

From External Stakeholder Pressure to Sustainable Practice in HEIs: Mechanisms and Internal Mediating Factors

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Abstract—Sustainable procurement is an important part of sustainable development in HEIs, playing a pivotal role in optimizing resource allocation, fulfilling social responsibilities, and promoting green development. However, existing research has paid insufficient attention to the impact of external stakeholder pressure on HEIs' sustainable procurement and its intrinsic action mechanism. To address this gap, this study aims to explore the influence path of external stakeholder pressure on HEIs' sustainable procurement and identify key mediating factors. This study collected 260 valid data points from Chinese higher education institutions with more than one year of purchasing experience through snowball sampling. PLS-SEM analysis results show that external stakeholder pressure not only directly promotes sustainable procurement but also exerts an indirect effect through two mediating paths: affective commitment and professional knowledge. The mediating role of affective commitment is stronger than that of knowledge, and affective commitment itself has the strongest direct impact on sustainable procurement among all variables. Theoretically, this study enriches the application scenarios of stakeholder theory and institutional theory in the field of higher education sustainable management. Practically, it provides actionable references for HEIs to enhance sustainable procurement performance by strengthening external stakeholder collaboration, optimizing knowledge management systems, and fostering employees' affective commitment.

Keywords—Sustainable procurement; HEIs; external stakeholder pressure; affective commitment; knowledge

ABBREVIATIONS

HEIs: Higher Education Institutions

ESP: External Stakeholders Pressure

KL: Knowledge

AC: Affective Commitment

SP: Sustainable Procurement

I. INTRODUCTION

Sustainable procurement is now a key component of sustainability in higher education institutions (HEIs) [1]. External stakeholder pressures strongly shape organisations' sustainable practices, typically stemming from groups like local governments, the public, and suppliers—all demanding environmental and social responsibility in procurement [2]. Local governments influence HEIs' sustainability decisions via

funding, policy incentives, and clear support; without this, HEIs struggle to advance sustainable practices [3]. Žalėnienė & Pereira [4] noted that HEIs must act socially responsible, address public sustainability demands, and that sustainable procurement is the key to meet these expectations. Meanwhile, under market logic, HEIs face external pressures (e.g., competition, accreditation) and need to boost their reputation and competitiveness through sustainable practices to attract funding and students.

A comprehensive framework for sustainable procurement shows external stakeholder pressures notably impact an organisation's internal environment—management, culture, competencies, attitudes—and thus its procurement practices [5]. Foerstl et al. [6] stressed that suppliers must understand customers' and stakeholders' sustainability priorities to engage effectively in sustainable supply chain management. Similarly, Ahmad et al. [7] found stakeholder pressures shape oil and gas industry sustainability goals, highlighting external factors' role in guiding organisational strategies. Liu et al. [2] further noted that external pressures affect public-sector sustainable procurement by shaping staff knowledge. In practice, organisations use complex mechanisms to address these pressures—most notably surface compliance [8, 9], where HEIs seem to meet sustainability requirements but lack substantive change. This decoupling raises a critical question: How to convert external pressures into genuine cognitive shifts and practical innovations?

Although sustainable procurement has become a core issue in the sustainable development of HEIs, there are still two key gaps in existing research that need to be addressed. First, most existing studies focus on sustainable procurement in businesses or general public sectors, and the way external stakeholder pressures influence the internal mechanisms of sustainable procurement in HEIs—a unique type of organization with both educational attributes and public service functions—has not been systematically explained, with empirical evidence being particularly scarce. Second, in research on the mediating mechanisms of sustainable procurement, existing models either use only a single mediator or do not compare the effects of multiple mediators, making it difficult to reveal the relative importance and synergistic effects of different mediating pathways. Guided by stakeholder theory, this study explores the mechanisms through which external stakeholder pressures affect HEIs' sustainable procurement and seeks to identify internal

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mediating factors for successful sustainability implementation. Accordingly, the following research questions are proposed:

Q1: For higher education institutions, how does external stakeholders' pressure affect sustainable procurement?

Q2: What is the mediator between external stakeholders' pressure and sustainable procurement?

