic settings. This study employs a systematic literature review (SLR), synthesising evidence from peer-reviewed journal articles and relevant policy reports published between 2014 and 2024. The selection process was based on three key criteria: relevance to digital transformation in higher education, focus on cultural barriers and applicability to the Vietnamese or broader Southeast Asian context. Through thematic analysis, the study identifies five core dimensions of cultural resistance: (1) entrenched Confucian educational traditions, (2) hierarchical institutional structures, (3) resistance to role change among faculty, (4) disparities in digital literacy, and (5) institutional inertia. To interpret these factors, the study synthesises three theoretical frameworks - the Technology Acceptance Model (TAM), Diffusion of Innovations (DOI), and Hofstede's Cultural Dimensions Theory - into an integrated analytical model that explains how cultural and institutional norms affect digital adoption in Vietnamese higher education institutions (HEIs). The study contributes a conceptual framework for understanding resistance patterns in culturally embedded HE systems and provides strategic recommendations, including leadership engagement, faculty digital training, and culturally sensitive blended learning models. Although theoretical in nature, this research offers a foundational basis for future empirical investigations and policy development, with broader relevance for other Confucian-influenced education systems undergoing digital transformation.

Keywords: **cultural resistance, digital transformation, higher education, systematic literature review, Vietnam.**

Classification numbers: **2.2, 3.1, 3.3**

1. Introduction

Digital transformation in higher education has become a global priority, enabling universities worldwide to enhance teaching quality, institutional efficiency, and academic innovation [1, 2]. However, HEIs face persistent resistance to digital transformation, primarily due to cultural and institutional barriers. Unlike technical challenges such as infrastructure limitations, cultural resistance stems from deep-rooted educational traditions, hierarchical faculty-student dynamics, and institutional reluctance to change [1, 2].

Vietnam's education system is shaped by long-standing educational traditions that emphasise teacher-centred instruction, structured classroom authority, and examination-oriented learning [3]. Faculty members, particularly those accustomed to traditional classroom settings, often view digital teaching methods as a threat to academic rigour, pedagogical authority, and established professional identity [4, 5]. Additionally, low digital literacy among educators, lack of structured training, uneven sharing of digital learning materials, and administrative hesitancy further slow digital adoption [4, 6]. Institutional inertia, reflected in rigid policies and slow bureaucratic

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processes, exacerbates this resistance, making large-scale transformation challenging [1, 4].

Comparative evidence from Asian contexts indicates that Vietnam's digital resistance shares common patterns with other higher education systems but also has distinctive features shaped by local institutional conditions. For example, a comparative study of Singapore and Vietnam shows that perceived usefulness, technical skills, and institutional support influence online learning preferences differently across national contexts [6]. Understanding these regional differences provides valuable insights for Vietnam's digital transformation strategy.

While numerous studies have addressed technical and infrastructural aspects of digital transformation in higher education, relatively few have systematically examined the cultural dimensions of resistance - particularly in Southeast Asian contexts such as Vietnam [4, 6]. This study addresses that gap by integrating established theoretical frameworks to explore how cultural traditions, institutional hierarchies, and digital competencies influence faculty attitudes towards digital adoption.

Given these challenges, this study aims to: Identify key cultural factors contributing to digital resistance in Vietnamese HEIs; Analyse how existing theoretical frameworks (TAM, DOI, and Hofstede's Cultural Dimensions Theory) explain faculty hesitancy toward digital adoption; Examine international higher education experiences to identify potentially relevant lessons for Vietnam's digital transformation; Propose strategic solutions to foster digital readiness and institutional change.

By addressing these research objectives, this study contributes to the broader discussion on digital transformation in higher education, emphasising the importance of culturally responsive strategies.

2. Literature review

The digital transformation of higher education has become a central theme in contemporary educational research, with increasing attention devoted to institutional reform, pedagogical innovation, organisational readiness, and the integration of digital technologies. International studies have primarily concentrated on process optimisation, technological deployment, and institutional barriers. For instance, recent work by K. Gkrimpizi, et al. (2023) [1] systematically classified barriers to digital transformation in higher education institutions, highlighting organisational, strategic, cultural, and technological challenges. In a similar vein, M. Bond, et al. (2018) [7] examined German higher education and showed that student and teacher perceptions and patterns of digital media use are central to digital transformation. M. Kopp, et al. (2019) [8] further argued that institutional assumptions - such as treating digital transformation as merely an IT responsibility - can prevent deeper organisational change.

Other scholars have addressed process-centric and organisational approaches. L.M.C. Benavides, et al. (2020) [2] reviewed digital transformation in HEIs as an institutional process involving technologies, actors, organisational structures, and change processes. These contributions reflect a growing interest in the managerial and technical dimensions of digital transformation. However, they are less explicit in explaining how socio-cultural values, academic identity, and pedagogical traditions shape resistance among faculty members.

In the Vietnamese context, existing literature remains comparatively sparse and unevenly distributed. Most studies have focused on digital infrastructure, faculty competence, LMS adoption, and institutional readiness. For example, the British Council report on digital transformation readiness in Vietnamese universities [4] provides important evidence on institutional gaps and partnership opportunities. T.S. Hoang, et al. (2022) [9] examined the digital competence of lecturers at universities of education in Vietnam, while B.T. Khoa, et al. (2020) [10] used TAM2 to analyse lecturers' adoption of LMS in Vietnamese universities. H.H. Pham, et al. (2020) [5] also discussed the transition towards e-learning in Vietnamese higher education after COVID-19. However, these works have yet to systematically theorise cultural resistance as a primary, enduring obstacle to digital transformation.

Similarly, international policy analyses have identified digital readiness gaps in HEIs, yet cultural resistance is often mentioned only tangentially, without theoretical elaboration [4, 11]. Existing studies rarely examine how traditional knowledge-transmission pedagogy, limited sharing of digital learning resources, uncertainty about AI ethics, and the digital competence of educational managers interact with faculty resistance in Vietnamese HEIs.

This study seeks to address these gaps by offering a secondary-data synthesis that foregrounds cultural resistance as a central analytical lens. Unlike existing

research that isolates technical barriers or managerial shortcomings, this paper synthesises cultural, institutional, pedagogical, and psychological factors to explain resistance behaviour among Vietnamese faculty and administrators. It contributes an integrated conceptual framework that enables a multidimensional interpretation of digital resistance within culturally embedded educational systems. This approach provides both a theoretical scaffold for future empirical work and a culturally responsive perspective that remains underrepresented in the global literature on digital transformation.

3. Methodology

3.1. Research approach

This study uses secondary data analysis based on an SLR to develop a theoretical understanding of cultural resistance to digital transformation in Vietnamese higher education. Rather than collecting new empirical data, the research synthesises insights from existing academic and policy sources to construct a conceptual framework grounded in current scholarship. The research is guided by four primary questions: What are the key cultural barriers to digital transformation in HEIs?; How do existing theoretical frameworks (TAM, DOI, and Hofstede's Cultural Dimensions Theory) explain resistance to digital change?; What lessons can be drawn from international higher education experiences for addressing cultural resistance in Vietnamese HEIs?; What solutions have been proposed to overcome cultural resistance in higher education?

3.2. Data collection and selection criteria

The study adopts a three-stage process for selecting and analysing literature. First, data collection was conducted through academic databases such as Scopus, Web of Science, Google Scholar, Springer, and ScienceDirect. In addition, reports from UNESCO, the World Bank, and Vietnamese government agencies were included to provide a contextual understanding of digital transformation efforts in Vietnam. Second, inclusion and exclusion criteria were applied to refine the dataset. The review included peer-reviewed journal articles published between 2014 and 2024 that addressed higher education, digital transformation, and cultural or institutional barriers, with particular attention to Vietnam and comparable Southeast Asian contexts. Relevant policy reports from international organisations and government agencies were also included to provide contextual evidence. Exclusion criteria comprised opinion pieces and other non-academic sources; studies focusing solely on technical barriers without examining cultural or institutional dimensions; and literature unrelated to higher education.

Third, a qualitative content analysis was conducted to extract thematic categories related to cultural resistance. By ensuring rigorous selection criteria, this study maintains a high level of validity and reliability in its findings.

3.3. Thematic analysis and conceptual framework

To analyse the selected literature, the study employs a qualitative thematic analysis approach. This method allows for the identification of recurring patterns, key themes, and theoretical insights regarding cultural resistance to digital transformation. The thematic analysis identified five core dimensions of cultural resistance: entrenched Confucian educational traditions, hierarchical institutional structures, resistance to role change among faculty, disparities in digital literacy, and institutional inertia.

The thematic analysis followed a three-stage coding process. First, open coding was conducted to identify recurring ideas and expressions related to cultural resistance across the selected documents. Second, axial coding was used to group related concepts into broader thematic categories such as pedagogical conservatism, institutional inertia, and digital skill disparities. Finally, selective coding was applied to synthesise the identified categories into a cohesive analytical structure. This structured approach ensures analytical consistency, depth, and traceability.

In addition to thematic coding, this study integrates three theoretical models - TAM, DOI, and Hofstede's Cultural Dimensions Framework - to interpret the findings. These models are synthesised into an integrated conceptual framework that explains how perceived usefulness, cultural hierarchy, and peer influence interact to shape faculty attitudes towards digital transformation.

By employing this structured approach, the study provides a theoretically grounded and evidence-based analysis of cultural resistance to digital transformation in Vietnamese higher education.

The literature identification and selection process was guided by the PRISMA 2020 framework [12].

A primary limitation of this study is the absence of empirical data, as the SLR method does not involve direct data collection through surveys or interviews.

However, this approach ensures a broad synthesis of existing knowledge and identifies recurring themes across multiple studies. Future research should consider employing mixed-method approaches, incorporating both quantitative surveys and qualitative interviews to validate the theoretical insights presented here. Such empirical investigations could provide deeper perspectives on faculty, student, and administrative attitudes towards digital transformation in Vietnamese higher education institutions.

4. Results and discussion

4.1. Cultural resistance in Vietnamese higher education institutions: Key themes

Cultural resistance remains a fundamental barrier to the successful implementation of digital transformation in HEIs [1, 2, 4]. While digital technologies promise efficiency, flexibility, and innovation in teaching and learning, their adoption is often met with scepticism and reluctance, particularly in institutions with deep-rooted educational traditions. This section explores key cultural barriers, focusing on traditional teaching methods, academic roles, institutional structures, digital literacy gaps, and cultural values.

One of the primary reasons for resistance is the adherence to traditional teaching methods, which have long been entrenched in Vietnamese higher education. Historically, Vietnamese pedagogy emphasises direct, instructor-led learning, where knowledge is transmitted from teacher to student through lectures, rote memorisation, and standardised examinations [3]. Digital learning environments, which emphasise student-centred learning, active participation, and self-directed study, are often perceived as a departure from this model [5, 13, 14]. Faculty members, particularly those who have spent decades teaching in conventional settings, may view online education and digital platforms as impersonal and less effective than face-to-face interactions. A study by N.T. Pham, et al. (2022) [13] found that lecturers' satisfaction with online teaching was shaped by technology quality, course design, perceived usefulness, and institutional support. T.X.L. Cao (2023) [14] also showed that LMS use in blended learning generates both benefits and practical challenges for teachers and students in a Vietnamese public university. Concerns that digital education compromises the authenticity and rigour of face-to-face instruction further exacerbate this scepticism [5].

Faculty resistance is largely driven by discomfort with shifting pedagogical roles. Many instructors, particularly those trained in traditional lecture-based environments, perceive digital teaching tools as impersonal or even as threats to academic authority. The integration of Artificial Intelligence (AI), Learning Management System (LMS), and automated grading systems raises concerns about diminished instructional autonomy or job relevance. Without institutional reassurance and peer support, these anxieties can lead to passive or active opposition to digital initiatives.

Another significant factor influencing the pace of digital transformation in Vietnamese HEIs is institutional structures and administrative processes, which may introduce complexities in the adoption of new technologies. Many HEIs, particularly public universities, operate within hierarchical frameworks, where decision-making follows structured approval processes. While these processes help ensure quality control and policy alignment, they can also extend the time required for integrating digital tools into curricula and administrative operations. As a result, faculty and administrators may struggle to navigate these procedures, which can impact the speed of technological adoption. Institutional support for digital transformation also varies across universities, with some institutions demonstrating strong leadership commitment, while others lack structured governance frameworks and clear mechanisms for sharing digital resources across faculties and departments [4, 9].

A critical factor exacerbating resistance is the lack of digital literacy and readiness among faculty members and administrators. Many educators, particularly older generations, have limited exposure to digital teaching tools and struggle with integrating them into their pedagogy. While younger faculty members tend to be more adaptable, disparities in digital competencies create inconsistencies in technology adoption across institutions [4, 9]. A study by T.S. Hoang, et al. (2022) [9] involving lecturers, managers, training experts, and institutional leaders at universities of education in Vietnam found that digital competence remained uneven and required systematic development. Evidence on LMS adoption in Vietnam also shows that perceived usefulness, ease of use, and social influence affect lecturers' willingness to use digital platforms [10]. These findings highlight persistent disparities in digital readiness that reflect generational, disciplinary, and organisational divides within Vietnamese HEIs. This

digital skills gap not only slows down adoption but also reinforces scepticism about the effectiveness of digital learning, as instructors who struggle with technology often transfer their apprehensions to students.

Beyond institutional and pedagogical factors, Vietnamese cultural values and social norms play a defining role in shaping attitudes towards digital transformation. Vietnam's educational culture emphasises respect for authority, hierarchical relationships, and structured learning. In this context, educational innovation that challenges established norms is often met with scepticism. Hofstede's Cultural Dimensions Framework (2001) [15] identifies Vietnam as a country with high power distance, meaning that deference to authority figures is deeply ingrained in academic settings. As a result, faculty members may hesitate to experiment with digital tools unless formally endorsed or mandated by institutional leaders.

4.2. Theoretical perspectives on resistance to digital transformation

Resistance to digital transformation in HEIs can be understood through various theoretical frameworks that explain how individuals and organisations respond to technological change. Among these, the TAM, DOI Theory, and Hofstede's Cultural Dimensions Framework provide critical insights into why faculty members and institutions hesitate to embrace digital technology. Each framework highlights different aspects of resistance, ranging from personal attitudes toward technology adoption to broader cultural and institutional influences.

The TAM, developed by F.D. Davis (1989) [16], suggests that an individual's willingness to adopt new technology depends primarily on perceived usefulness (PU) and perceived ease of use (PEU). Later developments of TAM also emphasise social influence, facilitating conditions, and intervention mechanisms [17]. From a TAM perspective, faculty members may resist digital technologies when they perceive them as difficult to use or of limited usefulness. Recent empirical work applying TAM in Vietnamese universities found that perceived usefulness significantly influenced faculty members' intention to adopt LMS tools [10]. Additionally, some faculty members believe that digital tools do not necessarily improve student engagement or learning outcomes, further reducing motivation to adopt new technologies. Without proper training and institutional incentives, digital transformation efforts are likely to face continued resistance. International evidence on faculty perceptions of online teaching also shows that perceived ease of use and perceived usefulness are central to technology adoption [18]. Evidence from Germany further highlights that teacher and student perceptions are decisive in shaping digital transformation in higher education [7].

The DOI Theory by E.M. Rogers (2003) [19] explains how technology adoption occurs within organisations. According to DOI, individuals adopt innovations at different rates, classified into five categories: innovators, early adopters, early majority, late majority, and laggards. In Vietnamese higher education, faculty members who are early adopters may readily integrate digital tools, while the late majority and laggards require significant persuasion and institutional support. DOI also emphasises the role of social influence and perceived relative advantage, meaning that if faculty members observe peers successfully utilising technology, they may be more inclined to follow. However, many Vietnamese universities lack structured mentoring programmes to encourage peer adoption, slowing the overall diffusion process.

Hofstede's Cultural Dimensions Framework provides another perspective on resistance, particularly in the Vietnamese context, where relatively high power distance may shape faculty attitudes towards institutionally endorsed change [15]. In hierarchical academic environments, faculty members may hesitate to experiment with digital teaching methods unless explicitly endorsed by senior administrators.

The interaction between these three frameworks highlights that digital resistance in Vietnamese HEIs cannot be attributed to a single factor. Faculty members may resist due to individual perceptions of usefulness (TAM), lack of peer influence (DOI), or broader cultural norms (Hofstede). Addressing these barriers requires targeted interventions that align with institutional culture while leveraging faculty training, leadership support, and structured policy changes to facilitate a smoother transition into digital education.

4.3. Lessons from global digital transformation in higher education

Examining global experiences in digital transformation provides valuable insights for addressing cultural resistance in HEIs. Many countries have successfully integrated digital technologies into their higher education systems by implementing strategic policies, investing in faculty training, and fostering a digital culture among educators and students. By learning from these examples, Vietnamese HEIs can develop more effective approaches to overcoming institutional and cultural barriers to digital transformation.

One of the key lessons from international HEIs is the role of government policies and national strategies in driving digital transformation. International evidence suggests that digital transformation requires more than technology procurement; it also requires governance, equity, teacher preparation, and evidence-based policy design [11]. In the United Kingdom (UK), frameworks such as the Jisc digital capabilities model have helped higher education institutions systematically conceptualise digital capability in terms of digital proficiency, information and media literacies, communication and collaboration, digital creation, digital learning, and digital identity [20]. These cases highlight the importance of structured policies, government support, and long-term strategic planning in fostering digital adoption in HEIs.

Another important lesson from global experiences is the emphasis on faculty training and digital literacy development. Resistance to digital transformation often stems from faculty members' lack of confidence in using digital tools and their perception that technology undermines traditional teaching methods. Professional development should therefore include hands-on training, peer mentorship, and sustained pedagogical support rather than one-off technical workshops. The Jisc framework is useful for designing tiered digital capacity programmes [20], while Beetham and Sharpe's work on digital pedagogy emphasises that technology integration must be grounded in learning design rather than tool adoption alone [21]. For Vietnamese HEIs, a structured approach to continuous professional development and faculty support will be essential in overcoming digital scepticism.

Global best practices also emphasise the importance of student-centred digital learning environments. Digital transformation is most effective when students are actively involved in shaping their digital learning experiences rather than treated as passive recipients of technology. Comparative evidence from Singapore and Vietnam shows that students' and educators' online learning preferences are influenced by perceived usefulness, digital skills, and contextual support [6]. Broader research on students' everyday engagement with digital technology in universities also cautions that usefulness depends on how technologies are embedded in authentic learning practices [22]. Vietnamese universities can adopt similar strategies by incorporating interactive digital content, fostering student collaboration on digital platforms, and encouraging feedback-driven improvements in digital learning environments.

A frequently overlooked aspect of digital transformation research is the student perspective. While much of the literature focuses on faculty and administrative challenges, students play a critical role in either accelerating or resisting digital adoption. Vietnamese evidence on students' adoption of e-learning during COVID-19 shows that behavioural intention and facilitating conditions shaped students' acceptance of e-learning in an emergency context [23]. At the same time, international policy analysis warns that digital technology can widen inequality if access, affordability, privacy, and teacher support are not adequately addressed [11]. To ensure an inclusive transition, universities should implement policies such as providing affordable digital devices, offering free campus-wide internet access, and developing user-friendly digital learning platforms. Addressing student concerns is essential to creating a more comprehensive and sustainable digital transformation strategy.

A critical factor in successful digital transformation is the development of a robust technological infrastructure. Evidence from German higher education indicates that digital transformation depends on how students and teachers perceive and use digital media, not simply on whether infrastructure exists [8]. International guidance also stresses that infrastructure planning must be aligned with pedagogical purpose, equity, data governance, and system-level support [11]. Vietnamese HEIs can learn from these insights by advocating for government-supported IT infrastructure investments, ensuring stable internet access, and using AI-driven tools only where they demonstrably enhance digital pedagogy and academic integrity.

By drawing on these international lessons, Vietnamese HEIs can accelerate digital adoption and address cultural resistance more effectively. Key takeaways include the importance of national digital policies, faculty training programmes, student-centred digital learning, and investments in technological infrastructure. These insights highlight the need for a systematic, well-supported approach to digital transformation, ensuring that universities in Vietnam can adapt to global trends while maintaining educational quality and accessibility. A summary of key cultural barriers and corresponding strategies is presented in Table 1.

Table 1. Summary of cultural barriers and strategic responses.

Cultural barrier	Strategic response
Confucian-rooted traditional pedagogy	Blended learning models that respect existing teaching norms
Hierarchical institutional structures	Top-down leadership commitment and change management frameworks
Faculty role anxiety and fear of loss of authority	Faculty autonomy, digital innovation grants, and peer mentoring
Digital literacy disparities	Tiered digital training programs and microcredentials
Institutional inertia and fragmented policy environment	Institutional digital strategies, infrastructure investment

Source: Author's synthesis based on the reviewed literature.

4.4. Overcoming cultural resistance: Proposed solutions

To address cultural resistance to digital transformation in Vietnamese HEIs, a comprehensive strategy is required, incorporating leadership commitment, faculty training, student engagement, and infrastructural improvements. Lessons from international best practices suggest that a multi-dimensional approach is essential to overcoming institutional inertia and fostering digital adoption.

4.4.1. Fostering leadership commitment and change management

Institutional leadership plays a critical role in digital transformation. Universities that demonstrate strong leadership commitment experience higher rates of faculty engagement and smoother transitions to digital education. HEI leaders must clearly articulate a digital vision, ensuring that faculty and staff understand the long-term benefits of technology integration. To facilitate change, institutions should adopt structured change management frameworks such as Kotter's Eight-Step Model [24]. This includes creating a sense of urgency, building guiding coalitions, and institutionalising change through policy and practice. In high power-distance cultures like Vietnam, visible support from senior leadership is especially crucial for reducing cultural hesitancy [15].

4.4.2. Developing digital literacy and capacity - Building programs

A key barrier to digital adoption is insufficient digital literacy among faculty members. To ensure sustainable digital capacity-building, universities should adopt a phased faculty training strategy over a three-year period. In Year 1, pilot digital pedagogy programmes can be implemented in digitally mature faculties (e.g., STEM departments). In Year 2, the training should be expanded university-wide with tiered tracks (basic-intermediate-advanced), tailored by age group and department needs. In Year 3, institutions should conduct impact assessments and refine training content based on feedback and evolving technologies. Training content should go beyond technical operation to include digital pedagogy, learning-material sharing, data privacy, academic integrity, and ethical use of AI in teaching and assessment [20, 25].

Faculty deans should oversee programme implementation, supported by IT departments and Centres for Teaching and Learning. Funding should be secured through a blended model involving Ministry of Education and Training (MOET) grants, private EdTech partnerships, and international donors (e.g., World Bank, ADB). Incentives such as internal certification or salary progression can encourage participation.

4.4.3. Aligning digital strategies with cultural norms

Cultural alignment is crucial in overcoming resistance to digital transformation. In Vietnam, where Confucian values emphasise hierarchy and structured learning, institutions must gradually introduce digital changes while respecting existing academic traditions. Blended learning is particularly effective, allowing continuity of face-to-face interaction while integrating digital enhancements. Furthermore, universities can leverage collectivist cultural values by promoting teamwork in digital projects, encouraging departmental digital committees, and creating shared learning goals.

4.4.4. Enhancing institutional policies and infrastructure support

A clear digital policy framework is essential to guide universities through transformation. Institutions should establish comprehensive digital policies that outline standards for technology integration, faculty support mechanisms, and student engagement strategies. Financial and infrastructural constraints are among the most cited obstacles in Vietnamese HEIs [4]. International policy evidence also highlights that

digital technology in education must be appropriate, equitable, scalable, and sustainable rather than adopted for its own sake [12]. Universities can pursue a hybrid investment strategy combining public funding, private EdTech partnerships, and international development assistance. To ensure feasibility, a phased implementation model is recommended - starting with pilot programmes in digitally ready faculties or urban universities, then gradually scaling nationwide based on lessons learned. A preliminary cost-benefit analysis (CBA) for each proposed intervention can assist institutional planners in prioritising investments.

A clear implementation roadmap is also required for infrastructure upgrades. Short-term actions (within 12-18 months) may include expanding campus-wide internet access and adopting cloud-based LMS platforms. Mid-term investments (within 3-5 years) should prioritise smart classrooms, AI-driven learning analytics, and cybersecurity. Infrastructure planning should be led by Vice Rectors for Administration, in consultation with IT units and Finance departments, and coordinated with national digital education initiatives.

4.4.5. Encouraging faculty autonomy and pedagogical flexibility

Providing educators with autonomy in technology adoption can reduce perceptions of forced change. Research suggests that faculty members who have the flexibility to choose digital tools that align with their teaching preferences are more likely to adopt them. Offering a range of digital teaching options - rather than mandating a one-size-fits-all approach - allows educators to explore technology at their own pace. Encouraging faculty-driven digital innovation by supporting action research projects and digital teaching experiments can further empower educators. Universities should create technology incubators where faculty members can pilot digital initiatives, share best practices, and refine digital pedagogies in a low-risk environment.

5. Conclusions

The digital transformation of higher education institutions (HEIs) in Vietnam represents a critical step towards modernisation, improving teaching quality, administrative efficiency, and institutional competitiveness. However, cultural resistance remains a significant challenge, rooted in traditional pedagogical practices, hierarchical institutional structures, digital literacy gaps, and broader socio-cultural values. Addressing these barriers requires a strategic, well-integrated approach that aligns technological advancements with institutional culture and educational norms.

This study identifies five core dimensions of cultural resistance in Vietnamese HEIs: (1) entrenched Confucian teaching traditions, (2) hierarchical authority structures, (3) resistance to faculty role change, (4) digital skill disparities, and (5) institutional inertia. These barriers are shaped by both cultural norms and organisational dynamics, complicating the implementation of digital initiatives.

By integrating the TAM, DOI, and Hofstede's Cultural Dimensions Theory, the study contributes a conceptual framework for understanding how these resistance patterns operate in culturally embedded educational systems. This framework offers a theoretically grounded lens through which future empirical research can be conducted.

Strategically, the study recommends multi-level interventions, including leadership-driven change management, tiered faculty development programmes, culturally adaptive digital pedagogy, and infrastructure investment. These approaches must be supported by financial planning and phased implementation to ensure feasibility in resource-constrained contexts.

Although this study is conceptual in nature, it lays the groundwork for future empirical validation. Subsequent research should employ mixed-methods designs, including large-scale faculty and student surveys, semi-structured interviews, and institutional case studies, to examine how cultural resistance manifests across different university contexts.

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 DOI: 10.31276/VMOSTJOSSH.2025.0051

The role of brand trust, brand love and brand loyalty in brand defence at public universities in Ho Chi Minh City

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Received 24 October 2025; revised 24 January 2026; accepted 4 February 2026

Abstract:

Brand defence has recently been recognised as a distinct construct in consumer-brand relationship research; however, its application in higher education remains limited. This study examines how students respond to negative information about their university brand and investigates the roles of brand trust, brand love, and brand loyalty in shaping such behaviours. Using a quantitative approach, data were collected from 283 valid responses from students and alumni of public universities in Ho Chi Minh city, Vietnam. The data were analysed using SmartPLS 3 with Partial Least Squares Structural Equation Modelling (PLS-SEM), following a two-stage procedure consisting of measurement model assessment and structural path testing via bootstrapping. The results confirm that brand trust, brand love, and brand loyalty all have significant positive effects on brand defence behaviour. These findings extend consumer-brand relationship theory to the higher education context and provide practical insights for universities seeking to strengthen brand resilience in increasingly competitive and digitally driven environments.

Keywords: **brand defence, brand love, brand loyalty, brand trust, higher education.**

Classification numbers: **2.2, 3.3, 4.1**

1. Introduction

In today's digital landscape, the rapid expansion of social media has made it easier than ever for individuals to share their experiences publicly, especially negative ones. Even minor issues, if left unresolved, can quickly escalate into reputational crises that threaten an organisation's brand image [1]. Within this context, brand protection emerges as a strategic imperative, functioning as a defensive mechanism against harmful narratives. Prior research indicates that strong emotional bonds between consumers and brands often lead to supportive behaviours when the brand faces adversity [2-4].

In higher education, this challenge is particularly pronounced. Public universities in Vietnam are under increasing pressure to achieve financial autonomy, intensifying competition not only among themselves but also with private institutions. While academic quality and infrastructure remain important, brand reputation has become a decisive factor in attracting students. Despite their historical prestige, public universities must now actively manage their image in a highly dynamic and competitive environment. This task is further complicated by the influence of student-generated content on social media, where negative narratives often spread faster than positive ones. For instance, a false rumour in 2023 about a student at a public university in Ho Chi Minh City being assaulted during military training spread rapidly online, resulting in mass one-star ratings and boycott calls against the university. Although the rumour was later disproven, the reputational damage required significant effort to repair. Such incidents illustrate how vulnerable universities are to online discourse and why proactive brand management is essential.

Students increasingly voice their opinions through unofficial channels such as community fanpages and online groups, rather than formal feedback systems. Platforms like the Facebook community "University, Just Don't Study" (an English rendering of the Vietnamese pun Đại Học Đừng Học Đại), with over 2.7 million members, illustrate how even minor complaints about tuition fees or administrative policies can spark widespread debate. Moreover, users tend to share negative experiences more frequently than positive ones, amplifying reputational risks for universities. However, not all students contribute to brand criticism. In many cases, they act as defenders

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of their university's reputation-correcting misinformation, expressing support, or maintaining neutrality to reduce the spread of negativity. This behaviour, known as brand defence, represents a valuable yet underexplored resource in the context of higher education.

Although brand defence has been studied in consumer markets, particularly in relation to physical products, there remains a significant gap in understanding this behaviour within service-based organisations such as universities [5, 6]. Universities offer long-term, relational services, and their brand is shaped not only by academic outcomes but also by the quality of relationships with students, alumni, and the broader community [7]. While some studies have examined students' positive word-of-mouth [8], few have addressed their active role in defending the brand.

This study aims to investigate brand defence behaviour among students at public universities in Ho Chi Minh City, Vietnam's largest urban centre with a diverse and competitive educational landscape. Specifically, it addresses two research questions: (1) How can brand defence behaviour be validly and reliably measured among university students? and (2) To what extent do brand love, brand trust, and brand loyalty influence students' brand defence behaviour, and does brand loyalty mediate the relationships between brand love, brand trust, and brand defence? By examining these antecedents of brand defence, this research seeks to validate a measurement scale suitable for the university context and to provide practical recommendations for student relationship management. Data collection was conducted between April 22 and May 20, 2025, targeting students from public universities in the city. The study is expected to make two main contributions. Theoretically, it extends brand defence research-previously examined mainly in physical-product and consumer-goods settings-to a long-term, relational service context, clarifying which dimensions of the construct are empirically applicable to higher education. Practically, it offers universities a validated diagnostic tool for assessing students' propensity to defend the institutional brand, together with guidance on cultivating trust, love, and loyalty as levers of brand resilience.

2. Research subjects and methods

2.1. Theoretical background

The consumer-brand relationship (CBR) theory provides a foundational lens for understanding how individuals form emotional and psychological bonds with brands. Rather than viewing consumption as transactional, CBR emphasises long-term relational engagement, where consumers integrate brands into their identity and social lives [9, 10]. In the context of higher education, this framework is particularly relevant. Students do not merely consume educational services; they co-create value through sustained interaction with their university, making constructs such as trust, love, and loyalty applicable to the student-university relationship.

Brand attachment theory, rooted in J. Bowlby's (1977) work [11], explains how emotional bonds with brands develop through positive experiences and perceived safety. These attachments foster advocacy and defence behaviours, especially when the brand is threatened [12, 13]. Complementing this, social identity theory [14] posits that individuals derive self-esteem from group affiliations. In branding, this translates to consumers defending brands that reflect their social identity, perceiving attacks on the brand as personal threats [15, 16].

Brand defence behaviour (DEF) has emerged as a distinct construct, reflecting consumers' active efforts to protect brands from criticism. J. Colliander, et al. (2013) [17] identified six types of DEF: advocating, justifying, trivialising, stalling, vouching, and doubting. These behaviours range from direct rebuttals to humorous dismissals and cautious scepticism, illustrating the complexity of brand defence beyond traditional word-of-mouth.

Despite its relevance, DEF remains underexplored. M. Javed, et al. (2015) [18] conceptualised it as an advanced form of positive word-of-mouth, while S.K. Roy, et al. (2023) [6] developed a multidimensional scale comprising defending, advocating, and forgiving. Their findings confirmed that brand love and trust are significant antecedents of DEF, and that DEF positively influences brand loyalty. This study adopts S.K. Roy et al.'s scale to measure DEF in the context of public universities in Ho Chi Minh City.

