



Determinants of Tourism Human Resource Quality in the Mountainous areas of Quang Ngai Province, Vietnam: A PLS-Sem Analysis with Dual Mediation

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Abstract

This study examines the determinants of tourism human resource quality in the mountainous areas of Quang Ngai Province - an ethnically diverse highland destination in central Vietnam where community-based and indigenous cultural tourism constitute the primary development trajectory. Grounded in an integrated theoretical framework drawing on human capital theory, the ability-motivation-opportunity model, human resource development theory and social exchange theory, the study proposes and tests a structural model in which five organisational and individual determinants - training and development, accumulated education and experience, compensation and incentives, work environment, and organisational support - influence tourism human resource quality both directly and indirectly through work motivation and job satisfaction as dual mediators. Survey data collected from 385 tourism workers employed in accommodation, tour operation and visitor attraction establishments across the highland sub-region were analysed using partial least squares structural equation modelling. All five determinants exert statistically significant positive effects on tourism human resource quality. Accumulated education and experience produces the largest direct effect ($\beta = 0.207$), an outcome explained through the mechanism of indigenous knowledge capital accumulation identified in the companion qualitative study. Work motivation mediates the effects of training and development, compensation and incentives, and organisational support; job satisfaction mediates the effects of work environment and organisational support. The total indirect effect via dual mediation is substantial and comparable in magnitude to the direct structural effects, confirming that motivation and satisfaction are not mere outcomes of the determinants studied but active transmission mechanisms through which organisational practices translate into improved workforce quality. These findings carry specific implications for training reform, human resource policy and tourism development strategy in highland indigenous tourism destinations.

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1. Introduction

The quality of the tourism workforce has long been recognised as a strategic determinant of destination competitiveness, visitor experience and tourism revenue sustainability (Baum, 2006; Kusluvan *et al.*, 2010)^[2, 18]. In contexts where tourism is built around the living cultural heritage of indigenous and ethnic minority communities - as is the case in the mountainous areas of Quang Ngai Province - this relationship acquires additional complexity: workforce quality determines not only the technical standard of service delivery but also the authenticity, depth and cultural integrity of the visitor experience that distinguishes the destination from competing alternatives (Tolkach & King, 2015; Zeppel, 2006)^[26, 28].

The mountainous areas of Quang Ngai Province, incorporating the territory of the former Kon Tum Province following the

recent administrative consolidation, constitute one of the most ethnically and culturally diverse highland territories in mainland Southeast Asia. Home to more than 28 ethnic minority groups including the Xơ Đăng, Ba Na, Gia Rai, Hrê, Ca Dong, Rơ Măm and Brâu peoples, the sub-region's tourism strategy for 2021–2030 designates cultural-ecological-community tourism as the priority development pathway (People's Committee of Quang Ngai Province, 2022) ^[21]. Despite this strategic positioning, the human resource base supporting this ambition is characterised by structural deficiencies: limited formal training coverage, high rates of informal and unaccredited employment, marked mismatch between occupational training content and the competencies that indigenous tourism destinations require, and persistent attrition of the most culturally capable workers from the formal tourism labour market.

Understanding the organisational and individual factors that drive workforce quality in this context is therefore not only a matter of academic interest but of direct strategic significance. Yet the empirical literature on tourism human resource quality determinants in highland, multi-ethnic destinations of mainland Southeast Asia remains thin. Existing quantitative studies are concentrated in urban hospitality environments or mass tourism destinations, where the competence requirements and the mechanisms through which they are developed are fundamentally different from those operating in indigenous highland settings. This study addresses that gap through a structural model test designed specifically to reflect the organisational realities of tourism enterprises in the highland Quang Ngai sub-region.

The study makes three primary contributions. First, it provides the first empirically tested structural model of tourism human resource quality determinants in the highland areas of Quang Ngai Province, generating province-specific evidence to inform the 2021–2030 tourism workforce development strategy. Second, it tests the dual mediation role of work motivation and job satisfaction simultaneously, advancing beyond existing studies that typically test single mediators in isolation. Third, it integrates structural model findings with the qualitative mechanism explanations established in the companion study (Study 2), yielding an explanatory account that quantitative analysis alone cannot provide - in particular, for the unexpectedly large direct effect of accumulated education and experience on workforce quality, which the qualitative analysis reveals as a proxy for indigenous knowledge capital.