This study has important theoretical and practical significance. At the theoretical level, by identifying the dual mediating mechanism of affective commitment and knowledge, it clarifies the transmission path of external pressure, internal capabilities, and sustainable practices. It not only fills the research gap in the internal transformation mechanism within organizational sustainability theory but also breaks through the linear cognition of the relationship between pressure and behaviour in stakeholder theory. Taking Chinese HEIs as a unique contextual setting, it expands the application boundary of the theory. Meanwhile, it refines the dual paths of cognitive internalization and emotional internalization in institutional theory, enriching the micro-mechanism research on the formation of legitimacy. At the practical level, based on empirical findings, the study proposes three targeted and actionable implications. First, strengthen the cultivation of affective identification by integrating sustainable development values into the training and performance promotion incentives for procurement personnel, and enhance value resonance through university-specific cases to activate intrinsic motivation for active participation. Second, establish an internal-external collaborative mechanism: externally, cooperate with government departments and environmental organizations to conduct policy and practical training, and build communication platforms between procurement personnel and stakeholders; internally, establish a sustainable procurement knowledge base and bind suppliers' obligations for sustainable training to form a closed loop for pressure transformation. Third, adapt to administrative characteristics to optimize governance and processes: integrate sustainable procurement into inter-departmental assessment, formulate special procurement lists and green clauses, and establish a supplier sustainability rating system to consolidate practical results at the institutional level. These implications provide an actionable framework with contextual adaptability and operability for Chinese HEIs to address the dilemma of surface compliance and improve the quality of sustainable procurement.

This study is structured into six sections: The first section outlines the study background, research objectives, and core questions; the second synthesizes literature and theoretical reviews; the third details the research methodology and measurement design; the fourth presents the data analysis results; the fifth elaborates on the study conclusions; and the sixth summarises the study's theoretical and practical contributions, as well as its limitations.

II. THEORY AND LITERATURE REVIEW

A. External Stakeholders

External stakeholders refer to interest groups outside an organization that have a connection with it. A core tenet of stakeholders theory is that organizational decision-making and operations must not only be accountable to shareholders but also

consider all groups affected by or capable of influencing its operations [10]. External stakeholders represent the pivotal component within this framework—individuals or entities outside the organization yet possessing substantial influence. Their impact is primarily exerted through three primary channels: financial investment intervention, coercive pressure application, and public opinion mobilization.

Liu et al. [2] identified local governments, leading sustainable suppliers, and society (public, non-governmental organizations (NGOs), and media) as external stakeholders in Chinese public procurement. Local government can incentivize sustainable behaviour in public sectors through financial incentives [11], regulatory guidance [12], and monitoring [1].

Sustainable suppliers are sustainability-conscious suppliers whose design, packaging, logistics, and other activities meet relevant sustainability and environmental standards [13]. The sustainable procurement and sustainable suppliers are inextricably linked. Sustainable procurements can increase the demand for sustainable products or services and become an important market for sustainable suppliers. To increase market, share and financial performance, sustainable suppliers press sustainable purchasing behaviour in the public sector through a variety of channels by having the required capabilities and resources [14].

The society (the public, non-governmental organizations, and the media) also constitutes important external stakeholders [15]. It is argued that public higher education institutions, as organizations with strong social influence, receive significant attention from society [3]. As the ultimate consumers of public procurement, the public's expectations serve as a key driver for promoting sustainable procurement. Meanwhile, environmental non-governmental organizations play an important role in facilitating local institutions' implementation of sustainable procurement [16]. With the increasing influence of the media, the public and non-governmental organizations are paying closer attention to the sustainable procurement behaviours of local institutions through the media [17]. This leads to Hypothesis 1.

- H1: External stakeholders' pressure has a positive effect on sustainable procurement in HEIs.