However, the applicability of the "forgiving" dimension in the higher education context warrants careful consideration. Unlike typical CBR, the student-university relationship is characterised by prolonged emotional investment, high switching costs, and strong identity attachment. In this context, negative events or reputational threats are often perceived as deeply personal and value-laden, making unconditional forgiveness less conceptually relevant. Therefore, while this study initially adopts S.K. Roy, et al. (2023) [6] multidimensional conceptualisation of DEF, the suitability of each dimension is empirically examined within the public university setting.

2.2. Hypothesis development

Brand trust (TRU) is defined as the belief in a brand's reliability and integrity [19]. In education, trust reflects students' confidence in their university's consistency and ethical conduct, reducing perceived risk and fostering long-term commitment [20, 21]. Trust also mediates satisfaction and loyalty [22]. This study applies the trust scale developed by R.K. Jillapalli, et al. (2014) [23], focusing on reliability and integrity.

Brand love (LOV) represents the deepest emotional connection consumers can form with a brand. B.A. Carroll, et al. (2006) [24] define it as passionate emotional attachment, while N. Albert, et al. (2008) [25] identify dimensions such as attachment, passion, positive evaluation, and self-identification. Brand love develops through shared values and meaningful experiences, leading to loyalty and advocacy [26, 27]. In higher education, brand love arises from academic experiences, brand image, and perceived personality of the institution [28, 29]. This study uses the multidimensional scale by R. Batra, et al. (2012) [27], adapted by P.A. Rauschnabel, et al. (2016) [30] for university settings.

Brand loyalty (LOY) reflects consumers' enduring commitment to a brand, encompassing emotional attachment and behavioural intentions [31]. Loyalty promotes advocacy and brand resilience, especially in competitive environments [32, 33]. In education, loyalty manifests through students' willingness to recommend their university, pursue further studies, and remain engaged post-graduation. This study adopts V. Kaushal, et al.'s (2020) [34] loyalty scale, which captures these dimensions in the university context.

Building on these theoretical foundations, the study proposes three hypotheses. First, brand love is expected to positively influence brand defence behaviour. Emotionally attached consumers are more likely to defend their favourite brands against criticism, perceiving such attacks as personal threats [2, 5, 35].

H1: Brand love has a positive effect on brand defence behaviour.

Second, brand trust is hypothesised to positively influence brand defence. Trust reduces perceived risk and encourages consumers to share positive experiences and defend the brand against negative information [36, 37].

H2: Brand trust has a positive effect on brand defence behaviour.

Third, brand loyalty is expected to drive brand defence behaviour. Loyalty reflects a strong relational bond, and consumers often defend brands that are integral to their social identity [38-40].

H3: Brand loyalty has a positive effect on brand defence behaviour.

Based on these hypotheses, the proposed research model illustrates the relationships among brand love, brand trust, brand loyalty, and brand defence behaviour in the university context.

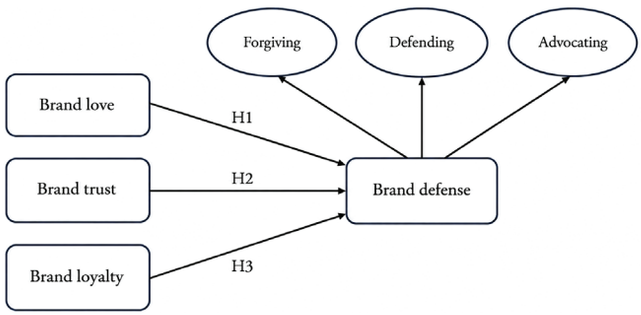


Fig. 1. The research model [6].

2.3. Research design

This study employs a quantitative approach to examine brand defence behaviour among university students. The research process was conducted in four stages. First, the study defined its objectives and reviewed relevant literature on CBR, focusing on brand love, brand trust, brand loyalty, and brand defence behaviour. Existing scales were adapted to suit the higher education context, ensuring relevance to the student population.

Second, a pilot test was conducted with a group of students to assess the clarity and appropriateness of the questionnaire. Feedback from 37 students at Ton Duc Thang University and academic supervisors was used to refine item wording and improve the overall structure of the survey instrument.

Third, the main survey was distributed online over a four-week period (22 April–20 May 2025) via platforms familiar to students, including Facebook, Zalo, email, and university academic groups. The questionnaire targeted undergraduate students, master's students, doctoral candidates, and alumni of public universities in Ho Chi Minh City, and comprised three parts: screening questions, 26 items measuring brand love, brand trust, brand loyalty, and brand defence, and a demographic section, requiring approximately five to seven minutes to complete. A total of 357 responses were collected. After data cleaning, 283 valid responses remained, meeting the minimum sample size required for structural equation modelling. The data were analysed using SmartPLS version 3, employing Partial Least Squares Structural Equation Modelling (PLS-SEM) to examine both the measurement and structural models. Following a two-stage approach recommended by J.F. Hair, et al. (2021) [41], reliability was first assessed, followed by convergent validity and discriminant validity of all constructs, and then causal relationships among brand love, brand trust, brand loyalty, and brand defence were tested using bootstrapping (5,000 resamples) to obtain path coefficients, t-statistics, and p-values. This approach is particularly suitable for exploratory research with complex models and moderate sample sizes. Although newer versions of SmartPLS are available, version 3

fully complies with current methodological standards and provides robust outputs for reliability, validity, and structural path testing, ensuring the accuracy of our findings.

To ensure measurement reliability, Cronbach's Alpha was used to assess internal consistency. Values above 0.70 are considered acceptable for exploratory studies, while values above 0.80 indicate strong reliability for confirmatory research [42]. Reliability was evaluated for each construct - brand love, brand trust, brand loyalty, and brand defence behaviour. Items failing to meet reliability standards were excluded to enhance the robustness of the final scale.

2.4. Instruments and measurement

Table 1. Measurement items of the survey.

Construct	Items		Source
Brand love	LOV1	I expect that university will be a part of my life for a long time to come	R. Batra, et al. (2012) [27]; P.A. Rauschnabel, et al. (2016) [30]; R.P. Bagozzi, et al. (2017) [43]
	LOV2	If university would go out of existence, I would feel anxiety	
	LOV3	Being a student at university makes my life more meaningful	
	LOV4	I feel myself desiring university.	
	LOV5	I feel emotionally connected to university.	
	LOV6	Overall, my feelings towards university are positive	
Brand trust	TRU1	This university can be trusted	R.K. Jillapalli, et al. (2014) [23]
	TRU2	This university is expected to do what is right	
	TRU3	This university has high integrity.	
	TRU4	This university keeps its promises.	
Brand loyalty	LOY1	Encourage friends to study.	V. Kaushal, et al. (2020) [34]
	LOY2	Information to potential students	
	LOY3	Support as alumni	
	LOY4	Recommend the program	
	LOY5	Recommend the university	
	LOY6	Choose same university if had to	
Brand defence	DEF1	I will take their criticism as personally threatening and will argue for my university.	S.K. Roy, et al. (2023) [6]
	DEF2	I will protect my university against any criticism.	
	DEF3	I will not let people criticise my university.	
	DEF4	I will defend my university.	
	DEF5	I will share my experience about the university	
	DEF6	I will recommend my university.	
	DEF7	I will ask people to experience the university for themselves.	
	DEF8	I forgive my favourite brand.	
	DEF9	I feel angry toward this brand.	
	DEF10	Even though the negative information hurts me, I do not feel ill-will toward my favourite brand.	

Source: Compiled by the authors from the cited studies.

The measurement model included 26 observed variables: six items for brand love [27, 30, 43], four items for brand trust [23], ten items for brand defence behaviour [6], and six items for brand loyalty [34]. All items were measured using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), allowing for nuanced responses and improved discriminant validity.

To contextualise brand defence behaviour, participants were presented with a scenario involving negative publicity about their university. Scenario-based measurement is widely used in marketing research [44, 45] as it simulates realistic conditions, minimises memory bias, and addresses ethical concerns related to recalling negative experiences [46]. The scenario described a student's positive experience at their university, followed by exposure to external criticism or rumours via social media or interpersonal channels. Participants were then asked how they would respond to such negative information. The scenario was adapted from L.A.N. Donovan, et al. (2012) [47] and validated through a preliminary test with student participants [6].

Sample size determination followed J.F. Hair, et al. (2021) [41] using the 10-times rule for PLS-SEM. The minimum sample size is ten times the largest number of structural paths directed at any endogenous construct. In the present model, brand defence receives three structural paths from brand love, brand trust, and brand loyalty; therefore, the minimum required sample size is 30 responses. The 283 valid responses substantially exceeded this minimum threshold, providing an adequate basis for the PLS-SEM analysis. A convenience sampling method was employed due to time constraints and resource limitations. The survey targeted students currently or previously enrolled in public universities in Ho Chi Minh City, verified through screening questions such as "Are you currently a student?", "Which university do you attend?", and "Did you study in Ho Chi Minh City?"

After data collection, responses were screened for completeness and validity. Of the 357 responses collected, 74 were excluded from analysis: some contained incomplete or missing answers, others displayed uniform response patterns (e.g., selecting the same scale point across all items, indicating inattentive responding), and a small number came from participants who did not meet the screening criteria (i.e., they were not currently or previously enrolled in a public university in Ho Chi Minh City). The remaining 283 valid responses were retained for analysis. This sample size substantially exceeded the minimum requirement for PLS-SEM based on the 10-times rule [41].

The final dataset was used to test the proposed research model and hypotheses. PLS-SEM was selected for its flexibility in handling complex models and its

suitability for exploratory research. The method allows for simultaneous assessment of measurement and structural models, providing insights into the relationships among brand love, brand trust, brand loyalty, and brand defence behaviour.

3. Results

3.1. Respondent demographics

Among the 283 valid responses, the majority were undergraduate students (n=210), spanning all study durations from less than one year to over four years. Master's students (n=15) were primarily concentrated in the 1-2 year range, consistent with the structure of postgraduate programs. One doctoral candidate reported a study duration exceeding four years. Additionally, 57 alumni indicated "graduated" as their study status, reflecting a clear distinction between current and former students.

Table 2 outlines key demographic characteristics, including gender, academic discipline, student status, and duration of study. Female respondents accounted for 58% (n=164), while males represented 42% (n=119), indicating a relatively balanced gender distribution. In terms of academic fields, Business and Management was the most represented group (51.6%), followed by Engineering and Technology (20.8%) and Architecture and Construction (13.8%). Other disciplines such as Natural Sciences, Social Sciences, and Health Sciences were less represented. Undergraduate students accounted for the largest share of respondents (n=210, 74.2%), followed by alumni (n=57, 20.1%), master's students (n=15, 5.3%), and one doctoral candidate. Duration of study among current students ranged from less than one year (n=93) to more than four years (n=21), with master's students concentrated in the one-to-two-year range, consistent with the structure of postgraduate programmes.

Table 2. Respondent demographics.

N=283	Attributes	Frequency	Percent (%)
Gender	Male	119	42.0
	Female	164	58.0
Academic discipline	Engineering and Technology	59	20.8
	Business and Management	146	51.6
	Health Sciences	6	2.1
	Social Sciences and Humanities	7	2.5
	Natural Sciences	26	9.2
	Architecture and Construction	39	13.8
Student status	Bachelor's student	210	74.2
	Master's student	15	5.3
	Doctoral candidate	1	0.4
	Alumnus/alumna	57	20.1
Duration of study	Less than 1 year	93	32.9
	1 to 2 years	45	15.9
	2 to 3 years	19	6.7
	3 to 4 years	48	17.0
	More than 4 years	21	7.4
	Graduated (alumni)	57	20.1

Source: Authors' survey data (2025).

The sample was obtained using convenience sampling, primarily targeting students from public universities and business-related majors. This led to uneven representation across disciplines and institutions, limiting the generalisability of the findings to the wider student population in Ho Chi Minh City. However, given the exploratory nature of the study and the use of PLS-SEM, this sampling approach remains appropriate, as the primary aim is to test the hypothesised relationships among brand love, brand trust, brand loyalty, and brand defence rather than to produce population-level estimates. Convenience sampling is also common in consumer behaviour studies, particularly in service and education contexts, where time and resource constraints are present [48]. This limitation is revisited in section 5.3.

3.2. Measurement model evaluation

In this study, brand defence behaviour (DEF) is conceptualised as a second-order reflective construct composed of three dimensions: defending, advocating, and forgiving. Following J.F. Hair, et al. (2017) [48], the evaluation of the measurement model was conducted in two stages. The first stage assessed the reliability, convergent validity, and discriminant validity of the first-order constructs. Once these criteria were met, the second stage examined the second-order structure, treating the three dimensions as indicators of the overarching DEF construct. This two-step approach ensures analytical precision and minimises misinterpretation due to unresolved measurement issues at the base level.

During the assessment of the measurement model, the initial three-dimensional structure of DEF (defending, advocating, and forgiving) was evaluated. The results indicated that the "forgiving" dimension did not meet the recommended thresholds for construct validity. Specifically, several indicators associated with forgiving exhibited low outer loadings, resulting in an Average Variance Extracted (AVE) below the acceptable level of 0.50. In addition, discriminant validity concerns were observed, as the forgiving dimension showed insufficient distinction from other DEF dimensions. Following the guidelines proposed

by J.F. Hair, et al. (2017) [48] and M. Sarstedt, et al. (2022) [49], the forgiving dimension was therefore excluded to enhance the reliability and validity of the DEF construct. The refined DEF construct, comprising defending and advocating, demonstrated satisfactory measurement properties and was retained for subsequent structural model analysis.

3.2.1. Stage 1: First-order measurement model

Reliability and convergent validity: Table 3 presents the reliability and convergent validity results for the latent constructs. LOV, TRU, and LOY demonstrated strong internal consistency, with outer loadings exceeding 0.70, Cronbach's alpha ranging from 0.894 to 0.909, composite reliability (CR) between 0.919 and 0.930, and AVE values from 0.655 to 0.770. These metrics surpass the recommended thresholds, confirming high reliability and adequate convergent validity [48].

Table 3. Reliability and convergent validity (first-order).

Construct	Items	Outer loading	Cronbach's alpha	CR	AVE
Brand defense	DEF1	0.762	0.861	0.893	0.480
	DEF2	0.77			
	DEF3	0.755			
	DEF4	0.768			
	DEF5	0.804			
	DEF6	0.793			
	DEF7	0.822			
	DEF8	0.473			
	DEF9	0.129			
	DEF10	0.525			
Brand love	LOV1	0.785	0.894	0.919	0.655
	LOV2	0.743			
	LOV3	0.829			
	LOV4	0.856			
	LOV5	0.83			
	LOV6	0.807			
Brand loyalty	LOY1	0.849	0.909	0.930	0.690
	LOY2	0.84			
	LOY3	0.793			
	LOY4	0.869			
	LOY5	0.868			
	LOY6	0.759			
Brand trust	TRU1	0.866	0.900	0.930	0.770
	TRU2	0.867			
	TRU3	0.888			
	TRU4	0.888			

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

However, the initial results for DEF were less satisfactory. Although Cronbach's Alpha (0.861) and CR (0.893) were acceptable, the AVE was 0.480, below the minimum threshold of 0.50. Among the ten indicators, DEF1 to DEF7 had acceptable loadings (0.755-0.822), while DEF8 (0.473), DEF9 (0.129), and DEF10 (0.525) showed weak loadings. DEF9, in particular, fell below the minimum acceptable level of 0.40, indicating poor contribution to the construct.

Based on these findings, DEF9 was removed from the model. A re-evaluation showed that DEF8 and DEF10 still had low loadings (0.475 and 0.519, respectively), but the AVE for DEF improved to 0.533, meeting the required threshold. Further consideration of discriminant validity was necessary before deciding whether to retain or exclude DEF8 and DEF10.

Discriminant validity: The C. Fornell, et al. (1981) [50] criterion revealed that DEF violated discriminant validity with brand loyalty. Specifically, the square root of the AVE for DEF (0.693) was lower than its correlations with brand love (0.715) and brand loyalty (0.767), indicating insufficient separation between constructs.

Following recommendations by J.F. Hair, et al. (2017) [48] and M. Sarstedt, et al. (2022) [49], discriminant validity must be established before proceeding with second-order modelling. To ensure construct validity, DEF8 and DEF10 were removed. This action allowed revised reliability and convergent validity results, showing that all remaining indicators met the required standards.

Outer loadings ranged from 0.76 to 0.891, Cronbach's Alpha values from 0.894 to 0.909, and CR values from 0.919 to 0.930. AVE values exceeded 0.50 for all constructs, with DEF reaching 0.632 and TRU peaking at 0.770. These results confirm that each set of indicators adequately explains the variance of its corresponding latent construct.

Three methods were used to confirm discriminant validity: Fornell-Larcker, cross-loadings, and the Heterotrait-monotrait ratio (HTMT). Fornell-Larcker Criterion: The square root of AVE for each construct was greater than its correlations with other constructs. For example, DEF had a square root AVE of 0.795, higher

Table 4. Heterotrait-monotrait.

	Brand defense	Brand love	Brand loyalty	Brand trust
Brand defense				
Brand love	0.760			
Brand loyalty	0.814	0.809		
Brand trust	0.709	0.720	0.749	

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

than its correlations with brand love (0.693), brand loyalty (0.747), and brand trust (0.644), confirming discriminant validity.

Cross-loadings: Each indicator loaded highest on its intended construct, with no evidence of cross-loadings, indicating clear conceptual boundaries between constructs. HTMT ratio (Table 4): All HTMT values were below the recommended threshold of 0.90. Specifically, HTMT between DEF and LOV was 0.760, between DEF and LOY was 0.814, and between DEF and TRU was 0.709. These results further support discriminant validity.

Collectively, these tests confirm that the refined measurement model meets all reliability and validity criteria, providing a sound basis for structural model analysis and second-order construct modelling.

3.2.2. Stage 2: Second-order measurement model

Based on the validated first-order constructs, the study proceeded to model DEF as a second-order reflective construct. In this structure, defending and advocating serve as reflective dimensions of DEF. The forgiving dimension was excluded due to low reliability and poor discriminant validity in the first-order analysis.

This approach aligns with S.K. Roy, et al. (2023) [6], who conceptualised DEF as a multidimensional construct. However, the exclusion of the forgiving dimension reflects the empirical realities of the current dataset and ensures the integrity of the measurement model.

Reliability and convergent validity of second-order construct: Table 5 presents the results of the second-order measurement model. The composite reliability and AVE values for the second-order DEF construct met the recommended thresholds, confirming that the construct is reliably measured through its two dimensions. This validation supports the use of DEF as a higher-order construct in subsequent structural model testing.

Brand defence behaviour (DEF) was modelled as a second-order reflective construct comprising two validated dimensions: Advocating (DEF5-DEF7) and defending (DEF1-DEF4). The forgiving dimension was excluded due to low reliability and poor discriminant validity in earlier analysis. The outer loadings of the two retained dimensions were 0.926 and 0.904, respectively, indicating strong associations with the higher-order construct.

The second-order DEF scale demonstrated high internal consistency and convergent validity, with Cronbach's alpha=0.806, composite reliability (CR)=0.911, and AVE=0.837. These values exceed recommended thresholds (J.F. Hair, et al. (2017)) [48], confirming the robustness of the construct.

Table 5. Reliability and convergent validity (second-order).

Construct	Items	Outer loading	Cronbach's alpha	CR	AVE
Brand defense	DEF5, DEF6, DEF7	0.926	0.806	0.911	0.837
	DEF1, DEF2, DEF3, DEF4	0.904			
Brand love	LOV1	0.786	0.894	0.919	0.655
	LOV2	0.743			
	LOV3	0.830			
	LOV4	0.856			
	LOV5	0.829			
	LOV6	0.807			
Brand loyalty	LOY1	0.849	0.909	0.930	0.690
	LOY2	0.840			
	LOY3	0.793			
	LOY4	0.869			
	LOY5	0.868			
	LOY6	0.759			
Brand trust	TRU1	0.866	0.900	0.930	0.770
	TRU2	0.867			
	TRU3	0.888			
	TRU4	0.889			

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

The remaining first-order constructs also met reliability and validity criteria. LOV showed Cronbach's alpha=0.894, CR=0.919, and AVE=0.655, with item loadings ranging from 0.743 to 0.856. LOY had Cronbach's alpha=0.909, CR=0.930, and AVE=0.690, with loadings between 0.759 and 0.869. TRU achieved Cronbach's alpha=0.900, CR=0.930, and AVE=0.770, with loadings from 0.866 to 0.889. These results confirm that all constructs are measured reliably and exhibit strong convergent validity.

Discriminant validity: Discriminant validity was assessed using three criteria: Fornell-Larcker, cross-loadings, and the HTMT. Results confirmed that the refined measurement model met all requirements.

According to the Fornell-Larcker criterion, the square root of AVE for each construct exceeded its correlations with other constructs. For instance, DEF had a square root AVE of 0.915, higher than its correlations with LOV (0.693), LOY (0.750), and TRU (0.641). Similarly, LOV (0.809), LOY (0.831), and TRU (0.877) also satisfied this criterion, indicating clear conceptual separation.

Cross-loading analysis further supported discriminant validity. Each indicator loaded highest on its intended construct, with no evidence of overlap. The two dimensions of DEF-advocating and defending-had loadings of 0.926 and 0.904, respectively, significantly higher than their loadings on other constructs.

HTMT values were all below the recommended threshold of 0.90 [51]. The highest HTMT value was between DEF and LOY (0.871), while other pairs remained well within acceptable limits. These results confirm that the constructs are distinct in the perception of respondents, supporting the validity of the measurement model.

3.3. Structural model evaluation

3.3.1. Multicollinearity assessment

Variance Inflation Factor (VIF) values were examined to assess multicollinearity among independent variables. As shown in Table 6, all VIF values were below the commonly accepted threshold of 3.3. The highest VIF was observed for DEF and LOY at 2.576, indicating no serious multicollinearity issues.

These results confirm that the structural model does not violate the assumption of linear independence among predictors. Therefore, the model is suitable for further hypothesis testing without requiring adjustments for multicollinearity.

Table 6. Variance Inflation Factor results.

	Brand defence	Brand love	Brand loyalty	Brand trust
Brand defence				
Brand love	2.389		1.738	
Brand loyalty	2.576			
Brand trust	2.063		1.738	

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

3.3.2. Hypothesis testing

Following the validation of the measurement model, the structural model was assessed to examine the relationships among latent constructs and test the proposed hypotheses. Table 7 presents the path coefficients, sample means, standard deviations, t-statistics, and p-values.

The analysis confirms that LOV positively influences brand DEF, with a path coefficient of 0.254 (t=3.875, p<0.001). This finding supports H1 and indicates that emotional attachment motivates students to defend their university brand.

Table 7. Hypothesis results.

	Original sample	Sample mean	Standard deviation	T statistics	P values	Result
Brand love -> Brand defence	0.254	0.254	0.065	3.875	0.0001	H1 was supported
Brand trust -> Brand defence	0.170	0.170	0.055	3.072	0.002	H2 was supported
Brand loyalty -> Brand defence	0.449	0.448	0.067	6.726	0.0001	H3 was supported

Source: Authors' calculations using SmartPLS 3 (bootstrapping, 5,000 resamples), based on survey data (2025).

TRU also shows a significant positive effect on DEF (β=0.170, t=3.072, p=0.002), suggesting that trust enhances students' willingness to engage in protective actions, validating H2.

LOY exerts the strongest influence on DEF (β=0.449, t=6.726, p<0.001), confirming H3 and highlighting loyalty as the most powerful driver of brand defence.

Collectively, these results demonstrate that the proposed model effectively explains the relationships among brand-related constructs in higher education.

3.3.3. R-square values

Table 8. R-square (R^2) values.

	R^2	Adjusted R^2
Brand defence	0.621	0.617
Brand loyalty	0.612	0.609

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

The adjusted R^2 for DEF is 0.617, meaning that 61.7% of its variance is explained by LOV, TRU, and LOY. Similarly, LOY has an adjusted R^2 of 0.609, indicating that brand love and trust account for 60.9% of its variance. These values reflect strong explanatory power, exceeding thresholds for moderate effect sizes in behavioural research [48].

3.3.4. F-square values

To assess the individual contribution of each predictor, the study examined f^2 values, which measure the effect size of each independent variable on the dependent variable. Table 9 presents the results, interpreted according to J. Cohen's (2013) [52] guidelines: small (0.02), medium (0.15), and large (0.35).

Table 9. F-square (f^2) values.

	Brand defence	Brand love	Brand loyalty	Brand trust
Brand defence				
Brand love	0.071		0.375	
Brand loyalty	0.205			
Brand trust	0.036		0.187	

Source: Authors' calculations using SmartPLS 3, based on survey data (2025).

Effect size analysis shows that LOY has a medium effect on DEF (f^2=0.205), while LOV (f^2=0.071) and TRU (f^2=0.036) have small effects. For LOY, LOV exerts a large effect (f^2=0.375), and TRU a medium effect (f^2=0.187).

These findings indicate that while all predictors contribute meaningfully to the model, brand loyalty plays a particularly prominent role in driving brand defence behaviour. The f^2 values confirm the practical significance of the relationships, complementing the statistical significance observed in the hypothesis testing.

4. Discussion

This study provides empirical evidence for a refined model of brand defence behaviour among university students in Vietnam, extending CBR theory to the higher education context. Brand defence was initially conceptualised as a three-dimensional construct comprising defending, advocating, and forgiving, consistent with S.K. Roy, et al. (2023) [6]. In this study, however, the construct was refined to two dimensions after the forgiving component failed to meet convergent and discriminant validity criteria. This finding diverges from S.K. Roy, et al. (2023) [6], who validated all three dimensions in consumer-goods settings, and points to a boundary condition of the original scale: in long-term, high-investment service relationships such as higher education, forgiveness may operate differently than it does for physical products, where a single unsatisfactory transaction can more easily be overlooked.

The finding that brand love, trust, and loyalty all significantly and positively influence brand defence corroborates prior work by F. Ali, et al. (2021) [2] in the restaurant industry and M. Javed, et al. (2015) [18] in the cosmetics and consumer-electronics sectors, lending cross-industry support to the proposition that strong consumer-brand bonds motivate protective behaviour when a brand is criticised [35, 38]. This study extends that literature by showing that brand loyalty is not only a direct antecedent but also the strongest predictor of brand defence and a partial mediator of the effects of brand love and brand trust-a mediating role also reported by M. Javed, et al. (2015) [18] in a commercial setting, but not previously tested in higher education. This suggests that in a relational service context, where students' involvement with the brand accumulates gradually over several years rather than through discrete purchase episodes, long-term relational commitment-rather than short-term emotional attachment alone-is the more critical proximate driver of protective behaviour, consistent with J. Colliander, et al. (2013) [17], who observed that online brand defenders tend to be embedded, long-standing community members rather than casual customers.

These results also resonate with social identity theory [14] and brand attachment theory [11], both discussed in the theoretical background: when the university becomes integral to a student's identity, criticism is experienced as a personal threat [15, 16], motivating loyal students in particular to respond. This pattern echoes findings from R. Ahluwalia, et al. (2000) [53] and M. Lisjak, et al. (2012) [38], who showed that highly committed consumers are the most likely to counter-argue negative information, and extends these insights to higher education, a setting in which the "product" is an extended, co-created experience rather than a discrete purchase.

Taken together, these findings highlight the strategic importance of fostering loyalty through consistent positive experiences and transparent policies, rather than relying on emotional appeals or trust-building alone. In an era where reputational risks are amplified by digital platforms, mobilising students as brand defenders can serve as a powerful, low-cost mechanism for brand resilience. At the same time, the exclusion of the forgiving dimension suggests that models of brand defence developed in consumer-goods contexts cannot be transplanted wholesale into service and educational settings, reinforcing the need for context-specific validation of CBR constructs [6, 7]; this and other limitations are discussed further in section 5.3.

5. Conclusions

5.1. Theoretical implications

This study contributes to the theoretical understanding of brand defence behaviour by refining its conceptualisation within the context of higher education. Drawing on the multidimensional framework proposed by S.K. Roy, et al. (2023) [6], the research confirms that brand defence can be effectively measured through two dimensions–advocating and defending-rather than the original three. This adjustment was necessary after empirical testing revealed that the forgiveness dimension lacked convergent validity and failed to demonstrate discriminant validity, particularly in relation to brand loyalty.

The findings suggest that the nature of student-university relationships differs significantly from typical consumer-brand interactions. Unlike emotional or transactional engagements in consumer goods sectors [17, 54], the university experience involves substantial investment of time and financial resources. As a result, students tend to evaluate institutional shortcomings more critically, making forgiveness a less applicable construct in this context. This highlights the need to reconsider or redefine forgiveness when applying brand defence theory to service-oriented sectors such as education.

The study also extends theoretical discussions by validating the roles of brand love, brand trust, and brand loyalty as antecedents of brand defence behaviour. The established relationships among these constructs reinforce existing literature on consumer-brand dynamics [5, 6, 53], while offering new insights into how these factors operate in long-term service relationships. Loyalty, in particular, emerged as the most influential driver, underscoring its central role in motivating protective behaviour.

Overall, the research advances brand relationship theory by adapting and validating a multidimensional construct in a novel context and explicitly grounding its implications in established frameworks. Specifically, it extends CBR Theory [9, 10], Brand Attachment Theory [11], and Social Identity Theory [55, 56] to the higher-education setting. By doing so, the study clarifies how emotional bonds, perceived safety, and identity-based commitment influence students' willingness to defend their university brand. Loyalty is positioned as the strongest activating mechanism for brand defence, enriching theoretical models of consumer-brand dynamics in long-term service relationships.

5.2. Managerial implications

The findings of this study demonstrate that the brand defence behaviour scale can be effectively adapted for university students in Ho Chi Minh City, offering meaningful insights for higher education managers seeking to build sustainable brand strategies. Students, as a key public, play a vital role in shaping and protecting institutional reputation, yet many universities have not fully leveraged this potential.

Currently, student relationship management remains fragmented across departments. Marketing and communications often focus on external branding and recruitment, while student affairs concentrate on internal policies and support services, as outlined in Circular No. 10/2016/TT-BGDĐT. This separation limits the strategic integration of student engagement into brand development. Universities should reconsider their organisational structures to foster cross-functional collaboration, ensuring that brand-building efforts are aligned with student relationship strategies.

Public universities in Vietnam possess inherent advantages-established reputation, academic quality, and affordable tuition. However, regulatory compliance alone is insufficient for brand enhancement. Institutions must proactively design comprehensive student relationship strategies that go beyond administrative functions. This study proposes a three-pillar approach: cultivating brand love, reinforcing brand trust, and fostering brand loyalty.

To nurture brand love, universities should create personalised, inspiring learning experiences that resonate with students' values and emotions [28, 29, 57]. Trust can be built through consistent, transparent practices and student-centred policies [20, 58, 59]. Loyalty, identified as the strongest predictor of brand defence, requires long-term commitment and emotional investment [60-62].

Some public universities have successfully implemented cross-departmental committees to evaluate student-brand relationships, involving key units such as admissions, communications, student affairs, academic departments, and alumni relations. Such initiatives promote cohesive and strategic student engagement, strengthening institutional brand resilience.

Practically, these insights translate into actionable strategies for universities. Institutions should design integrated approaches that foster emotional engagement (brand love), reinforce trust through transparent and student-centred policies, and build loyalty via long-term relationship programs and alumni engagement. For example, personalised learning experiences, clear communication of institutional values, and cross-functional committees can strengthen identity-based commitment and mobilise students as brand advocates and defenders in competitive, digitally driven environments. By linking these results to theory, universities can design interventions that not only strengthen emotional and relational bonds but also activate brand defence behaviours, ensuring resilience in competitive, digitally driven environments.

5.3. Limitations and future research

While this study offers valuable insights into brand defence behaviour among university students, several limitations should be acknowledged. First, the measurement of the "forgiving" dimension proved challenging. Future research should explore how students interpret forgiveness in the context of institutional shortcomings and identify which types of negative information they are willing to overlook versus those that prompt withdrawal of support.

Second, the study did not examine potential moderating variables that may influence the relationships between brand love, brand trust, and brand defence behaviour. Prior research (S.K. Roy, et al. (2023)) [6] suggests that individual traits, such as personality, may alter the strength of these psychological drivers. Incorporating such moderators could enrich theoretical understanding and enhance the model's applicability.

Lastly, the sample was collected using convenience sampling and was limited to students from public universities in Ho Chi Minh City, with an overrepresentation of business-related majors; both factors constrain the generalisability of the findings. The cultural and institutional characteristics of this region, together with the uneven distribution across disciplines, may differ from those of other geographic areas, private institutions, or more representative probability samples. Future studies should employ broader or probability-based sampling strategies and expand the sample across diverse regions and university types to validate and generalise the model more broadly within Vietnam's higher education landscape.

CRediT author statement

Tran Tu Uyen Le, Tan Lac Thien Vo: Software, Data curation, Writing - Original draft preparation, Visualisation, Investigation, Project administration, Literature review, Revision, Formal analysis, Formatting; Minh Tuan Phung: Conceptualisation, Methodology, Supervision, Validation, Resources, Funding acquisition, Structuring, Writing-Reviewing and Editing.

ACKNOWLEDGEMENTS

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.02-2021.56.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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 DOI: 10.31276/VMOSTJOSSH.2025.0055

Personalisation in tourism: The role of mobile technology and AI in enhancing visitor experience - Evidence from Hoi An Ancient Town

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Received 5 November 2025; revised 4 May 2026; accepted 12 May 2026

Abstract:

Mobile technology and artificial intelligence (AI) have become increasingly important in tourism. Their integration allows destinations to better understand tourist needs and deliver more relevant forms of support. This study examines the role of mobile technology and AI in shaping tourist experiences in Hoi An Ancient Town, with particular attention to how personalised travel experiences in a heritage destination are formed, perceived and interpreted. To address these objectives, the research employs a primarily quantitative exploratory-descriptive design informed by a preliminary qualitative phase of expert interviews. Survey results from 144 tourists indicate strong stated interest in AI-supported travel assistance, although this interest was not matched by uniformly high levels of current digital use. The findings suggest that the value of personalisation lies not only in technological responsiveness, but also in its practical relevance, usability and sensitivity to the socio-cultural context of a living heritage destination. The preliminary qualitative phase further provides contextual insight into the cultural specificity of Hoi An and the practical conditions under which personalisation can be understood as an interpretive experiential process embedded within the destination context, thereby contributing to a more cautious and in-depth approach to technology integration in heritage tourism. These findings provide exploratory evidence from Hoi An Ancient Town for future research on AI-supported personalisation in heritage tourism.

Keywords: **artificial intelligence, digital user experience, heritage tourism, mobile technology, personalisation.**

Classification numbers: **2.2, 4.1, 9.3**

1. Introduction

Mobile technologies and artificial intelligence (AI) increasingly support tourists in information search, planning and navigation by enabling more personalised information and recommendations [1, 2]. Existing research has examined personalisation primarily through recommender-system capabilities and technology acceptance perspectives [3, 4]. These perspectives explain how personalised support can be generated and why users may adopt it, but technical capability and acceptance alone do not determine its experiential value.

This limitation is particularly relevant in heritage destinations, where visitor experience involves questions of authenticity [5] and the social and cultural processes through which heritage meanings and values are constructed, negotiated and regulated [6]. Personalisation should not be assessed only through recommendation accuracy or convenience. Its value also depends on whether the support provided is relevant, usable and sensitive to the socio-cultural context without displacing direct experience.

Hoi An Ancient Town provides an appropriate context for examining this issue. As a living World Heritage destination [7], its visitor experience is shaped by both practical information needs and engagement with a culturally distinctive physical and social environment. Survey data from 144 visitors are interpreted alongside preliminary expert insights.

Accordingly, this study asks: “How might mobile technology and AI support personalised visitor experiences in Hoi An Ancient Town while remaining sensitive to the destination’s socio-cultural authenticity and visitors’ experiential autonomy?”. The study examines visitors’ current digital-use patterns, interest in personalised and AI-supported assistance, desired support functions and reported barriers. In doing so, the study links technology-acceptance and experiential perspectives within a smart tourism ecosystem and considers how system-specific

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digital UX may contribute to the broader destination experience.

2. Theoretical foundations and conceptual framework

2.1. Theoretical foundations

2.1.1. Smart tourism ecosystem (STE)

The smart tourism ecosystem provides the overarching lens for this study. It conceptualises tourism as a socio-technical network in which tourists, residents, suppliers, intermediaries, destination organisations, platforms and public bodies exchange data and co-create value through smart technologies [8]. Its purpose is not technology adoption in itself, but the creation of meaningful, high-value and sustainable tourism experiences. Mobile and AI-supported services are therefore treated as digital touchpoints embedded in the wider heritage-destination ecosystem.

2.1.2. User experience (UX) and customer experience (CX)

According to ISO 9241-210:2019, UX refers to a user's perceptions and responses that result from the use or anticipated use of a system, service or product [9]. In tourism, these responses are shaped not only by interface properties but also by the situation in which technology is used. "Technology-enhanced destination experience research spans the pre, during and post-travel phases" [10]. In this study, these phases are used to organise pre-trip, on-site and post-trip digital UX.

Customer experience (CX) is related to, but broader than, system-specific UX. It is a multidimensional and cumulative response formed through multiple touchpoints across the entire journey, including cognitive, emotional, behavioural, sensorial and social dimensions [11]. Digital UX at an application or AI touchpoint may contribute to destination CX, but it does not represent the total experience, which also develops through the heritage environment, local services, residents and other visitors. Satisfaction, revisit intention and recommendation intention are therefore treated as potential downstream CX-related outcomes rather than as definitions of UX. The study focuses analytically on digital UX, particularly the pre-trip and on-site stages where planning and real-time support are most directly relevant. CX is retained as the broader conceptual frame for interpreting how those digital touchpoints may support or disrupt the destination experience.

Although UX is often evaluated through functional attributes such as usefulness and usability, experiential responses may also involve sensory, affective, cognitive, behavioural and relational dimensions [12]. In hospitality and tourism contexts, these responses are further shaped by the physical environment, human interactions, personal characteristics and trip-related conditions [13]. Digital UX should therefore not be reduced to interface efficiency alone, but understood as part of the broader experiential value created through engagement with a destination. Taken together, these perspectives indicate that digital UX extends beyond technical efficiency to include subjective, affective and context-dependent responses during interaction.

2.1.3. Personalisation

Personalisation can be understood as a range of technologies and application features used to tailor end-user experiences according to users' needs, behaviours and information requirements. J. Kramer, et al. (2000) [14] further emphasise that the selection and implementation of personalisation features should be grounded in the value they provide to end users rather than in technological novelty alone.

At the technical level, this understanding of personalisation is rooted in the logic of recommender systems, which are designed to generate suggestions by matching user data, preferences and behavioural patterns [3]. Within the broader development of smart tourism, such forms of personalisation are increasingly embedded in data-driven tourism environments where destinations, technologies and users interact through digital infrastructures [2].

However, subsequent studies suggest that personalisation becomes more meaningful when recommendations are perceived as relevant within the specific context of use. This distinguishes data-driven personalisation, which focuses on algorithmic efficiency, from experience-oriented personalisation, which emphasises contextual relevance and perceived meaning. In this study, personalisation is therefore understood not only as a technical output, but also as a form of support whose value depends on whether tourists perceive it as relevant and meaningful within their travel experience.

This perspective is particularly appropriate in Hoi An Ancient Town, a cultural tourism space within a living heritage environment. In this setting, experiential value does not arise only from knowing where to go or what to do, but also from tourists' active participation in co-creating experiential value [15]. Therefore, personalisation in Hoi An becomes meaningful only when technology does not replace direct experience, but instead supports visitors in reaching the cultural depth of the destination in ways that are better aligned with their motivations and needs.

While personalisation is generally viewed positively, excessive reliance on AI-driven algorithms may lead to the

homogenisation of experiences, potentially diminishing the spontaneity essential to heritage exploration. Torabi et al. highlight the contribution of smart tourism technologies to memorable experiences, tourist satisfaction and revisit intention [16]. Yet in a heritage destination such as Hoi An Ancient Town, personalisation should not be reduced to algorithmic efficiency alone, but should also support the ways in which tourists interpret and connect with local culture. This is particularly important in heritage tourism, where visitors may seek meaningful and authentic engagement with place rather than efficient recommendation alone [5].

This perspective is also consistent with foundational heritage tourism scholarship. Heritage tourism is not simply tourism that takes place at heritage sites, but involves the management, interpretation and presentation of heritage in ways that shape how visitors encounter cultural value within a destination [17]. In heritage cities, cultural meanings are not always singular or neutral, which makes context-sensitive interpretation especially important [6]. Therefore, in the case of Hoi An Ancient Town, personalisation should not merely optimise travel choices, but should help visitors access, interpret and connect with the cultural meanings that distinguish the destination as a living heritage space.

2.2. Conceptual framework

Drawing on the smart tourism ecosystem, journey-stage UX, CX and personalisation, this study proposes a conceptual framework for analysing how mobile technology and AI may support personalised digital experiences in Hoi An Ancient Town (Fig. 1).

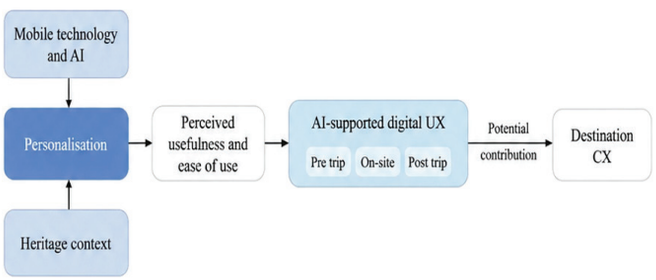


Fig. 1. Conceptual framework of the study.

Building on the STE, the conceptual framework focuses on the specific pathway through which mobile technology and AI may support personalised digital experiences in Hoi An Ancient Town. Within an STE, tourism-relevant data are collected, processed and exchanged among tourists, platforms, suppliers and destination actors, enabling personalised services and the co-creation of tourism value [8].

Mobile technology and AI serve as the technical foundation for personalising travel experiences by processing data on tourists' behaviours, preferences and needs. Within this framework, the effect of AI-supported personalisation is not assumed to be automatic, but is interpreted partly through two Technology Acceptance Model (TAM) - Related evaluations: perceived usefulness and perceived ease of use [4]. These evaluations may arise at different stages of the travel journey, where digital interaction takes different forms [10]. In Hoi An Ancient Town, the heritage context therefore conditions both how personalisation should be designed and how tourists interpret the relevance of the support provided. This contextual emphasis is important because tourism experiences are also shaped by the physical environment, human interactions, personal characteristics and trip-related conditions [13].

Digital UX is interpreted across the travel journey rather than as a single isolated interaction. Pre-trip UX includes information search, comparison and planning; on-site UX concerns real-time information access, navigation and interaction at the destination; and post-trip UX includes recollection, review and sharing [10]. These stages are treated as a temporal and interpretive lens rather than as three independently tested constructs. The framework therefore retains the central sequence from mobile technology and AI to personalisation, perceived usefulness and ease of use, and digital UX, while locating that UX across the pre-trip, on-site and post-trip stages.

Journey-stage digital UX may contribute to, but does not constitute the broader destination CX. CX develops cumulatively through multiple touchpoints across the customer journey and incorporates cognitive, emotional, behavioural, sensorial and social responses [11]. In a heritage destination, these touchpoints include not only mobile applications and AI-supported services, but also the physical environment, local services, residents, other visitors and the cultural meanings associated with place. Accordingly, AI is positioned as a mediating and supportive layer within the destination ecosystem rather than as a substitute for direct engagement with the living heritage environment. The framework is used to organise and interpret the empirical indicators and to discuss their implications for the wider destination experience.

3. Research methods

3.1. Research area

The study was conducted in Hoi An Ancient Town, Da Nang City. Historically, a trading hub connecting the Sa Huynh Culture with international maritime routes, Hoi An was recognised as a UNESCO World Cultural Heritage site in 1999. The inscribed property comprises a well-preserved complex of 1,107 timber-frame buildings that reflect the interaction of indigenous and foreign cultural influences [7]. Tourism has expanded substantially since

its World Heritage inscription, with visitor arrivals surging from 202,000 in 1999 to approximately 4.43 million by the end of 2024 [18]. Together, the destination's substantial tourism growth and the sensitivity of its heritage environment make Hoi An a relevant setting for examining how AI-supported personalisation can respond to visitor needs without diminishing the authenticity of the destination.

3.2. Sampling and sample size

The study adopts a non-probability convenience sampling technique [19]. This approach was selected because the target population consists of tourists in an open-access heritage destination where visitors are highly mobile, dispersed across multiple locations and difficult to capture through a stable sampling frame.

Of 150 submitted questionnaires, six respondents selected "never been" and did not complete the substantive survey items. The final analytic sample therefore comprised 144 respondents. The original origin variable contained 76 domestic visitors, 64 international visitors and four respondents living or working in the broader Hoi An area. For the domestic-international comparison, the four Hoi An-connected respondents were retained in the domestic group because their responses indicated visits to the Ancient Town for leisure, cultural exploration, visiting friends or relatives, or short business purposes. The derived comparison variable comprised 80 domestic and 64 international visitors.

3.3. Research design and data collection

The study employed a primarily quantitative cross-sectional design informed by a preliminary qualitative phase of expert interviews. The qualitative phase was used to clarify the cultural-tourism context of Hoi An, identify key conditions affecting the meaningful application of personalisation and support the interpretation of the subsequent survey findings. Data collection was conducted from January 2025 to June 2025 through both direct (face-to-face) and indirect (Google Forms) methods.

The survey participants were domestic and international tourists who had travelled to Hoi An within the most recent six months, in order to improve recall accuracy of experiential recall and reduce recall bias.

3.4. Preliminary qualitative phase: Expert interviews

A preliminary qualitative phase was conducted through face-to-face semi-structured interviews with five experts from fields relevant to the study, including culture and heritage, tourism and services, UX and design, and software/system development. Each interview lasted 30-60 minutes and focused on personalisation in the context of cultural tourism in Hoi An Ancient Town, the potential role of mobile technology and AI in supporting tourist experience and the conditions affecting the effectiveness of personalisation, including socio-cultural context, user behaviour, information reliability and practical conditions of use (Table 1). The interview data were summarised, coded by participant (E1-E5) and reviewed thematically in order to extract recurring insights that could support the interpretation of the quantitative findings.

Table 1. Summary of expert interview participants.

Code	Participant type	Expertise area	Broad professional role
E1	Expert	Culture/heritage	Museum/heritage specialist
E2	Expert	Art/design education	Academic specialist
E3	Expert	Tourism service	Tourism practitioner
E4	Expert	UX/design	Design specialist
E5	Expert	Software/system development	Technical specialist

3.5. Survey instrument and scale structure

The survey instrument was a bilingual (Vietnamese-English) questionnaire designed to capture a multi-dimensional view of the tourist experience in Hoi An Ancient Town. To improve content and contextual validity, the survey design was informed by the preliminary expert interview phase described above. A pilot test (n=15) was also conducted prior to the primary data collection. Feedback from the pilot participants led to minor linguistic adjustments to ensure the terminology was accessible to a broad range of domestic and international tourists.

The final questionnaire was structured into five primary sections: demographic information and trip characteristics; difficulties when travelling in Hoi An; mobile application usage habits and AI acceptance (DA); interest in tourism-support applications in Hoi An (APN); and inconveniences in using tourism applications (INC). Although the questionnaire was not originally designed as three separate UX scales, its items were mapped by content to their most relevant travel contexts: planning method and DA2 to pre-trip digital behaviour; travel difficulties and APN to on-site or anticipated on-site UX; DA1 and INC to digital use and friction that may occur across stages; and DA3-DA4 to stated interest in personalised and AI-supported assistance across the journey.

The four DA items captured related but conceptually distinct aspects of current digital-use behaviour and stated interest in personalisation and AI-supported assistance. DA1 and DA2 concerned current use of travel applications and virtual assistants, whereas DA3 and DA4 concerned interest in preference-based recommendations and a Hoi An-specific AI assistant. The items were therefore analysed separately at the item level rather than combined into a single scale score.

The APN section captured the practical value tourists attach to AI-supported functions such as real-time question and answer (Q&A), AI-generated destination and cultural recommendations, verified reviews and mobility support within the heritage urban structure. The INC section captured usability barriers, including irrelevant recommendations, difficult-to-use interfaces, lack of support and missing features.

Accordingly, the empirical design focuses on pre-trip and on-site digital UX, where mobile and AI-supported services are most directly involved in planning and real-time assistance. The instrument supports a stage-informed and TAM-informed interpretation of perceived usefulness, perceived ease of use and adoption-related responses [4, 20], rather than a formal test of TAM or a validated UX or CX scale. No retrospective CX composite was constructed from unrelated items; satisfaction, revisit intention and recommendation intention are used only to interpret the broader conceptual context. All participants were informed of the research objectives and data collection strictly followed protocols for respondent anonymity and voluntary participation.

3.6. Data processing and analysis methods

After data collection, the qualitative interview material and the quantitative survey data were processed separately in accordance with their respective analytical purposes. Sample characteristics and multiple-response items were summarised using frequencies and percentages.

For DA1-DA4, response distributions and median values were reported. Domestic and international visitors were compared for each DA item using two-sided Mann-Whitney U tests.

APN and INC were analysed descriptively as multiple-response questions, using the number and percentage of participants who selected each option. Given the non-probability sampling strategy, the inferential findings were interpreted as patterns within the surveyed sample rather than generalised to the wider visitor population.

4. Results

4.1. Qualitative insights from expert interviews

Drawing on five expert interviews (Table 1), the qualitative phase suggests that personalisation in Hoi An Ancient Town should not be understood merely as a technical function, but as a process shaped by context, user behaviour and the cultural specificity of the destination.

The experts emphasised three conditions for meaningful personalisation: practical value, including tourism utility, ease of use, reliable information and system stability; the creation of destination-specific value through local cultural identity; and AI-supported assistance that can adapt to user behaviour, travel purpose, time constraints, budget and practical conditions of use. These qualitative insights provide contextual grounding for the interpretation of the quantitative findings presented in the following sections.

4.2. Sample characteristics

The analytic sample comprised 144 eligible respondents, of whom 80 were classified as domestic and 64 as international. Table 2 consolidates the key sample characteristics used to contextualise the subsequent analyses.

Table 2. Characteristics of the surveyed sample (n=144).

Characteristic	Category	n	Valid percentage (%)
Visitor market (used in comparative analyses)	Domestic (*)	80	55.6
	International	64	44.4
Age	Under 18 years old	3	2.1
	18-35 years old	112	77.8
	36-60 years old	26	18.1
	Over 60 years old	3	2.1
Occupation	Students	28	19.4
	Office employees	56	38.9
	Freelancers	25	17.4
	Tourism workers	12	8.3
	Artists, content creators	15	10.4
	Others/not disclosed	8	5.6
Visit frequency	First time	82	56.9
	More than twice	62	43.1
Length of stay	Day trip	30	20.8
	1-2 days	41	28.5
	3-4 days	51	35.4
	More than 4 days	22	15.3
Usual travel planning method	Online research	86	59.7
	Friends or family	34	23.6
	Travel advertising	16	11.1
	Travel agents	8	5.6

(*): For domestic-international comparisons, four respondents who reported living or working in the broader Hoi An area were included in the domestic group.

The sample was concentrated in the 18-35 age group (77.8%), and office employees formed the largest occupational category (38.9%). First-time visitors accounted for 56.9% of respondents, while 35.4% reported stays of 3-4 days.

Length-of-stay patterns differed descriptively between the two visitor markets. Day trips or stays of 1-2 days accounted for 70.0% of domestic visitors, whereas stays

of 3 days or more accounted for 76.6% of international visitors.

4.3. Digital-use and AI-related interest indicators

Online research was the leading travel-planning method among both domestic visitors (61.3%) and international visitors (57.8%), indicating that pre-trip information seeking was predominantly digital across the two visitor markets. The journey-stage framework was therefore used as an interpretive lens for organising the subsequent digital-use findings. The four DA indicators were examined separately rather than treated as a single scale. DA1 captured general travel-application use that may extend across different stages of the journey, while DA2 captured current virtual-assistant use for trip planning. DA3 and DA4 reflected respondents' stated interest in preference-based recommendations and Hoi An-specific AI-supported assistance. Their response distributions are presented in Table 3.

Table 3. Distribution of digital-use and AI-related interest indicators (n=144).

Code	Indicator	Median	Levels 1-2, n (%)	Level 3, n (%)	Levels 4-5, n (%)
DA1	Frequent use of general travel applications	3	59 (41.0)	29 (20.1)	56 (38.9)
DA2	Frequent use of virtual assistants for trip planning	4	35 (24.3)	19 (13.2)	90 (62.5)
DA3	Desire for travel recommendations based on preferences	5	6 (4.2)	10 (6.9)	128 (88.9)
DA4	Desire for an AI virtual assistant specifically for Hoi An	4.5	9 (6.3)	11 (7.6)	124 (86.1)

Values are presented as n (%) unless otherwise stated. Responses were measured on a five-point agreement scale (1=strongly disagree; 5=strongly agree).

DA1 showed a polarised response pattern: 41.0% selected levels 1-2, 20.1% selected level 3 and 38.9% selected levels 4-5 (median=3). For DA2, 62.5% selected levels 4-5 (median=4).

Responses to DA3 and DA4 were concentrated at levels 4-5, selected by 88.9% and 86.1% of respondents, respectively; the corresponding medians were 5 and 4.5. These patterns indicate strong stated interest in personalised support at planning and anticipated-use touchpoints, rather than actual experience outcomes.

4.4. Domestic and international visitor comparison

Two-sided Mann-Whitney U tests were used to compare the DA response distributions of domestic (n=80) and international (n=64) visitors. Table 4 reports the group medians, percentages selecting levels 4-5, U statistics and two-sided p-values.

Table 4. Domestic and international visitor comparison of DA indicators.

Code	Domestic median	Domestic levels 4-5 (%)	International median	International levels 4-5 (%)	Mann-Whitney U	p
DA1	3	43.8	2.5	32.8	2939.5	0.116
DA2	4	51.3	4	76.6	1939.0	0.010
DA3	5	86.3	4.5	92.2	2566.0	0.980
DA4	4	83.8	5	89.1	2433.0	0.576

DA2 was the only item for which the response distribution differed significantly between domestic and international visitors (U=1939.0, p=0.010). A larger proportion of international visitors selected levels 4-5 than domestic visitors (76.6% vs 51.3%), indicating stronger agreement with the statement concerning the use of virtual assistants for trip planning. No statistically significant between-group differences were observed for DA1, DA3 or DA4.

4.5. Desired tourism-support functions and reported usage barriers

On-site support needs were first reflected in the difficulties reported during travel: insufficient time to explore (54.9%), difficulty finding information about attractions, shops or food (52.8%), mobility within the Ancient Town (47.2%), lack of event or festival information (31.9%) and difficulty communicating with local residents (25.7%). The APN and INC multiple-response items were then summarised using frequencies and percentages; because respondents could select more than one option, percentages within each question may exceed 100% (Tables 5 and 6).

Table 5. Desired tourism-support functions (APN) (n=144).

Function	n	(%)
Food and cultural experience suggestions	114	79.2
Virtual-assistant support	102	70.8
Attraction suggestions	102	70.8
Reviews from other travellers	67	46.5
Event/festival suggestions	58	40.3
Mobility support in the Hoi An Ancient Town	22	15.3

Table 6. Reported barriers to using tourism applications (INC) (n=144).

Barrier	n	%
Irrelevant recommendations	89	61.8
Difficult interface or information search	87	60.4
No support when problems occur	39	27.1
Missing needed features	23	16.0

Food and cultural experience suggestions were selected most frequently (79.2%), followed by virtual-assistant support and attraction suggestions (70.8% each). The most frequently reported barriers were irrelevant recommendations (61.8%) and difficult interfaces or information search (60.4%). These patterns identify desired on-site digital touchpoints and cross-stage friction that may shape UX during use.

5. Discussion

The survey shows strong stated interest in personalised and AI-supported travel assistance. Levels 4-5 were selected by 88.9% of respondents for preference-based recommendations (DA3; median=5) and by 86.1% for a Hoi An-specific AI assistant (DA4; median=4.5). From a TAM-informed perspective, these patterns indicate receptiveness to services expected to be useful and relevant to practical travel needs within the heritage destination [4]. From an experience-economy perspective, the value of such support lies not only in functional efficiency but also in its potential contribution to memorable and personally engaging experiences [21]. In Hoi An, this experiential value further depends on whether digital support facilitates meaningful engagement with the culturally distinctive heritage setting. The preliminary expert interviews similarly emphasised practical utility, cultural specificity and sensitivity to actual conditions of use.

Responses concerning current digital use were more differentiated. DA1 was polarised, with 41.0% selecting levels 1-2 and 38.9% selecting levels 4-5 (median=3), whereas 62.5% selected levels 4-5 for DA2 (median=4). DA2 was also the only item for which the response distribution differed significantly between domestic and international visitors: 76.6% of international visitors and 51.3% of domestic visitors selected levels 4-5 ($U=1939.0$, $p=0.010$). These results indicate an interest-use gap within the surveyed sample: strong stated interest in personalised support did not translate uniformly into agreement with current-use statements.

International visitors in the surveyed sample reported longer stays than domestic visitors. Although the present study did not directly measure cultural distance, prior cultural knowledge or the reasons underlying this difference, cross-cultural heritage research provides a useful interpretive perspective. M.M. Su, et al. (2019) [22] suggest that greater cultural distance may be associated with lower prior familiarity with the host culture but stronger interest in experiencing local ways of life. Their findings also indicate that deeper exploration and interaction with residents can be associated with longer engagement, particularly among international visitors [22]. Research at built heritage sites in Beijing likewise shows that visitors' cultural backgrounds, prior knowledge, motives and interpretive preferences influence how they understand heritage and what forms of information they require [23]. These findings do not establish why international visitors in the present sample stayed longer, but they indicate that visitor market alone is an insufficient basis for personalisation. An AI-supported assistant should therefore consider visitor background and prior knowledge [23], alongside contextual variables such as time available, travel goals and knowledge of the surroundings [24]. In the present study, language, cultural interests and length of stay represent additional design variables suggested by the Hoi An findings. These variables could support concise, prioritised routes for day visitors and short-stay tourists, while enabling deeper cultural interpretation and flexible itinerary adjustment for longer-stay visitors. The higher DA2 responses among international visitors, who also tended to stay longer in this sample, reinforce the relevance of adaptable planning support without establishing a causal relationship between length of stay and AI use. Length of stay should therefore inform the depth, pace and sequencing of recommendations rather than whether AI support is provided.

More broadly, the survey did not directly examine the mechanisms underlying the difference between stated interest and reported current use. Prior research conceptualises mobile tourism support as context-aware, providing timely and relevant information across the planning, booking, on-site and post-trip stages of travel [25]. Perceived personalisation and privacy concerns may influence tourists' willingness to adopt mobile travel advice [26], while performance efficacy, intrinsic motivation, facilitating conditions and emotional responses may also shape acceptance of AI-supported service encounters [27].

The APN and INC findings provide more direct context for this pattern. Respondents most frequently selected food and cultural experience suggestions (79.2%), virtual-assistant support (70.8%) and attraction suggestions (70.8%) as desired functions. At the same time, irrelevant recommendations (61.8%) and difficult interfaces or information search (60.4%) were the most frequently reported barriers.

Taken together, these descriptive patterns are consistent with the interpretation that receptiveness to AI-supported personalisation may depend on the relevance, usability and destination specificity of the support provided.

Accordingly, AI-supported personalisation is more appropriately understood as selective, context-aware assistance than as continuous mediation throughout a trip. From a psychological perspective, tourist experiences are shaped by expectations, experienced events and the ways in which these events are subsequently constructed in memory [28]. From this perspective, personalisation should be understood as an interpretive and co-created experiential process, in which value is determined not only by the system's recommendation capacity, but by how digital support is received in relation to the specific cultural context of the destination.

From a critical perspective, treating AI as a complete solution to complex tourism problems would risk reducing socio-cultural and experiential issues to matters of technological efficiency-a form of technological solutionism [29]. In the present study, AI is therefore understood as a supportive tool rather than as a substitute for the experiential process as a whole. Drawing on tourism-authenticity scholarship [5, 30], the present study argues that digital support should preserve opportunities for direct, place-based and culturally meaningful engagement with the heritage setting. Personalisation should therefore provide verified information and adaptable planning assistance while preserving space for spontaneous discovery, interaction with local residents and place-based heritage experiences tied to the real environment. Research on group-trip recommender systems shows that personalisation can balance individual preferences with shared group experience by allowing flexible periods of "time apart" and "time together" during the journey [31]. In the present study, this perspective suggests that AI-supported personalisation should accommodate individual needs without eliminating the collective and social dimensions of heritage travel.

A balanced interpretation should also acknowledge that AI-driven personalisation does not always generate positive outcomes. If recommendation systems repeatedly reproduce popularity rankings, they may direct tourists toward familiar hotspots and intensify pressure on the heritage core, particularly in the central Ancient Town-an implication consistent with broader research on overtourism [32]. From this perspective, this narrowing may also be understood as a socially shaped mode of seeing: repeated algorithmic emphasis on particular sites, images and routes could influence which aspects of the destination visitors learn to notice and value [33]. When designed carefully, AI may also broaden the range of meaningful options available to visitors by suggesting less congested spaces, activities and routes that still match their needs, time constraints and travel purposes. In this sense, personalisation should function as a way of balancing individual relevance with a more even distribution of experience across the destination.

In the surveyed sample, 49.3% of respondents were day visitors or stayed for only 1-2 days. For visitors with limited time, context-relevant digital support may help them prioritise information and identify culturally meaningful options. If AI-supported personalisation is driven primarily by popularity, convenience and algorithmic efficiency, it may reinforce a superficial consumption of heritage, in which visitors engage with familiar routes and photogenic surfaces rather than with the deeper historical, architectural and socio-cultural meanings of the destination. By contrast, meaningful personalisation in Hoi An should create differentiated pathways into the destination's cultural depth according to visitors' motivations. For example, visitors interested in architecture may be guided toward the layered Vietnamese, Chinese and Japanese influences reflected in Hoi An's architectural heritage, while visitors seeking a deeper understanding of local life may be connected more directly to craft traditions, community life or local cultural rhythms. In this sense, personalisation becomes valuable not when it simply predicts what tourists are likely to consume, but when it helps them access and interpret the cultural meanings that distinguish Hoi An as a living heritage space. Neuhofer et al. conceptualise technology as a means of enabling tourists to participate actively in the co-creation of destination experiences across the pre-travel, on-site and post-travel stages [10]. In the present study, this supports the view that digital assistance should complement, rather than substitute for, tourists' direct engagement with and interpretation of Hoi An's heritage environment.

Beyond tourist participation, this issue also has implications for local stakeholders and heritage governance. AI-supported personalisation in a heritage destination may affect not only tourists' individual experiences, but also the ways in which local culture is selected, framed and made visible through digital mediation. Likewise, heritage interpretation is shaped by institutional and professional discourses that

privilege particular forms of knowledge and value, while alternative community meanings may be marginalised or contested [6]. In the context of Hoi An, this implies that if AI-supported recommendation systems repeatedly prioritise particular sites, stories or routes, they may influence not only visitor concentration but also which dimensions of local culture receive greater visibility and are more frequently reproduced, while other spaces, practices or community-linked meanings remain more peripheral. As a design implication of the present study, aggregated and anonymised preference patterns may also help local stakeholders identify recurring visitor needs and develop more context-relevant services [25]. However, the use of such data should remain accountable to inclusive heritage-governance processes and community interests.

These findings reinforce a context-dependent understanding of digital UX in heritage tourism. Visitor experiences at heritage sites are personal, subjective and multidimensional, encompassing cognitive, emotional, sensory, relational and other forms of response. Such experiences emerge through the interaction between external activities, settings and events and what visitors bring to the encounter, including their prior experiences, interests, expectations and motivations [34]. Digital UX should therefore not be reduced to interface performance alone. In Hoi An Ancient Town, technology can function as an intermediary layer that supports access to information and the interpretation of place-based cultural meanings, while the experience itself remains shaped by visitors' engagement with the destination's physical and social environment. This interpretation is consistent with experiential perspectives that distinguish experiences from service provision and emphasise memorable and personally engaging encounters [35].

Within the broader CX framework, these digital touchpoints contribute to rather than constitute the destination experience. Relevant, usable and culturally appropriate support may reduce planning and on-site friction, whereas generic or intrusive recommendations may weaken engagement with place. Destination CX develops cumulatively through digital, physical, social and cultural touchpoints across the smart tourism ecosystem [8, 11]. The study therefore examines the contribution and limits of digital UX without claiming direct effects on overall satisfaction, revisit intention or recommendation intention.

6. Conclusions

Using survey data and preliminary expert interviews, this study examines pre-trip and on-site digital UX associated with mobile technology and AI-supported personalisation in Hoi An Ancient Town. The analysis interprets these digital touchpoints in relation to practical utility, contextual fit and cultural sensitivity, and considers how they may contribute to - but do not constitute - the broader destination CX.

Taken together, the findings show a clear contrast between strong stated interest in personalised and AI-supported assistance and more uneven patterns of current digital use. Respondents expressed strong stated interest in preference-based recommendations and a Hoi An-specific AI assistant, whereas reported current use of general travel applications was markedly polarised. This contrast suggests that interest in personalised support does not automatically translate into consistent use across visitors. The preliminary expert interviews provide contextual interpretation of this variation by identifying practical utility, relevance, usability and cultural sensitivity as important conditions shaping the perceived value of digital support. Within these limits, AI is more appropriately positioned as a selective and supportive layer that can assist visitors at relevant moments without replacing direct engagement with the living heritage environment. These findings should be regarded as exploratory and context-specific, requiring further validation through larger and more diverse samples and direct measures of actual system use and visitor experience.

Unlike studies that approach personalisation primarily from a technical standpoint, this research positions personalisation in heritage tourism as a context-dependent and interpretive process. In this view, technology does not replace the destination experience. Rather, it functions as a bridge between individual tourist needs and the socio-cultural environment of the heritage site. In the case of Hoi An Ancient Town, the value of AI lies not only in improving convenience, but also in supporting access, interpretation and trip planning in ways that remain sensitive to the cultural depth, direct experience and experiential rhythm of a living heritage space.

6.1. Theoretical and practical contributions

From a theoretical perspective, this study contributes to discussions of UX personalisation and the heritage-destination context by linking a technology-acceptance perspective with experiential

approaches to tourism. Perceived usefulness and ease of use help explain tourists' receptiveness to digital support [4], while experiential perspectives clarify why the value of such support also depends on personal interpretation, engagement and the cultural context in which the interaction occurs [34, 35].

The study further extends this relationship by locating digital UX across the pre-trip, on-site and post-trip journey, while distinguishing system-specific digital UX from the broader and cumulative destination CX [10, 11]. In this framework, AI-supported personalisation is understood not simply as an algorithmic output or an isolated technical intervention, but as a context-sensitive experiential process through which tourists access, interpret and engage with place. The preliminary expert interviews strengthen this interpretation by showing how practical utility, cultural specificity and actual conditions of use can enrich the explanation of the quantitative patterns.

From a practical perspective, the findings suggest that in Hoi An Ancient Town and similar heritage destinations, the integration of AI and mobile technology should focus on context-relevant support rather than on the accumulation of technological features alone. Transparent data practices and the involvement of local stakeholders are also important when deciding which places, narratives and services are made visible through digital recommendations. Digital support is likely to be more valuable when it is trustworthy, unobtrusive and sufficiently responsive to tourists' changing needs, while still preserving direct cultural experience at the destination. In this way, AI-assisted tools may contribute to more meaningful visitor experiences and more balanced destination management.

6.2. Limitations and future research

This study has several limitations. The convenience sample was non-probabilistic, concentrated in the 18-35 age group and collected through a cross-sectional design. As an exploratory descriptive study based on a non-probability sample, the findings should be interpreted within the surveyed context of Hoi An Ancient Town rather than as statistically representative of the broader tourist population. Further validation in broader or more diverse destination contexts is needed before wider generalisation can be made. The domestic-international comparison is exploratory, and the polarised DA1 distribution does not reveal the mechanisms underlying current use.

The questionnaire was not designed as a validated UX, CX or formal TAM scale. DA3 and DA4 measure stated interest rather than actual experience, while APN and INC are multiple-response indicators. The study also did not directly measure post-trip UX, overall satisfaction, revisit intention or recommendation intention. Future research should use purpose-designed stage-specific measures, behavioural data and longitudinal designs to assess how digital UX develops and whether it contributes to broader CX outcomes.

The preliminary qualitative phase was limited to five experts and reflects expert perspectives more directly than tourists' lived experiences or community viewpoints. Future research should adopt broader mixed-method designs, including in-depth tourist interviews, observation or journey diaries, and participation from residents and heritage stakeholders. Such work could examine how personalisation is experienced, negotiated and adjusted in real time, extend the framework to post-trip UX and evaluate governance implications across different heritage destinations.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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Educational cooperation as a pillar of Vietnam-Japan relations: The case of Vietnam Japan University

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Received 3 November 2025; revised 27 April 2026; accepted 27 April 2026

Abstract:

Since the twentieth century, Vietnam-Japan relations have evolved through periods of tension and cooperation, with a sustained emphasis on partnership and development. While existing scholarship has focused primarily on economic, political, and diplomatic dimensions, educational cooperation - particularly in higher education - remains comparatively underexplored. This article addresses this gap by analysing educational cooperation as a structured component of Vietnam-Japan relations through the case of the Vietnam Japan University (VJU). Drawing on a qualitative case-study approach and document analysis, the study examines how policy commitments, resource allocation, and joint governance are translated into institutional design and measurable outcomes. The findings indicate that educational cooperation at VJU operates as an institutionalised mechanism linking diplomatic intentions with human resource development, reflected in governance structures, partnership networks, and academic outputs. At the same time, the case reveals constraints related to governance complexity, financial sustainability, and cross-cultural integration. By situating VJU within broader frameworks of education diplomacy, soft power, and higher education internationalisation, the article contributes to the literature by demonstrating how educational cooperation can function as a structured and operational "pillar" of bilateral relations, while also highlighting its context-dependent limitations.

Keywords: **education, international cooperation, Japan, Vietnam, Vietnam Japan University.**

Classification numbers: **3.1, 5.2, 5.3**

1. Introduction

The historical relationship between Vietnam and Japan in the twentieth century has experienced many ups and downs. At the beginning of the twentieth century, Japan was a model for Vietnamese patriots seeking national liberation [1]. However, by the late 1930s and early 1940s, the two sides stood on opposing fronts: the Allies and the Fascists. In the latter half of the century, Vietnam's division and prolonged struggles for national defense, coupled with intense power competition among major nations during the Cold War, significantly influenced the dynamics between Vietnam and Japan. Although they were no longer enemies, the journey towards becoming partners in a unified Vietnam would take several decades. The establishment of diplomatic relations between Japan and the Democratic Republic of Vietnam in 1973 was a pivotal event [1]. This milestone not only highlighted the goodwill and cooperation aspirations of both countries but also signified a broader shift in international relations, from confrontation to cooperation.

Over the past 52 years (1973-2025), the relationship between Vietnam and Japan has seen periods of strong cooperation, as well as times marked by tension and misunderstanding. However, the commitment from both countries to mend and enhance their relationship is apparent. One significant avenue of connection, particularly during the most challenging times, has been in the field of education, especially higher education. The progression of the relationship from a strategic partnership in 2009 to a comprehensive strategic partnership in 2023 is both a catalyst for further enhancing cooperation in higher education and a result of ongoing collaborative efforts in this area [2].

Regarding educational cooperation between Vietnam and Japan, several studies have been published on the topic. The book "Quan hệ văn hoá, giáo dục Việt Nam-Nhật Bản và 100 năm phong trào Đông Du" [Vietnam-Japan cultural and educational relations and 100 years of the Dong Du movement], edited by Nguyen Van Khanh, focuses on two primary issues: (1) Vietnam-Japan cultural and educational relations, and (2) the Dong Du movement and

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its influence on the Vietnamese revolution [3]. The article "Hợp tác giáo dục và đào tạo nguồn nhân lực giữa Việt Nam và Nhật Bản" [Educational cooperation and human resource training between Vietnam and Japan] by Ngo Huong Lan, published in the *Northeast Asia Research Journal*, reviews the significant achievements in educational cooperation between Vietnam and Japan across various levels, including primary education, secondary education, higher education, and human resource training [4]. K. Yoshida's (2009) [5] research report, titled "Japan's international cooperation for educational development: Review of prospects for scaling up Japan's aid to education", analyses Japan's role in supporting the education sector in developing countries, including Vietnam, through Official Development Assistance (ODA) from 1991 to 2000. The article "Hợp tác Việt Nam-Nhật Bản trong lĩnh vực giáo dục và đào tạo nguồn nhân lực" [Vietnam-Japan cooperation in the field of education and human resources training] by Hoang Minh Loi, also published in the *Northeast Asia Research Journal*, examines the relationship between Vietnam and Japan in educational cooperation and human resources training at various levels, including cooperation between governments, schools, research institutes, centres, organisations, and individuals [6]. Two additional studies, "From oriental studies to South Pacific studies: The multiple origins of Vietnamese studies in Japan, 1881 to 1951" by Frederic Roustan (*Journal of Vietnamese Studies*, 2011) and "From 'Ideal Social Model' to Reality: Vietnamese Studies in Japan" by Hisashi Shimojo (*Journal of Vietnamese Studies*, 2021), clarify the origins and development of Vietnamese Studies in Japan, which is a significant aspect of educational cooperation between the two countries [7, 8]. Upon reviewing these works on Vietnam-Japan relations, it is evident that the field of educational cooperation has attracted the attention of scholars from Vietnam, Japan, and internationally. This body of literature establishes that educational cooperation constitutes a meaningful and multifaceted component of Vietnam-Japan relations, encompassing historical exchange, policy coordination, and institutional collaboration. However, the number of publications on this topic is modest compared to research in other fields, such as economics, politics, and diplomacy.

Subsequently, exploring the cooperative relationship between Vietnam and Japan through higher education provides valuable insights into the ties between the two countries, particularly in an area that has not been extensively researched. This examination allows for a deeper understanding of the role of education in fostering connections between Vietnam and Japan. Historically, collaborative efforts in education have been consistent, and in the twenty-first century, these activities have become one of the fundamental pillars of the relationship. Analysing the partnership through the lens of the Vietnam Japan University (VJU) serves as an ideal case to illustrate the close educational ties and the shared commitment to higher education between the two nations in this century. Building on this perspective, the study is guided by two central questions: How does educational cooperation, via VJU, operate as a "pillar" of Vietnam-Japan relations, and to what extent is this role visible in institutional design and outcomes?

Beyond documenting VJU's establishment and milestones, this study makes three original contributions. *First*, it advances a conceptual model that frames educational cooperation as a structural pillar of Vietnam-Japan relations rather than a derivative outcome. *Second*, it elucidates the causal mechanism through which diplomatic commitments, ODA allocation, and joint governance are translated into institutional practices and outcomes at VJU. *Third*, the study provides systematic, longitudinal evidence linking policy intentions to operational performance, offering an evaluative perspective on the effectiveness and limitations of the joint-university model as an instrument of bilateral cooperation.

2. Theoretical framework and methods

2.1. Theoretical framework

This study is grounded in three interrelated theoretical lenses to explain how educational cooperation functions as a strategic component - a "pillar" - of Vietnam-Japan relations. *First*, the concept of education diplomacy positions higher education not merely as a sectoral activity but as an instrument through which states pursue broader diplomatic goals. Education diplomacy emphasises policy coordination, knowledge exchange, and people-to-people connectivity as mechanisms for building long-term trust and political alignment [9, 10]. Within this framework, VJU can be interpreted as a diplomatic platform through which both countries institutionalise mutual commitment and project shared strategic visions for Asia's future.

Second, soft power theory provides a useful lens for understanding Japan's long-standing investment in human resource development in Vietnam. Japan's ODA allocations, training programs, and support for VJU reflect a deliberate strategy to strengthen influence through attractiveness - via technology transfer, academic quality, and cultural engagement - rather than coercive means [9, 11]. Vietnam, for its part, views educational cooperation as a pathway to enhance national capacity, modernise science and technology, and cultivate a generation of leaders familiar with Japanese culture, governance, and professional norms.

Third, the internationalisation of the higher education framework helps explain VJU as a form of cross-border or joint university, in which curriculum co-design, shared governance, and international mobility serve broader foreign policy objectives. Joint universities are increasingly interpreted as hybrid institutions that facilitate knowledge co-creation while reinforcing bilateral partnerships [12-14].

Analytically, the designation of education as a "pillar" is operationalised through three observable dimensions: (1) its explicit elevation in high-level joint statements; (2) the sustained allocation of Japanese ODA to human resource development; and (3) its symbolic role - as exemplified by VJU - in embodying mutual trust, long-term commitment, and a shared vision for cooperative development. Within these theoretical frames, VJU emerges as both a diplomatic tool and a strategic mechanism for shaping future generations and sustaining the Vietnam-Japan partnership.

To ensure systematic application of these theoretical lenses, the study employs the analytical framework summarised in Table 1, linking concepts to observable indicators and empirical evidence.

Table 1. Analytical framework: Concepts, indicators, and evidence.

Concepts	Operational indicators	Evidence
Education diplomacy	Inclusion in joint statements; institutional co-governance	VJU named in bilateral strategic documents; joint council structure
Soft power	Human resource investment; cultural-academic diffusion	ODA-funded faculty, Japanese curriculum elements
Internationalisation of higher education	Joint programs; faculty mobility; Q&A standards	Binational teaching staff; international accreditation

Source: The author's compilation.

This framework is subsequently used to structure the empirical analysis, allowing the study to assess how each theoretical dimension is institutionalised through governance, staffing, curriculum design, and measurable outputs, rather than relying on chronology alone.

2.2. Methods

To address the research objectives, this study combines historical and logical methods, supported by several interdisciplinary approaches to ensure analytical rigour and data credibility. The historical method is applied to trace the formation and development of VJU within the broader political-diplomatic context and the evolution of higher education reforms in both countries. This approach systematises key events, decisions, and cooperative activities from 2006 - when the initial idea of VJU emerged - through 2025, allowing the study to identify the motivations, conditions, and contextual factors shaping the bilateral university model.

In parallel, the logical method is applied to examine the major transformations in the cooperation mechanism, institutional structure, and operational outcomes of VJU. This method clarifies how the strategic objectives of Vietnam and Japan are translated into practice at VJU, thereby enabling a structured assessment of effectiveness, achievements, and remaining limitations.

In addition to the primary methods, the study employs complementary approaches. Document analysis and synthesis establish the evidentiary basis for evaluating policies, the cooperation model, and institutional performance. Policy analysis and statistical methods are used to trace policy changes in both countries and assess their impact on bilateral higher education cooperation. Quantitative data further illustrate the scale, characteristics, and developmental trajectory of cooperation from inception to operation.

The research draws on a wide range of sources, including primary documents from the Ministries of Foreign Affairs, the Japan International Cooperation Agency (JICA) reports, and VJU's internal data, as well as secondary sources such as monographs, scholarly articles, conference papers, and publications from relevant institutions. These materials were systematically collected, classified by source and theme, and analysed using qualitative document analysis and content analysis. Primary and secondary sources were cross-examined to reconstruct the development of Vietnam-Japan educational cooperation, identify policy and institutional changes, and evaluate VJU's governance and operational outcomes, thereby enhancing the reliability of the findings through source triangulation.

3. Vietnam-Japan educational cooperation: Historical roots and strategic drivers

In the early twentieth century, Japan served as an inspiration for colonised countries, such as Vietnam, seeking liberation. Vietnamese students and intellectuals responded to the call of patriot Phan Boi Chau by studying in Japan, leading to the Dong Du movement - a significant trend of Vietnamese students traveling to Japan for education [3]. In the late 1960s, as the Vietnamese national liberation struggle surged, a new generation of Japanese intellectuals emerged in opposition to U.S. war policy and to the cooperation between the U.S. and Japanese governments, giving rise to the influential citizens' movement known as Beheiren [15]. This opposition arose from a deep sympathy for the nationalist movements in Southeast Asia, particularly Vietnam.

From the late 1960s to the early 1970s, the unexpected détente in U.S.-China and U.S.-Soviet Union relations, as well as the oil crisis, were also among the reasons leading to a change in Japan's foreign policy towards Southeast Asia in general and Vietnam in particular [1]. Japan desired to implement a more independent foreign policy, and Japan's official establishment of diplomatic relations with the Democratic Republic of Vietnam in parallel with maintaining allied relations with the U.S. and the Republic of Vietnam can be seen as one of the concrete manifestations of Japan's independent foreign policy.

Although diplomatic relations were officially established in 1973, the relationship between the two countries did not have the conditions to develop from 1973 to 1975. It was only after 1975 that the relationship began to improve gradually. In October 1975 and January 1976, Vietnam and Japan exchanged embassies in each other's capitals. The two sides engaged in negotiations to address outstanding issues from the past, which included signing agreements concerning postwar economic cooperation and compensation arrangements, provided in the form of non-refundable aid totalling 13.5 billion Yen (equivalent to approximately 45 million USD) [15][1]. On May 19, 1975, the Japan-Vietnam Science and Technology Exchange Association was established to promote scientific and technological exchanges between the two countries.

During his visit to ASEAN countries in August 1977, Japanese Prime Minister Fukuda delivered a speech on Japan's Southeast Asia policy in Manila, known as the Fukuda Doctrine. The Doctrine declared Japan's resolve to never again become a military power and to strive to strengthen its relations with the nations of Southeast Asia [16]. Fukuda also emphasised Japan's willingness to increase economic assistance to ASEAN nations and to promote "heart-to-heart" human relations [15].

Between the late 1970s and the 1980s, Japan suspended official relations and the aid it had pledged to Vietnam due to incidents in Cambodia. However, exchanges between the two countries began to resume in 1986, highlighted by Vietnamese Foreign Minister Nguyen Co Thach's visit to Japan in October 1990. Subsequently, Japanese Foreign Minister Nakayama visited Vietnam in June 1991 [1].

Between 1992 and 2002, the relationship between Japan and Vietnam developed rapidly. Japan increasingly embraced dialogue and cooperation for mutual development, leading to a stronger interdependence between the two countries on both global and regional scales. Additionally, Japan shifted its foreign policy from closely aligning with the U.S. and Western countries to a "return to Asia" strategy aimed at enhancing its influence in the region. The regional context also created favourable conditions for Japan to act as a bridge between ASEAN and Vietnam, in alignment with the spirit of the Fukuda Doctrine established in 1977 [1]. On the Vietnamese side, the country adopted an open foreign policy that focused on diversifying and multilateralising international relations. Vietnam aimed to establish friendships with all nations to maximise external resources for its national construction and development. As a result, Japan emerged as one of Vietnam's key partners.

During this period, several meetings took place between Vietnam and Japan. On the Vietnamese side, the notable visits included Prime Minister Vo Van Kiet to Japan in March 1993, General Secretary Do Muoi's trip to Tokyo in April 1995, National Assembly Chairman Nong Duc Manh's visit to Japan in December 1995, and Foreign Minister Nguyen Manh Cam's journey to Japan in May 1997. From the Japanese side, Prime Minister Murayama visited Vietnam in August 1994, followed by Prime Minister Hashimoto in January 1997. Additionally, Japanese Foreign Minister Ikeda travelled to Hanoi in July 1996, and Japan's Defence Agency Director Kyuma made an official visit to Vietnam in January 1998 [1]. The exchanges between the legislative bodies of both countries also strengthened during this period through mutual visits from delegations of the Vietnamese National Assembly and the Japan-Vietnam Parliamentary Friendship Alliance.

This period marked several important milestones that demonstrated the strengthening of the relationship between Vietnam and Japan, laying the groundwork for enhanced cooperation in higher education between the two countries. In April 2002, Vietnam and Japan established a framework for a "reliable, long-term, stable partnership". Following the upgrade of their relationship to a "Strategic partnership for Peace and Prosperity in Asia" in 2009, Japanese Foreign Minister Masahiko Komura remarked, "One of the most important factors in realising the Vietnam-Japan strategic partnership is people-to-people exchange" [17]. This statement emphasised the importance of enhancing cooperation in areas such as culture, science and technology, education and training, and youth exchanges. Additionally, it highlighted the need to respect each other's cultural traditions and collaborate on the preservation of cultural heritage. Following this event, the first VJU Rectors' Association was convened in Hanoi, bringing together representatives from universities and government organisations from both countries. In March 2014, President Truong Tan Sang and Japanese Prime Minister Shinzo Abe signed a Joint Statement that upgraded the Vietnam-Japan strategic partnership to the new level of an "Extensive Strategic Partnership for Peace and Prosperity in Asia".

In recognition of the remarkable achievements in the bilateral relationship over the past 50 years (1973-2023), and with a strong belief in the promising future of cooperation between the two nations, President Vo Van Thuong and Prime Minister Kishida of Japan agreed to issue a Joint Statement on upgrading the Vietnam-Japan relationship to "Comprehensive Strategic Partnership for Peace and Prosperity in Asia and the World" at the talks on November 27, 2023. This agreement underscores the commitment of both countries to enhance cooperation across all sectors and explore new areas of collaboration.

[1]The grant was divided into two periods. The first instalment of 8.5 billion Yen (approximately 28 million USD) was awarded in the fiscal year 1975, while the remaining 5 billion Yen (around 17 million USD) was granted in 1976.

With the upgrading of diplomatic relations, cooperation between Vietnam and Japan in higher education has strengthened significantly. In March 2008, Vietnam and Japan signed a Memorandum of Understanding (MoU) in Tokyo, which outlined Japan's assistance to Vietnam in training 1,000 PhD candidates by 2020 [18]. In March 2014, the Strategic Program for Educational Cooperation between Vietnam's Ministry of Education and Training and Japan's Ministry of Education, Culture, Sports, Science and Technology was approved [19]. Under this program, Japan committed to actively support Vietnam in human resource development, promote Japanese language education in Vietnam, and establish vocational skills standards. Both countries agreed to continue enhancing exchanges among universities, students, and researchers to foster mutual understanding between the younger generations, thereby contributing to the advancement of Vietnam-Japan relations. In October 2018, Vietnam and Japan signed another MoU aimed at reducing the number of international students who violate laws in Japan [20]. In November 2021, the Prime Ministers of both countries agreed to review progress in eight areas of cooperation, including cultural and educational initiatives [21]. On April 28, 2025, a new MoU was signed between Vietnam's Ministry of Education and Training and Japan's Ministry of Education, Culture, Sports, Science, and Technology [22].

Taken together, these developments illustrate the gradual consolidation of educational cooperation along three analytical dimensions: formal policy recognition, sustained investment through ODA and institutional programs, and increasing institutionalisation through bilateral initiatives. This trajectory establishes the structural conditions under which projects such as VJU can be understood not as isolated initiatives, but as institutional embodiments of a broader strategic alignment.

4. Building a shared vision: Vietnam-Japan cooperation in the university's formation process

The initiative to establish VJU began in 2006 when Vietnam's Prime Minister Nguyen Tan Dung reached out to the Japan-Vietnam Parliamentary Friendship Alliance concerning human resource development. This initial proposal can be interpreted as an early diplomatic signal that framed higher education as a strategic instrument for long-term bilateral cooperation rather than a standalone educational project [23]. In October 2006, Prime Ministers Shinzo Abe and Nguyen Tan Dung signed the Japan-Vietnam Joint Statement, in which the construction of the Hoa Lac Hi-Tech Park was included as one of three main cooperation projects between the Japanese government and Vietnam [23]. The explicit linkage between high-technology infrastructure and educational development in this statement illustrates how human resource training was embedded within broader economic and technological cooperation agendas.

In 2012, the establishment of VJU was discussed with representatives from Japan's leading universities, including the University of Tokyo, Kyoto University, Osaka University, the University of Tsukuba, Nagoya University, Waseda University, and several other research-intensive institutions. Their participation demonstrated a deliberate effort to mobilise Japan's leading academic resources at the design stage, reinforcing the interpretation of VJU as a flagship project of education diplomacy rather than a conventional capacity-building initiative. At the beginning of 2013, JICA initiated the "Vietnam Japan University Project Information Collection and Confirmation Survey" to gather information related to the Vietnam Japan University Project [23].

The basic principles for building VJU were defined as follows:

"1. To provide a high-quality education capable of studying at leading Japanese universities;

2. To provide practical education based on Japanese technologies and experiences;

3. To establish the university in accordance with the current cooperation of universities of both countries;

4. To respect the initiatives of each university;

5. To implement lectures and human resource training in Japanese language, principally as well as in English" [23].

Analytically, these principles operationalise the dual objectives of educational quality assurance and cultural-institutional transfer, which are central indicators of soft power deployment through higher education.

In the preparation stage, the University aims to accommodate 6,000 students, with 2,200 students in Natural Sciences and approximately 3,800 students in Humanities and Social Sciences. Japanese experts and advisors involved in the project explained that the modest initial enrolment numbers are intentional. Rather than signalling limited ambition, this approach reflects a quality-oriented development strategy prioritising institutional credibility and long-term reputation over rapid expansion. Additionally, there are plans to expand related activities, including collaborations with private companies, the establishment of research laboratories, and the construction of experimental facilities. It is also crucial to consider the additional space required for training programs aimed at producing highly qualified specialists and technical experts from the outset [23].

In the early years, the University constructed a campus in Hoa Lac Hi-Tech Park. This campus serves as a centre for research laboratories, industry-academia collaboration,

and human resource training for specialists. Meanwhile, the Vietnam National University (VNU) campus is dedicated to education and basic research, with a satellite campus established in Hanoi. This spatial and functional division reflects an intentional institutional design aligning applied research and industry engagement with national innovation priorities, while preserving VNU's traditional strengths in foundational education and research. To finance the construction of the University, a combination of funding sources has been utilised. This includes a substantial ODA fund provided by the Japanese Government, land offered by the Vietnamese Government, as well as additional funding from bank financing, donations, and investments from companies. The mixed financing model further underscores the hybrid nature of VJU as both a public diplomatic project and an institution oriented toward long-term sustainability.

VJU, operating under the umbrella of VNU, was established to offer a range of natural science and humanities courses. Initially, its curriculum included subjects such as Science and Technology, Medical Care and Nursing, Medicine, Agriculture, Forestry and Fisheries, Economics and Management, Law, and Japanology, along with the Japanese language. After the first ten years, VJU expanded its scope to encompass four schools and faculties, including graduate schools. The education programs at VJU are designed to leverage the strengths of its partner universities in Japan while also addressing the social needs of Vietnam and other countries in the region.

Institutional sustainability, however, depended not only on physical infrastructure and funding but also on an effective governance model capable of coordinating multiple stakeholders. The project planning stated that VJU should be established under a strong authority with adequate autonomy of the University. The secretariat of VJU should have the responsibilities for the total process of construction of VJU and should be in charge of matters such as the formation of university courses for undergraduates and post-graduates, the fiscal plan, the formation and execution of the budget, and coordination with the VJU Fund. As for the curriculum formations and the recruitment of professors and staff of the University, those will be mostly treated by the Japanese universities in charge of the administration and management, or by the VJU secretariat. In the cooperation and integrated developments with VNU-Hanoi, VJU will promote the recruitment of Vietnamese staff, including lecturers and management staff, and will train them for the purpose of shifting most jobs of the University to Vietnamese as soon as possible [23]. This governance arrangement institutionalises joint decision-making while embedding a gradual localisation strategy, thereby balancing international academic standards with national ownership.

Japanese universities played an essential role in preparing the academic and training components of VJU across multiple disciplines. Leading institutions such as the University of Tokyo, Kyoto University, Osaka University, Nagoya University, the University of Tsukuba, and Waseda University supported programme development across science and technology, medicine, agriculture, economics, law, and Japanese studies [23]. The disciplinary allocation of Japanese partner universities demonstrates a targeted transfer of expertise, aligning Japan's academic strengths with Vietnam's development priorities.

During the preparatory stage, Japanese and Vietnamese experts clearly identified the unique characteristics of the VJU, distinguishing it from traditional universities in Vietnam as well as from international collaborative institutions like the Vietnam-German University and the Vietnam-French University. According to the project plan, VJU was conceived as an autonomous member of VNU-Hanoi that would benefit from interdisciplinary collaboration and shared academic resources while maintaining close cooperation with leading Japanese universities. The model emphasised institutional autonomy, enabling the university to capitalise on VNU-Hanoi's multidisciplinary structure, extensive interconnection among its member institutions, and the active participation of Japanese universities. VJU was designed as an applied-science-based university that has connections with private-sector enterprises. Its curriculum integrates education, research, and knowledge transfer to serve both Vietnamese and Japanese companies, especially Japanese enterprises in Vietnam [24]. This statement articulates VJU's positioning as a hybrid institution that simultaneously leverages domestic academic networks and intensive international participation, a defining feature of joint-university models.

The decision to use English, Vietnamese, and especially Japanese as languages of instruction is due not only to survey findings on learners' preferences, but also reflects the international character of the university, the connection between the two countries, and the university's commitment to VJU students both during and after their training. As stated in the final report of establishing the VJU, "it is important to have a basic knowledge of the Japanese language, to have the behaviour and values that fit into a Japanese company and to have some knowledge of Japanese arts and culture. In this regard, it is important for students to have a culturally diverse experience, to be able to take classes on Japanese arts and culture, and to have access to a study abroad program at Japanese universities, which will be a good entryway into internships with leading multinational Japanese companies" [24]. It can be said that, language policy at VJU functions as both a pedagogical tool and a cultural transmission mechanism, reinforcing people-to-people connectivity and enhancing graduates' integration into Japanese-affiliated professional networks.

Generally, the formation of VJU illustrates how policy commitments, resource allocation, and institutional design converge to produce a joint-university model that embodies educational cooperation. This process provides empirical support for interpreting education as a structured and operational "pillar" of Vietnam-Japan relations, rather than a purely symbolic or descriptive domain.

5. Vietnam-Japan collaboration in the governance and operation of VJU

VJU was established in 2014 by Decree No. 1186/QD-TTg, dated July 21, 2014, of the Vietnamese Prime Minister, becoming the seventh member university of the VNU-Hanoi [25]. In 2016, VJU welcomed the first master's course students. Although the university has been operational for about a decade, its development trajectory provides an empirically grounded basis for evaluating how bilateral educational cooperation is translated into institutional governance and performance outcomes. VJU has already achieved notable results, gradually aligning its operations with the goals and missions articulated at the time of its establishment.

In this study, institutional success is assessed using four analytical criteria: (1) the density and sustainability of partnership networks with universities and industry; (2) staff recruitment, graduate placement, and mobility outcomes; (3) international and joint accreditation outcomes; and (4) research productivity normalised within the VNU system.

VJU follows a step-by-step process aimed at establishing Vietnam as a hub for higher education in Asia. From an internationalisation perspective, the composition of the student body serves as a key indicator of cross-border academic attractiveness. The master's programs offered by VJU attract students from various countries, including Japan, Mekong River nations, Nigeria, Russia, and other African countries [26].

Since its establishment, VJU has expanded through a phased development strategy. Beginning with six master's programmes in 2016, the university gradually diversified its academic portfolio by introducing additional master's programmes, undergraduate programmes in 2020, and its first doctoral programme in 2023 [26, 27]. This phased expansion illustrates how institutional development was aligned with capacity accumulation and bilateral resource availability rather than immediate comprehensiveness.

The cooperation between Vietnam and Japan has continued to strengthen, especially during the operation of the VJU in recent years. On February 18, 2020, VJU and JICA signed an MoU to implement the Technical Cooperation Project aimed at enhancing training, research, and university management capacity at VJU (referred to as TC2). This second phase of the cooperation project focuses on improving these capacities and was underway from March 2020 to March 2025. The goal is to train high-quality human resources at all three levels: undergraduate, graduate, and doctoral. Throughout the implementation of this project, Japan continued to provide support in terms of resources, techniques, and technology transfer. This assistance helps VJU develop into an international-class research institution and gradually achieve autonomy and sustainability [28].

Strong cooperative relations between Vietnam and Japan have flourished during the operation of VJU over the past decade, benefiting both the training and post-graduate phases. Committed to educating a generation that meets the high demands of the labour market and is capable of competing internationally, VJU works closely with businesses and entrepreneurs both domestically and globally. This collaboration creates an engaging learning environment that prioritises practical experience for students. In recent years, numerous memorandums of understanding have been signed between VJU and various enterprise partners in Vietnam, Japan, and other countries. These partnerships serve as a practical indicator of social connection and labour-market relevance, linking educational outcomes to economic and professional networks.

VJU signed an MoU with National Centre for Technological Progress (NACENTECH) on March 25, 2019, specifying the cooperation in science and technology research, cooperation in science and technology application, consultancy, production and business activities, and cooperation in training [29]. On April 8, 2021, another MoU was signed between VJU and Mitani Co., Ltd., as well as Koganeu Seiki Company. This agreement established these two companies as major strategic partners of the University, particularly in the area of training activities. Some modules are delivered by these enterprises, including "Japanese and Vietnamese Business", "Japanese Management", and "Japanese-style Manufacturing". These courses are specifically designed for students in the Business Study Japan (BSJ) program, not only providing students with valuable opportunities to gain practical knowledge from a business perspective, but also including field visits that offer insights into real working environments within these companies [30]. These arrangements institutionalise industry participation in curriculum delivery, reinforcing the applied-science orientation of VJU's educational model.

An MoU between VJU and ONE Values (a top M&A consulting firm in Japan) was signed on March 20, 2025. This event is seen as a significant step in enhancing collaboration between academia and industry, which

will help develop high-quality human resources and strengthen the connection between educational practices and business operations. The MoU will serve as a basis for future initiatives such as exchange programs, internships, research projects, and partnerships between students and businesses [31].

On the same date, another MoU was signed between VJU and Daiwa Living Vietnam, one of Japan's leading real estate and construction corporations. Under the MoU, Daiwa Living Vietnam commits to supporting VJU students through internship opportunities, career support, academic seminars, and exclusive service discounts at D-WORK PLACE. The MoU also creates a foundation for the two parties to cooperate in scientific research projects, technology applications, and consultancy services [32].

Besides the international cooperation, which mainly focuses on Japanese partners, in recent years, VJU has promoted its cooperation with many higher education institutions in Vietnam, such as an MoU signed with Nguyen Tat Thanh University on February 6, 2018 [33], and an MoU signed with the Institute of Transport Science and Technology [34]. On July 13, 2023, a signing ceremony of the memorandum of understanding between VJU and Ha Long University took place at campus 1, Ha Long University, Uong Bi City, Quang Ninh province [35]. These domestic partnerships complement international cooperation by reinforcing VJU's integration into Vietnam's higher education system.

The graduation of the first cohort at VJU provides an initial indication of the outcomes associated with Vietnam-Japan collaboration in higher education. In July 2018, 56 students completed their master's degree program. Among them, 11 chose to pursue doctoral programs at VJU, with six receiving scholarships from the Japanese government. Additionally, 30 graduates accepted positions in various businesses and organisations. These included 12 students who relocated to Tokyo to work for companies such as Yoshinoya, Juntos, ALPS Electric, Hirose, and Sojitz, as well as Japanese firms operating in Vietnam like Nippon Express, DENSO, MSIG Insurance, and DHL, etc [26]. These outcomes provide concrete evidence of graduate mobility and labour-market integration, linking educational cooperation to human resource circulation.

The composition of VJU's teaching staff, particularly the proportion of Japanese professors, may be interpreted as an indicator of the degree of Vietnam-Japan collaboration in the university's operation. According to publicly available data for 2024, the distribution of teaching staff across sectors is as follows:

Table 2. Teaching staff of Vietnam Japan University in the 2023-2024 academic year.

Sector	Vietnamese	Japanese
Sector III (Business, Management, Laws)	1	12
Sector V (Statistics, Computer and Information Technology, Engineering Technology, Production and Processing Engineering, Architecture and Construction, Agriculture, Forestry and Fisheries, Veterinary Medicine)	25	12
Sector VII (Humanities, Social and behavioural sciences, Journalism and information, Social services, Tourism, hotels, sports and personal services, Transport services, Environment and environmental protection, Security, National Defence)	5	18
Other sectors	5	4
Total	36 (accounting for 44% of the total)	46 (accounting for 56% of the total)

Source: Statistics were derived from Vietnam Japan University [36].

The strong presence of Japanese faculty, particularly in sectors such as management, policy, and environmental studies, embeds Japanese academic standards and pedagogical norms into the institution, reinforcing VJU's identity as a hybrid, binational university. Meanwhile, the substantial proportion of Vietnamese faculty ensures curricular relevance to national development priorities and supports institutional continuity. This mixed composition also shapes the curriculum: Japanese faculty contribute theoretical rigor and international orientation, whereas Vietnamese faculty localise content and integrate practical needs of Vietnam's socio-economic context. Together, the staffing structure materially reflects and operationalises VJU's dual mission as both an international and a nationally responsive institution.

The governance model at VJU also reflects a balanced integration of Japanese and Vietnamese administrative practices. It operates under a tripartite structure consisting of the University Council, Executive Board, and Supervisory Board, ensuring strategic oversight, operational efficiency, and accountability. In terms of finance, with support from diverse funding sources and internal revenue generation, the university has developed a financial sustainability plan for its operations. This governance configuration reflects an institutionalised balance between international partnership and national regulatory frameworks.

VJU has developed an internal quality assurance system aligned with VNU and the ASEAN University Network-Quality Assurance (AUN-QA) standards. The university employs the PDCA (Plan-Do-Check-Act) cycle to monitor and improve educational programmes, research activities, and institutional performance [37].

Strong industry participation in curriculum delivery and internships further strengthens the university's applied orientation and responsiveness to labour-market demands.

Another strength of VJU is its commitment to faculty development. Faculty members are encouraged to engage in research, collaborate with international partners, and participate in workshops focused on teaching innovation. VJU provides funding and support for faculty involved in joint projects with Japanese universities and industry partners. Additionally, the publication-to-faculty ratio at VJU ranks among the highest in VNU, highlighting the university's robust research culture. As of the 2024-2025 school year, in addition to domestic publications and topics, the school has 291 international publications in the ISI/Scopus list, 13 books and monograph chapters published in foreign languages, and 29 topics implemented in the project system sponsored by JICA [38]. This represents a notable achievement within the total of 1,892 international publications produced by VNU as of December 2024 [39].

The quality of training and the reputation of the university were evaluated both internally and externally. According to the Accreditation Report dated May 27, 2025, VJU meets the International Joint Accreditation Standards approved by the International Joint Accreditation Committee. Table 3 below shows the achievement of the six baseline standards.

Table 3. The achievement results of each standard[2].

Standard	Performance	Standard	Performance
Standard 1: Mission, Goals & Strategy	3	Standard 4: Faculty	3
Standard 2: Internal Quality Assurance	3	Standard 5: Social Connection	4
Standard 3: Teaching & Learning	3	Standard 6: Governance	3

Source: International Joint Accreditation [37].

Accreditation results indicate that VJU demonstrates its greatest strength in Standard 5 (Social Connection), as evidenced by extensive partnerships with Japanese universities, local governments, and industry, supported by JICA and other long-term initiatives. In contrast, Standards 1, 2, 3, 4, and 6 remain at a good level, primarily due to challenges inherent in operating as a bi-national institution. These challenges also hinder VJU in fulfilling its binational mission.

From a comparative perspective, VJU shares several institutional characteristics with other transnational or joint universities established in Asia during the same period, such as the Vietnam - German University (VGU) and selected Sino-foreign joint universities. Similar to these institutions, VJU combines foreign academic participation with domestic regulatory frameworks and public funding. However, unlike many joint universities that operate primarily as offshore extensions or discipline-specific institutions, VJU is embedded within a comprehensive national university system (VNU) and pursues a multi-disciplinary mission closely aligned with bilateral diplomatic commitments. This positioning underscores the distinctive role of VJU as an institution simultaneously serving higher education internationalisation and state-level partnership objectives.

Despite these documented achievements, the operational experience of VJU also reveals a set of structural and institutional constraints that complicate the long-term sustainability of the joint-university model. *First*, although the dual governance structure has enabled close cooperation between Vietnam and Japan, it also requires continuous coordination among VNU, Vietnamese government agencies, Japanese partner universities, and JICA. The coexistence of multiple decision-making bodies and stakeholders may slow institutional responsiveness, particularly in academic planning, financial management, and administrative procedures.

Second, VJU's development has depended heavily on Japanese ODA and long-term technical cooperation. The university's infrastructure, institutional capacity-building, and the second phase of the JICA Technical Cooperation Project (2020-2025) have all relied substantially on Japanese financial and technical support. While this cooperation has been instrumental to VJU's success, it also raises questions regarding financial sustainability once large-scale external assistance is reduced and the university is expected to increase its financial autonomy.

Third, although VJU has built an international academic environment, the composition of its faculty reflects an ongoing reliance on Japanese human resources. In the 2023-2024 academic year, Japanese academics accounted for 56% of the teaching staff, compared with 44% Vietnamese faculty. This staffing structure has been essential for maintaining Japanese academic standards and delivering bilingual programmes, but it also highlights the continuing challenge of developing a sufficiently large cohort of internationally competitive Vietnamese faculty capable of sustaining the model over the long term.

Finally, VJU operates within a competitive higher education environment in Vietnam, where public universities, foreign-invested institutions, and other international joint universities compete for talented students, faculty members, research funding, and industry

[2]The performance levels are: 5 - Excellent, 4 - Very Good, 3 - Good, 2 - Requiring Improvement, and 1 - Insufficient.

partnerships. Maintaining its distinctive identity therefore requires continuous innovation beyond its initial diplomatic and institutional advantages.

Collectively, these challenges do not diminish the achievements of VJU; rather, they illustrate the inherent tensions faced by binational universities operating across different governance, financial, and academic systems. The VJU experience therefore suggests that the long-term success of joint universities depends not only on strong bilateral commitment but also on sustained institutional adaptation, diversified funding sources, and the gradual localisation of academic and managerial capacity.

6. Conclusions

In the twentieth century and the early decades of the twenty-first century, we have witnessed many pivotal moments in the relationship between Vietnam and Japan. Despite various historical events, the most significant aspect of their connection has been a shared desire to cooperate and build relationships. This commitment has led to the establishment of a "Comprehensive Strategic Partnership for Peace and Prosperity in Asia and the World" in 2023. This partnership serves as a solid foundation for enhancing cooperation between Vietnam and Japan, particularly in the field of education, exemplified by the establishment of VJU in 2014.

The establishment and operation of VJU illustrate the strong cooperation between Vietnam and Japan. Japan's role is prominently evident in both the human and financial resources dedicated to preparing for VJU's establishment. This support continues during VJU's operation. This collaboration has contributed to VJU's progress toward meeting international academic standards and has supported its positioning within the regional higher education landscape.

Over the past decade, VJU has consistently pursued the objectives and mission established at its inception. The university has achieved significant progress in administration, educational programs, pedagogical approaches, and research outcomes. As a result, VJU has not only met the accreditation standards of the Vietnamese Ministry of Education and Training but has also attained international accreditation. However, VJU continues to face structural challenges, including long-term financial sustainability, recruitment of permanent faculty, and the complexities of a bi-national governance model. Addressing these issues is essential for the university's continued development. In spite of that, the achievements the VJU obtained reflect the sustained efforts of VJU members, effective collaboration between Vietnamese and Japanese faculty, and supportive policies from both governments, which together create an environment conducive to teaching, training, and research. VJU can be understood as an institutional expression of the strategic partnership in culture and education between Vietnam and Japan.

Beyond its mission in education and research, VJU has become a hub for promoting art, culture, sports, and information exchange between Vietnam and Japan. Assessed against clearly defined institutional and performance indicators, VJU demonstrates how educational cooperation can function as an operational and symbolic pillar of Vietnam-Japan relations. While not without structural constraints, the VJU case provides systematic evidence that joint universities can translate diplomatic intent into durable institutional outcomes, thereby offering a replicable - though context-dependent - model of education diplomacy in Asia.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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 DOI: 10.31276/VMOSTJOSSH.2026.0018

The cuisine of ethnic minority communities in the mountainous areas of Da Nang within an expanded urban space: From indigenous knowledge to contemporary values

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Received 3 April 2026; revised 21 June 2026; accepted 23 June 2026

Abstract:

In recent years, Da Nang has often been recognised as a dynamic coastal city and a major centre for tourism, services, and events in Central Vietnam. While this image accurately reflects part of the city's development, it has inadvertently overshadowed another cultural space that receives far less attention: the mountainous areas and ethnic minority communities living in the western and northwestern parts of the city, associated with the Truong Son mountain range. After July 2025, in the context of administrative boundary expansion and the restructuring of urban space, the mountainous areas of Da Nang have been more deeply integrated into the overall development structure of a modern city. In this process, the culinary culture of ethnic minority communities has emerged as a domain that both embodies indigenous knowledge and is significantly influenced by the market economy, tourism, and cultural exchange. By employing methods of synthesis, analysis, and ethnographic fieldwork, this article approaches the cuisine of ethnic minorities in the mountainous areas of Da Nang as a form of indigenous knowledge and a type of living heritage, examining it in relation to the process of urbanisation and the expansion of Da Nang's urban space. On that basis, the study points out the values, transformations, and challenges facing ethnic cuisines, while also proposing several orientations for their preservation and promotion in the contemporary urban context.

Keywords: **cuisine, Da Nang City, ethnic groups, mountainous areas, urban space.**

Classification numbers: **4.3, 9.3, 10**

1. Introduction

Through contemporary anthropological and cultural studies approaches, cuisine has been increasingly viewed as a system of indigenous knowledge that has been formed, accumulated, and transmitted across generations through the interaction between humans, the natural environment, and social structures [1-6]. For ethnic minority communities in mountainous areas, culinary knowledge encompasses not only an understanding of ingredients, preparation methods, and taste preferences, but also conceptions of worldview, human existence, and social order encoded through food-related practices [7-11]. On this basis, recent studies on the preservation of gastronomy heritage have shifted from a static approach, which views traditional cuisine as a practice to be preserved unchanged, towards a dynamic approach emphasising the role of communities in maintaining and reproducing culinary heritage as a living practice [12-14]. This perspective expands the notion of preservation from the "preservation of artifacts" to the "preservation of practices," in which cultural values are sustained through continuous adaptation and transformation.

Alongside this, international discussions on cultural/indigenous knowledge mobility suggest that cultural/indigenous knowledge does not exist as a closed system but is constantly restructured when transferred into new social/spatial contexts, particularly under conditions of globalisation and urbanisation [15-24]. This process involves not only reception and transformation but also reflects the active role of communities in selecting, reinterpreting, and reaffirming indigenous culture/knowledge through everyday practices [8, 25-28]. In this regard, theories of cultural adaptability and evolution emphasise that cultural practices, including cuisine, can transform in response to new environments without necessarily losing their essential characteristics [29-34].

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This is particularly evident in transitional spaces, where cuisine becomes a form of hybrid cultural expression, reflecting interactions between traditional and modern value systems [34-38].

Building upon and extending these approaches, our study goes beyond affirming the dynamic nature of gastronomy heritage and further clarifies the relationship between indigenous knowledge, living heritage, and urban space. Specifically, in the case of ethnic minority communities in Da Nang, the evolution of ethnic culinary practices has not occurred within isolated cultural spaces but has increasingly shifted toward new contexts shaped by urbanisation and tourism. This indicates that the transformation of gastronomy values is not merely a process of passive adaptation, but rather one of active restructuring, in which traditional elements are selectively retained, reinterpreted, and integrated into new contexts. In doing so, this study contributes to existing academic discussions by demonstrating that the dynamic nature of heritage is shaped not only by temporal change but also by spatial mobility, particularly within expanding urban environments in Southeast Asia in general and Vietnam in particular.

In our view, the concept of "expanded urban space" used in this article emphasises that modern urban areas are not confined to the central urban core, but also encompass peripheral zones, transitional areas, and distinctive ecological-cultural spaces such as mountainous regions. Accordingly, the western and northwestern areas of Da Nang, which are associated with the Truong Son mountain range, have evolved from being regarded as peripheral spaces into integral components of a multi-centred and multifunctional urban structure. This space can be understood as a "cultural transition zone", where cultural practices, particularly cuisine, are continuously restructured under the influences of urbanisation, tourism, and interregional exchange. Approaching cuisine within an open spatial framework enables a broader perspective beyond traditional dichotomies such as "rural-urban" or "traditional-modern", moving instead toward a more flexible understanding of the intersections and interactions among multiple layers of space and culture.

At the research site, the mountainous region of Da Nang has long served as a settlement area for ethnic groups such as the Co-tu, Gie-Trieng, Xo-dang, and Cor peoples, primarily concentrated in Hoa Bac and Hoa Phu communes (formerly part of Hoa Vang district), as well as border areas adjacent to Quang Nam province, including Tay Giang, Dong Giang, Nam Tra My, and Phuoc Son. This region represents a transitional zone between the coastal plains and the Truong Son mountain range, characterised by hilly terrain, rich forest ecosystems, and high biodiversity. Through generations of habitation, local communities have developed distinctive cultural characteristics, notably indigenous knowledge related to forest resource use, community organisation, and interactions with the natural environment. However, under the impacts of urbanisation, tourism development, and cultural exchange, the lives of these ethnic communities have undergone significant transformations, creating a context in which traditional cultural values are simultaneously preserved and reshaped. Within this context, cuisine emerges as an important, and particularly revealing, "observational lens" through which these processes of cultural transformation can be identified and examined. This article seeks to affirm the value of the research as an effort to connect international academic approaches with the practical context of Vietnam, thereby contributing empirical evidence to scholarly discussions that view culinary knowledge as a form of living heritage. At the same time, it highlights the dynamic nature and adaptability of ethnic cultures within contemporary urban spaces.

On this basis, the study addresses three main research questions: (1) Through what dimensions can the culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang be identified? (2) How has this culinary knowledge been transformed and reconfigured in the context of the expanding urban space? (3) What values does the presence and transformation of this culinary knowledge reflect for the cultural life of ethnic minority communities and for Da Nang's urban cultural space? By addressing these questions, the study seeks to clarify the nature of culinary knowledge as a living heritage that continuously evolves through processes of spatial transformation. It also provides empirical evidence of the adaptation and reconfiguration of ethnic cultures in the context of urban expansion in Vietnam.

2. Methodology

To achieve the research objectives, this study employs methods of synthesis, analysis, and ethnographic fieldwork. The ethnographic fieldwork adopts a qualitative approach, combining data collection techniques such as in-depth interviews, participant observation, and focus group discussions to gain direct access to culinary practices and indigenous knowledge systems within communities undergoing transformations in cultural space in Da Nang. The research sample was selected through purposive sampling, focusing on groups of participants who play different roles in preserving, practicing, and transmitting culinary knowledge, including: (1) elderly members of the Co-tu and Xo-dang ethnic groups; (2) women, who are directly involved in food preparation and the maintenance of culinary practices; and (3) different

generational groups within the community. Specifically, the study conducted four interviews with elderly participants, four unstructured in-depth interviews with women, and two focus group discussions divided into two age groups (50-70 years old and under 45 years old) in order to identify intergenerational differences in the reception and transformation of knowledge.

Data were collected through field notes and subsequently synthesised and analysed thematically, with particular attention to indigenous knowledge of ingredients, food preparation techniques, the organisation of eating spaces, and transformations in culinary practices under conditions of urbanisation. Data analysis was conducted using content analysis combined with intergroup and intergenerational comparison, while interpretations were situated within theoretical perspectives on living heritage and the transformation of cultural values. The reliability of the study was strengthened through triangulation and cross-verification of information from multiple primary and secondary data sources. The procedures for data collection and analysis were implemented consistently to ensure transparency in data processing and the interpretation of findings.

3. Culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang

The culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang has been formed and developed through these communities' long-term adaptation to the forested mountain environment of the Truong Son range. This knowledge is reflected in various aspects allowing for a deeper understanding of the relationship between humans, the environment, and culture.

First, there exists a close relationship between culinary ingredients and ecological knowledge.

Given the region's steep topography, distinct seasonal climate, and the uneven distribution of natural resources across space and time, the selection of food ingredients among ethnic minority communities is not merely an act of exploiting nature. Rather, it reflects indigenous ecological knowledge systems accumulated and transmitted across generations. Evidence suggests that traditional food sources among these communities are primarily derived from three fundamental ecological spaces: swidden fields, forests, and streams. The fieldwork data demonstrate that most in-depth interview participants consistently reported that the selection of food ingredients is intrinsically linked to seasonal availability and the ecological characteristics of local habitats. In addition, focus group discussions documented more than 30 traditional food ingredients regularly incorporated into local diets, with approximately two-thirds originating from forests and streams, while the remainder were obtained from swidden cultivation and household gardens. These findings provide empirical evidence that indigenous culinary knowledge is deeply embedded in, and fundamentally shaped by, the ecological systems of the Truong Son mountain region. Crops such as upland rice, maize, and cassava serve as staple foods, while wild vegetables, bamboo shoots, mushrooms, tubers, and small aquatic species found along rivers and streams provide important seasonal nutritional supplements. Notably, community knowledge regarding these food resources extends beyond simple identification, encompassing comprehensive understandings of growth cycles, harvesting periods, regenerative capacities, and the biological safety of particular plant and animal species within their ecological environment. Data from the in-depth interviews further indicated that all elderly participants recognized that each food resource has an "appropriate harvesting season". According to their accounts, harvesting resources outside the appropriate season not only compromises food quality but also undermines the natural regenerative capacity of the ecosystem. Participants also demonstrated the ability to differentiate between morphologically similar plant species with distinct levels of toxicity or different culinary uses. These findings suggest that indigenous culinary knowledge is founded upon long-term ecological observation, accumulated experiential knowledge, and intergenerational transmission through everyday practice. For example, the Co-tu people distinguish among various types of wild bamboo shoots and apply different processing methods accordingly: some varieties require repeated boiling to remove toxins, whereas others must be dried or fermented before consumption to reduce bitterness. Similarly, among the Xo-dang people (particularly the Ca-dong subgroup), resource extraction practices are governed by unwritten customary rules, such as prohibitions against harvesting early-season bamboo shoots or hunting animals during reproductive periods [39, 40]. Clearly, these practices demonstrate a worldview grounded in harmonious coexistence with nature, in which communities utilise resources at sustainable levels to maintain ecological balance and regenerative capacity, rather than perceiving humans as possessing absolute control over the natural world. From an ecological anthropology perspective, these findings indicate that the more extensive the community's knowledge of local food resources, the more closely resource harvesting is guided by principles of sustainable use. This pattern highlights the intrinsic relationship between indigenous ecological knowledge and culinary practices, demonstrating that food-related practices are embedded not only in cultural traditions but also in locally developed systems of environmental stewardship.

Thus, from this perspective, the culinary knowledge of ethnic minority groups may be understood as a form of "cultural ecological mapping", whereby knowledge of food simultaneously constitutes knowledge of the environment, seasonal rhythms, and the limits governing the exploitation of natural resources.

Second, the culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang is clearly reflected in their methods of food preparation and ways of adapting to the living environment.

If food ingredients reflect communities' understanding of the ecological environment in general, cooking techniques demonstrate their flexible responses to the natural conditions of the Truong Son region. In these communities, common food preparation methods practiced by the Co-tu, Xo-dang include grilling over charcoal, cooking meat and fish in bamboo tubes, hanging wild game or stream fish above kitchen hearths for smoking, as well as pickling and natural fermentation. Basically, in contexts where modern preservation technologies are limited, such traditional food processing techniques serve not only to create distinctive flavours but also function as practical food preservation strategies adapted to local environmental conditions and subsistence patterns. In addition, the use of readily available natural materials such as bamboo, reeds, and leaves facilitates daily activities during extended periods of labour in swidden fields or forests. These materials can be used directly for food preparation on-site while reducing the need to carry complex cooking utensils, thereby contributing to savings in water, fuel, and labour. Participants in focus group discussions shared: "I often go into the forest for three to four days and usually bring com lam (bamboo-tube rice) and some smoked meat prepared at home because it is more convenient than cooking"; and "Whenever I go to work in the fields, I do not bring many cooking tools because there are plenty of natural materials available there that can be used instead" (Fieldwork, 7/2024).

Thus, it can be seen that these food preparation practices suggest that cuisine extends beyond the basic function of meeting nutritional needs. Rather, they reflect accumulated survival experience in challenging mountainous environments and demonstrate the intersection between ecological knowledge and the deeper cultural dimensions embedded within the community's worldview and philosophy of life. Through this, the culinary knowledge and cooking practices of local communities have become a form of indigenous technology, reflecting the adaptability, creativity, and close relationship between ethnic communities and their familiar ecological spaces.

In our view, an evocative image that illustrates both culinary techniques and environmental adaptation in the lives of many ethnic minority communities in the mountainous areas of Da Nang is the hearth fire. In traditional houses (such as stilt houses or communal houses like the Guol/Rong), the hearth is not merely a place for cooking but also a common living space where family members gather, share experiences, and transmit knowledge. For example, simply by observing elders lighting the fire, selecting firewood, adjusting heat, or dealing with ingredients, younger generations gradually acquire culinary knowledge through direct learning from everyday practice rather than through formal instruction. This mode of transmission shows that culinary knowledge exists as a form of experiential knowledge - "learning through practice" [25, 41-43]. At the same time, the hearth space reinforces family bonds and social relationships while maintaining community structures, thereby reproducing and transmitting cultural values across generations [29, 30]. Therefore, cooking methods and environmental adaptation not only produce food but also sustain the social life and cultural identity of the community. Findings from our ethnographic fieldwork indicate that the hearth remains the most common gathering space within households, serving as a place where family members share experiences and transmit knowledge in everyday life. Focus group discussions consistently revealed that, after a day of labour, household members often gather around the fire to prepare meals, discuss daily work activities, teach one another how to identify food resources, and share appropriate preparation methods for different ingredients. One female participant explained: "We share and teach one another everyday food practices, from simple to more complex tasks. For example, in using fire, children and grandchildren simply sit by the hearth, watch adults, and gradually learn how to cook, choose firewood, and keep the fire burning steadily. I do not really teach them directly." (Fieldwork, August 2024). These observations suggest that culinary knowledge within the community is not transmitted primarily through formal instruction or explicit teaching, but rather accumulated through participation, observation, and repeated daily practice. In this sense, the hearth functions not only as the material centre of domestic life but also as a distinctive cultural "school", where culinary knowledge and environmental adaptation practices are preserved, reproduced, and naturally transmitted across generations.

Third, the culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang is also expressed through dining spaces and their social meanings.

In the lives of these communities, eating is a social practice with ritualistic and relational significance rather than a purely biological activity. Meals associated with festivals, agricultural rituals, or life-cycle ceremonies serve to reaffirm the bonds between individuals, families, and the broader community.

Within the traditional societies of ethnic minority groups in the mountainous areas of Da Nang, eating spaces have functioned not merely to satisfy everyday subsistence needs but also as important socio-cultural environments through which knowledge, norms, and community values are naturally transmitted. Ethnographic findings indicate that food-related practices are commonly organised according to strong communal principles, particularly during village festivals and collective activities held in the Guol house/ Rong house. In these settings, food is typically arranged collectively on mats, and participants gather to eat within an atmosphere characterised by solidarity and mutual sharing. Unlike urban contexts, where individual portions are often clearly separated, what matters most in these communities is the presence and participation of each member within the collective. As one participant explained: "Eating together is what makes the occasion joyful and meaningful. Everyone contributes something and then shares the meal; that is what represents our village's food culture." (Fieldwork, August 2024). This communal orientation extends beyond festivals and collective rituals into everyday family life. Observations in several households showed that family members commonly share meals from the same tray or serving arrangement, while children are guided on how to invite elders to eat, sit in appropriate positions, and behave according to family hierarchy. One interviewee noted: "Children must invite elders before eating, learn how to eat together with others, and should not eat separately." (Fieldwork, August 2024). These seemingly ordinary practices suggest that behavioural norms, hierarchical relations, and collective consciousness are transmitted and internalised naturally through everyday domestic and communal interactions. In this way, food practices become an important medium through which social values are reproduced across generations. Seating arrangements, the sequence of inviting others to eat, and the selection and sharing of dishes all express respect for age hierarchy, kinship relations, and the social roles of community members. In this context, culinary knowledge extends beyond techniques of food preparation to encompass systems of social norms and ethical values. Through everyday eating practices, values such as communal solidarity, respect for elders, reciprocity, and social cohesion are maintained and continually reaffirmed, thereby contributing to the preservation and expression of ethnic cultural identity. Taken together, these findings suggest that eating among these communities should not be understood merely as a biological activity of nourishment, but rather as a socially embedded practice with deep cultural significance, playing an important role in sustaining communal relationships and preserving ethnic identity.

4. Transformations of cuisine in the expanded urban space

The integration of the mountainous areas of Da Nang into an expanded urban space has become an inevitable trend, creating momentum for transformations in cultural practices, including the cuisine of ethnic minority communities. Previously, the cuisine of these communities existed mainly within village settings, closely associated with swidden agriculture, community rituals, and traditional social relations. Today, however, dishes, cooking techniques, and the "cultural narratives embedded in food" of these communities are gradually moving beyond their original living spaces to appear in cultural festivals, community-based tourism activities, local promotional events, and urban media platforms.



Fig. 1. A traditional meal in a community-based tourism setting. Source: Tran Tan Vinh.

This transformation reflects a process that anthropologists often describe as "cultural recontextualisation", whereby traditional cultural practices are relocated into new social settings and, in the process, acquire additional functions and meanings. Currently, within ecotourism programs, community-based tourism initiatives, and ethnic village tourism in areas such as Dong Giang, Tay Giang, Tra My, and Hoa Bac in the mountainous region of Da Nang, many traditional dishes of the Co-tu, Xo-dang peoples, including bamboo-tube rice, grilled meat cooked in bamboo tubes, stream fish, wild vegetables, and traditional fermented rice wine - have become distinctive cultural markers of ethnic identity and popular attractions for visitors. These foods, once primarily consumed as part of everyday subsistence practices, have increasingly been transformed into culinary products with unique cultural and tourism value. This transformation can be clearly observed in the way traditional dishes are selected, prepared, and arranged into complete meals for visitors. The meal setting therefore serves not

only to meet visitors' culinary needs but also as a means of showcasing and communicating elements of local culture through the ingredients used, preparation techniques, and presentation of the dishes (Fig. 1). As a result, indigenous cuisines have gained broader social recognition, contributed to the visibility of ethnic cultural identities, and created additional sources of income and opportunities for participation in service-based economies among local communities.

From another perspective, however, the incorporation of traditional cuisine into urban spaces and tourism markets has also brought significant changes to both the form and content of ethnic culinary practices. Such transformations include adjustments to flavour profiles to accommodate broader consumer preferences, increased attention to visual presentation, greater standardisation for larger numbers of guests, and shortened preparation processes to meet the demands of faster consumption patterns. For example, in the preparation of bamboo-tube rice, community members traditionally filled bamboo tubes to approximately two-thirds of their length with rice, added water just above the rice level, sealed the openings with banana or "dong" leaves, and then roasted the tubes around charcoal or wood fires for approximately 45 minutes to over an hour. In some places today, however, rice is partially cooked beforehand and only later placed into bamboo tubes for roasting, reducing preparation time to approximately 15-20 minutes (Fieldwork, 7/2024). Although this modified method differs from traditional techniques, the taste and overall eating experience remain relatively similar, continuing to provide an appealing experience for visitors, albeit often regarded as less authentic than the traditional version. This example illustrates that traditional ethnic cuisines no longer exist as static or immutable cultural forms. Rather, they continue to change and adapt in response to new socio-economic conditions, demonstrating the capacity of cultural practices to evolve while maintaining elements of continuity [21, 28, 44]. Indeed, such ongoing processes of adaptation and recreation may be understood as essential conditions enabling ethnic culinary heritage to persist and remain meaningful within new social contexts.

For this reason, as discussed in the theoretical framework, a growing body of international scholarship no longer interprets transformations in traditional ethnic cuisine as evidence of cultural decline or rupture. Instead, such changes are increasingly viewed as expressions of cultural resilience, adaptation, and the dynamic reproduction of living heritage. In practice, this process reflects an ongoing negotiation of identity, in which communities simultaneously adapt to the demands of the market and expanding urban spaces while striving to preserve elements regarded as essential to tradition. In other words, heritage can only truly survive when it is continuously reinterpreted and performed within new social contexts [13, 15]. However, from another perspective, excessive tourism-oriented commercialisation may also give rise to important concerns: when cuisine becomes increasingly detached from ritual systems, community relations, and the symbolic meanings embedded in dishes and traditional preparation processes, and is instead transformed into a consumer product primarily serving tourism or market demands, the risk of cultural simplification and the erosion of ethnic groups' socio-cultural depth becomes difficult to avoid. Nevertheless, it is emphasised that the core issue does not lie in whether traditional culinary practices should remain unchanged or be transformed, but rather in the ability to identify the boundary between creative adaptation and reductive commercialisation. Accordingly, the discussion of culinary transformation within Da Nang's expanding urban space reflects a dual process in theoretical inquiry: on the one hand, it creates opportunities to enhance cultural values and community livelihoods; on the other, it raises the need to recognise and safeguard the foundational layers of cultural meaning so that ethnic minority cuisine may continue to exist as a living social practice, rather than merely as commodified products designed for display and consumption.

5. Values of ethnic minority cuisine in the mountainous areas within Da Nang's urban space and directions for preservation and promotion

The presence of ethnic minority cuisine from the mountainous areas within the expanded urban space, as discussed above, not only reflects processes of cultural transformation but also highlights the multidimensional values that this form of living heritage contributes to the sustainable development of Da Nang.

First, from a cultural perspective, the cuisine of mountainous ethnic groups contributes to deepening the city's identity. If Da Nang has long been recognised as a coastal city associated with tourism and modern services, the presence of ethnic minority culinary practices from mountainous areas adds a new cultural layer to this identity. This layer is rooted in the forested landscapes of the Truong Son range, encompassing ecological knowledge, collective memory, and ways of life closely connected to nature among ethnic minority communities. In the context of globalisation and the growing homogenisation of urban spaces, such indigenous culinary values become important sources of cultural distinctiveness, contributing to the formation of a more multilayered and inclusive urban identity for Da Nang.

Second, from an economic and tourism perspective, ethnic cuisine holds significant potential as a resource for the development of cultural tourism, community-based tourism, and eco-tourism in the western and northwestern mountainous areas of the city. Traditional dishes, when introduced through community tourism models or cultural

events, not only offer distinctive experiences for visitors but also create new livelihood opportunities for local communities. Notably, the tourism value of culinary products lies not only in their taste but is also constituted by knowledge of ingredients, food preparation techniques, methods of wrapping, and ways of presenting the products. The use of natural leaves for wrapping food, combined with traditional woven implements for preserving and presenting the products, demonstrates the interweaving of culinary knowledge, environmental knowledge, and the community's craft skills (Fig. 2). When incorporated into tourism settings, these elements can become an integral part of the cultural experience, while also enhancing the value of the products and creating additional livelihood opportunities for local communities. However, the economic value of ethnic minority cuisine can only be sustainably realised when local communities maintain a central role as key actors in preserving, producing, presenting, and benefiting from their own culinary heritage. If communities participate merely as labour providers, while elements of ethnic cuisine are exploited only as illustrative images or supplementary products for tourism activities, culinary heritage risks becoming commodified and detached from its original cultural context. Such a process not only diminishes the social significance and indigenous knowledge embedded in ethnic cuisine in particular, and ethnic culture more broadly, but also risks transforming vibrant living cultural practices into performative products designed solely to satisfy tourism consumption demands.



Fig. 2. Traditional food products wrapped in leaves and placed in woven baskets. Source: Tran Tan Vinh.

Third, ethnic cuisine carries profound educational and social values. Through food practices, knowledge about the environment, community history, and the relationship between humans and nature is conveyed in a direct and accessible way to urban residents. Engaging with ethnic cultures through cuisine contributes to raising awareness of cultural diversity, fostering respect for differences, and strengthening connections between urban areas and mountainous regions within a shared socio-cultural framework.

However, in practice, the integration of ethnic minority cuisine from the mountainous areas of Da Nang into urban spaces also presents several notable challenges. Excessive commercialisation may lead to the reduction of traditional dishes into purely consumable products, detached from their original cultural and ritual contexts. Simultaneously, asymmetries of power in tourism promotion and heritage commodification may erode the agency of ethnic communities in interpreting and narrating their own culinary traditions. In many instances, tourism enterprises, media institutions, and intermediary actors exercise disproportionate influence over the construction of cultural representations, the selection of promotional narratives, and the modes through which cultural value is transformed into economic capital. This may result in culinary cultural elements being simplified, detached from their socio-historical contexts, or even selectively reinterpreted to satisfy tourism demands and commercial interests. Furthermore, the economic gains derived from the exploitation of culinary heritage are often unevenly distributed among stakeholders. Whereas businesses and tourism operators capture a significant share of commercial benefits, local communities, as the original bearers, creators, and transmitters of heritage, frequently receive only limited returns or participate primarily as providers of labour. Such imbalances not only reinforce community dependence on external actors but also risk undermining cultural autonomy and weakening the internal motivation necessary for sustaining heritage preservation. These issues indicate that the preservation, utilisation, and promotion of ethnic culinary heritage should be approached with caution, through interdisciplinary perspectives, and with a long-term orientation.

In our view, based on the identification of the values and challenges in the "story" of ethnic minority cuisine in the mountainous areas of Da Nang discussed above, several orientations for appropriate preservation and promotion strategies in the current context of urbanisation can be proposed: (1) culinary preservation should be understood as a process of adaptive preservation, which acknowledges inevitable changes while maintaining the fundamental values of knowledge, techniques, and the social meanings embedded in ethnic culinary practices; (2) a community-centred approach should serve as a guiding principle throughout the process of preservation and promotion. Ethnic minority communities should not be regarded merely as beneficiaries, but as active agents who create, transmit, and determine how their culinary heritage is to be sustained and developed; (3) from a governance perspective, ethnic cuisine should be recognised as a form of soft cultural resource, strategically integrated into planning of cultural-tourism development and the urban spaces of Da Nang, in order to ensure a balance between economic development, cultural preservation, and social sustainability.

6. Discussion

The findings indicate that the culinary knowledge of ethnic minority communities in the mountainous areas of Da Nang does not exist as a fixed system of knowledge; rather, it is continuously transformed and reconfigured as it moves into the expanding urban space. This finding is consistent with recent perspectives in anthropology and heritage studies, which conceptualise heritage not as a set of values preserved in an unchanged form, but as living heritage that is continuously recreated by communities through everyday practices and adaptation to changing social contexts. In the case examined in this study, the transformation of culinary practices does not signify the erosion of tradition. Instead, it demonstrates the initiative of local communities in selectively adapting and reinterpreting their cultural practices in response to new economic, social, and spatial conditions.

A notable contribution of this study is its emphasis on the role of the expanding urban space as a transitional cultural space. While many previous studies have primarily interpreted cultural transformation as a consequence of globalisation or commercialisation, the findings presented here suggest that urban expansion itself also functions as a significant driver of the reconfiguration of indigenous knowledge. This perspective extends current discussions of cultural transformation by foregrounding the spatial dimension of change, demonstrating that the dynamics of heritage unfold not only over time but also through the movement of communities and their cultural practices across different social spaces.

Furthermore, this study provides additional empirical evidence supporting the perspective that culinary knowledge constitutes an integral component of indigenous ecological knowledge. Knowledge concerning the selection of ingredients, food preparation techniques, meal organisation, and intergenerational modes of transmission demonstrates that cuisine serves not only to meet biological needs but also as a repository of communal memory, environmental knowledge, adaptive experience, and the social norms of ethnic communities. As this system of knowledge is incorporated into the urban context, it continues to be reconfigured while retaining its core cultural values, thereby demonstrating the adaptive capacity of ethnic cultures in responding to the changing conditions of contemporary development. From a theoretical perspective, the findings suggest that culinary practices in the context of urban expansion should be understood beyond the conventional dichotomies of “tradition” versus “modernity” and “preservation” versus “transformation”. Rather, the transformation of culinary practices should be viewed as an ongoing process of negotiation between local communities and the new economic, social, and cultural conditions they encounter. Through this process of negotiation, culinary knowledge is continually recreated while continuing to function as a vital cultural resource that enriches urban identity and reinforces cultural diversity within the broader process of urban development in Vietnam.

7. Conclusions

In summary, the culinary practices of ethnic minority communities in the mountainous areas of Da Nang reflect not only everyday subsistence needs but also embody a system of indigenous knowledge formed through long-term interactions between humans, the natural environment, and social life. The ways in which ingredients are selected, foods are prepared, eating spaces are organised, and meals are shared demonstrate that culinary traditions function as a form of living heritage, sustained through community practice and intergenerational transmission. In the context of Da Nang’s expanding urban landscape and the ongoing reconfiguration of cultural spaces, the culinary traditions of mountainous communities no longer exist solely as conventional practices but are increasingly evolving through continuous processes of adaptation and renewal, becoming sites of interaction between indigenous knowledge and contemporary urban life.

From this perspective, the study suggests that culinary heritage should be understood as a dynamic system of values capable of transformation within new socio-economic and spatial conditions, thereby contributing to a deeper understanding of the role of heritage within processes of urbanisation. The integration of culinary heritage into urban spaces not only enriches cultural identity and enhances the diversity and depth of urban life, but also creates opportunities for sustainable tourism development when organised on the basis of respect for cultural context and community agency. However, this process also raises challenges related to the risks of value reduction, commercialisation, and the detachment of culinary practices from their original cultural environments. Accordingly, fully recognising the value of the culinary heritage of ethnic minority communities in mountainous areas, while developing adaptive strategies for its preservation and promotion, constitutes an essential requirement in the context of contemporary urban development. This calls for a combination of interdisciplinary approaches, meaningful participation of local communities, and appropriate policy mechanisms to ensure that indigenous knowledge in general, and culinary heritage in particular, are not only safeguarded but also continuously revitalised and promoted as important cultural resources in the sustainable development of contemporary Da Nang.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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Outlining the history of emotions in Vietnam: The case of Cao Ba Quat

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Received 26 April 2025; revised 29 April 2026; accepted 12 May 2026

Abstract:

The emotional history of the Vietnamese people remains largely unexplored. To address this gap, this article analyses the literary works of Cao Ba Quat, a prominent figure in Vietnam's sentimentalist movement during the eighteenth and nineteenth centuries. The study examines his emphasis on emotion, his methods of emotional expression, and the tension between emotional liberation and emotional restraint in his writing. It also highlights contradictions between his theoretical perspectives and practical applications, interpreting these tensions in relation to the constraints of centralised power on Confucian scholars in medieval Vietnam. Through the case of Cao Ba Quat, the article shows how literature could become a medium for articulating personal emotions, including grief, frustration, familial affection, and desire, while still remaining shaped by political, cultural, and literary constraints. By examining this case, the article delineates the limitations of the sentimentalist movement, which ostensibly liberated Vietnamese literature from the emotional constraints that dominated from the tenth to the seventeenth century, but did not fully overcome inherited norms of indirect and restrained expression.

Keywords: **emotional control, emotional liberation, history of emotions, literary norms, political-cultural institutions.**

Classification numbers: **8.1, 9.2, 10**

1. Introduction

J. Marks, in his article "Emotion East and West: Introduction to a Comparative Philosophy", observed that although emotions have become a central focus of research in the West, there is "the almost total absence of references to Asian thought" [1]. He highlighted the necessity for comparative studies between Eastern and Western perspectives on emotions. Subsequently, in collaboration with R.T. Ames, Marks published *Emotions in Asian Thought: A Dialogue in Comparative Philosophy*, which presents twelve essays examining Eastern conceptions of emotions in relation to Western philosophical traditions [2]. Beyond this volume, several works have addressed emotions in Eastern contexts, including B. Bruya's articles "Emotion, Desire, and Numismatic Experience in René Descartes, Zhu Xi, and Wang Yangming" and "Qing 情 and Emotion in Early Chinese Thought", U. Middendorf's "The Making of Emotive Language: Expressions of Anxiety in the Classic of Poetry", and R. Firth-Godbehere's book *A Human History of Emotion: How the Way We Feel Built the World We Know* [3-6]. Despite this growing body of scholarship, Vietnam remains largely absent from studies by foreign scholars.

Within Vietnam, there has not yet been a comprehensive, in-depth study of Vietnamese conceptions of emotion or of their expression across historical periods. Existing discussions of the history of emotions in Vietnam are typically general and brief, as they are often addressed incidentally within broader analyses [7-10]. Tran Nho Thin provides the most extensive treatment of this topic, dedicating a 77-page chapter in his work *Cultural Approaches in Research and Teaching Literature* to "track the changes in the concept of emotions, the influence of this concept on themes, subjects, literary symbols, and other factors derived from this concept" in Vietnam from the Middle Ages (tenth to nineteenth centuries) through 1975 [11]. Nevertheless, Tran Nho Thin's account does not fully capture the emotional landscape of historical Vietnamese society, as numerous significant authors, works, and issues remain unaddressed.

This article seeks to fill a gap in current scholarship by analysing the literary works of Cao Ba Quat (1809-1855), focusing on his conceptualisation and articulation of emotions, thereby clarifying the specific ways emotions are reflected in Vietnamese sentimentalist literature of the eighteenth and nineteenth centuries. Cao Ba Quat is widely recognised for his defiance of examination regulations, notably for secretly amending the exam papers of certain candidates to facilitate their success in the Thua Thien local examination in 1841. He is also renowned for his opposition to the Nguyen dynasty, the ruling government under whose

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examination system he had to endure significant challenges and hardships[1], ultimately participating in the Le Duy Cu's uprising in My Luong (present-day Hanoi, formerly Son Tay province). With these two bold actions, Cao Ba Quat was considered a man with a "heroic spirit" who "bravely expressed his feelings, both angry and heroic, both tragic and noble" in any situation [12]. Cao Ba Quat consistently emphasised the elevation of emotions and natural feelings in both his literary works and criticism. This emphasis contributes to his recognition as a prominent figure within the sentimentalist movement in Vietnam during the eighteenth and nineteenth centuries [10]. Nevertheless, this focus does not imply that Cao Ba Quat freely expressed his personal emotions in his writings. The constraints on emotional expression, even for an individual regarded as courageous and resilient within the Vietnamese medieval autocratic regime, prompt consideration of whether Vietnamese Confucian scholars of the eighteenth and nineteenth centuries were truly able to express their emotions.

This article analyses nearly 1,400 extant literary works by Cao Ba Quat[2] using frameworks from cultural studies and discourse theory. Drawing on the assertion that "[artistic] creation is governed by culture" [11, 13], it reconstructs the cultural environment in which these works were produced. It explores the influence of ideological trends, aesthetic and humanistic concepts, and the political, economic, and social contexts of Cao Ba Quat's era on his conceptualisation and articulation of emotions in literary language. Through discourse theory, the article examines emotions in Cao Ba Quat's literature as products of constructivist processes, emphasising the identity of the emotional speaker or representer, the situational context of emotions, and the power relations that inform their expression. Thus, this article elucidates two apparently contradictory aspects of Cao Ba Quat's personality and contends that these contradictions are linked to the restrictive nature of the centralised power structure in medieval Vietnam. By examining Cao Ba Quat's case, the article further explores the limitations of the sentimentalist movement, which is regarded as a response to the prioritisation of reason and sobriety among traditional Confucian scholars from the tenth to the seventeenth century [14].

[1]Cao Ba Quat gained recognition for his intelligence and literary talent from an early age. However, between his first provincial examination in Bac Ninh in 1821 and the examination in 1841, he either failed or did not attain a high rank. Subsequently, following the recommendation of a mandarin from Bac Ninh province, he was summoned to the capital, Hue, and appointed to a minor position in the Ministry of Rites.

[2]Following Cao Ba Quat's death in battle and the suppression of Le Duy Cu's uprising, the Nguyen Dynasty exterminated the entire Cao family. Cao Ba Quat's literary works were confiscated, destroyed, and banned from storage and circulation. According to Vu Khieu [13], only 1,353 poems and 21 prose works by Cao Ba Quat remain.

2. Cao Ba Quat's exaltation of emotions

Emotional restraint represents a significant trend in Vietnamese literature from the tenth to the seventeenth centuries. Scholar Tran Nho Thin observed that Vietnamese writers, including Confucian ones, during this period typically avoided excessive or extreme emotional expression, maintaining composure and self-control even in adverse circumstances [11]. These writers also seldom addressed certain emotional states commonly experienced in life, such as romantic love [11]. This phenomenon can be attributed to the moralisation of emotions in Confucianism, a doctrine that exerted a profound influence on Vietnamese medieval literature, especially between the tenth and seventeenth centuries [15]. Y.P. Wang (2008) [16] observes that emotions play a central role in the ethical teachings of Confucius and Mencius. According to these philosophers, emotions not only motivate human behaviour but also serve as indicators of moral character within specific contexts [16]. Confucianism does not assign equal value to all emotions; rather, it maintains that "only with the emotional involvement in and commitment to the good can the good life be both possible and ethical" [16]. Consequently, Confucius and other Confucian thinkers advocated for the expression of emotions solely for morally justifiable reasons, as opposed to spontaneous or instinctive displays. The Confucian approach to moralising emotions is reflected in statements such as: "君子憂道, 不憂貧 The gentlemen only care about the Way, not about poverty" (論語 *The Analects*) [17]. Additionally, Confucian doctrine emphasises that emotional expression should be controlled and restrained, avoiding extremes and remaining appropriate to the context, the individuals involved, and established etiquette. This principle is articulated in the statement: "喜怒哀樂之未發謂之中, 發而皆中節謂之和; 中也者, 天下之大本也; 和也者, 天下之達道也; 致中和, 天地位焉, 萬物育焉 If joy, anger, sadness, and happiness are not expressed outwardly, it is called neutrality; if they are expressed in the right degree, it is called harmony. Neutrality is the great root of the world; harmony is the complete way of the world. When reaching neutrality and harmony, heaven and earth are in order, and everything grows" (中庸 *The Doctrine of the Mean*) [18]. This statement demonstrates that Confucian thinkers recognised emotions as an inherent aspect of human nature and did not advocate for their eradication. However, outward expressions of emotion must conform to the principle of "in the right degree", meaning they should be appropriate, moderate, and fitting; otherwise, they may disrupt social order. Thus, emotion is not merely a personal matter but becomes a behavioral standard essential for maintaining both social order and cosmic stability. Confucius's praise for the poem "關雎 Guanju" in 詩經 *The Book of Songs* exemplifies this standard within aesthetic creation: "關雎, 樂而不淫, 哀而不傷 'Guanju' is happy but not too happy, sad but not tragic" (*The Analects*) [17]. Although "Guanshu" addresses romantic

affection, an instinctual emotion prone to excess, Confucius esteemed it highly because it establishes boundaries for artistic expression. The poem regulates joy, preventing it from descending into indulgence and licentiousness, and restrains grief, preventing sorrow from becoming morbid sentimentality that could harm an individual's physical and mental well-being. In other words, by expressing emotion with restraint, "Guanshu" achieves the Confucian aesthetic ideal: art serves not as a means for unrestrained emotional release, but as a tool to guide individuals toward balance and harmony. Obviously, from philosophical discourse to literary theory, Confucianism consistently maintains that moderation of emotion reflects one's self-cultivation and morality. In accordance with these principles, devout followers of Confucianism, including Vietnamese Confucian scholars from the tenth to the seventeenth centuries, consistently regulated and controlled emotional expression in their literary works. The emotions depicted are frequently the outcome of deliberate attempts to reinforce moral standards such as "loyalty", "benevolence", "righteousness", and "trustworthiness", rather than to convey the complex emotional experiences of ordinary individuals.

During the eighteenth and nineteenth centuries, a significant literary trend emerged that prioritised emotions/feelings. Literature was no longer evaluated solely through a moral lens but was increasingly appreciated for its focus on feelings and emotions. Works such as *Lament of the Soldier's Wife* by Dang Tran Con, *Records on Prolonged Grief* by Nguyen Ki Trai, and *Records on a Heart-breaking Pain* by Pham Nguyen Du were commended by contemporary intellectuals for their authentic and diverse portrayals of emotional states. Prominent literary characters, including Vuong Thuy Kieu in Nguyen Du's *The Tale of Kieu*, were celebrated for their complex spiritual lives. The concept of "情 qing" (emotions/feelings) was regarded as the foundation and impetus for creativity, as well as the source of value in poetry and literature more broadly, according to numerous Confucian scholars such as Le Huu Kieu, Dang Tran Con, Le Quy Don, Ngo Thi Si, Pham Nguyen Du, Phan Huy Ich, Nguyen An, Bui Duong Lich, Nguyen Du, Nguyen Hanh, Ho Xuan Huong, and Vu Duy Thanh.

Among them, Cao Ba Quat stands out as the leading figure of the sentimentalist movement in Vietnamese literature during this period. He consistently underscored the central role of emotions. In his preface to 倉山詩集 (*Thuong Son's Poetry Collection*) by Mien Tham (1819-1870), Cao Ba Quat expressed his disagreement with the tendency of many contemporary writers to worship Tang poetry and mocked those who indulged in imitating stereotyped and stylised expressions, because according to him, "to write poetry, one must be rooted in emotions" [19]. In other words, he believed that the essence of poetry lies in emotions, in the sincerity of the feelings expressed. In his poems, he also affirmed that having feelings/emotions is ordinary: "情詎能忘況客心 How can one forget feelings, especially for those far from home" (*The Boat Returns, Passing the Northern Island, I Have Been Sick for Several Days, at Midnight I Go up to the Mast, Looking at the Surrounding Scenery, Feeling Sad and Homesick, I Write a Poem to Tran Ngo Hien - The Second Poem*); "忘情能有幾 How many people can forget feelings" (*Having Thoughts*) [13]. Here, Cao Ba Quat did not interpret emotions through an ascetic, restrictive perspective of orthodox Confucianism. Instead, he asserted that expressing emotion is a legitimate inner necessity. Neglecting one's emotions was considered inhuman and nearly impossible for an authentic individual, especially in situations of solitude, displacement, or hardship. The most significant point in Cao Ba Quat's philosophy is his elevation of emotion as the defining criterion that separates human beings from the inanimate world. His statement "人生非草木/哀樂係知識 Humans are not plants/They have sadness and joy because they have consciousness" (*Writing a Poem When Receiving a Letter from Family*) [13] articulates an intrinsic relationship between emotion and intellect. According to him, humans differ from plants and trees not only in their perceptual abilities, but also because this perceptual capacity gives rise to emotional experiences such as sorrow and joy. Experiencing sorrow, joy, and existential anxiety, therefore, represents the highest form of awareness and humanhood. Thus, Cao Ba Quat demanded genuine emotions in art and exalted emotion as an indicator affirming the existential status of human beings, who were capable of resonance, pain, and profound love in life.

Not only did Cao Ba Quat contribute theoretically to the formation and development of the sentimentalist movement, but he also concretised its principles by showing the diversity of emotions in his literary works. It is clear that Cao Ba Quat did not conceal his distinct personality to meet established emotional standards. He openly expressed his bitterness and frustration at the indifference he faced during difficult times (*On October 17, After Being Tortured by the Ministry of Rites, I Force Myself to Write Four Poems*). He revealed the feeling of helplessness of a "decrepit but not the dead person/Trying to carry the worn-out skeleton still having to rely on others" (*Illness*), "a weak body still having to live", and "a guilty person abandoned" (*January 21, I am Taken to Thua Thien Prison*) [13]. He affirmed his determination to be a "stubborn immortal" (*Inviting Guests on September 9*), "a hat standing tall in the mortal world [...] not going into a low roof, bowing down or up must follow the will of others" (*The Song in Dong Vu*), and "stepping towards fame without bowing my head" (*Poems About the Shackle - The Third Poem*) [13]. He expressed his torment at making his old parents worry about him constantly (*September 7, I am Imprisoned in Tran Phu Prison Because of the Exam Incident*), and at seeing his old mother both happy and sad as she came to welcome him after many months apart (*Coming Home*). Remembering his

deceased sister, Cao Ba Quat could not hide his pain because he had not fulfilled his duty as a filial son and had entrusted the care of his two parents to his hard-working sister (*Crying for a Deceased Sister*). In addition, poverty made him even more tormented. Deeply imprinted in the mind of the man far from home were the images of his young child clinging to his wife's upper garment, crying from hunger (*Having Thoughts*), of his ill-fated daughter wearing ragged clothes and returning in his dream with a gloomy face (*Dreaming of a Deceased Daughter*), and of his poor wife, who had to work hard every day (*Receiving a Letter from My Wife with Warm Clothes, a Pen and a Few Other Things*; *Self-comfort*). He blamed himself for letting his wife and children drift into a foreign land (*End of the Year*), for causing his wife to work hard and suffer (*Blaming Myself*), and for allowing his daughter and son to die early in poverty (*Dreaming of a Deceased Daughter*; *Losing a Son*). Cao Ba Quat was bitter and regretful because he was an official but could not give his family a decent meal: "親戚日已疏/何嘗嘗速肥羜 Relatives are becoming fewer each day/When will I be able to slaughter a fat goat to invite them?" (*I Cross the Sandbank and Reach Dong Du Village, It is Dark, So I Stay There*) [13]. Medieval Vietnamese Confucian literature frequently addressed concerns regarding duties and responsibilities toward relatives. Confucian scholars prior to Cao Ba Quat, while attentive to filial obligations, often derived spiritual fulfilment from meeting the expectations of their parents and embodying the ideal of manhood. For these scholars, poverty was not a source of distress, as they believed that contentment could be found in living according to the Way (安貧樂道). Consequently, even when expressing regret for perceived shortcomings as sons, husbands, or fathers, Vietnamese Confucian writings on familial themes before the eighteenth century adhered to the emotional standard advocated by Confucius: "being happy but not too happy, sad but not tragic" (樂而不淫, 哀而不傷). In contrast, Cao Ba Quat's classical Chinese poetry departed from this tradition of emotional restraint. Rather than suppressing instinctive feelings to conform to the Confucian ideal of the gentleman, Cao Ba Quat openly conveyed his genuine emotions. His works are characterised by an unrestrained expression of sentiment, distinguishing them from the more controlled emotional tone of earlier literature. These emotions were frequently expressed through tears. Among male writers of the period, he most extensively examined the theme of tears in Vietnamese Confucian literature, producing 34 works on the subject. This number surpasses those of Nguyen Du (26 works), Pham Nguyen Du (16 works), Do Lenh Thien (13 works), Nguyen Hanh (9 works), Pham Thai (8 works), Ngo Thi Si (8 works), and Ngo Thi Nham (7 works). He shed tears when remembering his loved ones: "一緘燈下萬行啼 Before the lamp, opening the letter, tears stream down" (*Receiving a Letter from My Wife with Warm Clothes, Pen and a Few Other Things*); "驟見淚如催 Briefly seeing my child, tears stream down" (*Dreaming of a Deceased Daughter*); "腸斷南風哭姊悲 Before the south wind, heartbroken, sad to cry for my deceased sister" (*Crying for a Deceased Sister*); "獨夜裁書淚 Alone in the night, I write a tearful letter" (*In the Evening, I Know the Address of a Brother's Lodging, and at Night, I Write a Letter to Send to Him*) [13]. He compared the sadness he felt as his relatives passed away one after another to the endless heaven and earth (*Writing a Poem When Receiving a Letter from Family*). Potent expressions such as "heartbroken," "tears stream down," and a sorrow described as endless as heaven and earth serve to illustrate that his personal grief had reached its utmost intensity, surpassing the limits of self-control. Notably, his act of "going crazy and shouting to everyone" (*Losing a Son*) [13] following the loss of his son represents the apex of this emotional outpouring. At this point, the archetype of the composed and self-possessed Confucian scholar collapsed, giving way to an individual experiencing profound anguish in the face of tragedy. This state of "going crazy" functions both as evidence of deep affection and as an indication of helplessness in confronting a harsh fate. By refusing to conceal or embellish his vulnerability, Cao Ba Quat revealed himself in a candid and unvarnished manner. The honesty of the emotions expressed in literature revealed the hidden corners of a determined and courageous man like Cao Ba Quat.

In particular, sexual desire - an emotion that was once considered taboo and rarely mentioned in Vietnamese Confucian literature from the tenth to the seventeenth centuries - also appears in Cao Ba Quat's poetry. Cao Ba Quat, like Dang Tran Con and Nguyen Gia Thieu in their celebrated works 征婦吟曲 (*Laments of a Soldier's Wife*) and 宮怨吟曲 (*Laments of an Odalisque*), employed ventriloquism by adopting a female narrative voice to express longing for physical intimacy with a spouse, as exemplified in poems such as *From the Day You Left* and *The Soldier's Wife*. He further conveyed this desire through symbols associated with married life, including the "衾 blanket," "枕 pillow," "閨 room," and "床 bed." For instance, he writes, "此夜殘魂繞繡閨 Tonight, [my] soul wanders around the embroidery room" (*Receiving a Letter from My Wife with Warm Clothes, Pen, and a Few Other Things*), "衾枕臥常單 Blanket and pillows often lonely" (*Alone in the Night*), and "天邊征客閨中婦 The man in the horizon, the woman in the room" (*Raining All Night, I Have Feelings and Write a Poem*) [13]. His yearning for reunion is also directly articulated upon receiving a warm coat from his wife (*Receiving a Letter from My Wife with Warm Clothes, Pen, and a Few Other Things*) and when observing a Western couple displaying affection on a boat (*Poem about a Western Woman*). The expression of romantic affection, including instinctual needs and the desire for physical intimacy, revealed Cao Ba Quat's recognition of the fundamental aspects of human nature. By openly

addressing his anxieties regarding the "blanket", "pillow", and "bed", as well as his longing for spousal reunion, Cao Ba Quat challenged the prevailing taboos of a society shaped by Confucian asceticism, where marital affection was often subordinated to loyalty to the sovereign and filial piety or filtered through strict moral codes. Rather than perceiving romantic sentiment as degradation or sin, he valued it as an essential and legitimate aspect of spiritual life. Furthermore, Cao Ba Quat demonstrated openness by observing the happiness of a Western couple with admiration and empathy, rather than with hostility. In doing so, Cao Ba Quat engages with a fundamental dimension of human experience.

By incorporating tears, a broad range of emotions, and particularly sexual desire in his works, Cao Ba Quat transformed literature from a vehicle for moral instruction and the affirmation of aspirations into a medium for expressing everyday personal emotions. Nevertheless, he did not fully transcend the emotional constraints imposed by his social class during his era, a point that will be further examined in the following section.

3. The limits of expressing emotions in Cao Ba Quat's writings

In a poem dedicated to his close friend Diep Xuan Huyen (alias Di Xuan), Cao Ba Quat articulated a perspective that appears to contradict the emphasis on emotional expression he previously affirmed in literature: "涉世方知儉笑顰 After experiencing life, [I] realise that [I] have to be frugal with laughter and frowning" (*Dedicating to Di Xuan*) [13]. According to Cao Ba Quat, this insight was acquired through life experience. The notion of being "frugal" with laughter and frowning prompts several questions. Despite his reputation for challenging examination regulations and advocating for emotional expression, why did Cao Ba Quat believe that he, and perhaps Di Xuan, should refrain from freely expressing emotions such as laughter and frowning? Furthermore, how might the act of expressing emotions through smiling or frowning influence the individual? What forms of emotional expression were considered acceptable during Cao Ba Quat's era?

The precise date and circumstances of the poem's composition, *Dedicating to Di Xuan*, remain unknown, making it difficult to ascertain the specific experiences that informed the author's insights. Nevertheless, other literary works by Cao Ba Quat offer valuable context. During his imprisonment and torture for correcting examination papers, Cao Ba Quat reflected on the fate of Yang Xiu, who was executed by Cao Cao for discerning his intentions from a single command (*On October 17, After Being Tortured by the Ministry of Rites, I Force Myself to Write Four Poems - The Second Poem*). The precarious position of a subject serving the emperor is further illustrated in verses expressing the bitterness of a talented individual exiled for attempting to protect other gifted persons: "擬向平人話心事/低聲長恐忤天顏 [I] want to confide in everyone/But [I] have to speak softly, afraid that if [I] go against the thought of Heaven, [I] will be hated by Heaven" (*On October 17, After Being Tortured by the Ministry of Rites, I Force Myself to Write Four Poems - The Fourth Poem*) [13]. As in these examples, Cao Ba Quat's statement in *Dedicating to Di Xuan* appears to convey a lesson on the strategies required of mandarins within an autocratic regime, where truth and ultimate authority resided with the sovereign. Although he maintained his innocence, believing his actions to be virtuous (*Poems About the Shackle - The Second Poem*), Cao Ba Quat could only speculate about his release from prison, as his fate was entirely subject to Emperor Thieu Tri: "何當架作雲梯去/一笑乘風穩趁休 [I] wish [I] could use this shackle as a ladder to the clouds/With a laugh, [I] could ride the wind to climb up to freedom" (*Poems About the Shackle - The Third Poem*) [13]. As in other subjects under medieval autocratic governments, Cao Ba Quat was denied absolute freedom, including the freedom to express personal emotions. Frowning, which signified annoyance, doubt, denial, or dissatisfaction, was considered inappropriate in the presence of the monarch. Conversely, laughter was seldom taken seriously and was thus discouraged in formal, disciplined settings such as the royal court[3] [20]. The principle of "being frugal with laughter and frowning" likely represents a lesson Cao Ba Quat derived from his setbacks as a mandarin, particularly after facing severe consequences for violating examination protocols and for failing to navigate the complexities of courtly relationships.

Medieval mandarins could only gain respect, demonstrate their talents, and, at times, preserve their lives by mastering the art of winning others' hearts and minds. In theory, the monarch was expected to embody qualities such as extreme benevolence (至仁), filial piety (至孝), wisdom (至明), sincerity (至誠), and respectfulness (至敬) to justify his responsibilities and rights. However, as scholar Tran Ngoc Vuong observes, "no monarch in reality could fulfil even a part of such ideal requirements (...) Of course, there were countless differences between the theoretical model of the emperor and the real emperor in history" [21]. This discrepancy also characterised the relationship between the monarch and the scholar, mandarin, or subject. Although Xun Zi summarised the principle of governance as "愛民而安, 好士而榮, 兩者無一焉而亡 loving the people will bring peace, loving the scholars will bring glory; if one of these two is lost,

[3]While serving as a mandarin in the state of Lu, Confucius strongly objected to Duke Jing of Qi's use of singers and dwarfs to entertain Duke Ding of Lu and other guests. He described these entertainers as "a group of ruffians who bewitched the vassals and deserved to be killed." As a result, Duke Jing of Qi was compelled to order their execution, despite such performances being customary in the Qi court [20]. This incident established a precedent for the Confucian perspective on laughter and comedy.

the throne will be lost" (cited in [22]), few rulers adhered to this principle in practice. Confucius similarly remarked, "吾未見好德如好色者也 I have never seen anyone who craves virtue as much as he craves beauty" (*The Analects*) [17]. The monarch's supreme power rendered his will the highest law [21], and scholars and subjects remained bound by loyalty to the king, precluding unwise or careless actions. Consequently, Confucian classics frequently emphasise the importance of observing the facial expressions of superiors. For example, "侍于君子有三愆： 言未及之而言谓之躁， 言及之而不言谓之隐， 未见颜色而言谓之瞽 When conversing, a gentleman has three faults: speaking before his turn, that is rash; speaking when his turn comes but not speaking, that is concealment; speaking before seeing the facial expression [of his superior], that is blindness" (*The Analects*) [17]. There are also requirements to adjust one's facial expressions and attitudes to be "gentle" and "modest," as in "君子有九思： 視思明， 聽思聰， 色思溫， 貌思恭… A gentleman has nine things to think about: look carefully, listen carefully, look gently, and act modestly…" (*The Analects*) [17]. One of the four standards of accomplished scholars (達士) was the ability to "察言觀色 examine others' words and observe others' expressions" (*The Analects*) [17]. A closer examination of the above citations reveals that Confucian instructions for scholars communicating with the monarch extend beyond reminders of social etiquette. Instead, they constitute a sophisticated art of survival and remonstrance within autocratic power structures. Notably, three citations from the *Analects* establish a fundamental requirement: the ability to examine words and observe facial expressions. Confucius warns that one of the three errors of gentlemen when attending to a monarch is "speaking before seeing the facial expression [of his superior]", while also identifying "examine others' words and observe others' expressions" as the standard for "accomplished scholars". This emphasis demonstrates that understanding the monarch's psychology is essential. In a context where the emperor's authority is absolute, a remonstrance - however justified - delivered at an inopportune moment, such as when the monarch is angry, complacent, or fatigued, is not only ineffective but may also result in severe consequences for the scholar. Thus, observing the superior's facial expression is not an act of flattery or servility; rather, it enables the subject to determine the optimal moment to influence the ruler's judgment. In addition to observing the counterpart, scholars are required to self-adjust so that their facial expressions and attitudes remain "gentle" and "modest", which helps to neutralise potential power conflicts. The primary purpose of remonstrating is to point out the mistakes or limitations of the monarch. Maintaining a humble and gentle demeanor allows the scholar to minimise the perceived threat to his superior's self-esteem, thereby preventing agitation and facilitating the acceptance of honest counsel. Thus, Confucian prescriptions regarding body language, facial expressions, and attitude provide scholars with the means to reconcile two demanding obligations: fulfilling the duty of loyalty by candidly assisting the king in correcting errors, while prudently safeguarding their own lives amid the uncertainties of absolute authority. Both Confucian teachings and historical context compelled scholars to carefully regulate the expression of personal emotions. The tension between individual freedom and the constraints of centralised authority led scholars to suppress natural emotions and adopt implicit, cautious modes of expression.

This contradiction is evident in the restrained nature of Cao Ba Quat's emotional expression. Although he emphasised the importance of conveying feelings, his methods remained rooted in the implicit and cautious language characteristic of earlier writers. Rather than employing direct language, his resentment toward the king was conveyed indirectly through classical allusions such as "chicken tendon" from the story of Cao Cao and Yang Xiu, the phrases "the exiled person" and "the exiled soldier", or by drawing parallels with Qu Yuan, an intellectual who suffered injustice in ancient China. In a poem commemorating the seventieth birthday of his colleague Nguyen Cong Tru, Cao Ba Quat subtly expressed dissatisfaction with the Nguyen dynasty by posing a seemingly innocent question regarding Nguyen Cong Tru's retirement: "豈應六十九年非 Could it be that you were wrong for sixty-nine years?" (*Respectful Response to Mr. Nguyen's Poem*). Even when addressing the deeply human theme of sexual desire, Cao Ba Quat resorted to adopting a female voice or discreetly alluding to desire through symbols of married life. The limitations in Cao Ba Quat's emotional expression, despite his reputation as one of the most resolute and daring figures in medieval Vietnam, not only reveal the constrained fate of scholars, mandarins, and subjects under an autocratic regime but also highlight the boundaries of the sentimentalist movement in Vietnam from the eighteenth century to the first half of the nineteenth century. Other prominent writers of this movement, such as Ngo Thi Si (1726-1780), Pham Nguyen Du (1740-1786), and Nguyen Du (1766-1820), did not attain full emotional liberation within Vietnamese Confucian literature. In their respective collections addressing grief over their wives' deaths - *Records on the Pain in the Room* and *Records on a Heartbreaking Pain* - Ngo Thi Si and Pham Nguyen Du illustrate that the emotional constraints of their era remained influential. Like Cao Ba Quat, they expressed sexual desires indirectly by employing conventional symbols associated with married life. The predicament of scholars under the autocratic regime, along with their sense of guilt for perceived failures in fulfilling familial and societal obligations, is subtly conveyed through the motif of tears. In contrast, although Nguyen Du was deeply affected by the suffering of the populace and recognised the court's inhumane policies as the root cause,

he refrained from overt indignation or from turning *Notes on What Was Seen on the Way to the North* into a direct critique of governmental abuses. Instead, he followed the traditional approach of Confucian scholars, presenting his poetry to the monarch as a depiction of reality in the hope of inspiring policy reform. According to scholar Tran Ngoc Vuong, medieval Vietnam offered only a few paths that preserved individual space and allowed some freedom and independence, including freedom of emotional expression [21]. These included heroes in troubled times, hermits, Zen masters, talented Confucian scholars, and knights or bandits. Cao Ba Quat's separation from the Nguyen dynasty and participation in the Le Duy Cu's uprising demonstrated his aspiration to become a hero in troubled times. However, before attaining freedom and independence, Cao Ba Quat paid with his own life and that of his entire family. Unable to "raise [my] hand to create a change in fate" (*Poem on the Misery of a Talented Scholar*) [13], he was ultimately unable to achieve complete emotional liberation within medieval Vietnamese Confucian literature.

4. Conclusions

Nearly 1,400 extant literary works by Cao Ba Quat document not only the events of his brief yet eventful life but also offer insight into the thoughts, feelings, and emotions of a scholar, mandarin, or subject under the autocratic regime of medieval Vietnam. These writings demonstrate Cao Ba Quat's recognition of the importance of emotion in literature. In many respects, he transformed literature from a tool for reinforcing moral models into a medium for articulating the inner lives of ordinary individuals. His works display a broad spectrum of emotions, conveyed with notable intensity, which stands in sharp contrast to the emotional restraint typical of Vietnamese Confucian literature from the tenth to the seventeenth centuries. However, natural emotions in his works were not entirely unbounded; a degree of restraint persisted, as the author employed classical allusions, symbolism, ventriloquism, and other indirect modes of expression rather than direct language. This tension reflects the constraints faced by scholars within the autocratic context of medieval Vietnam. Although they encouraged greater emotional expression than earlier Vietnamese Confucian literature, Cao Ba Quat and other writers associated with the sentimentalist movement of the eighteenth and nineteenth centuries remained subject to entrenched political, cultural, and literary norms. These constraints were arguably only relaxed in the early twentieth century, when the New Poetry movement provided a platform for more liberated emotional expression.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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 DOI: 10.31276/VMOSTJOSSH.2025.0049

Syncretism in the worship of royal female deities in the Red River Delta: An interdisciplinary approach from area studies

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Received 11 October 2025; revised 7 February 2026; accepted 13 March 2026

Abstract:

The worship of royal female deities in the Red River Delta is a distinctive phenomenon that exemplifies the interplay and creativity within Vietnamese cultural life. Drawing on an interdisciplinary approach from area studies and combining fieldwork with textual analysis, this paper examines the process of syncretism between the worship of royal female deities and external religious-philosophical systems such as Buddhism, Confucianism, and Daoism. At the same time, it highlights the unique fusion of courtly and popular elements within this belief system. Using evidence from worship spaces, festival rituals, local narratives, and authorised texts (including decrees, deity chronicles, inscriptions, and official titles in historiography), the study shows how dynastic authority is translated into local ritual legitimacy through titles, moralised biography, and the organisation of sacred space. The findings demonstrate that the worship of royal female deities not only honours the special role and status of women in Vietnamese history but also vividly reflects the flexibility, inclusiveness, and creativity of Vietnamese culture in absorbing and transforming external influences. In doing so, the investigation demonstrates the enduring vitality of Vietnamese culture within the broader regional context.

Keywords: **area studies, cultural syncretism, interdisciplinary approach, Red River Delta, royal female deities, worship of female deities.**

Classification numbers: **9.3, 10, 11**

1. Introduction

In Vietnam's Red River Delta, folk beliefs express the spiritual needs of agricultural communities. They also preserve historical memory and affirm national identity. One prominent strand is the worship of royal female deities. This practice links court culture with the village religious life through the veneration of royal women such as Empress Dowager Y Lan, Empress Tran Thi Dung, Queen Ly Chieu Hoang, Princess An Tu, and Princess Tu Hoa, among others. These were historical figures who made significant contributions in politics, diplomacy, and society. After their passing, their merit and prestige were honoured by imperial decrees and further sanctified by the people, transforming them into protective deities for communal spiritual life.

A distinctive feature of the worship of royal female deities is "syncretism". Its formation and development embody the fusion of indigenous agrarian beliefs with external elements from Buddhism, Confucianism, and Daoism. This combination imparts to the worship practice both the spiritual depth characteristic of folk religion and the solemnity associated with the imperial court, resulting in a unique character within the spiritual life of the inhabitants of the Red River Delta. Although Vietnamese folk religion and goddess worship have been widely studied, the syncretic formation of royal female deities and their mediating role between the court and local communities remains underexplored.

From an area studies perspective, this phenomenon requires an interdisciplinary approach. It belongs not only to the realm of religion and belief but also reflects Vietnam's history, culture, society, and politics across different periods. Studying it helps affirm the prominent role of women in the nation's history while also highlighting the flexibility and inclusiveness of Vietnamese culture in adopting and integrating external elements. Syncretism does not erase local identity; rather, it enables the belief to adapt and endure. At the same time, examining the worship of royal female deities underscores the value of interdisciplinary methods in area studies. By investigating worship spaces, rituals, legends, and festivals, and combining fieldwork with textual analysis, one can reconstruct the processes of formation, transformation, and dissemination of this phenomenon. A comparative perspective further situates it within the regional context, revealing similarities with the worship of female

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deities in Southeast Asia, such as Dewi Sri[1] in Indonesia, Mae Phosop[2] in Thailand, and the Nat spirits[3] in Myanmar.

Studying the worship of royal female deities in the context of globalisation not only affirms Vietnamese cultural identity but also highlights the universality of goddess-centred beliefs in agrarian societies. This belief system is both locally rooted in Vietnam's feudal history and transregional, connecting with broader Southeast Asian and global traditions. The interweaving of courtly and popular elements, as well as of indigenous and foreign influences, has endowed this belief with enduring vitality.

This study addresses two questions: (1) How does royal female deity worship in the Red River Delta emerge through syncretism between indigenous agrarian beliefs and Buddhism, Confucianism, and Daoism?; (2) How is the standardisation of royal authority reinterpreted in local worship through decrees, official historiography, and the organisation of sacred space?

2. Literature review

The literature relevant to the syncretism of royal female deity worship in the Red River Delta falls into two groups. The first group theorises that syncretism and hybridity are processes shaped by historical contact, institutional authority, and local agencies. The second group examines goddess-centred traditions in northern Vietnam and the Red River Delta, including studies documenting royal women who later became objects of worship. However, few studies connect these two groups to explain how dynastic authority is translated into local ritual practice through authorised texts, court-centred historiography, and sacred spaces. This article addresses that gap.

2.1. Research on syncretism in popular religion and festivals: global debates and Vietnam

In the first group, key works argue that syncretism is not a neutral mixture of intact traditions. Research by C. Stewart, et al. (1994) [1] shows that "syncretism and anti-syncretism" emerge from struggles over authenticity and authority in religious life, and that any integration of beliefs reflects social contestation as much as cultural blending. In this view, religious synthesis is also a struggle over legitimacy. A.M. Leopold, et al. (2004) [2] similarly argue that syncretism is not a simple mixture of traditions, but a dynamic process shaped by historical contact, social negotiation, and power relations. Taken together, these works support the analysis of royal female deity worship as a negotiated field in which court institutions and local communities advance different claims to legitimacy.

Recent scholarship focuses on the fluid character of contemporary religiosity and the practical nature of hybridity. B. Bognár (2024) [3] shows that modern social and spatial transformation facilitates individualised, "patchwork" religious practice rather than fixed institutional adherence. P. Kitiarsa (2005) [4] argues that the popular spirit medium cults in Thailand operate as hybrid formations sustained by ritual performance and pragmatic borrowing across traditions. The author terms this process "hybridisation" rather than mere syncretism. These studies justify a practice-based approach in which syncretism is observed through ritual repertoires, participation, and the organisation of sacred space, rather than inferred from doctrine. Accordingly, the analysis below traces syncretism through what people at specific sites do and how ritual practice is authorised, organised, and remembered.

Vietnamese scholarship on religion and festivals repeatedly frames syncretism (hỗn dung) as a normal feature of vernacular practice rather than an anomaly. D.D. Nguyen (2004) [5] describes mixing in northern pagodas, including the Four Dharmas Goddesses or the Four Ladies, including the Cloud Goddess, The Rain Goddess, The Lightning Goddess and The Thunder Goddess, and the widespread pattern of "Buddha in the front, Saints in the back rear" (tiền Phật, hậu Thánh), where Buddhist worship coexists with other local deities [6]. At the festival scale, Q.V. Tran's discussion of Huong Pagoda Festival (Hội chùa Hương) shows a Buddhist pilgrimage centred in Huong Tich (Hương Tích) that also incorporates Mountain Spirit Worship (Sơn Thần) at Trinh Temple (Đền Trình) and a Mother goddess (Thần Mẫu) at Cua Vong Temple (đền Cửa Võng), illustrating a layered ritual landscape of Vietnam [7]. This perspective aligns with Vietnamese studies of festival community and participation as the main areas where legitimacy is negotiated.

In the Vietnamese context, studies on folk religion, Buddhism, Daoism, and Confucianism consistently describe a multi-layered religious field in which imported ideologies have been adapted, indigenised, and woven into agrarian cosmology. Particularly relevant is N.T. Nguyen's case study of the Tianhou cult in Ca Mau [8], which demonstrates how ritual incorporation enables cross-cultural communication while preserving symbolic difference. This concept helps explaining how Buddhist, Confucian, and Daoist elements can enter royal female deity worship while remaining recognisable. The theoretical significance of this practice-based approach is supported by K. Pomeranz's study of the Taishan goddess cult (2007) [9], which illustrates how orthopraxy, state authority, and local agency interact in processes of religious standardisation. Together, these works provide an important foundation for analysing how syncretic practice is shaped by negotiation between institutional power and popular devotion. Building on K. Pomeranz's (2007) [9] discussion of

[1]This is an indigenous fertility cult syncretised with Hinduism and Islam, creating a symbol that is at once local and global.

[2]This is a Thai indigenous belief system, linked to the wet-rice cultivation cults of Southeast Asian peoples, which later merged with Theravāda Buddhism.

[3]This belief encompasses 37 deities, combining indigenous spirits, historical figures, and Theravāda Buddhism, thereby forming a multi-layered religious model.

contested standardisation, this article treats royal decrees as interventions rather than automatic instruments of uniformity. Standardisation is not a single top-down act. It is produced through texts, narratives, and sacred space, and its effects depend on local mediation. In the Red River Delta, imperial titles legitimise royal female deities in an official idiom. However, local elites and devotees still negotiate how these figures are remembered and enacted through festivals, temple layout, repair work and everyday devotional practice. The outcome is therefore uneven: royal authority shapes what can be publicly authorised, while communities reshape what is ritually meaningful.

2.2. Research on the worship of the Red River Delta goddesses

Research on Vietnamese goddesses in the Red River Delta is extensive. The most developed strand focuses on Mother Goddess traditions, especially Mother Goddess Worship of Three Realms and Four Palaces (Đạo Mẫu Tam phủ - Tứ phủ). Key studies describe Mother Goddess Religion as a coherent ritual system with an organised pantheon, stable ritual repertoires, and recognised ritual specialists. T.D. Ngo's Vietnamese Mother Goddess Religion systematises the Three Realms and Four Palaces pantheon and clarifies the cultural meanings of mediumship (lên đồng) as a central ritual practice within this indigenous tradition [10]. Ethnographic research examines mediumship as a lived practice rather than a doctrine. K. Fjelstad, et al. (2006) [11] show that the spirit mediumship is sustained through a network of mediums, patrons, and temples, and that possession rituals organise authority, participation, and meaning in contemporary Vietnamese communities.

Beyond these traditions, case-based studies examine how particular goddess cults operate in contemporary socio-economic change. L.H. Le (2007) [12] analyses the Lady of the Treasury (Bà Chúa Kho) in Bac Ninh province and shows that the temple became a major pilgrimage destination from the 1990s, linking this expansion to the Đổi Mới revival of religious practice and socio-economic transformation after 1986. M.S. Nguyen (1998) [13] approaches folklore beliefs as a flexible system of local classifications and ritual practice rather than fixed doctrines. His work provides analytical vocabulary for understanding how deities, including female figures, are recognised in rural religious life.

A related but distinct body of work discusses the Cult of the Four Dharma Goddesses (Pháp Vân, Pháp Vũ, Pháp Điện, Pháp Lôi) centred on the Dau temple (Dâu), Dau temple (Đậu), Tuong temple (Tường) and Dan Temple (Dàn) system in Kinh Bac (Kinh Bắc) and its wider northern network [14]. This literature is relevant to this study because it illustrates a form of goddess-centred worship in northern Vietnam in which Buddhist idioms are expressed through temple spaces, ritual calendars, and local narratives. However, unlike royal female deities, the Four Dharma Goddess cult is not anchored in dynastic biography or court authorisation. It therefore serves mainly as a comparative reference rather than as a direct account for royal female deity worship.

A smaller, dispersed body of scholarship addresses women of royal origin who later became objects of worship in the Red River Delta and northern Vietnam. One strand draws on court-centred historiography, especially Complete Chronicle of Dai Viet (Đại Việt sử ký toàn thư) [15] and Imperial Annotated Comprehensive History of Vietnam (Khâm định Việt sử Thông giám cương mục) [16] (initiated in 1856 and issued in 1884), to identify royal women and trace how official narrative and evaluative comments frame their virtues, authority, and posthumous legitimacy. This historiography and these local materials are repeatedly mobilised for figures such as Y Lan, Ly Chieu Hoang, and Huyen Tran, who are all worshipped at multiple sites in the Delta and northern Vietnam. A second strand uses Buddhist historiography, such as L. Nguyen (2010) [17], N.T. Thu (2021) [18], to situate royal women within the historical development of Buddhism and the patterns of elite patronage. A third strand consists of compilations that list Vietnamese goddesses and notable women (e.g., works cataloguing queens and royal women across dynasties) [19]. These publications are valuable for mapping names, basic narratives, and distributions of cult figures, but they often remain descriptive. More analytical contributions come from studies that classify vernacular deities and titles (e.g., M.S. Nguyen) [20], from the research on festival and village institutions (e.g., C.B. Nguyen) [21] and from scholarship on material culture and royal/elite patronage in Buddhist contexts (e.g., T.H. Vu) [22]. Finally, reference tools such as Index of Deity Chronicles by Village and Locality [23] and Bibliography of Deity Chronicles and Royal Ordinations support identification of deity chronicles by locality and help locate archival holdings for further verification [24]. Taken together, this scholarship provides rich materials on specific figures, sites, and textual corpora. However, the existing works tend to focus on individual figures or single sites and draw on local deity chronicles, court-centred historiography, inscriptions, royal decrees, and local archival materials. This scholarship offers rich descriptive material but rarely explains, across multiple communities, how dynastic biography becomes durable local sacred authority through authorised texts, historiography, and temple patronage. This article addresses that gap by treating royal female deities as a comparative category within Red River Delta goddess worship and by analysing standardisation as a contested process across three linked channels: decree language, court-centred historiography, and material patronage expressed in temple construction, restoration, and festival organisation.

Despite substantial scholarship on syncretism and on goddess worship in northern Vietnam, the literature rarely explains how dynastic authority becomes durable local ritual legitimacy of royal female deity cults. This article contributes in three ways. First, it integrates a practice-based approach

to syncretism with Vietnamese-based goddess scholarship to analyse royal female deities as a distinct category within Red River Delta worship. Second, it operationalises "standardisation" as a contested process across three linked channels: decree language, court-centred historiography, and material patronage expressed in temple construction, restoration, and festival organisation rather than treating royal recognition as automatic uniformity. Third, it clarifies what is distinctive about royal female deity worship in the region compared with the major non-royal goddess tradition in northern Vietnam.

3. Study approach and research methods

3.1. The concept of syncretism

In the study of religion and belief, *syncretism* is a key concept referring to the blending and integration of different faiths. According to the *Cambridge English Dictionary*, "syncretism" is defined as "the combining of different religions, cultures, or ideas" [6]. However, scholarship treats syncretism as a contested process rather than a neutral mixture. C. Stewart, et al. (1994) [1] show that "syncretism and anti-syncretism" emerge from struggles over authenticity and authority in religious life, and any integration of beliefs reflects social contestation as much as cultural blending. In this view, religious synthesis is also a struggle over legitimacy. A.M. Leopold, et al. (2004) [2] similarly argue that syncretism is not a simple mixture of traditions, but a dynamic process shaped by historical contact, social negotiation, and power relations. Because these struggles are often expressed in practice, syncretism is best analysed through ritual repertoires, shrine organisation, and the use of authorised titles, rather than through doctrine alone [4]. Taken together, these works support analysing royal female deity worship as a negotiated field in which court institutions and local communities advance different claims about legitimacy. In the historical development of Vietnamese culture, syncretism has been a prominent feature of the Vietnamese people's spiritual life. Rooted in an agrarian rice civilisation with fertility cults at its foundation and situated along the crossroads of East-West cultural exchanges, Vietnam has long interacted with and absorbed external ideologies such as Buddhism, Confucianism, and Daoism. This process did not unfold in an exclusive or oppositional manner; rather, it was characterised by adaptation, flexibility, integration, and harmonisation, resulting in a multi-layered and polytheistic belief system. This historical openness should not be perceived merely as a cultural mixture but as an ongoing negotiation through which communities adapted external systems to articulate local identity and establish sacred authority.

Within this context, the worship of royal female deities in the Red River Delta both absorbed external cultural values and creatively transformed them to bear distinct local characteristics. This paper aims to clarify the syncretism between the worship of royal female deities and Buddhism, Confucianism, and Daoism, while also analysing the interweaving of courtly and folk elements in this system of belief.

Through this examination, it becomes evident how the Vietnamese constructed a religious-spiritual tradition that is both receptive to outside influences and firmly rooted in indigenous cultural foundations.

3.2. Area studies and the interdisciplinary approach

Area studies is understood as "a highly interdisciplinary field that takes human communities as its central subject, examining their cultural, economic, and social characteristics through an integrated and historically grounded approach within a defined cultural region" [25].

In this sense, it is clear that area studies is not confined to a single discipline; rather, it draws upon the methodologies and knowledge of multiple fields. This interdisciplinarity enables scholars to approach cultural and social phenomena across multiple dimensions, from micro-level (community, local) dynamics to macro-level patterns at the national, regional, and transregional scales.

Studying the worship of royal female deities in the Red River Delta from the perspective of area studies is therefore particularly appropriate, as the phenomenon is multi-layered and complex. On the one hand, this belief system combines courtly traditions with folk practices; on the other hand, it embodies religious syncretism, where Buddhism, Daoism, and Confucianism are intertwined with indigenous beliefs. If examined solely through the lens of a single discipline - such as history or religious studies - it would be difficult to fully capture the multidimensional nature of this phenomenon. By contrast, through an interdisciplinary lens, area studies allow for a clearer identification of the layers of syncretism: between history and myth, folk and court, and indigenous and external influences.

Simultaneously, it is crucial to elucidate the practical implementation of this interdisciplinary synthesis. Rather than merely listing related disciplines, the present study operationalises area studies through the combined use of ethnographic fieldwork, textual-historical analysis, and comparative cultural interpretation. Ethnography documents contemporary ritual spaces, festival practices, and local narratives; textual analysis of deity chronicles, official histories, royal decrees and Hán - Nôm sources reconstructs historical trajectories and processes of standardisation; comparative cultural methods situate the worship of royal female deities within wider regional patterns of goddess veneration. The convergence of these methods enables tracing multiple layers of syncretism and generating analytical insights that would not emerge from any single disciplinary approach.

3.3. Research methodology

This study combines ethnographic fieldwork with textual analysis to examine syncretism in the worship of royal female

deities. Here, syncretism refers to the practical mixing of court-based authority and local religious life. It is visible when Buddhist, Confucian, or Daoist elements appear in rituals, temple layouts, narratives, and titles, while the cult remains anchored in local agrarian moral worlds. Standardisation refers to the efforts to regulate and legitimise worship through state-linked instruments, especially authorised titles, official histories, and patterns of temple patronage. Incorporation refers to the movement of ritual forms and symbols across domains without erasing their recognisable origins. Evidence for incorporation includes ritual objects and actions crossing between public sites and domestic rites, and borrowed symbols that remain identifiable within local practice. This approach aligns with Pomeranz's account of contested standardisation and with N.T. Nguyen's analysis of ritual incorporation [8, 9].

This article operationalises "standardisation" as a contested process through three channels of observation. First, it analyses decree language as an attempt to define authorised titles, virtues, and ritual legitimacy. An example is the set of decrees of Y Lan at Yen Thai temple (Hang Bong street, Ha Noi), with the earliest preserved decree dated Canh Hung 14 (1753). The decree's honourific formula frames her through her dynastic ranks and moralised language (e.g., Linh Nhan Hoang Thai Hau, Thanh Mau Y Lan), thereby standardising who she is and what she can do in an authorised idiom. However, C.B. Nguyen (2013) [21] argues that court promotion and local acceptance are not identical, and "the deity of the king" and "the deity of the people" may even coexist in the same site. This standardisation is not automatic uniformity; it provides a template that local custodian draw upon while festivals, offerings, and narratives rework her authority into maternal care and everyday protection. Second, it reads court-centred historiography as an official frame that selects and orders events, then compares this frame with local narratives and temple memory to identify shifts in emphasis. Third, it treats material patronage, temple construction, renovation, and the reorganisation of worship space as evidence of how authority is made durable in the sacred landscape. Together, these channels show standardisation as an intervention whose effects depend on local mediation rather than producing a uniform outcome.

Fieldwork was conducted as part of doctoral research between 2022 and 2025, including repeated visits to 20 worship sites in and around Hanoi, Bac Ninh, Hung Yen, Nam Dinh provinces (since July 2025 part of Ninh Binh province), and Thai Binh province (since July 2025 part of Hung Yen province). Data were collected through observation of worship spaces, architecture, and sanctuary arrangement; participant observation of rituals and festivals; and 15 semi-structured interviews with temple caretakers, ritual specialists, and local devotees. These interviews provided evidence on ritual practice, local interpretation, and historical memory.

To clarify what is distinctive about royal female deity worship, the study applies a within-region controlled comparison within the same regional religious ecology (the Red River Delta). The study compares royal female deities to three established female-centred traditions that share similarities in ritual aesthetics and sacred landscapes but differ in their sources of authority: (1) Four Dharmas Goddesses (agrarian weather goddesses tied to rainmaking and seasonal survival), (2) Mother Goddesses (a structured cosmology sustained through mediumship and ritual performance), and The Family Goddess (female ancestor veneration anchored within lineage-scale ritual boundaries). The Four Ladies grounds sacred authority in agrarian cosmology and weather control. These cases are selected because they represent three different bases of sacred authority - natural force, cosmological hierarchy, and kinship memory - whereas royal female deities are anchored in dynastic biography and state-linked recognition. The comparison isolates how dynastic categories become ritually workable in village life.

Textual analysis focused on mythic legends, imperial decrees, genealogical records (*ngọc phả)*, and Hán-Nôm inscriptions. Field observations were compared with textual materials to strengthen the consistency and interpretation. Additional interviews conducted during ritual events with the temple caretakers help clarify local views and ritual meanings. Textual sources include local deity chronicles (thần tích), imperial decrees (sắc phong), genealogical records (ngọc phả), and Hán-Nôm inscriptions.

Finally, the study adopts an area-studies lens to integrate evidence and interpretation across disciplines. It draws on history, religious studies, ethnology, cultural studies, and anthropology while keeping the unit of analysis grounded in place and practice. This lens links court texts and institutions to village ritual life. It also connects local cases to wider patterns of goddess veneration in Southeast Asia. Syncretism is analysed not only as a set of mixed symbols but also as a process by which authority is produced, contested, and reworked across scales.

4. The worship of royal female deities in the cultural life of Red River Delta communities

The worship of royal female deities represents a distinctive form of female deity worship in Vietnam, rooted in female-centred religious and rice-based agricultural culture. Throughout history, alongside natural goddesses such as Mother Earth, Mother Water, and Mother Rice, a new pantheon emerged: women of royal descent (empress dowagers, empresses, princesses, and imperial consorts) who made significant contributions or exerted great influence and were subsequently deified and venerated by local communities. They were created to embody protective power, blessings, and spiritual guardianship for communal life. This indicates that the sacred authority of royal women was shaped through both historical legitimacy and the agrarian moral imagination.

The formation of this belief is closely tied to the Red River Delta, as it is both the political centre of Vietnamese dynasties and the heartland of agrarian culture. From the 10th century onwards, following national independence, the growth of local cults created space for royal women to move from the inner court into village worship. During the Ly and Tran dynasties, when Buddhism held the position of state religion, many queens and princesses served as cultural and religious patrons, fostering the intersection of folk beliefs and imported religions. From the Le So dynasty[4] onwards, many royal women were granted imperial decrees and became officially recognised deities, thus legitimising folk practices and enabling their wide diffusion. This process reflected both the connection between the court and village communities and the consolidation of these beliefs within communal life. As a result, the Red River Delta became home to numerous temples and shrines dedicated to royal female deities, often associated with vibrant folk festivals.

Among the pantheon of deities, several figures stand out: Empress Dowager Y Lan - a capable regent, revered by the people as "Lady Tam", protector of the nation and its people; and Princess Tu Hoa (Từ Hoa) - credited with introducing sericulture, worshipped as the patron deity of this craft. Other venerated figures include Princess Huyen Tran, Empress Tran Thi Dung, and Trinh Thi Ngoc Truc. These diverse roles demonstrate the intertwining of female sanctity with governance, craft transmission, and agricultural life.

In the cultural life of Red River Delta communities, the worship of royal female deities plays a vital role in strengthening social cohesion, nurturing cultural identity, and transmitting historical traditions. It fosters national pride and instils the moral principle of *"When drinking water, remember its source"* (a Vietnamese proverb emphasising gratitude and remembrance of origins). Festivals and rituals associated with this worship also create spaces for communal cultural activities, where folk performances, music, and oral literature converge. These festivals and rituals also sustain local participation in performance, music, and oral narrative, while helping to transmit shared memory across generations.

At the same time, this worship is not merely commemorative; it is a space where communities negotiate power, gender, and morality within a post-feudal Vietnamese society. Local ritual choices are narrative emphases that show that the cult remains adaptable while preserving its historical core.

These dynamics are not unique to Vietnam. They also appear across many agrarian societies in Asia, where feminine sacred power often represents land, fertility, and communal protection. In South Asia, Shakti (India) traditions and village mother cults play similar roles, while in Southeast Asia, the worship of rice goddesses and female tutelary spirits connects women's sacred authority with the protection of crops, households, and local moral order. Viewed through this wider regional lens, Vietnamese worship of royal female deities fits into a broader transnational pattern in which feminine divinity provides an alternative source of legitimacy and empowerment within rural communities. This comparative perspective shows that the cult of royal female deities honours historical women and offers a subtle way for communities to express and negotiate gendered power.

5. Expressions of syncretism in the worship of royal female deities in the Red River Delta

5.1. Syncretism with Buddhism

The worship of royal female deities in the Red River Delta demonstrates profound syncretism with Buddhism. Buddhism was introduced to Vietnam in the early centuries CE at the Luy Lau (Luy Lâu) Centre in Bac Ninh province, which was established through visits by Indian monks arriving by sea. Even before these monks, Indian merchants had already come to Vietnam, bringing Buddhist practices with them [17]. From the very beginning, Buddhism had opportunities to interact, spread, and establish a place within local beliefs.

When entering Vietnam, Buddhism did not impose itself as an "external religion" but instead adapted and integrated with local customs and spiritual sensibilities. A prime example is its fusion with the worship of the Four Dharmas - indigenous agricultural deities associated with natural phenomena: Clouds, Rain, Thunder, and Lightning. These elements were crucial to wet-rice cultivation, as reflected in the proverb "first water, second fertiliser, third diligence, fourth seeds". As scholar L. Nguyen (2010) [17] observed, "One characteristic of Vietnamese Buddhism in the second century was its spirit of religious harmony. Buddhism permeated into local beliefs in Giao Chi as naturally as water soaks into the soil, without opposition, since local beliefs did not conflict with Buddhism's fundamental tenets".

With its teachings of compassion, benevolence, and community-mindedness, Buddhism was readily embraced by the Vietnamese and harmonised with traditional worship. People visited pagodas not only for moral cultivation - "to accumulate virtue for descendants" - but also to pray for peace and prosperity, much as they turned to female deities or mother goddesses for blessings and protection. This parallel facilitated the close affinity between Buddhism and Mother Goddess worship, laying the foundation for the later worship of royal female deities.

One of the clearest expressions of this syncretism is the worship structure known as "Buddha in the front, Saints in the rear" (Tiền Phật, hậu Thánh). Many pagodas in the Red River Delta enshrine not only the Buddha but also Mother Goddesses or saints, creating a hybrid pagoda-temple form. Fieldwork shows examples such as Ba Tam Pagoda in Duong Xa, Hanoi, Thanh Chua Pagoda (Hanoi), Do Temple (Dinh

[4]The Lê Sơ (Early Lê) dynasty, 1428–1527, established by Lê Lợi, marked a period of strong central rule and Confucian state consolidation.

Bang, Bac Ninh province administrative merged), and the shrine of Linh Tu Quoc Mau (Linh Từ Quốc Mẫu) in Thai Binh (since July 2025 part of Hung Yen province). Some of these were originally Buddhist temples but gradually incorporated the worship of saints or royal female deities [26].

The Ba Tam temple-pagoda complex (Duong Xa, Gia Lam, Hanoi) is a notable case. It honours Empress Dowager Ỷ Lan - a remarkable historical figure, a devout Buddhist, and revered in folklore as the Bodhisattva of Compassion. The large complex, built in the traditional temple layout with "an inner-shaped core and an outer enclosed-shaped frame" ("nội công, ngoại quốc") style, includes pagodas, shrines, temples, and sanctuaries. Initially dedicated mainly to the Buddha and Y Lan, it later expanded to include a Mother Goddess shrine (rebuilt in 2015 on its old foundation)[5]. Today, the site encompasses all three forms of worship: Buddha, Mother Goddesses, and Saints, reflecting not only the flexibility of local practices but also the Vietnamese ethos of inclusivity, blending different sacred figures within one space.

Another key example is Do Temple (Đền Đô) in Bac Ninh province administrative merger, the ancestral temple of the Ly dynasty. Established in the 11th century to honour eight Ly kings, it also bears deep Buddhist connections, as the Ly dynasty was devoutly Buddhist, and many queens and princesses were Buddhist practitioners. Behind the main shrine lies a sanctuary dedicated to seven queens of the Ly dynasty. Significantly, this form of goddess worship does not follow the common Three Palaces - Four Palaces belief systems but instead focuses directly on royal women. The structure demonstrates a distinctive type of syncretism: the intertwining of worshipping kings, Buddhas, and Mother Goddesses within one religious-architectural space. Scholars have noted that the "Buddha in the front, Saints in the rear" model is a unique Vietnamese religious architecture, not found in India, China, Cambodia, or Thailand [27].

Another important aspect of this syncretism is the role of royal women in Vietnamese Buddhist history. Many were simultaneously members of the royal family, devout Buddhists, and later venerated as deities. A prime example is Empress Dowager Y Lan, who twice served as regent and made immense contributions to Buddhism, building hundreds of pagodas across the Red River Delta. For these merits, she was revered as "Ba Tam Bodhisattva" and regarded as an incarnation of the Bodhisattva of Compassion. Researcher Nguyen Minh San identified Y Lan as one of three women (alongside Ba Chua Ba and Thi Kinh) honoured as Avalokitesvara Bodhisattvas in Vietnamese folklore [13].

Another striking case is Queen Trinh Thi Ngoc Truc, wife of King Le Than Tong. As a devout Buddhist, she once practised at But Thap Pagoda (1644) and authored *Chi Nam Ngoc Am giai nghia*, a bilingual Sino-Nom encyclopaedic dictionary with 3,394 entries. This invaluable cultural-linguistic work demonstrates her role in preserving and fostering Buddhist scholarship [27]. She is worshipped at several places, notably at Mat Pagoda (Thanh Hoa province), where her statue is remarkable: carved from a single block of wood, it depicts the queen in full lotus posture. Her right hand is raised in the *Abhaya mudra* (gesture of fearlessness and universal salvation), symbolising compassion and Buddhist spirit; her left hand rests in her lap in the *nectar mudra*, expressing steadfastness in Buddhist law and the wish to grant beings a peaceful, liberated life [28]. Thus, she is remembered as a queen, a Buddhist devotee, and a sacred figure, a vivid illustration of syncretism.

Through these examples, it is evident that the syncretism of Buddhism and the worship of royal female deities extends beyond sacred spaces to the worshipped figures themselves (royal women are simultaneously honoured as Buddhists, saints, and deities). This reflects a cultural logic in Vietnam: Buddhism does not conflict with but rather integrates with indigenous beliefs, while royal women - bridging the court and the populace - serve as mediators, embodying both dynastic authority and sacredness in folk consciousness.

In short, the syncretism between Buddhism and the worship of royal female deities in the Red River Delta is a distinctive cultural phenomenon. It is manifested through the association of Buddhism with the Four Dharmas, the widespread architectural model of "Buddha in the front, Saints in the rear", and the dual identity of royal women as Buddhists, saints, and deities. These expressions highlight the flexibility, inclusivity, and creativity of Vietnamese culture, while affirming the unique intermediary role of royal female deity worship in the nation's cultural-historical development.

5.2. Syncretism with Confucianism

Confucianism, one of the major philosophical schools of ancient China, exerted profound influence on many fields and societies in East Asia, including Vietnam. The doctrine was introduced into Vietnam in the early centuries Common Era. However, it was introduced into Vietnam largely during the period of Chinese rule, and it initially did not establish the same firm position in Vietnamese spiritual life as Buddhism or Daoism. A turning point came in 1070, when King Ly Thanh Tong ordered the construction of the Temple of Literature, with statues of Confucius, Zhou Gong, and the Four Correlates; portraits of the Seventy-Two Worthies; and mandated seasonal rituals there, while the Crown Prince studied at the site [15]. This marked the official reception of Confucianism as state orthodoxy.

As scholars have noted, the Vietnamese "resisted Sinicisation but did not completely reject Confucianisation" [29]. Thus, Confucianism was accepted but continually adapted to local socio-cultural and economic conditions. Although it never replaced Buddhism or Daoism in the sphere

[5]In-depth interview with Mr. Phung Huy Dien, Management Board of Ba Tam Temple Relic Site (Gia Lam, Hanoi).

of faith, Confucianism played a crucial role in education, ideology, and social organisation, with direct influence on women in the royal family.

First of all, Confucianism shaped the thought, character, and ethics of royal women. In the courtly environment, empresses, empress dowagers, and princesses were among those who directly engaged with Confucian teachings. They were educated as learnt persons (*kẻ sĩ*), instructed within the framework of orthodox dynastic ideology. While Buddhism conveyed compassion and salvation, and Daoism offered a cosmological-spiritual framework, Confucianism stressed moral norms and socio-political ideals. Particularly, it imposed ethical standards such as the three obediences (*tam tòng)*, four feminine virtues (*Tứ đức)*, chastity, and filial piety upon women. Within this framework, royal women were trained to embody the role of the "exemplary mother of the realm", serving as moral models for society. When they were venerated after death, their images were also idealised according to Confucian virtues, creating a unique syncretism: on the one hand, they retained their folk sacredness; on the other, they embodied the ethical discourse of official Confucianism.

The influence of Confucianism is also evident in the imperial decrees that conferred titles upon royal female deities. Granting honorific epithets was not only a way for the monarchy to honour and legitimise its rule but also a means of embedding Confucian ideology in folk worship. During the Le So and Le Trung Hung periods, many empresses and princesses were bestowed with titles imbued with Confucian values, such as "Chaste and Virtuous" (*Trinh Thuc*), "Manifested Saint" (*Hiển Thánh*), and "Reverent and Compassionate" (*Cung Từ*). These titles both recognised their merits and bound their sacred images to the moral ideals of Confucianism. Notably, at Yen Thai Temple - once the residence of an empress - there still hangs a banner inscribed "Exemplary Mother of the Ly dynasty" (*Lý Đại Mẫu Nghi*) [20], a vivid testimony to the fusion of female deity worship and Confucian moral discourse.

While Confucian norms often reinforced patriarchal expectations, feminist scholarship in East Asia shows that women in imperial settings used Confucian virtues strategically rather than passively submitting. In Vietnam, figures such as Y Lan, Tran Thi Dung, and Trinh Thi Ngoc Truc mobilised ideals such as filial piety, benevolence, and moral exemplarity to justify political action and strengthen their spiritual authority. Their later deification demonstrates how royal women could transform a patriarchal ethical system into a source of female prestige and sacred power, revealing Confucianism as a field of negotiation rather than mere constraint.

Thus, Confucianism shaped the worship of royal female deities in the Red River Delta in two dimensions: (i) By forming and reinforcing ethical standards and exemplary character for royal women to serve as societal models; (ii) Through imperial decrees and honourific titles, by sacralising and legitimising their cults, ensuring that the veneration of these deities simultaneously affirmed dynastic political authority. This exemplifies religious syncretism in Vietnam: an imported ideology, when absorbed into local life, was adjusted and fused with indigenous beliefs, serving both the spiritual needs of the people and the political-social aims of the ruling class.

5.3. Syncretism with Daoism

Daoism was introduced into Vietnam quite early and quickly found its place due to similarities with indigenous beliefs and the wet-rice agricultural culture. Vietnam has long been regarded as a land of rich yet unpredictable nature: both "forests of gold and seas of silver" and "sacred forests and poisonous waters". Agricultural life was heavily dependent on unstable weather and natural forces. Because of such precariousness and harshness, the Vietnamese tended to revere magic, believe in talismans, and emphasise ritual ceremonies to subdue or harmonise with nature. Daoism, especially magical Daoism, "quickly penetrated and blended easily with indigenous magical beliefs to the point where boundaries no longer existed" [30].

This integration was so profound that it "led not a few scholars to attribute all traditional Vietnamese beliefs to Daoism, while in reality, Vietnamese people fascinated with spirit-possession and talismans often had no idea what Daoism actually was" [28]. As a result, many folk religious practices appear at first glance to be direct products of Daoism but are in fact uniquely Vietnamese creations, most typically the Mother Goddess Religion or the Three Palaces-Four Palaces system. This is why some scholars have remarked, "The Daoist element is merely a matter of form; its influence on the substance of these beliefs is insignificant" [30]. Such observations show that the Vietnamese received Daoism in a highly distinctive way: not by adopting it wholesale, but by fusing and transforming it, producing a system that is at once indigenous yet infused with Daoist traces.

In the worship of royal female deities, syncretism with Daoism also unfolded naturally, without clear boundaries. The Vietnamese spiritual world has long been "inclined toward shamanism, spirit possession, and talismans" [31] and thus these practices easily merged with Daoist images of immortals and sorcery. This convergence enhanced sacredness, creating a mystical aura in rituals devoted to female deities in general and royal women in particular. From talismans and ritual singing *(chầu văn)* to ritual platforms, all bear the marks of Daoist-folk interaction.

At the same time, Daoist-influenced elements not only create a mystical atmosphere; they also reshape local spiritual authority. Sacred shrines, immortal symbolism, and tales of divine intervention enhance the moral standing of royal female deities and reinforce their role as protectors of communal ethics. This sacralisation emerged largely from local practice rather than elite design, though the state

later appropriated this prestige through imperial decrees to consolidate dynastic legitimacy. In this way, Daoist syncretism becomes a negotiated space in which communities exercise agency while also internalising broader moral and political norms.

An illustrative example can be found at the relic site dedicated to Nguyen phi Y Lan in Duong Xa commune. During field work, the caretaker explained that within the grounds stands a sacred shrine, long associated with mysterious tales. The shrine (*miếu*) is an architectural form imbued with Daoist symbolism, often associated with immortals and the supernatural. Locals still say that those who pass by the Lady's Shrine without showing respect will suffer illness or misfortune. Such accounts reveal how Daoist mysticism "intensifies" the aura of sacredness while simultaneously merging with the worship of Y Lan as a historical royal woman.

Thus, syncretism with Daoism in the cult of royal female deities manifests on two levels. First, at the formal level, many ritual practices, symbols, and sacred spaces carry Daoist features (shrines, talismans, spirit possession, and immortal imagery). Second, at the substantive level, royal female figures preserve their historical and social essence tied to the court but are sacralised and mystified through Daoist elements, thereby strengthening their spiritual authority and efficacy in communal belief. Thanks to this interplay, the worship of royal female deities has become a multi-layered sacred space: both a commemoration of historical figures and a mystical realm of supernatural powers. It shows that, while Daoism did not determine the content of this worship, it powerfully shaped its atmosphere of sacredness, mysticism, and sacralisation.

5.4. Syncretism between courtly and folk elements

The case of Imperial Consort/Empress Dowager Y Lan illustrates one of the most notable examples of the blending between courtly and folk elements in the cult of royal female deities in the Red River Delta. She was not only an important historical figure of the Lý dynasty but also became a tutelary goddess in popular belief, worshipped by the people under various names, images, and rituals. Through legends, temple inscriptions, and village festivals, her courtly virtues were continually reinterpreted in local settings, allowing a royal figure to be absorbed into familiar rural moral worlds. In popular narratives, Y Lan appears not only as a powerful queen but also as a nurturing mother, a figure associated with moral protection, household well-being, and everyday livelihood. Many local traditions portray her as a young village woman (often associated with Co Tam), revealing how communities translated the symbols of authority into forms that resonated with the rural village. This process illustrates the dynamic and negotiated nature of belief formation, as the courtly image was adapted, softened, and integrated into the moral imagination of agrarian communities.

This case demonstrates what Pomeranz terms "contested standardisation": Court text defines authorised identity, but local practice determines what becomes ritually effective. It also illustrates Stewart and Shaw's argument that legitimacy is negotiated, as official titles and local narratives do not always align [9].

Official historiography (Chính sử) provides the court's authorised frame for this transformation. In Complete Chronicle of Dai Viet, Y Lan is constructed through the vocabulary of legitimacy: dynastic title, lawful regency, moral exemplarity, and agrarian protection. This is not a neutral description. It is a standardising discourse that makes a royal woman "publicly speakable" as a moral and political figure. Local worship then reworks this authorised biography into ritual efficacy. Legends and festivals foreground maternal care and everyday protection, but they often rely on the court's categories of rank and virtue as a base layer of legitimacy.

Table 1. Key narratives of Y Lan in Complete Chronicle of Dai Viet and their relevance in local worship.

Events in official history	Official framing	Standardisation function	Likely implications for local worship and memory
1063: The King performs a fertility rite at Thanh Chua pagoda; Y Lan becomes pregnant with Can Duc (King Ly Nhan Tong).	Links royal authority to Buddhist space and fertility	Authorises a "sacred origin" for the royal production	Supports later for interpretations of Y Lan as a fertility and protection figure
1066: Y Lan is granted the title "Thần phi"	Establishes rank through court title language	Creates a stable official idiom of status (title-making)	Produces a textual anchor for later decrees and temple honouring
1069: The king campaigns in Champa; Y Lan manages internal affairs	Frames competence as legitimate political agency	Legitimises female regency through merit and governance	Enabls local narratives to recast authority as moral care and protection
1072: The king dies; Càn Đức ascends; Y Lan acts as regent ("behind the curtain")	Frames Ỷ Lan as a lawful political actor	Standardises the regency role as a legitimate form of rule	Supports worship of Ỷ Lan as a protector of the realm and the community
1073: She is elevated to Linh Nhân Hoàng Thái hậu (Mother of the King)	Moralises authority through "maternal virtue" and exemplarity	Encodes virtue in official naming	Aligns with popular "motherly" memories and compassionate images
1103: She uses palace funds to redeem poor girls sold into bondage and arranges marriages	Frames benevolence as state-backed normal action	Converts biography into moral legitimacy.	Feeds the local theme of cứu dân (relieving suffering or helping people)
1117: Death; posthumous title; burial ritual	Ritualises closure through state and ceremony, and dating	Fixes memory through official calendrical markers	Provids an authoritative basis for anniversaries and festival timing

Source: Author's compilation from Complete Chronicle of Dai Viet [15].

Table 1 summarises the key episodes and shows how official narrative, court titles, and policy acts stabilise Y Lan's sanctity before communities localise its meaning.

Taken together, these entries show how official narratives stabilise a public biography, while local communities translate this biography into efficacy through rituals, space, and offerings.

This court-village interaction is also evident at Yen Thai (Hang Bong Street, Hanoi), an old shrine known historically as Dong Thien temple (Quán Động Thiên), where Y Lan is worshipped as the central deity. During fieldwork, a notice from the communal house's management board stated that the site still preserves several valuable relics, including a bronze bell dated from Tu Duc's 17th year (1857), eight stone steles, stone palanquins, a lacquered horizontal board (hoành phi), parallel sentences (câu đối), and a set of imperial decrees (sắc phong) for Phu Khanh Linh Nhan Hoang Thai Hau. The earliest decree is dated from Canh Hung's 14th year (1753). At Yen Thai, material remains make the three channels visible. This site preserves imperial decrees (the earliest is Canh Hung 14, 1753), steles, and other ritual objects. First, the decree authorised titles and virtues, giving an official idiom for public ritual. Second, historiography frames her through governance, rank, and approved virtue; local legends and festival narratives foreground maternal care and everyday protection. Third, restoration and spatial arrangement materialise authorised memory by fixing it in place through inscriptions, layout, and curated objects. This outcome is uneven but productive: courtly authority shapes what can be publicly authorised, while local practice decides what becomes ritually meaningful.

First, this blending is evident in the system of names and images associated with Y Lan. In official histories, Y Lan was elevated from imperial consort (thần phi) to empress dowager [15], affirming her courtly status. However, among the people, she was affectionately called Lady Tam, Female Guanyin, or Holy Mother. Unlike The Four Dharma Deities (Tứ Pháp), where sacred power rests on agrarian natural force, Y Lan's authority begins with dynastic biography and then becomes locally effective through naming, legend, and ritual. The name "Y Lan", bestowed by the king, was both elegant and rustic, quickly becoming an intimate symbol. This coexistence of courtly titles and folk names created a multi-layered symbolic system that embodied the popularisation of a royal figure.

Second, there is the phenomenon of assimilation between Y Lan and the fairy-tale character Tam. Her life bore many similarities to the *Tam Cam (Tấm Cám)* motif: losing her mother early, living with a stepmother, being a village girl, and suddenly entering the royal palace. Legends even recount that when asked her name by the king, she replied, "Tấm". After her death, the pagoda she had built was called Lady Tấm Temple. "it seems that no one has ever found a second region that worships Lady Tam (Bà Tấm) like Luy Lau" [32]. Through this association, the historical figure was merged with a familiar folk archetype. Nevertheless, unlike Tam, whose story ends with becoming the king's wife, Y Lan took on state affairs, raised King Ly Nhan Tong (Lý Nhân Tông), relieved famine, and left great merits. This relationship helped shape the dual image of Lady Tam - Y Lan: at once close to the people and of courtly stature.

Third, the syncretism between court and folk is also visible in the worship spaces dedicated to Imperial Consort Y Lan. At Lady Tam Temple (đền Bà Tấm) in Gia Lam, Hanoi, courtly imprints are clear in the architecture and sculpture. Images of dragons, phoenixes, and lions - signalling royal power - are intricately carved. Notably, the pair of Ly dynasty stone lions beneath the pedestal of the Three Buddhas have been recognised as national treasures, affirming the pinnacle of Ly court art [33]. Furthermore, the worship space includes great generals such as Ly Thuong Kiet, Ly Đao Thanh, and the six Ladies of the Six Ministries (Lục Bộ Chầu Bà) - manifestations of the court's bureaucratic system [26]. Yet alongside these courtly elements, the pagoda's space - with its water pavilion, trees, and incorporation of the Three Palaces tradition of Mother Goddess worship - reflects popular religiosity, showing its deep attachment to village communities.

Fourth, the rituals dedicated to Y Lan also demonstrate the blending of courtly and folk traditions. The festival at the Lady Tam Temple includes solemn ceremonies with courtly features: processions, palanquins, sacred horses, and male-female ritual troupes. However, folk elements play a central role: fetching water from the village well or the Red River; simple offerings such as ritual offering cakes (Bánh Oản), sticky rice, betel and areca, and rice wine [34]; and a calendar that follows the familiar village spring-festival rhythm, while major observations also mark Y Lan's death anniversary (the eighth lunar month). These agrarian gestures recall ritual logics seen in Tứ Pháp, yet the cult centres on a named royal woman and her public merits. Its authority is framed through royal biography and honorific epithets, rather than through a palace-based cosmological hierarchy as in Mother Goddess Worship of Three Realms and Four Palaces (Đạo Mẫu Tam phủ Tứ phủ) or lineage-based obligation as in Family Goddess (Bà Tổ Cô, hereafter "Family Goddess") worship. The festive part features Quan ho singing on the water pavilion - a fertility-inspired practice that is both religious and recreational. Thus, courtly elements are woven into a folk setting, simultaneously honouring royal authority and preserving community traditions.

From these aspects, it is clear that the worship of Imperial Consort Y Lan exemplifies the syncretism between courtly and folk traditions. The coexistence of royal titles and folk names, of historical figures and fairy-tale archetypes, of courtly architecture and popular elements, and of courtly ritual and agrarian festivity has created a unique cultural phenomenon. This blend not only enriches Vietnam's religious heritage but also reveals the creativity and adaptability of folk culture in absorbing and sacralising historical figures.

5.5. Comparative discussion: what is distinctive about royal female deities

To identify what is distinctive about the worship of royal female deities, this article compares it with three established belief complexes in the Red River Delta: The Four Dharma Goddesses, Mother Goddess Three Palace and the cult of Family Goddess. These traditions often share ritual practices and temple landscapes. However, they ground sacred authority in different ways. The comparison highlights what is specific to royal female deities and reveals the political and social discourse embedded in worship.

In the Red River Delta, goddess worship is diverse and layered. Clear boundaries are difficult to draw because cults overlap in origin, function, and sacred place. Royal female deity worship operates inside this wider field. It shares a common foundation with other goddess traditions, such as the veneration of women as protectors, nurturers, and sources of life. However, its distinctive feature is the social and political origin of the worshipped figures. These deities are linked to the royal family and carry the historical political imprint of a specific dynasty.

A brief comparison with three female-centred traditions helps clarify this distinctiveness. First, The Four Dharma Goddesses sacralise the agrarian culture of natural forces (cloud, rain, thunder, lightning). Its authority is grounded in weather control and seasonal survival. Vietnamese scholarship explicitly characterises this belief as a rain-invoking belief system (tín ngưỡng cầu mưa, cầu đảo) [14]. Worship is organised through a linked regional system rather than isolated village shrines. Although individual deities may be worshipped at different pagodas or temples within a district, they are ritually connected as a pair or group of figures, most commonly the Cloud Goddess, The Rain Goddess, or the full set of four deities. Their statues often occupy prominent positions within pagoda spaces, indicating the ritual priority accorded to agrarian protection [14].

Second, Mother Goddess worship centres sacred authority in a universal female cosmology and a structured pantheon, sustained through spirit mediumship and its ritual aesthetics. Although this tradition is closely connected to indigenous culture, the two are not identical. Vietnamese scholars emphasise that "All Mother Goddesses are female deities, but all female deities are recognised as Mother Goddesses. Only a limited number are elevated to the status of Mother Goddess within the Three Palaces- the Four Palaces" [10]. This distinction situates royal female deities outside of the formal pantheon of Đạo Mẫu, even when symbolic features overlap.

Third, the cult of the Family Goddess grounds authority in kinship morality and domestic obligation. Worship is usually confined to the household or lineage and derives its efficacy from family memory rather than from public history or political status. Studies of Family Goddess worship show that there is no fixed or standardised form of altar design or ritual practice. Altar arrangements or ritual objects vary across families and communities in the Northern Delta, reflecting the lightly localised or personalised character of the cult [35].

Against these three traditions, royal female deities stand out because they make dynastic memory workable in local ritual. Their authority is neither cosmological, as in the Four Dharma Goddesses, nor primarily familial, as in the cult of The Family Goddess. Nor are they integrated into a unified ritual system, like the Mother Goddess. Instead, their sacred status emerged from the interaction between historical remembrance and village-level religious practice. Syncretism here is best understood as negotiation, in which a broader historical frame shapes recognition, while local communities determine how these figures are ritually enacted and made meaningful in everyday worship.

Royal female deity worship also carries a specific political and social discourse that is weaker or absent in the other comparison cases. Through decrees, royal authority enters villages as a moral vocabulary of rank and exemplarity. Through official historiography, royal women become "speakable" as legitimate political actors and ethical models. Through patronage and spatial ordering, that authorised memory is established in the sacred landscape and embedded in local institutions that host many festivals and public rituals. Local community members do not simply receive this state-like frame. They translate it into practical efficacy: it is not only a blending of symbols. It is a negotiation in which dynastic categories are converted into local authorities.

6. Significance from the perspective of area studies

The study of syncretism in the worship of royal female deities in the Red River Delta not only helps to identify the distinctive features of Vietnamese culture but also contributes to explaining the formation and development of national identity within the broader flow of regional and global integration. This is a unique cultural-religious phenomenon that vividly reflects the Vietnamese people's flexibility, creativity, and resilience in responding to external influences.

From the perspective of area studies, the syncretism observed in the worship of royal female deities in the Red River is not only a distinctive feature of Vietnamese culture but also a broader cultural, historical, and political dynamic that shapes identity formation across regional and transregional contexts. Area studies emphasises an interdisciplinary grounding in locality, historical depth, and community practice, making it an effective framework for understanding how this belief system evolved at the intersections of imperial structures and external religious influences.

First, research into the worship of royal female deities affirms the special role of women in Vietnamese history and culture. In contrast to Confucian notions that often relegated women to a secondary position, this practice demonstrates that many royal women were not confined to the inner court

but actively participated in political, military, and cultural life. Figures such as Imperial Consort Y Lan, Princess Huyen Tran, Empress Tran Thi Dung, Trinh Thi Ngoc Truc, and Princess Dieu Nhan all serve as vivid examples. Imperial Consort Y Lan is particularly exemplary: she twice acted as regent in place of the king, governing the country with wisdom and decisiveness, while also being a devout Buddhist who combined political authority with spiritual influence. In recognition of her merits, people in many localities established temples in her honour after her death. She is especially venerated in provinces such as Hanoi, Bac Ninh (administrative merger), Hung Yen, and Hai Duong (since July 2025 a part of Hai Phong city).

Second, the study of syncretism reflects the adaptability and elasticity of Vietnamese culture in engaging with external influences such as Buddhism, Daoism, and Confucianism. At its core, the worship of royal female deities derives from indigenous agricultural goddess worship - the image of the mother or woman associated with fertility, reproduction, and safeguarding crops. Yet it does not exist in isolation but instead merges with imported religious ideologies and models. With Buddhism, many royal women were associated with the image of the Bodhisattva of Compassion, as in the cases of Imperial Consort Y Lan or Trinh Thi Ngoc Truc; furthermore, many temples still preserve the architectural model "Buddha in the front, Saints in the rear", a concrete manifestation of the combination between Buddhism and goddess worship. With Daoism, the presence of talismans, ritual altars, trance-possession ceremonies (*hầu đồng*), as well as images of "sacred temples" or "sacred mounds" within the sanctuaries added layers of mysticism and sacrality to the practice. With Confucianism, the presence of honorific titles in royal decrees, such as "Chaste and Virtuous", "Manifested Saint", or "Reverent and Compassionate", shows how feudal authority employed Confucian discourse to legitimise and reinforce the prestige of these female deities. Thus, the worship of royal female deities is a striking example of the Vietnamese capacity for adaptation, integration, and creative synthesis throughout history.

Third, from the perspective of area studies, the study of syncretism in the worship of royal female deities should not be confined to the field of religion or belief but approached in an interdisciplinary manner, drawing upon history, culture, anthropology, gender studies, and area studies. On the historical level, this worship is closely tied to major events and figures of the feudal dynasties, reflecting the interplay between state power and popular religiosity. On the cultural level, it demonstrates the tight connection between religious practices and customs, folk arts, architecture, sculpture, and music (such as *chầu văn* singing or ritual songs). On the gender level, the worship of royal female deities offers valuable sources for studying the roles and status of women in traditional Vietnamese society, while also opening possibilities for dialogue with modern feminist theories.

At the regional level, the worship of royal female deities can be compared with similar phenomena in Southeast Asia. In Indonesia, the goddess Dewi Sri embodies rice, protects crops, and represents profound maternal symbolism. In Thailand, the goddess Mae Phosop is considered the soul of rice, linked with fertility and the prosperity of the community. In Myanmar, the system of Nats includes many female figures who were once historical persons and, after death, were deified – similar to the folk deification of royal women in Vietnam. Such comparisons demonstrate that Vietnamese goddess worship embodies both the shared universality of Southeast Asian agrarian cultures and the particular distinctiveness of Vietnam, given its deep entanglement with political history, culture, and the dynamics of religious adaptation.

In sum, the study of syncretism in the worship of royal female deities in the Red River Delta from the perspective of area studies illuminates the enduring values of national culture: honouring the role of women and demonstrating resilience in the face of external influences while fostering interdisciplinary dialogue and regional comparison. This research direction is significant not only academically but also in contributing to the preservation and promotion of the distinctive spiritual heritage of the Vietnamese people in today's globalised context.

7. Conclusions

Regarding the first research question, the findings show that royal female deity worship in the Red River Delta developed through the selective incorporation and reinterpretation of indigenous agrarian beliefs together with elements of Buddhism, Confucianism, and Daoism. Buddhist influences appear in shared temple-pagoda spaces, the "Buddha in the front, Saints in the rear" model, and associations of royal female deities with compassion and salvation, while Confucianism contributes moral ideals, honorific titles, and models of female virtue, and Daoist and vernacular elements emphasise supernatural efficacy and protection. Rather than being simply combined, these elements were adapted to the historical biographies of royal women and the ritual needs of local communities, producing a form of worship that joins dynastic solemnity with village religiosity.

Regarding the second research question, the study shows that royal authority was standardised through imperial decrees, official historiography, and sacred space: decrees authorised titles, virtues, and ritual status; historiography constructed legitimate biographies; and temple inscriptions, ritual objects, restoration activities, and festival practices materialised these authorised memories in local landscapes. Yet standardisation did not create uniform worship. Local communities reinterpreted official identities through folk names, legends, offerings, ritual practices, and narratives of maternal compassion and protection, thereby turning royal authority into local ritual legitimacy.

Taken together, these findings show that royal female deity worship developed through religious syncretism and the local reinterpretation of standardised royal authority.

Court recognition provided legitimacy, while village practice transformed royal women into accessible, protective, and ritually effective sacred figures. This interaction between official authority and local agency distinguishes royal female deity worship in the Red River Delta and helps explain its continuity in communal religious life.

From an area studies perspective, the findings show the value of combining historical, religious, cultural, anthropological, and spatial evidence to explain how dynastic authority was transformed in local settings. Royal female deity worship thus reflects both the historical role of royal women and the ability of local communities to select, reinterpret, and sustain different sources of sacred authority. Further research could examine how heritage governance and mediated communication shape the presentation of royal female deity worship at specific sites.

COMPETING INTERESTS

The author declares that there is no conflict of interest regarding the publication of this article.

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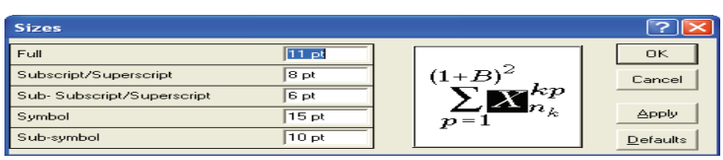


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P-ISSN 2734-9373 • E-ISSN 2815-6471

VMOST Journal of Social Sciences and Humanities

AUGUST 2026 • VOLUME 68 NUMBER 2

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PUBLICATION LICENCE

No. 459/GP-BTTTT 20th July 2021
No. 50/GP-BTTTT 1st February 2023