2. Theoretical Background and Research Hypotheses

2.1. Tourism Human Resource Quality: A Multi-Dimensional Outcome Construct

Tourism human resource quality is theorised in this study as a five-component reflective-formative second-order construct comprising professional knowledge, occupational skills, service attitude and professional conduct, foreign language and digital capability, and occupational health and psychological resilience (Hair *et al.*, 2022; Kusluvan *et al.*, 2010) ^[18]. This five-component architecture is grounded in the Vietnam Tourism Occupational Standards, the ASEAN Tourism Competency Standards, the human capital framework of Schultz (1961) ^[23] and Becker (1964) ^[4], and the competence model of Spencer and Spencer (1993) ^[24], refined through the systematic review of prior empirical studies in the context of Vietnamese and Southeast Asian tourism (see Chapter 1 of the parent dissertation for the full

theoretical derivation). As the companion qualitative study (Study 2) demonstrates, a sixth component - indigenous cultural competence - is theoretically warranted for community-based indigenous tourism destinations; however, given the absence of a validated scale for this component, it is incorporated in the present study through the accumulated education and experience construct, whose observable indicators include items measuring depth of local cultural familiarity and years of community residency in addition to formal educational attainment and years of work experience.

2.2. Theoretical Framework

The integrated theoretical framework draws on four complementary theories, each making a distinct contribution to explaining different segments of the proposed structural model.

Human capital theory (Schultz, 1961; Becker, 1964) ^[23, 4] provides the foundational rationale for the effect of individual-level investment in knowledge and skills - whether through formal education, accumulated work experience or indigenous knowledge formation - on the productive capacity of the workforce. In the present context, this theory underpins the expected effect of accumulated education and experience on all five components of tourism human resource quality, and guides the interpretation of indigenous knowledge as a form of tacit human capital that formal credentials do not adequately measure.

The ability-motivation-opportunity model (Appelbaum *et al.*, 2000; Boxall & Purcell, 2003) ^[1, 6] organises the determinants of employee performance around three analytical categories. Ability-enhancing practices - principally training and development - build the technical and behavioural competence base. Motivation-enhancing practices - principally compensation and incentives - sustain the willingness to deploy that competence. Opportunity-enhancing practices - principally organisational support and a conducive work environment - create the conditions under which ability and motivation can be translated into actual performance. In the highland Quang Ngai tourism context, this tripartite logic maps directly onto the structural constraints identified in the qualitative phase: training coverage addresses the ability deficit; adequate compensation addresses the motivation and retention deficit; and organisational support and work environment address the conditions-of-performance gap.

Human resource development theory (Swanson & Holton, 2009) ^[25] extends human capital theory by emphasising that individual capability improvement requires not only investment in training but also the organisational architecture - managerial support, learning climate, developmental feedback, access to learning resources - that enables training to translate into improved performance. This theory underpins the hypothesised effects of both training and development and organisational support.

Social exchange theory (Blau, 1964; Cropanzano & Mitchell, 2005) ^[5, 8] provides the mechanism-level explanation for why organisational investments in training, compensation and support generate motivational and attitudinal responses in workers, which in turn translate into quality improvements. When workers perceive that the organisation is investing in them - signalled through training provision, fair compensation, supportive supervision and a positive work environment - the norm of reciprocity motivates them to reciprocate with increased engagement, effort and quality of

performance. This mechanism explains the mediating roles of work motivation and job satisfaction in the proposed structural model.

2.3. Research Hypotheses

Drawing from this integrated framework and the evidence base reviewed in Chapter 1 of the parent dissertation, the following hypotheses are proposed:

Direct Effects on Tourism Human Resource Quality

H1: Training and development has a significant positive direct effect on tourism human resource quality.

H2: Accumulated education and experience has a significant positive direct effect on tourism human resource quality.

H3: Compensation and incentives has a significant positive direct effect on tourism human resource quality.

H4: Work environment has a significant positive direct effect on tourism human resource quality.

H5: Organisational support has a significant positive direct effect on tourism human resource quality.

Effects on Mediating Constructs

H6: Training and development has a significant positive effect on work motivation.

H7: Training and development has a significant positive effect on job satisfaction.

H8: Compensation and incentives has a significant positive effect on work motivation.

H9: Compensation and incentives has a significant positive effect on job satisfaction.

H10: Work environment has a significant positive effect on job satisfaction.

H11: Work environment has a significant positive effect on work motivation.

H12: Organisational support has a significant positive effect on work motivation.

H13: Organisational support has a significant positive effect on job satisfaction.

Effects of Mediating Constructs on The Outcome

H14: Work motivation has a significant positive direct effect on tourism human resource quality.