External stakeholder pressure has been identified as the main driver behind environmental commitment, with research highlighting the role of external expectations and normative pressure. Several studies have shown that external stakeholders significantly influence organisational behaviour and commitment through multiple forms of pressure [18]. This pressure stems from the need for organisations to meet external expectations and demonstrate environmental responsibility [19]. This normative pressure contributes to higher education institutions feeling compelled to adopt green practices to meet external expectations, which in turn affects their affective commitment to such initiatives. This normative pressure is consistent with findings from SMEs that environmental expectations are a core normative driver influencing organisational response [20]. The study shows that external stakeholder pressure significantly increases organizational level of environmental awareness and commitment, which strongly confirms the important role of external expectations in shaping

organisational attitudes. These findings suggest that when firms perceive that external stakeholder expectations are compatible with their core values, the impact is not limited to the compliance level, but also builds a genuine emotional bond.

Research has also shown that positive stakeholder relationships strengthen affective bonds and organisational loyalty [21]. Trust, in particular, appears to be a key factor that moderates the effects of external pressures, thereby enhancing affective attachment and commitment to organisational goals. Conversely, external pressures can sometimes trigger resistance, especially when organisations perceive these pressures as threats or are subject to controlling motives rather than intrinsic values [22]. This suggests that the nature of external stakeholder influence may vary from person to person, and that different groups may have different levels of affective commitment depending on their own perceptions and internalisation of pressure. This leads to Hypothesis 2.

- H2: External stakeholders' pressure has a positive effect on affective commitment in HEIs towards sustainable procurement.

In the field of supply chain management, external stakeholders such as non-governmental organisations (NGOs) play a key role in driving the diffusion of knowledge and application of sustainable practices. Siems et al. [23] stated that such external organisations are able to motivate firms to implement sustainable supply chain management practices by exerting pressure. This external influence tends to increase the environmental awareness and proactive participation of firms, which in turn promotes organisational learning and competence. It emphasised that translating stakeholder pressure into environmental practices requires the management of new knowledge and ideas that contribute to sustainable business expansion within a sustainable framework. This suggests that external pressure can act as a catalyst for organisations to acquire and implement sustainability knowledge. Ullah et al. [24] showed that green knowledge integration capabilities combined with regulatory pressures and stakeholder demands are effective in enhancing firms' green innovation outcomes. The above evidence suggests that external stakeholder pressure is an important factor influencing the acquisition, diffusion, and application of sustainable knowledge within organisations. This leads to Hypothesis 3.

- H3: External stakeholders' pressure has a positive effect on knowledge in HEIs towards sustainable procurement.

B. Sustainable Knowledge

In the field of sustainable procurement, the core of knowledge centres on procurement professionals' level of awareness and understanding of the concepts, standards, tools, and practices in this domain [25]. This level of awareness is not merely an accumulation of theory; it directly represents procurement professionals' operational capability to practice sustainable behaviours in their day-to-day work. Whether these professionals can accurately judge the sustainability of procurement options or proficiently use relevant tools to optimize procurement processes is essentially determined by this level of knowledge [26]. At the same time, this knowledge base also plays a supporting role: it provides procurement

professionals with the necessary theoretical basis and practical guidance for implementing sustainable behaviours when making specific procurement decisions, ensuring their operational capability has clear directions and methods to follow [27]. Based on this, the hypothesis is proposed (Hypothesis 4):

- H4: Sustainable knowledge has a positive effect on sustainable procurement in HEIs.

C. Affective Commitment

Meyer & Herscovitch [28] vividly likened commitment to change to "the adhesive that forges critical connections between people and change objectives". Affective commitment is the willingness of an individual to initiate change based on the recognition of the intrinsic value of change. Affective commitment is a crucial driver of sustainable procurement behaviours within organizations. There is ample evidence in the existing literature that emotional commitment plays a key role in driving sustainable procurement behaviours. Several studies have shown that emotional commitment to change significantly influences the adoption and implementation of sustainable procurement practices. Meyer et al. [29] found that employees' affective commitment to organizational change is positively correlated with change behaviours. This may be because such commitments encourage employees to go above and beyond minimum behavioural requirements, even making personal sacrifices. Grandia [30] verified that affective commitment to sustainable procurement reform has a direct and significant effect on sustainable purchasing behaviours. When procurement officers understand the value of sustainable procurement reform and have affective commitment, they will participate more actively in relevant activities. Boesen [31] found in a study of procurement officials that affective commitment is positively related to sustainable procurement behaviour, emphasising that affective commitment to the SDGs motivates proactive green procurement actions. Overall, the reviewed documents collectively highlight that affective commitment is a vital psychological factor that enhances the effectiveness of green procurement initiatives. This leads to Hypothesis 5.

- H5: Affective commitment has a positive effect on sustainable procurement in HEIs.

D. Mediating Role of Knowledge

The mediating role of knowledge in promoting sustainable procurement has attracted significant attention from scholars, highlighting the impact of knowledge in enhancing sustainable practices within organisations. Liu et al. [2] examined how external stakeholders influence green public procurement practices through organisational learning mechanisms, implying that knowledge acquisition and dissemination mediate this relationship. This is consistent with the broader understanding that knowledge helps to integrate external environmental and social factors into procurement strategies, thereby promoting sustainability. Mohaghegh et al. [32] proposed a theoretical framework that reinforces the notion that knowledge is a key mediator that enhances an organisation's ability to achieve sustainable performance. In addition, Sondhi et al. [33] emphasised that knowledge acts as a bridge that enables organisations to translate strategic orientation into sustainable performance outcomes. Knowledge integration capabilities and

service innovation mediate the relationship between elements of strategic orientation (e.g., customer-orientation, competitor-orientation, and technology-orientation) and sustainable competitive advantage. Together, these studies recognised that the mediating effect of knowledge contributes to the integration of sustainability principles into procurement practices, digital transformation and strategic decision-making, ultimately contributing to sustainable development within organisations. This leads to Hypothesis 6.

- H6: Knowledge has a mediating effect between external stakeholders' pressure and sustainable procurement in HEIs.

E. Mediating Effect of Affective Commitment

The mediating role of affective commitment has been a focal point for understanding various organisational and behavioural outcomes in different contexts. Affective commitment mediates the effect of external incentives on green purchasing behaviour. Wang et al. [34] validated that project managers' affective commitment to change partially mediates the relationship between perceptions of environmental regulations and environmentally sustainable project management practices. Indra et al. [35] revealed from organisational support that there was a significant effect between supervisor support for intention to leave and affective commitment mediation. A study on brand positioning showed that affective commitment mediates the relationship between organisational strategy and sustainable outcomes a step proved the mediating effect of affective commitment [36]. This suggests that employees' emotional attachment to organisational change initiatives is critical in translating external pressures into sustainable purchasing practices. This leads to Hypothesis 7.

- H7: Affective commitment has a mediating effect between external stakeholders' pressure and sustainable procurement in HEIs.

Based on the above assumptions, the research framework of this study is displayed in Fig. 1.

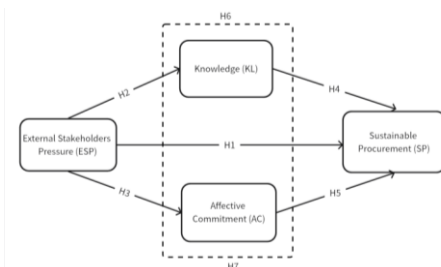


Fig. 1. Conceptual framework.

III. RESEARCH METHODOLOGY

A. Data Collection

This study focuses on the impact of external stakeholders on sustainable procurement in Chinese Higher Education Institutions (HEIs), and therefore the survey primarily targeted personnel with more than 1 year of experience in procurement in Chinese HEIs (HEIs). Such a target population is strongly

specialised and scarce, making it suitable for recruitment using snowball sampling [37].

The study integrated elements of stratification at the institutional level (undergraduate/vocational) and geographic level, and used a four-tiered referral mechanism to expand the sample incrementally. The researchers selected an initial sample of 20 procurement supervisors from different regions and types of institutions, proportional to the distribution of higher education institutions, through a variety of sources including the Ministry of Education's list of higher education institutions and public procurement conferences. After telephone and face-to-face communication, each supervisor recommended 2 to 3 direct subordinates who matched the characteristics of the study population, constituting the second-tier sample. Subsequently, the second-tier participants were invited to recommend 2 peers from the same city but from different institutions. A third-tier sample was also formed. