

Servant Leadership, Job Satisfaction and Organizational Commitment: Evidence from Guangxi Private Universities

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Received	Revised	Accepted	Published
25 February 2026	20 May 2026	31 May 2026	30 June 2026

ABSTRACT

Employee job satisfaction and organizational commitment are vital to workforce stability and service quality in Guangxi's private universities. In this context, limited resources and heightened performance demands increase the importance of effective leadership. Drawing on self-determination theory and social exchange theory, this study examines how servant leadership influences these work attitudes through employee motivation (Deci & Ryan, 2000; Blau, 1964). Data were collected through a cross-sectional survey of academic and administrative staff ($n = 327$). The proposed mediation model was analyzed using PLS-SEM in SmartPLS with bootstrapping procedures (Hair et al., 2024). Harman's single-factor test suggested that common method bias was not a major concern, as the first factor explained 22.66% of the variance (Kock, 2021). The results supported all hypothesized direct effects: servant leadership positively predicted employee motivation, job satisfaction, and organizational commitment, and employee motivation positively predicted job satisfaction and organizational commitment. Bootstrapped mediation analyses further demonstrated significant indirect effects of servant leadership on job satisfaction and organizational commitment via employee motivation. The model accounted for substantial variance in job satisfaction ($R^2 = 0.638$) and organizational commitment ($R^2 = 0.586$) and showed positive predictive relevance for endogenous constructs ($Q^2 > 0$). Overall, the findings provide mechanism-based evidence that employee motivation is a key pathway through which servant leadership enhances important work outcomes in Guangxi private universities, with practical implications for leadership development and human resource management.

Keywords: *Servant leadership; employee motivation; job satisfaction; organizational commitment; private universities; PLS-SEM*

How to Cite:

Yang, W., Saludin, M. N., Kaur, K., & Omar, M. (2026). Servant leadership, job satisfaction, and organizational commitment: evidence from Guangxi private universities. *The Asian Journal of Professional & Business Studies*, 7(1), 34–53. <https://doi.org/10.61688/ajpbs.v7i1.503>

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1. INTRODUCTION

1.1 Research background and practical significance

Private higher education has expanded rapidly in China, creating a distinctive organizational context where institutions must pursue educational quality while operating under tight resource constraints, market competition, and rising performance expectations. In Guangxi, private universities often face practical challenges in sustaining stable and capable workforces, especially when staff undertake multiple roles and must respond to intensified teaching, administrative, and service demands. Under these conditions, leadership becomes a central managerial lever because day to day supervisory behaviours shape how employees interpret organizational support, fairness, and development opportunities. Servant leadership is particularly relevant in this setting because it emphasizes prioritizing employees' growth and wellbeing, listening and empowering, and aligning leadership with service and stewardship values (van Dierendonck & Nuijten, 2011). Recent research continues to show that servant leadership tends to be associated with a broad set of positive employee outcomes, including improved wellbeing, satisfaction, and stronger psychological connections with the organization (Bai et al., 2023; Coun et al., 2023; Ouyang et al., 2025).

Among the many outcomes linked to leadership, job satisfaction and organizational commitment are especially high value indicators for private universities. Job satisfaction reflects employees' overall evaluation of their job experiences and signals whether daily work conditions are perceived as supportive and meaningful (Spector, 1997). Organizational commitment captures employees' psychological attachment and willingness to remain and invest effort in the organization, which is critical for workforce stability and institutional continuity (Meyer & Allen, 1991). In educational organizations, the consequences of low satisfaction and weak commitment are not limited to turnover risk. They can also translate into reduced discretionary effort, weaker service quality, and disruptions to core teaching and administrative processes. Therefore, understanding how leadership behaviours translate into these two attitudes has clear managerial relevance for Guangxi private universities that aim to maintain stable operations and quality outcomes with constrained resources.

1.2 Theoretical gap and problem statement

Although servant leadership is widely studied and generally linked to favourable employee attitudes, two limitations remain salient for both scholarship and practice. First, a significant share of prior work has focused on establishing that servant leadership is associated with desirable outcomes, while providing less clarity on how these effects unfold through specific psychological mechanisms. In other words, servant leadership is often treated as a beneficial input, yet the internal processes that convert servant-oriented behaviours into satisfaction and commitment are not always explicitly tested. This mechanism gap matters because managers need actionable levers, not only evidence that a leadership style correlates with outcomes. If organizations can identify the psychological pathway through which servant leadership operates, they can target leadership development and human resource practices toward that pathway.

Second, the context of Guangxi private universities remains underrepresented in the servant leadership literature. While servant leadership research has grown across industries and countries, the private higher education sector in China presents a distinctive combination of mission driven goals, performance pressures, and human resource constraints. Evidence generated from other contexts cannot be assumed to generalize fully to Guangxi private universities, where employees' expectations, institutional governance, and resource conditions may differ. A growing stream of research calls for more context sensitive tests and mechanism-based explanations of servant leadership effects, including studies grounded in specific cultural and organizational settings (Bai et al., 2023; Ouyang et al., 2025). Addressing these gaps requires a model that does not merely reaffirm positive associations but explains how servant leadership translates into key work attitudes in this particular higher education environment.

1.3 Research objectives and research questions

To respond to these gaps, this study develops and tests a mechanism-based model in which servant leadership shapes job satisfaction and organizational commitment directly and indirectly through employee motivation in Guangxi private universities. Employee motivation is a theoretically plausible mediator because it represents a proximal psychological driver of how employees engage with their work, interpret job demands, and evaluate their employment relationship. Recent motivation research emphasizes that motivation is not only a matter of intensity but also of quality, reflecting the extent to which employees internalize goals and experience autonomy, competence, and relatedness in the work environment (Deci & Ryan, 2000; Trépanier et al., 2023). Servant leaders are expected to foster such conditions by supporting development, granting

autonomy, and demonstrating genuine concern, thereby strengthening motivational states that translate into more favourable attitudes toward the job and the organization.

Accordingly, this study addresses the following research question: How does servant leadership translate into job satisfaction and organizational commitment through employee motivation among employees in Guangxi private universities? This question is examined through a mediation framework that integrates self-determination theory and social exchange theory. From a self-determination perspective, servant leadership can satisfy employees' psychological needs and enhance autonomous forms of motivation, which are strongly linked to positive work attitudes (Deci & Ryan, 2000; Jiang & Wei, 2024). From a social exchange perspective, servant leaders provide support and fair treatment that employees may reciprocate through more positive evaluations of their jobs and stronger attachment to the organization (Blau, 1964; Bai et al., 2023).

1.4 Contributions of the study

This study makes three contributions that align with mechanism-based leadership research and the practical needs of private higher education management. First, it contributes theoretically by clarifying employee motivation as a central pathway through which servant leadership translates into job satisfaction and organizational commitment. While prior research has examined various mediators such as psychological safety and burnout, motivation remains a particularly fundamental mechanism because it directly shapes employees' engagement, persistence, and affective evaluation of work (Bai et al., 2023; Trépanier et al., 2023). By testing motivation as the mediator, this study helps open the black box between servant leadership and employee attitudes and links servant leadership more directly to well-established motivational theory.