H15: Job satisfaction has a significant positive direct effect on tourism human resource quality.

Indirect Mediation Effects

H16: Work motivation mediates the effect of training and development on tourism human resource quality.

H17: Work motivation mediates the effect of compensation and incentives on tourism human resource quality.

H18: Work motivation mediates the effect of organisational support on tourism human resource quality.

H19: Job satisfaction mediates the effect of work environment on tourism human resource quality.

H20: Job satisfaction mediates the effect of organisational support on tourism human resource quality.

3. Methodology

3.1. Research Design and Sample

The study employs a cross-sectional survey design with quantitative analysis using partial least squares structural equation modelling, constituting the second phase of the parent dissertation's sequential mixed-methods design. The choice of PLS-SEM over covariance-based structural

equation modelling is justified by three considerations aligned with the guidelines of Hair *et al.* (2022): the study's objective is primarily predictive - estimating the relative magnitude of determinant effects on a complex multi-dimensional outcome - rather than confirmatory of a highly specified factor structure; the second-order reflective-formative specification of the outcome construct is technically better suited to composite-based estimation; and the expected sample size of approximately 350–400 is adequate for PLS-SEM but potentially underpowered for some covariance-based specifications with this number of constructs. SmartPLS 4.0 was used for all estimation procedures.

The target population comprises tourism workers employed in formal tourism enterprises - accommodation establishments, tour operators and licensed visitor attractions - in the highland districts of Quang Ngai Province that were incorporated from the former Kon Tum Province, as well as the indigenous highland districts of historical Quang Ngai. Based on preliminary enterprise enumeration data from the Quang Ngai Provincial Department of Tourism (2023), the estimated total formal tourism workforce in the sub-region comprises approximately 2,100 individuals. Using Yamane's (1967)^[27] formula at the 95% confidence level with a 5% margin of error, the minimum required sample size is 337 respondents. The study targeted 420 respondents to allow for an anticipated non-response and unusable response rate of approximately 20%, ultimately yielding 385 complete and usable questionnaires - a rate of 91.7% - which exceeds the minimum requirement and satisfies the ten-times rule of thumb for PLS-SEM (Hair *et al.*, 2022).

Stratified purposive sampling was employed across three strata - accommodation (47.5%), tour operations (28.1%) and visitor attraction/community tourism village workers (24.4%) - proportionate to the estimated size of each stratum within the sub-regional tourism labour market. Within each stratum, individual respondents were recruited through a combination of direct enterprise contact and snowball referral, with questionnaires administered in person by trained research assistants during the primary fieldwork period of January to August 2025.

3.2. Measurement Instrument

Scale items were developed from a combination of established measures adapted for the highland Quang Ngai tourism context and original items generated from the qualitative phase (Study 2). All constructs were measured using reflective scales with five-point Likert responses ranging from 1 (strongly disagree) to 5 (strongly agree). The full scale with item sources is presented in Appendix A.

Tourism human resource quality (THRQ) was specified as a second-order reflective-formative construct. The five first-order components - professional knowledge (PK, 5 items), occupational skills (SK, 5 items), service attitude and professional conduct (SA, 4 items), foreign language and digital capability (FD, 4 items), and occupational health and psychological resilience (HP, 4 items) - were each measured reflectively. The second-order construct was then specified formatively from its five first-order component scores following the two-stage procedure recommended by Hair *et al.* (2022).

The five determinant constructs were each measured reflectively: training and development (TD, 5 items adapted from Khuong *et al.*, 2015^[16] and Swanson & Holton, 2009)

^[25]; accumulated education and experience (EE, 5 items, incorporating two original items from Study 2 measuring depth of local cultural familiarity); compensation and incentives (CI, 4 items adapted from Khuong *et al.*, 2015)^[16]; work environment (WE, 4 items adapted from Elshaer *et al.*, 2023)^[10]; and organisational support (OS, 5 items adapted

from Karatepe, 2013^[15] and Eisenberger *et al.*, 1986)^[9]. The mediating constructs - work motivation (WM, 4 items adapted from Ryan & Deci, 2000)^[22] and job satisfaction (JS, 4 items adapted from Nguyen *et al.*, 2025)^[20] - were also measured reflectively. Table 1 summarises the construct specifications.

Table 1: Construct specification summary

Construct	Code	Order	Type	Items	Key sources
Tourism human resource quality	THRQ	2nd	Formative	5 dimensions	VTOS (2015); ASEAN Tourism Standards; Spencer & Spencer (1993) ^[24]
- Professional knowledge	PK	1st	Reflective	5	Baum (2006) ^[2] ; Kusluvan <i>et al.</i> (2010) ^[18]
- Occupational skills	SK	1st	Reflective	5	Spencer & Spencer (1993) ^[24] ; VTOS (2015)
- Service attitude & conduct	SA	1st	Reflective	4	Karatepe (2013) ^[15] ; Kusluvan <i>et al.</i> (2010) ^[18]
- Foreign language & digital capability	FD	1st	Reflective	4	Baum (2015) ^[3] ; Ministry of CST (2015) ^[19]
- Occupational health & psychological resilience	HP	1st	Reflective	4	Baum (2006) ^[2]
Training and development	TD	1st	Reflective	5	Swanson & Holton (2009) ^[25] ; Khuong <i>et al.</i> (2015) ^[16]
Accumulated education & experience	EE	1st	Reflective	5	Schultz (1961) ^[23] ; Becker (1964) ^[4] ; Study 2
Compensation and incentives	CI	1st	Reflective	4	Khuong <i>et al.</i> (2015) ^[16]
Work environment	WE	1st	Reflective	4	Elshaer <i>et al.</i> (2023) ^[10]
Organisational support	OS	1st	Reflective	5	Eisenberger <i>et al.</i> (1986) ^[9] ; Karatepe (2013) ^[15]
Work motivation	WM	1st	Reflective	4	Ryan & Deci (2000) ^[22]
Job satisfaction	JS	1st	Reflective	4	Nguyen <i>et al.</i> (2025) ^[20]

3.3. Common Method Bias Assessment

Given the cross-sectional, self-report design, the potential for common method bias (CMB) was assessed using Kock's (2015)^[17] full collinearity variance inflation factor (VIF) test. No construct VIF exceeded 3.3 (range: 1.44–2.87), well below the threshold value of 3.3, indicating that CMB does not pose a significant threat to the validity of the findings. As a procedural precaution, the questionnaire incorporated an instructional attention-check item and randomised the presentation order of item blocks across respondents.

4. Results

4.1. Respondent Profile

Of the 385 usable respondents, 54.3% were female. The age

distribution was skewed toward younger workers, with 61.8% aged 22–35 years and 28.6% aged 36–45 years. Educational attainment was concentrated at the vocational certificate and associate degree level (52.7%), reflecting the training infrastructure available in the highland sub-region; 21.8% held a bachelor's degree or higher, and 25.5% held no formal post-secondary qualification. Ethnic minority workers constituted 31.7% of the sample - predominantly Xơ Đăng (12.2%), Ba Na (8.3%) and Hrê (6.5%) - a proportion consistent with provincial demographic data. Mean years of work experience in tourism was 6.3 years (SD = 3.8). Employment was distributed across accommodation (47.5%), tour operations (28.1%) and visitor attraction establishments (24.4%).

Table 2: Respondent demographic profile (*n* = 385)

Characteristic	Category	n	%
Gender	Female	209	54.3
	Male	176	45.7
Age	22–35 years	238	61.8
	36–45 years	110	28.6
	46 years and above	37	9.6
Education	No post-secondary qualification	98	25.5
	Vocational certificate or associate degree	203	52.7
	Bachelor's degree or higher	84	21.8
Ethnicity	Kinh	263	68.3
	Xơ Đăng	47	12.2
	Ba Na	32	8.3
	Hrê	25	6.5
	Other ethnic minority groups	18	4.7
Establishment type	Accommodation	183	47.5
	Tour operations	108	28.1
	Visitor attraction / community tourism village	94	24.4
Work experience	1–3 years	112	29.1
	4–7 years	149	38.7
	8 years and above	124	32.2

4.2. Measurement Model Evaluation

The measurement model was evaluated following the two-stage criteria recommended by Hair *et al.* (2022): internal consistency reliability assessed through Cronbach's alpha and composite reliability (CR); convergent validity assessed through average variance extracted (AVE) and indicator loadings; and discriminant validity assessed through the heterotrait–monotrait ratio (HTMT)

Internal consistency reliability: All constructs achieved Cronbach's alpha values above 0.70 and composite reliability values above 0.80, meeting the accepted thresholds (Hair *et al.*, 2022). Table 3 reports the full reliability statistics.

Convergent validity: All indicator loadings exceeded 0.70,

and all AVE values exceeded 0.50, satisfying Fornell and Larcker's (1981)^[11] convergent validity criterion. The AVE values ranged from 0.512 (FD) to 0.639 (SA), indicating adequate convergent validity across all first-order reflective constructs.

Discriminant validity: The HTMT ratio for all construct pairs fell below the conservative threshold of 0.85 recommended by Henseler *et al.* (2015)^[14], confirming discriminant validity. The highest observed HTMT value was 0.823 (between WM and JS), indicating that while these two mediating constructs are related, they are empirically distinguishable as separate constructs.

Table 3: Measurement model results

Construct	Items	Loadings range	Cronbach's α	CR	AVE
PK	5	0.712–0.821	0.841	0.883	0.601
SK	5	0.724–0.839	0.853	0.891	0.621
SA	4	0.741–0.856	0.847	0.897	0.639
FD	4	0.706–0.798	0.796	0.862	0.512
HP	4	0.718–0.832	0.824	0.877	0.583
TD	5	0.731–0.847	0.862	0.898	0.638
EE	5	0.703–0.824	0.844	0.883	0.601
CI	4	0.719–0.841	0.827	0.882	0.615
WE	4	0.728–0.853	0.839	0.893	0.626
OS	5	0.714–0.838	0.857	0.894	0.627
WM	4	0.734–0.851	0.831	0.886	0.620
JS	4	0.722–0.847	0.826	0.880	0.613

Note. CR = composite reliability; AVE = average variance extracted. All loadings significant at $p < 0.001$.

The second-order formative specification of THRQ was evaluated by examining the outer weights and VIF values of its five component constructs. All five components yielded statistically significant outer weights, and VIF values ranged from 1.23 to 2.14, confirming the absence of multicollinearity among the components and the acceptable formative specification of the second-order construct.

4.3. Structural Model Evaluation

The structural model was evaluated using bootstrapping with 5,000 subsamples following the guidelines of Hair *et al.*

(2022). Model fit was assessed using standardised root mean square residual (SRMR = 0.062, below the threshold of 0.08) and the normed fit index (NFI = 0.921, above the threshold of 0.90), indicating acceptable model fit. The coefficient of determination (R^2) for THRQ was 0.618, indicating that the five determinants and two mediators jointly explain 61.8% of the variance in tourism human resource quality - a satisfactory explanatory power for a complex behavioural outcome construct in a field study context. The R^2 values for work motivation and job satisfaction were 0.531 and 0.497, respectively.

Table 4: Direct effects on tourism human resource quality ($n = 385$)

Hypothesis	Path	β	SE	t-value	p-value	95% CI	Outcome
H1	TD $\rightarrow$ THRQ	0.136	0.047	2.893	0.004	[0.044, 0.228]	Supported
H2	EE $\rightarrow$ THRQ	0.207	0.051	4.059	< 0.001	[0.107, 0.307]	Supported
H3	CI $\rightarrow$ THRQ	0.118	0.044	2.682	0.007	[0.032, 0.204]	Supported
H4	WE $\rightarrow$ THRQ	0.097	0.042	2.310	0.021	[0.015, 0.179]	Supported
H5	OS $\rightarrow$ THRQ	0.143	0.048	2.979	0.003	[0.049, 0.237]	Supported
H14	WM $\rightarrow$ THRQ	0.174	0.053	3.283	0.001	[0.070, 0.278]	Supported
H15	JS $\rightarrow$ THRQ	0.159	0.051	3.118	0.002	[0.059, 0.259]	Supported

Note. β = standardised path coefficient; SE = standard error; CI = bootstrap confidence interval.

Table 5: Direct effects on mediating constructs

Hypothesis	Path	β	SE	t-value	p-value	Outcome
H6	TD $\rightarrow$ WM	0.241	0.058	4.155	< 0.001	Supported
H7	TD $\rightarrow$ JS	0.187	0.054	3.463	0.001	Supported
H8	CI $\rightarrow$ WM	0.289	0.062	4.661	< 0.001	Supported
H9	CI $\rightarrow$ JS	0.214	0.057	3.754	< 0.001	Supported
H10	WE $\rightarrow$ JS	0.253	0.060	4.217	< 0.001	Supported
H11	WE $\rightarrow$ WM	0.198	0.055	3.600	< 0.001	Supported
H12	OS $\rightarrow$ WM	0.267	0.061	4.377	< 0.001	Supported
H13	OS $\rightarrow$ JS	0.231	0.058	3.983	< 0.001	Supported

Table 6: Indirect (mediation) effects via work motivation and job satisfaction

Hypothesis	Indirect path	β	SE	t-value	p-value	95% CI	Outcome
H16	TD $\rightarrow$ WM $\rightarrow$ THRQ	0.042	0.018	2.333	0.020	[0.007, 0.077]	Supported
H17	CI $\rightarrow$ WM $\rightarrow$ THRQ	0.050	0.020	2.500	0.013	[0.011, 0.089]	Supported
H18	OS $\rightarrow$ WM $\rightarrow$ THRQ	0.046	0.019	2.421	0.016	[0.009, 0.083]	Supported
H19	WE $\rightarrow$ JS $\rightarrow$ THRQ	0.040	0.018	2.222	0.027	[0.005, 0.075]	Supported
H20	OS $\rightarrow$ JS $\rightarrow$ THRQ	0.037	0.017	2.176	0.030	[0.004, 0.070]	Supported
-	TD $\rightarrow$ JS $\rightarrow$ THRQ	0.030	0.015	2.000	0.046	[0.001, 0.059]	Significant
-	CI $\rightarrow$ JS $\rightarrow$ THRQ	0.034	0.016	2.125	0.034	[0.003, 0.065]	Significant
-	WE $\rightarrow$ WM $\rightarrow$ THRQ	0.034	0.016	2.125	0.034	[0.003, 0.065]	Significant

Note. Bootstrapping with 5,000 subsamples; two-tailed significance.

To assess the nature of mediation, the ratio of indirect to total effect was calculated for each mediated path. For training and development (total effect = 0.208), the indirect effects via motivation (0.042) and satisfaction (0.030) together constitute 34.6% of the total effect, indicating partial mediation. For compensation and incentives (total effect = 0.202), indirect effects account for 41.6% of the total. For

organisational support (total effect = 0.226), indirect effects account for 36.7%. These results confirm partial mediation throughout, consistent with the expectation that direct effects of organisational practices on worker competence operate concurrently with, but not exclusively through, the motivational and attitudinal pathways.

Table 7: Effect size (f^2) and predictive relevance (Q^2) for key paths

Path / Construct	f^2	Interpretation	Q^2
EE $\rightarrow$ THRQ	0.093	Medium	-
OS $\rightarrow$ THRQ	0.064	Small-medium	-
TD $\rightarrow$ THRQ	0.051	Small	-
WM $\rightarrow$ THRQ	0.078	Small-medium	-
JS $\rightarrow$ THRQ	0.069	Small-medium	-
THRQ (endogenous)	-	-	0.394
WM (endogenous)	-	-	0.302
JS (endogenous)	-	-	0.278

Note. Q^2 values above 0 indicate predictive relevance (Stone-Geisser criterion). Effect size benchmarks: $f^2 \geq 0.02$ small; ≥ 0.15 medium; ≥ 0.35 large (Cohen, 1988) [7].

5. Discussion

5.1. The Dominant Effect of Accumulated Education and Experience

The largest direct effect on tourism human resource quality is produced by accumulated education and experience ($\beta = 0.207$, $f^2 = 0.093$), exceeding training and development ($\beta = 0.136$), organisational support ($\beta = 0.143$) and compensation and incentives ($\beta = 0.118$). This finding is consistent with the predictions of human capital theory regarding the productivity of cumulative knowledge investment (Becker, 1964) [4], but its magnitude and relative ranking require a context-specific interpretation that goes beyond generic human capital arguments.

The companion qualitative study (Study 2) provides the mechanism-level explanation: in the highland Quang Ngai tourism context, the items that empirically drive the accumulated education and experience construct with the highest loadings are not those measuring formal educational attainment (loading = 0.703) but those measuring depth of familiarity with local ethnic cultures (loading = 0.824) and years of residence in the community (loading = 0.798). This loading pattern suggests that the construct is functioning, in this context, as a proxy for indigenous knowledge capital - the form of tacit, community-embedded cultural knowledge that Study 2 identifies as the foundational determinant of distinctive service quality in indigenous tourism destinations. Workers who possess this form of capital - acquired through years of living within and participating in ethnic minority communities - demonstrably deliver a higher quality of cultural tourism experience than workers whose only comparative advantage is a formal qualification with no local cultural content.

This finding has significant methodological implications for future research: the accumulated education and experience construct as typically specified in tourism human resource studies - combining formal educational attainment with years of occupational experience into a single composite - is likely to be conflating two qualitatively different forms of human capital whose effects and development pathways are distinct. Studies in comparable indigenous tourism contexts should consider separating these components into two independently measured constructs to allow their relative contributions to be estimated directly.

5.2. Dual Mediation and the Social Exchange Mechanism

All five mediation hypotheses are supported, and the pattern of mediation results is theoretically coherent in a way that provides convergent support for the social exchange theory account. The indirect effects via work motivation are larger for training and development ($\beta = 0.042$) and compensation and incentives ($\beta = 0.050$) than for work environment, while the indirect effects via job satisfaction are more prominent for work environment ($\beta = 0.040$) and organisational support ($\beta = 0.037$). This differential pattern is interpretively meaningful: training investment and compensation signal to workers that the organisation values their development and rewards their effort, triggering motivational reciprocity (Ryan & Deci, 2000) [22]; work environment quality and organisational support, by contrast, create the conditions for positive affective experience in the job, producing satisfaction-mediated effects on performance quality (Khuong *et al.*, 2015) [16].

The combined indirect effects are not trivial. For compensation and incentives, the total indirect effect (0.084)

exceeds the direct effect (0.118) by a margin that suggests that the motivational and attitudinal pathway is at least as important a transmission mechanism as the direct competence-building effect of higher pay. This has direct managerial implications: compensation reform in highland Quang Ngai tourism enterprises should be understood not only as a labour market competitiveness measure but as a motivational intervention with compounding effects on workforce quality through both the direct incentive channel and the satisfaction-mediated reciprocity channel.

Organisational support produces the largest total effect on tourism human resource quality ($\beta_{\text{total}} = 0.226$), combining a meaningful direct effect ($\beta = 0.143$) with the most diversified mediation pattern in the model - operating through both work motivation and job satisfaction simultaneously. This result is consistent with Eisenberger *et al.*'s (1986)^[9] foundational work on perceived organisational support and Karatepe's (2013)^[15] findings in hospitality contexts, and underscores the critical role of supportive supervisory relationships, access to resources and psychological safety in translating worker capability into sustained performance quality. In the highland Quang Ngai context, where workers - particularly ethnic minority workers - often enter tourism employment with limited formal qualifications and high awareness of their credential disadvantage, the signal of organisational support may carry an additional motivational weight that generic service industry studies in more credentialised environments do not capture.

5.3. The Relatively Weaker Effect of Work Environment

Work environment produces the smallest direct effect ($\beta = 0.097$) of the five determinants, though it remains statistically significant and its total effect ($\beta_{\text{total}} = 0.171$ when indirect effects are included) is materially meaningful. The limited magnitude of the direct effect may reflect the specific physical and social conditions of highland tourism enterprises in the sub-region, where the natural environment itself - rainforest landscapes, traditional village settings, cool highland climate - constitutes a positive contextual feature of the work setting that partially compensates for infrastructural deficiencies in the formal work environment. Workers in community tourism villages and eco-tourism resorts operate in environments that would score poorly on conventional work environment scales designed for urban hotel settings - lacking standardised facilities, career visibility and formal performance management systems - yet may experience those same environments as motivationally positive due to their scenic beauty, communal character and alignment with workers' personal identities.

This finding cautions against the uncritical application of work environment measurement instruments developed for urban hospitality contexts to highland indigenous tourism settings, and reinforces the case for context-specific scale adaptation in future studies.

5.4. Comparison with the Vietnamese and Southeast Asian Literature

The finding that training and development exerts a significant but not dominant direct effect on tourism human resource quality ($\beta = 0.136$) is broadly consistent with studies in urban Vietnamese hospitality contexts (Khuong *et al.*, 2015; Nguyen *et al.*, 2025)^[16, 20], which report similarly sized effects in the range of $\beta = 0.12$ – 0.18 . However, the relatively stronger effect of accumulated education and experience in

the present study, compared with training and development, represents a reversal of the rank ordering typically found in urban hotel studies, where training effects routinely exceed experience effects. This reversal is the clearest quantitative signal that the determinants of tourism human resource quality operate differently in highland indigenous tourism contexts than in urban hospitality environments - a finding that could not have been anticipated from the existing literature and represents a substantive contribution of this study.

The dual mediation finding - that both motivation and satisfaction simultaneously mediate multiple determinant-quality relationships - extends prior Vietnamese tourism studies that tested single mediators. Mai *et al.*'s (2015) study in Ho Chi Minh City hospitality enterprises tested job satisfaction as a single mediator and found indirect effects consistently exceeding direct effects; the present study refines this finding by showing that motivation and satisfaction function as parallel pathways rather than substitutes, and that their relative importance varies across determinants in interpretively predictable ways.

6. Conclusions, Implications and Limitations

6.1. Conclusions and Scholarly Contributions

This study establishes and empirically validates a structural model of tourism human resource quality determinants grounded in the specific organisational and cultural context of highland indigenous tourism in the mountainous areas of Quang Ngai Province. The model explains 61.8% of the variance in tourism human resource quality, all five proposed determinants are supported, both mediating constructs are confirmed as active transmission mechanisms, and all 20 hypotheses receive empirical support. The study makes four primary scholarly contributions.

First, it provides the first empirically tested structural model of tourism human resource quality determinants specific to the highland Quang Ngai sub-region, filling the most direct research gap identified in the dissertation's literature review. Second, the reversal of the typical rank ordering between training effects and experience effects - with accumulated education and experience producing the largest direct effect - constitutes a substantive empirical finding that cannot be explained by generic human capital theory alone and requires the mechanism-level interpretation supplied by the companion qualitative study. Third, the dual mediation architecture - demonstrating that work motivation and job satisfaction operate as parallel, not redundant, mediation pathways - advances the Vietnamese tourism human resource literature beyond single-mediator studies. Fourth, the convergence of the quantitative and qualitative findings provides an integrated explanatory account of workforce quality determinants in indigenous tourism destinations that neither study alone could deliver.

6.2. Implications for Human Resource Management in Highland Indigenous Tourism

For enterprise management: Organisational support emerges as the determinant with the largest total effect on workforce quality. Management teams in highland tourism enterprises should prioritise the cultivation of supportive supervisory relationships, transparent communication about performance expectations and systematic provision of the resources - including time, access to equipment and managerial guidance - that workers need to deliver quality

cultural tourism experiences. The cost of these measures is low relative to their structural importance: supportive management is not primarily a budgetary commitment but a behavioural and cultural one.

Compensation and incentive structures should be redesigned to function not merely as retention tools but as motivational signals. The finding that compensation produces its largest effect on workforce quality through the motivational mediation pathway - rather than directly - suggests that the design of compensation systems matters as much as their absolute level. Performance-related components that recognise cultural knowledge demonstration, indigenous interpretation quality and visitor satisfaction with cultural experience content would direct motivational energy toward the specific competencies that differentiate highland indigenous tourism quality.

For training institutions: The finding that training and development produces a smaller direct effect than accumulated education and experience is not a justification for reduced training investment; it is a diagnosis that current training is not well targeted. Training content for highland Quang Ngai tourism workers should be redesigned to build systematically on indigenous knowledge capital rather than replicating urban hospitality curricula. This requires structured partnerships with ethnic minority communities, integration of local elders and cultural custodians as knowledge contributors to training programmes, and the development of indigenous interpretation modules tailored to the specific ethnic cultural resources of the sub-region.

For provincial policy: The provincial tourism development authority should establish a Recognition of Prior Learning pathway that allows workers with demonstrable indigenous cultural knowledge - as measured through direct assessment of cultural competence, not proxied through formal credentials - to obtain occupational certification. This reform addresses the equity dimension of the current credentialisation system, which systematically disadvantages the workers with the richest indigenous knowledge, and reduces the attrition of precisely this category of worker from the formal tourism labour market.

6.3. Limitations and Directions for Future Research

Four limitations merit acknowledgement. First, the cross-sectional design precludes causal inference; longitudinal or quasi-experimental designs would be required to establish causal ordering with confidence. Second, the accumulated education and experience construct, as specified in this study, bundles formal human capital with indigenous knowledge capital into a single composite, meaning that the estimated effect of 0.207 reflects their combined contribution without separating them. Future research should develop a standalone indigenous cultural competence scale - whose conceptual architecture has been established by Study 2 - and integrate it as an independent construct in the structural model. Third, the sample is limited to formal enterprise employees, excluding community members who participate in informal homestay and traditional craft demonstration activities; these informal workers may constitute a strategically important segment whose determinant profile differs from the formal workforce modelled here. Fourth, the cross-sectional snapshot may not fully capture the seasonal dynamics of highland tourism, where workforce quality challenges are likely to be most acute and motivationally most demanding during peak visitor periods.

Future research should pursue longitudinal panel designs to track workforce quality improvement following specific organisational interventions; develop a validated scale for indigenous cultural competence; extend the model to informal community-based tourism workers; and conduct multi-province comparative studies across the Central Highlands territories to test the contextual generalisability of the reversal finding.

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