Second, it contributes contextually by providing evidence from Guangxi private universities, a setting that remains underexamined in the servant leadership literature. Demonstrating the relationships among servant leadership, motivation, satisfaction, and commitment within this environment extends empirical understanding to a region and sector where leadership practices must function under constrained resources and high performance expectations. Recent work highlights the need to evaluate servant leadership in specific occupational contexts, including educational settings, to strengthen generalizability and to identify context-dependent managerial implications (Coun et al., 2023; Ouyang et al., 2025).

Third, the study offers practical contributions by translating statistical relationships into actionable guidance for leadership development and human resource management. If employee motivation is a key transmission mechanism, then leadership interventions should focus on behaviours that support autonomy, competence, and relatedness, such as empowering employees, providing developmental feedback, and demonstrating consistent care and fairness. These behaviours are central to servant leadership and are likely to be feasible even in resource-constrained environments because they rely more on relational and managerial practices than on costly incentives. In this way, the study provides a clear managerial lever for improving satisfaction and commitment in Guangxi private universities through leadership behaviour that strengthens motivational states (Jiang & Wei, 2024; van Dierendonck et al., 2024).

1.5 Structure of the paper

The remainder of this paper reviews the relevant literature and develops hypotheses regarding the relationships among servant leadership, employee motivation, job satisfaction, and organizational commitment. It then outlines the methodology and analytical procedures, presents the empirical results from the PLS-SEM analyses, discusses the theoretical and practical implications, and concludes by noting the study's limitations and suggesting directions for future research.

2. LITERATURE REVIEW

2.1 Job satisfaction and organizational commitment

Job satisfaction and employee organizational commitment are two central indicators of employees' work attitudes and are particularly consequential in education organizations where service quality depends heavily on sustained human interaction and professional effort. Job satisfaction refers to employees' overall evaluative judgment about their work experiences, reflecting whether day-to-day tasks, interpersonal relations, and organizational practices are perceived as rewarding and acceptable (Spector, 1997). In private universities, job satisfaction is often closely linked to retention intentions, discretionary effort, and service orientation, because employees' satisfaction shapes how they engage with students, colleagues, and

administrative responsibilities. Even when employees remain employed, low satisfaction can reduce enthusiasm and cooperation and can weaken the quality of educational services that rely on consistent effort across teaching and support functions.

Organizational commitment reflects employees' psychological attachment to the organization and their willingness to maintain membership and contribute to organizational goals (Meyer & Allen, 1991). For private universities, commitment is not only a desirable employee state but also an operational necessity. Higher commitment helps stabilize staffing in environments where recruitment and replacement can be costly and disruptive, and where institutional reputation and student experience depend on continuity in teaching and administrative services. In education settings, commitment is also associated with stronger alignment to institutional missions and a greater willingness to invest in long term development, which supports quality assurance and organizational learning. For these reasons, job satisfaction and organizational commitment provide high value outcome indicators for examining leadership effects in Guangxi private universities.

Recent servant leadership research continues to treat satisfaction and commitment as key downstream outcomes because they capture how employees evaluate the employment relationship and how strongly they identify with the organization (Coun et al., 2023; Ouyang et al., 2025). However, in many studies these outcomes are examined as endpoints without fully specifying the psychological processes that convert leadership behaviours into sustained positive attitudes. This gap is especially relevant in private universities where employees face workload intensity and performance demands, and where leadership must translate values and support into daily motivational energy that underpins satisfaction and commitment.

2.2 Servant leadership

Servant leadership is a people-centered leadership approach defined by a leader's orientation toward serving followers, prioritizing their development and wellbeing, and acting with humility and stewardship (Greenleaf, 1977; van Dierendonck & Nuijten, 2011). In contrast to leadership styles that emphasize authority or transactional exchange, servant leadership focuses on empowering followers, providing individualized support, fostering growth, and building a supportive climate. In organizational settings, servant leadership is often operationalized through behaviours such as listening, empowering, helping followers develop, and demonstrating ethical and caring conduct (van Dierendonck & Nuijten, 2011).

The relevance of servant leadership to private higher education stems from the strong relational and developmental needs that characterize educational work. Employees in universities frequently manage complex interpersonal demands, balancing teaching quality, administrative tasks, and service roles. Servant leaders can strengthen employees' perceptions of respect and support and can reduce relational friction by communicating care and fairness. Empirically, recent studies show that servant leadership is associated with improved job satisfaction across diverse employee groups and communication contexts, highlighting the importance of supportiveness and relational quality for satisfaction (Coun et al., 2023). In China, evidence also indicates that servant leadership can shape employee attitudes through psychological processes such as psychological safety and reduced burnout, implying that servant leadership functions as a resource that buffers strain and supports positive attachment (Bai et al., 2023).

Servant leadership may influence employee attitudes in private universities through both immediate and sustained channels. Immediately, servant-oriented behaviours can improve daily interactions and perceptions of fairness and recognition, which are foundational for satisfaction. Over time, servant leadership can strengthen employees' sense of belonging and alignment with institutional goals, supporting commitment. A growing stream of recent work emphasizes that servant leadership fosters meaningfulness, positive affective states, and high-quality engagement experiences, suggesting that servant leadership can produce an upward spiral of positive work attitudes (van Dierendonck et al., 2024). In education and teacher related contexts, systematic evidence similarly suggests that servant leadership is beneficial for teacher outcomes, reinforcing the relevance of servant leadership for educational organizations (Ouyang et al., 2025).

Despite these positive associations, a persistent issue is that many studies establish relationships between servant leadership and attitudes without identifying the most proximal mechanism that translates servant leadership into both satisfaction and commitment. For private universities facing resource constraints, it is important to identify an internal pathway that can be strengthened through leadership practices and organizational systems. This motivates a focus on employee motivation as a central mediating mechanism.

2.3 Mediating mechanism: Employee motivation

Employee motivation is widely understood as a proximal driver of how employees allocate effort, persist in the face of challenges, and interpret job experiences. Motivation influences both performance-related behaviours and evaluative attitudes because it shapes whether employees experience work as meaningful, self-endorsed, and worthwhile. Modern motivation research highlights that motivation differs not only in strength but also in quality, including the extent to which motivation is autonomous and internally endorsed rather than purely controlled by external pressures (Deci & Ryan, 2000; Trépanier et al., 2023). When employees perceive their work goals as internalized and aligned with personal values, they are more likely to experience positive affect and satisfaction and to develop stronger organizational attachment.

In higher education settings, motivation is particularly important because employees often face nonroutine demands and must sustain effort across periods of workload intensity. For private universities, where material resources and formal incentives may be constrained, motivation can become an especially influential determinant of whether employees remain psychologically engaged and satisfied. Motivation can also shape commitment by strengthening employees' sense of purpose and by supporting alignment between personal and organizational goals. Recent validation work on multidimensional work motivation underscores the importance of measuring motivation carefully and treating it as a mechanism that links organizational conditions to outcomes (Trépanier et al., 2023).

Employee motivation is theoretically well suited as a mediator between servant leadership and work attitudes. Servant leadership is fundamentally oriented toward fulfilling followers' developmental needs, granting autonomy, and recognizing employees' contributions. These behaviours should improve the quality of employees' motivation by supporting psychological needs and by strengthening internalization of work goals. As motivation becomes stronger and more self-endorsed, employees are more likely to evaluate their jobs positively and to develop a stronger psychological bond with the organization. Thus, motivation provides a clear transmission channel through which servant leadership can translate into both job satisfaction and organizational commitment.

2.4 Theoretical lens and mechanism explanation

Drawing on self-determination theory, this study explains the process through which servant leadership may improve job satisfaction and organizational commitment by first enhancing employee motivation. Self-determination theory argues that employees develop higher-quality motivation when their work settings satisfy the basic psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 2000; Deci et al., 2017). Servant leaders are well positioned to create such conditions: they can increase autonomy by sharing authority and inviting participation in decisions, strengthen competence by offering coaching, feedback, and developmental opportunities, and nurture relatedness through authentic care and respectful interpersonal treatment. Satisfaction of these needs encourages employees to internalize work goals and experience their roles as meaningful and self-congruent, which in turn tends to raise job satisfaction and deepen organizational commitment. Consistent with this self-determination logic, recent research on servant leadership has identified need-supportive leadership as a key route to positive employee states, particularly via autonomy support and growth-oriented experiences (Jiang & Wei, 2024; van Dierendonck et al., 2024).

Social exchange theory offers a complementary mechanism that emphasizes reciprocity in relationships. Social exchange theory suggests that employees respond to supportive and fair treatment by reciprocating with positive attitudes and behaviours toward the organization and its representatives (Blau, 1964). Servant leaders who demonstrate care, ethical conduct, and support can signal that the organization values employees' wellbeing, which strengthens perceived obligation and fosters positive evaluations. In this view, servant leadership creates social resources and relational trust that employees repay through stronger job satisfaction and organizational commitment. Empirical evidence in China indicates that servant leadership is linked to commitment through psychological and relational processes, consistent with exchange-based explanations (Bai et al., 2023). Similarly, research on job satisfaction shows that servant leadership supportiveness and communication practices can improve satisfaction, reinforcing the importance of relational exchange pathways (Coun et al., 2023).

Together, self-determination theory and social exchange theory suggest a coherent mechanism chain. Servant leadership provides need supportive and relationally supportive experiences, these experiences strengthen employee motivation as a proximal psychological driver, and motivation then translates into more favourable work attitudes, including job satisfaction and organizational commitment. This integrated mechanism perspective motivates the research framework and the hypotheses developed below.

2.5 Research framework and hypotheses development

Servant leadership and employee motivation. Because servant leaders focus on followers' development and well-being, they tend to create climates characterized by empowerment, participation, and developmental support. Self-determination theory suggests that these need-supportive conditions foster goal internalization and higher-quality motivation, increasing employees' willingness to expend effort and align with work objectives (Deci & Ryan, 2000; Deci et al., 2017). Empirical work further shows that servant leadership is linked to more positive employee states via growth-oriented experiences, consistent with the proposition that motivation improves under servant-oriented leadership (Jiang & Wei, 2024). Thus, servant leadership is expected to positively predict employee motivation.

H1: Servant leadership is positively related to employee motivation.

Servant leadership and job satisfaction. Servant leadership is also likely to enhance job satisfaction by shaping everyday exchanges at work, including supportive communication, appropriate recognition, and fairness-related signaling. Social exchange theory argues that employees reciprocate supportive and ethical treatment with more favorable job evaluations, which is reflected in higher satisfaction (Blau, 1964; Coun et al., 2023). Moreover, by fostering meaningfulness and more positive work experiences, servant leadership can strengthen satisfaction as a global appraisal of the job (van Dierendonck et al., 2024). Accordingly, servant leadership is expected to be positively associated with job satisfaction.

H2: Servant leadership is positively related to job satisfaction.

Servant leadership and organizational commitment. Beyond its effects on satisfaction, servant leadership is likely to strengthen organizational commitment by shaping relationship-based resources such as trust and perceived support, and by signaling that employees are respected and appreciated. Evidence from China links servant leadership to commitment outcomes through psychological mechanisms reflecting greater relational security and lower strain, which can increase employees' attachment and intention to stay (Bai et al., 2023). Similar patterns have been observed in educational settings, where servant-oriented leadership among teachers is associated with a stronger psychological connection to the organization (Ouyang et al., 2025). Hence, servant leadership is expected to positively predict organizational commitment.

H3: Servant leadership is positively related to organizational commitment.

Employee motivation and job satisfaction. Employee motivation is a near-term driver of employees' day-to-day work experience. When employees feel autonomously motivated and endorse their reasons for working, they tend to appraise job demands as meaningful and to report greater satisfaction with their roles and work environment (Deci & Ryan, 2000; Trépanier et al., 2023). This logic is particularly relevant in contexts with limited extrinsic rewards, where motivational quality becomes central to sustaining positive job evaluations. Accordingly, employee motivation is expected to positively predict job satisfaction.

H4: Employee motivation is positively related to job satisfaction.

Employee motivation and organizational commitment. Motivation may also deepen organizational commitment by promoting value congruence and encouraging continued investment in the employment relationship. From a self-determination perspective, satisfaction of basic needs and autonomous motivation support the internalization of organizational values, which can develop into stronger organizational attachment (Deci et al., 2017). Within private universities, such motivational processes may be especially consequential for whether employees remain psychologically committed to the institution. Therefore,

employee motivation is expected to be positively related to organizational commitment.

H5: Employee motivation is positively related to organizational commitment.

The mediating role of employee motivation. Taken together, the preceding discussion suggests that employee motivation functions as the key transmission mechanism through which servant leadership shapes job satisfaction and organizational commitment. By providing both need-supportive and relationship-enhancing experiences, servant leadership is likely to elevate employees' motivation; in turn, motivation influences how employees evaluate their jobs and the extent to which they feel attached to the organization (Blau, 1964; Deci & Ryan, 2000). Compared with mediators emphasized in earlier studies—such as psychological safety or burnout—motivation captures a more basic and proximal process that can account for servant

leadership effects on multiple attitudinal outcomes concurrently (Bai et al., 2023). Accordingly, employee motivation is expected to mediate the associations between servant leadership and both outcomes.

H6: Employee motivation mediates the relationship between servant leadership and job satisfaction.

H7: Employee motivation mediates the relationship between servant leadership and organizational commitment.

2.6 Conceptual model figure

Figure 1:

Illustrates the interactions of the independent variable, the mediating variable, the dependent variable, and the research hypotheses

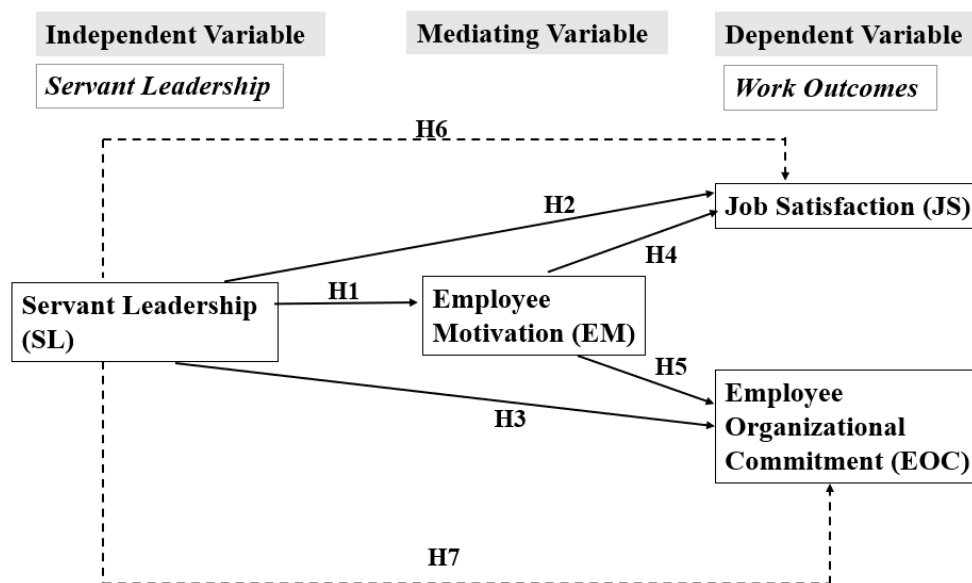


Figure 1 presents the proposed research model. Servant leadership is specified as the antecedent, employee motivation as the mediating mechanism, and job satisfaction and organizational commitment as the two work attitude outcomes. Direct paths from servant leadership to both outcomes are retained to assess whether motivation explains the relationships fully or partially. This model enables a simultaneous test of direct effects and mediation effects within the Guangxi private university context.

3. METHODOLOGY

3.1 Sample and data collection

This study employed a quantitative, cross sectional research design to examine how servant leadership translates into job satisfaction and organizational commitment through employee motivation among employees in Guangxi private universities. A survey approach was appropriate because the focal constructs represent perceptual and attitudinal variables that are commonly assessed through standardized self-report measures in organizational research, and because the study aimed to test a theoretically specified mediation model using variance based structural equation modelling procedures (Hair et al., 2024; Guenther et al., 2023).

Data were collected from academic and administrative staff working in 12 private universities in Guangxi. The sampling strategy followed a proportional quota approach at the institutional level to ensure representation across participating universities with different staff sizes. The overall staff population across the 12 institutions was 8,639, and a target sample size

of 368 was estimated to support model testing. The field implementation followed the stratified by institution allocation to distribute responses across universities in proportion to staff size, and the institutional allocation plan is provided in Online Appendix Table A1. The survey was administered online using Wenjuanxing, which facilitated broad access across institutions and reduced administrative burden during fieldwork.

Prior to the main fieldwork, the questionnaire underwent a pilot study to refine wording and assess preliminary internal consistency. The pilot sample included 55 respondents, and the pilot results indicated strong internal consistency for all constructs, supporting the instrument's readiness for the main study. During the main data collection, the survey invitation was distributed with an informed consent statement that emphasized voluntary participation, anonymity, and the absence of right or wrong answers. These procedural remedies are recommended for reducing social desirability pressures and method-related biases in single-source survey designs (Podsakoff et al., 2003).

The main data collection was conducted between 1 December 2024 and 28 February 2025. A total of 445 questionnaires were returned. Data screening was then conducted to ensure quality and eligibility for analysis, including checks for missing values and response patterns. After screening and cleaning, 327 usable responses were retained for model estimation. The demographic and professional characteristics of the final sample are summarized in Table 1. This final sample size exceeded minimum requirements commonly suggested for PLS SEM studies with comparable model complexity and enabled stable bootstrapping-based inference for direct and indirect effects (Hair et al., 2024; Sarstedt et al., 2022).

Table 1:
Sample Profile of Respondents (n = 327)

Variable	Category	N	%
Gender	Female	158	48.32
	Male	169	51.68
Age group	30 and below	115	35.17
	31–40	140	42.81
	41–50	57	17.43
	51 and above	15	4.59
Educational level	Bachelor's degree	84	25.69
	Master's degree	188	57.49
	Doctorate (PhD)	52	15.90
	Other	3	0.92
Work experience in higher education (years)	1–3	116	35.47
	4–6	115	35.17
	7–10	53	16.21
	More than 10	43	13.15
Current position	Teaching assistant	65	19.88
	Lecturer	168	51.38
	Associate professor	49	14.98
	Professor	29	8.87
	Unrated	15	4.59
	Other	1	0.31
Primary job type	Teaching and research position	218	66.67
	Administrative position	109	33.33
Institution (anonymized)	Institution A	58	17.74
	Institution B	31	9.48
	Institution C	21	6.42
	Institution D	18	5.50
	Institution E	34	10.40
	Institution F	18	5.50
	Institution G	18	5.50
	Institution H	20	6.12
	Institution I	27	8.26
	Institution J	16	4.89
	Institution K	17	5.20
	Institution L	49	14.98

Note: Institutions were anonymized to protect confidentiality. Percentages may not sum to 100 due to rounding.

3.2 Measures

The key study variables were operationalized with established, validated instruments, with minor adaptations made to ensure contextual appropriateness. Participants indicated their agreement using a seven-point Likert-type response format (1 = strongly disagree, 7 = strongly agree). The survey operationalized four reflective latent constructs, servant leadership, employee motivation, job satisfaction, and employee organizational commitment, and also collected demographic information to profile the respondents.

Servant leadership was measured with 11 items adapted from the Servant Leadership Survey, which captures service orientation, empowerment, and follower development behaviours (van Dierendonck & Nuijten, 2011). Employee motivation was assessed with six items adapted from recent empirical work that operationalized motivation as a proximal driver of employee effort and engagement in organizational settings (Wardiansyah et al., 2024). Job satisfaction was measured with six items adapted from Spector's job satisfaction framework, which has been widely applied in service and education related occupations where attitudinal outcomes are consequential for performance and retention (Spector, 1997). Employee organizational commitment was measured with six items reflecting employees' psychological attachment to the organization, grounded in the organizational commitment tradition emphasizing employee identification and willingness to remain (Meyer & Allen, 1991).

Because the study was implemented in a Chinese language context while drawing on English language scales, the instrument was translated using a translation and back translation procedure, followed by bilingual review to ensure semantic equivalence and contextual appropriateness. Back translation remains a widely accepted method for strengthening cross language comparability when instruments are adapted across languages (Brislin, 1970). Recent guidance on questionnaire translation similarly emphasizes careful attention to meaning, response options, and cultural appropriateness to protect construct validity during translation and adaptation (Behr, 2023). Documentation of the translation confirmation and the full questionnaire is available in the study appendices.

3.3 Data analysis

To test the proposed mediation framework, we employed partial least squares structural equation modeling (PLS-SEM) in SmartPLS and relied on bootstrapping to derive inferential statistics. This approach is appropriate for predictive models that include several endogenous constructs and for mediation testing when indirect effects are of primary interest, particularly in applied settings where multivariate normality is not guaranteed (Hair et al., 2024; Guenther et al., 2023). Reporting followed contemporary guidance for PLS-SEM studies in business and management research (Sarstedt et al., 2022).

Model evaluation followed a staged procedure. In Step 1, the measurement model was scrutinized before testing hypotheses. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability. Convergent validity was established by inspecting item loadings and the average variance extracted (AVE). Discriminant validity was evaluated using the heterotrait-monotrait (HTMT) ratio, a recommended criterion for variance-based SEM because it detects discriminant validity problems more sensitively than many traditional checks (Henseler et al., 2015).

In Step 2, the structural model was assessed to examine the hypothesized direct paths. We estimated standardized path coefficients and evaluated their significance with bootstrapped confidence intervals and t-statistics. The model's explanatory performance was assessed using R^2 values for employee motivation, job satisfaction, and organizational commitment, whereas out-of-sample predictive relevance was examined through Q^2 . Finally, we computed f^2 effect sizes to determine the relative importance of each predictor for the endogenous constructs, consistent with established PLS-SEM reporting conventions (Hair et al., 2024; Sarstedt et al., 2022).

In Step 3, mediation hypotheses were tested by estimating the indirect effects of servant leadership on job satisfaction and organizational commitment through employee motivation. Indirect effects were evaluated using bootstrapped confidence intervals because this approach does not rely on normality assumptions and provides a direct assessment of mediation strength and uncertainty (Hair et al., 2024). This staged approach ensured that conclusions about the structural relationships were grounded in a validated measurement model and supported by appropriate inferential procedures for both direct and indirect pathways.

4. FINDINGS

4.1 Common method bias test

Given that servant leadership, employee motivation, job satisfaction, and organizational commitment were measured from the same respondents using a single, cross-sectional survey, the possibility of common method bias was evaluated (Podsakoff et al., 2003). We applied Harman's single-factor test by conducting an unrotated exploratory factor analysis. The analysis produced multiple factors, with the largest factor accounting for 22.66% of the overall variance. As this value falls well below the frequently cited 50% cutoff, the results suggest that common method bias is unlikely to materially compromise the study's validity (Kock, 2021). The detailed Harman's single-factor results are reported in Table 2.

Table 2:
Harman's Single-Factor Analysis

Component	Initial Eigenvalues	
	Total	% of Variance
1	15.61	22.66
2	8.97	14.34
3	4.67	6.27
4	3.22	5.427

4.2 Measurement model assessment

The measurement model was evaluated prior to hypothesis testing to ensure that conclusions about the structural relationships were grounded in reliable and valid measurement (Hair et al., 2024; Sarstedt et al., 2022). Indicator reliability was assessed through outer loadings. Most indicators loaded above 0.50, supporting acceptable indicator performance. One job satisfaction indicator (JS1) showed a lower loading of 0.444. This indicator was retained because the job satisfaction construct demonstrated strong construct-level reliability and convergent validity, and the item contributed to content coverage. In PLS SEM applications, retaining an indicator with a loading slightly below conventional cutoffs can be justified when construct-level metrics remain robust and theoretical coverage would be reduced by deletion (Hair et al., 2024).

Internal consistency reliability was assessed using Cronbach's alpha and composite reliability. All constructs exceeded the commonly accepted threshold of 0.70 for both indices. Specifically, servant leadership demonstrated Cronbach's alpha of 0.899 and composite reliability of 0.916. Employee motivation demonstrated Cronbach's alpha of 0.936 and composite reliability of 0.951. Job satisfaction demonstrated Cronbach's alpha of 0.870 and composite reliability of 0.905. Organizational commitment demonstrated Cronbach's alpha of 0.898 and composite reliability of 0.922. These values indicate strong reliability for all latent variables.

Convergent validity was evaluated using average variance extracted. All constructs met the recommended criterion of 0.50 or above. Servant leadership showed AVE of 0.502, employee motivation showed AVE of 0.764, job satisfaction showed AVE of 0.621, and organizational commitment showed AVE of 0.666. Taken together, the indicator loadings pattern and the construct level reliability and AVE statistics provide evidence that the measures are sufficiently reliable and capture the intended constructs. Table 3 reports the key measurement model statistics for each construct, including the number of items, indicator loadings range, internal consistency reliability (Cronbach's alpha and composite reliability), and convergent validity (average variance extracted).

Table 3: *Measurement Model Reliability and Convergent Validity Statistics*

Construct	No. of items	Indicator loadings (range)	Cronbach's alpha	Composite reliability (CR)	AVE
Servant leadership	11	0.561 to 0.817	0.899	0.916	0.502
Employee motivation	6	0.702 to 0.917	0.936	0.951	0.764

Job satisfaction	6	0.444 to 0.873	0.870	0.905	0.621
Employee organizational commitment	6	0.614 to 0.892	0.898	0.922	0.666

Note: Indicator loadings refer to outer loadings of retained items in the measurement model. CR refers to composite reliability. AVE refers to average variance extracted. Servant leadership, employee motivation, job satisfaction, and employee organizational commitment were measured using multi item reflective indicators.

4.3 Discriminant validity

Discriminant validity was assessed using the heterotrait monotrait ratio, which is widely recommended for PLS SEM because it provides a sensitive evaluation of whether constructs are empirically distinct (Henseler et al., 2015). All HTMT values were below 0.85, supporting discriminant validity. The largest HTMT value was observed between employee motivation and job satisfaction (HTMT = 0.836), which remained below the threshold and is consistent with the theoretical expectation that motivation is closely related to satisfaction while still representing a distinct construct. Other HTMT values were lower, including the relationships involving servant leadership. Overall, these results indicate that the four constructs capture conceptually different phenomena and that the measurement model is appropriate for testing the hypothesized structural relationships. Table 4 presents the heterotrait–monotrait (HTMT) ratios used to assess discriminant validity among the four latent constructs.

Table 4: *HTMT Discriminant Validity Results*

Construct	EM	EOC	JS	SL
EM	—			
EOC	0.804	—		
JS	0.836	0.740	—	
SL	0.542	0.547	0.629	—

Note: HTMT = heterotrait–monotrait ratio. EM = employee motivation; JS = job satisfaction; EOC = employee organizational commitment; SL = servant leadership. Discriminant validity is supported when HTMT values are below the recommended threshold (e.g., 0.85).

4.4 Structural model and hypothesis testing

After establishing measurement adequacy, the structural model was assessed to test the hypothesized relationships among servant leadership, employee motivation, job satisfaction, and organizational commitment. Significance testing relied on bootstrapping procedures, consistent with recommended practice for PLS SEM (Hair et al., 2024; Sarstedt et al., 2022). Before estimating the path coefficients, collinearity was examined to ensure that the predictor constructs did not bias the structural estimates. As reported in Table 5, tolerance values exceeded the recommended threshold and VIF values were below the conventional cutoff, indicating that multicollinearity was not a concern and supporting the stability of the estimated path coefficients. Figure 2 presents the estimated structural model, including standardized path coefficients and the explained variance of the endogenous constructs.

Table 5: *Collinearity Statistics (Tolerance and VIF)*

Construct	Tolerance (> 0.20)	VIF (< 5.00)
Servant leadership (SL)	0.671	2.269
Employee motivation (EM)	0.351	3.761
Job satisfaction (JS)	0.455	2.477
Employee organizational commitment (EOC)	0.945	2.690

Note: Tolerance values above 0.20 and VIF values below 5.00 indicate no problematic multicollinearity among predictors. In the structural model, job satisfaction (JS) and employee organizational commitment (EOC) are endogenous outcomes.

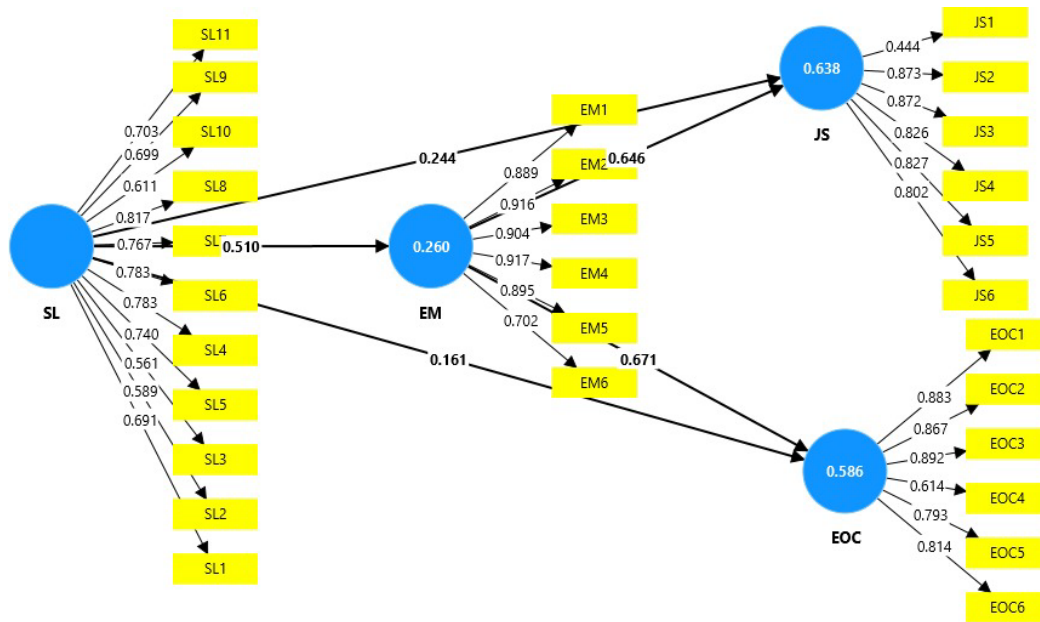


Figure 2: Smart PLS structural model results for the direct effects

Note: SL - Servant Leadership, EM - Employee Motivation, JS - Job Satisfaction, EOC - Employee Organizational Commitment

Results supported all proposed direct effects. Servant leadership was positively associated with employee motivation (H1: $\beta = 0.510$, $t = 9.375$, $p < 0.001$). Servant leadership also directly predicted job satisfaction (H2: $\beta = 0.574$, $t = 11.116$, $p < 0.001$) and organizational commitment (H3: $\beta = 0.503$, $t = 10.732$, $p < 0.001$). Employee motivation showed strong positive effects on job satisfaction (H4: $\beta = 0.646$, $t = 12.926$, $p < 0.001$) and on organizational commitment (H5: $\beta = 0.671$, $t = 10.702$, $p < 0.001$). These findings indicate that servant leadership relates to both outcomes directly and that employee motivation is strongly associated with both job satisfaction and organizational commitment.

Effect sizes were examined using f squared to evaluate the relative contribution of each predictor to its endogenous construct. Servant leadership had a substantial effect on employee motivation (f squared = 0.351). In contrast, the direct effects of servant leadership on the two outcomes were smaller in magnitude (f squared = 0.122 for job satisfaction; f squared = 0.047 for organizational commitment). Employee motivation exhibited large effect sizes on both outcomes (f squared = 0.855 for job satisfaction; f squared = 0.805 for organizational commitment). This pattern suggests that motivation is the more proximal driver of the two work attitudes, consistent with the view that leadership shapes employee attitudes partly by influencing employees' motivational states rather than only through direct evaluative pathways (Deci & Ryan, 2000; Trépanier et al., 2023). The model's explanatory power was assessed using R squared. The model explained 26.0 percent of the variance in employee motivation (R squared = 0.260), 63.8 percent of the variance in job satisfaction (R squared = 0.638), and 58.6 percent of the variance in organizational commitment (R squared = 0.586). These values indicate that the model accounts for a substantial portion of variance in both work attitude outcomes within the Guangxi private university sample. Predictive relevance was evaluated using Stone Geisser's Q squared, and the Q squared values were positive for all endogenous constructs (employee motivation Q squared = 0.752; job satisfaction Q squared = 0.710; organizational commitment Q squared = 0.632), suggesting that the model has meaningful predictive relevance in this dataset (Hair et al., 2024). Table 6 summarizes the direct and indirect effects, effect sizes (f^2), and the model's explanatory (R^2) and predictive relevance (Q^2) indices.

Table 6 : Direct and indirect effects, effect sizes, and model explanatory and predictive indices

Panel A. Direct effects and effect sizes				
Path	β	t	f^2	Decision
SL $\rightarrow$ EM	0.510	9.375	0.351	Supported**
SL $\rightarrow$ JS	0.574	11.116	0.122	Supported**
SL $\rightarrow$ EOC	0.503	10.732	0.047	Supported**
EM $\rightarrow$ JS	0.646	12.926	0.855	Supported**
EM $\rightarrow$ EOC	0.671	10.702	0.805	Supported**

Panel B. Indirect effects (mediation)

Indirect path	β	t	95% CI	Decision
SL → EM → JS	0.329	8.196	[0.248, 0.405]	Supported**
SL → EM → EOC	0.342	7.123	[0.248, 0.433]	Supported**

Panel C. Model explanatory and predictive relevance

Endogenous construct	R^2	Q^2
EM	0.260	0.752
JS	0.638	0.710
EOC	0.586	0.632

Note: SL = servant leadership; EM = employee motivation; JS = job satisfaction; EOC = employee organizational commitment. β = standardized path coefficient. t values are based on bootstrapping. f^2 indicates effect size. R^2 indicates explained variance. Q^2 (Stone–Geisser) values greater than 0 indicate predictive relevance. ** $p < .001$.

4.5 Mediation analysis

Mediation hypotheses were tested by examining the bootstrapped indirect effects of servant leadership on job satisfaction and organizational commitment through employee motivation. Bootstrapping based inference is recommended for mediation testing because indirect effect distributions often deviate from normality, and confidence intervals provide a direct basis for assessing statistical significance (Hair et al., 2024).

Results supported both mediation hypotheses. The indirect effect of servant leadership on job satisfaction via employee motivation was positive and significant (H6: $\beta = 0.329$, 95 percent confidence interval [0.248, 0.405]). The indirect effect of servant leadership on organizational commitment through employee motivation was also positive and significant (H7: $\beta = 0.342$, 95 percent confidence interval [0.248, 0.433]). Importantly, servant leadership retained significant direct effects on job satisfaction and organizational commitment even after accounting for employee motivation. This combination of significant direct and indirect effects is consistent with complementary, partial mediation. Substantively, the findings indicate that servant leadership improves work attitudes through two routes. It directly shapes how employees evaluate their job and attachment to the organization, and it indirectly shapes these evaluations by strengthening employees' motivational states. Table 7 reports the bootstrapped indirect effects, standard errors, significance tests, confidence intervals, and the extent and type of mediation for the two outcome variables.

Table 7: Bootstrapped indirect effects for mediation hypotheses

Indirect path	β (indirect)	SE	t	p	LLCI (95%)	ULCI (95%)	VAF	Mediation type
SL → EM → JS	0.329	0.040	8.196	< .001	0.248	0.405	0.364	Complementary partial mediation
SL → EM → EOC	0.342	0.048	7.123	< .001	0.248	0.433	0.405	Complementary partial mediation

Note: SL = servant leadership; EM = employee motivation; JS = job satisfaction; EOC = employee organizational commitment. β = standardized indirect effect. SE is the bootstrapped standard error. LLCI and ULCI are the lower and upper bounds of the bootstrapped 95% confidence interval. VAF (variance accounted for) is calculated as the indirect effect divided by the total effect (direct effect + indirect effect). Both mediation paths represent complementary partial mediation because the direct and indirect effects are significant and in the same direction.

4.6 Discussion

The results provide a coherent mechanism-based explanation of how servant leadership translates into job satisfaction and organizational commitment among academic and administrative staff in Guangxi private universities. First, the study finds that servant leadership is positively associated with both work attitude outcomes. Employees who perceive their leaders as more servant-oriented report higher satisfaction and stronger commitment. Second, employee motivation emerges as a central pathway that transmits servant leadership effects to both outcomes. Motivation has strong positive associations with job satisfaction and organizational commitment and carries a significant portion of the servant leadership effect, while the direct effects of servant leadership remain significant. Third, the model demonstrates substantial explanatory power for both outcomes

and positive predictive relevance, indicating that the servant leadership and motivation framework is informative for understanding work attitudes in this private higher education context.

These findings align closely with self-determination theory and help clarify why employee motivation functions as a bridge between leadership and attitudes. From a self-determination perspective, servant leaders are likely to support employees' psychological needs by empowering them, fostering competence through developmental feedback, and strengthening relatedness by demonstrating care and respect (Deci & Ryan, 2000; Deci et al., 2017). When employees experience these need supportive conditions, they tend to internalize work goals more strongly and sustain higher quality motivation. Higher quality motivation then translates into more favourable job evaluations and a stronger inclination to remain attached to the institution. The strong effects of motivation on both satisfaction and commitment observed in this study are consistent with this logic and are also consistent with recent servant leadership work that highlights growth, meaningfulness, and positive motivational processes as key explanatory channels (Jiang & Wei, 2024; van Dierendonck et al., 2024).

Social exchange theory offers a complementary explanation that is particularly relevant for employment relationships in universities where relational and moral expectations are salient. Servant leadership communicates benevolence, support, and ethical conduct, which can strengthen employees' sense of obligation and trust and can encourage reciprocation through positive attitudes (Blau, 1964). In this view, employees respond to servant-oriented treatment by evaluating their jobs more favorably and strengthening their attachment to the organization. Prior evidence in China suggests that servant leadership relates to commitment through psychological processes that reflect relational security and reduced strain, which is consistent with exchange-based pathways (Bai et al., 2023). The present findings extend this reasoning by showing that motivation is an additional and fundamental exchange relevant mechanism, because motivation captures employees' readiness to invest effort and align with organizational goals, which in turn supports both satisfaction and commitment.

The Guangxi private university context further helps interpret why motivation appears to be a high leverage mechanism. Private universities often face constraints in financial resources, staffing flexibility, and career development structures, which can limit the effectiveness of purely material incentive approaches. Under such constraints, leadership behaviours that enhance employees' motivational states can play an especially important role in shaping how employees experience their work and how strongly they remain psychologically connected to the institution. Servant leadership emphasizes empowerment, individualized support, and development, which are practices that can be implemented through daily management behaviours even when financial resources are limited (van Dierendonck & Nuijten, 2011). The effect size pattern observed in this study reinforces this managerial insight. Motivation exerted large effects on both outcomes, while servant leadership's direct effects on the outcomes were smaller, indicating that improving motivation quality may be an efficient pathway for enhancing satisfaction and commitment. This is consistent with recent evidence that servant leadership benefits in education related contexts are often linked to supportive climates and need satisfaction related experiences that sustain positive work attitudes (Coun et al., 2023; Ouyang et al., 2025).

From a practical standpoint, these results suggest that leadership development initiatives in Guangxi private universities should prioritize servant leadership competencies that strengthen motivation. Examples include autonomy supportive supervision, such as involving staff in decisions related to teaching or administrative processes when feasible, competence support through coaching and developmental feedback, and relatedness support through respectful communication, genuine care, and consistent fairness. Human resource policies can reinforce these leadership behaviours by incorporating servant leadership indicators into supervisory evaluation and training programs and by ensuring that workload and recognition systems do not undermine autonomy and competence. When such practices are implemented consistently at the frontline, employee motivation is more likely to improve, thereby translating into higher job satisfaction and stronger organizational commitment. Consistent with the structural pattern shown in Figure 2, the results indicate complementary partial mediation, with employee motivation carrying a substantive portion of servant leadership's influence on both outcomes.

5. CONCLUSION

5.1 Research conclusions

This study examined how servant leadership translates into job satisfaction and organizational commitment through employee motivation among employees in Guangxi private universities. The findings provide consistent support for all hypothesized direct relationships and mediation pathways. Servant leadership was positively associated with employee motivation and also directly predicted job satisfaction and organizational commitment. Employee motivation, in turn, showed strong positive effects on both job satisfaction and organizational commitment. Mediation analyses further demonstrated that employee motivation

significantly transmitted the effects of servant leadership to both outcomes while the direct effects remained significant, indicating complementary partial mediation. Together, these results confirm that servant leadership contributes to more favourable work attitudes in Guangxi private universities both directly and through the motivational states that leaders cultivate in employees.

5.2 Theoretical contributions

This study makes several theoretical contributions to the servant leadership and work attitudes literature. First, it advances mechanism-based understanding by positioning employee motivation as a central transmission channel that explains how servant leadership translates into both job satisfaction and organizational commitment. While prior research has examined mediators such as psychological safety, burnout, and other relational states, motivation is a foundational proximal driver that shapes how employees internalize work goals and evaluate their work experiences. By empirically demonstrating significant indirect effects through motivation, the study helps open the black box between servant leadership and downstream attitudes and strengthens theoretical integration with self-determination theory and social exchange theory (Deci & Ryan, 2000; Blau, 1964).

Second, the study contributes by jointly explaining two critical work attitude outcomes within a single model. Much of the prior literature investigates job satisfaction or organizational commitment separately, even though these attitudes often co-occur and jointly shape retention risk, discretionary effort, and service quality. By modelling job satisfaction and organizational commitment simultaneously, the study clarifies that employee motivation is not only relevant for employees' evaluations of their job but also for their attachment to the organization. This integrated approach supports a more comprehensive understanding of how leadership behaviours shape the quality of the employment relationship.

Third, the study provides context specific evidence from Guangxi private universities, a sector and region that remain underrepresented in servant leadership research. Private higher education in China is characterized by distinctive resource constraints, market-oriented pressures, and demands for service quality. By demonstrating robust relationships among servant leadership, motivation, and work attitudes in this setting, the study strengthens the external validity of servant leadership theory and offers a basis for more context sensitive theorizing about leadership effects in higher education organizations.

5.3 Managerial implications

The findings provide actionable guidance for leadership and human resource practice in Guangxi private universities. For university and college administrators, the results indicate that servant leadership behaviours can be an effective lever for improving employees' motivational states and, in turn, strengthening satisfaction and commitment. Practical leadership behaviours consistent with servant leadership include empowering staff by involving them in decisions when feasible, clarifying autonomy boundaries while allowing discretion in how work is completed, and providing coaching oriented feedback that strengthens competence perceptions. Leaders can also strengthen relatedness and trust through respectful communication, active listening, and consistent care for employees' work challenges and development needs. Fairness and transparency are particularly important in resource constrained settings. When leaders explain decisions clearly, allocate resources and opportunities equitably, and recognize contributions, employees are more likely to experience the employment relationship as supportive and meaningful, thereby sustaining motivation and positive attitudes.

For human resource units, the results suggest that leadership development and motivational systems should be aligned rather than treated as separate initiatives. HR can translate servant leadership principles into competency frameworks and incorporate them into selection, promotion, and performance evaluation for supervisors and department heads. Training programs can focus on autonomy supportive supervision, developmental coaching, and fair and supportive communication practices. In addition, HR practices can reinforce motivational pathways by ensuring that development opportunities, workload arrangements, and recognition systems support employees' sense of competence and progress. Even when financial incentives are limited, universities can strengthen motivation through non-monetary practices such as transparent career development pathways, professional learning support, and recognition of service contributions. By aligning leadership behaviours with systems that sustain motivation, private universities can create conditions that promote higher satisfaction and commitment.

5.4 Limitations and future research

Several limitations should be considered when interpreting the results. First, the study relied on cross sectional data, which limits strong causal inference regarding the direction of effects among servant leadership, motivation, and work attitudes. While the hypothesized model is grounded in established theory and mediation was tested with bootstrapped indirect effects, longitudinal designs would provide stronger evidence for temporal ordering. Second, the data were collected using a single source self-report survey, which can introduce common method bias. Although Harman's single factor test suggested that common method bias was unlikely to be a major concern, future research should further reduce this limitation through multi source designs, such as combining leader ratings, peer ratings, or objective indicators with employee self-reports, and through time lagged data collection (Podsakoff et al., 2003; Kock, 2021). Third, the study focused on Guangxi private universities, which strengthens contextual relevance but may limit generalizability to other regions or to public universities with different governance and resource conditions. Replication across provinces and across public and private higher education systems would strengthen external validity.

Future research can extend the current model by introducing additional mediators and boundary conditions that may shape how servant leadership operates in private higher education. For example, psychological safety and perceptions of fairness may function as parallel mechanisms alongside motivation, and workload pressure or role conflict may moderate the strength of motivational pathways. Multi-level perspectives could also be valuable, examining how department level servant leadership climates influence collective motivation and unit level outcomes. These extensions would provide a more nuanced understanding of how leadership translates into work attitudes under varying institutional conditions and would further inform leadership development and human resource policy in higher education.

6. ACKNOWLEDGEMENT

The authors would like to thank the participating private universities in Guangxi and the academic and administrative staff who voluntarily contributed their time to complete the survey. The authors also acknowledge the support received during the data collection process from institutional contacts who facilitated survey distribution. In addition, the authors appreciate the academic support and guidance provided by Infrastructure University Kuala Lumpur in facilitating the research procedures and documentation for data collection.

7. CONFLICT OF INTEREST

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

8. AUTHOR CONTRIBUTION STATEMENT

Wenjing Yang: Conceptualization, Methodology, Investigation (data collection), Data curation, Formal analysis, Writing original draft.

Mohamad Nasir Saludin: Supervision, Validation, Writing review and editing.

Kamaljeet Kaur: Supervision, Validation, Writing review and editing.

Muhammad Omar: Validation, Writing review and editing.

All authors have read and approved the final version of the manuscript.

9. ETHICS STATEMENT

The study procedures complied with the ethical guidelines of Kuala Lumpur University of Science and Technology and were consistent with the Declaration of Helsinki. Participation was entirely voluntary, and responses were collected anonymously. Prior to participation, all respondents provided electronic informed consent. The survey did not collect any personally identifiable information. Collected data were used exclusively for scholarly purposes and are presented in aggregate to protect participant confidentiality.

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APPENDICES

APPENDIX: Online Appendix Table A1. Institutions, Total employees, Proportional Quotas (Target n = 368), and Final Usable Cases (n = 327)

Institution	City	Total employees (N)	Employee-count source	Share of total (%)	Proportional quota (plan) for n=368	Final usable cases (n), n = 327
Institution A	Nanning	1,412	Institutional HR record	16.34	60	58
Institution B	Nanning	886	Estimated from institutional sources	10.26	38	31
Institution C	Nanning	471	Estimated from institutional sources	5.45	20	21
Institution D	Nanning	450	Estimated from institutional sources	5.21	19	18
Institution E	Nanning	942	Estimated from institutional sources	10.90	40	34
Institution F	Nanning	471	Estimated from institutional sources	5.45	20	18
Institution G	Beihai	528	Estimated from institutional sources	6.11	23	18
Institution H	Beihai	600	Estimated from institutional sources	6.95	26	20
Institution I	Guilin	739	Estimated from institutional sources	8.55	31	27
Institution J	Guilin	491	Estimated from institutional sources	5.68	21	16
Institution K	Liuzhou	471	Estimated from institutional sources	5.45	20	17
Institution L	Chongzuo	1,178	Estimated from institutional sources	13.64	50	49
Total		8,639		100.00	368	327

Notes: Total employees across the 12 institutions were N = 8,639. “Share of total” was calculated as each institution’s employee count divided by N. Proportional quotas were computed by multiplying each institution’s share by the target sample size (n = 368) and rounding to whole numbers; therefore, totals may not sum exactly due to rounding. “Final usable cases” refers to questionnaires retained after data screening (e.g., missing data and careless responses). The target sample size (n = 368) was determined using the Raosoft sample size calculator (population size N = 8,639; 95% confidence level; 5% margin of error; 50% response distribution). (<http://www.raosoft.com/samplesize.html>)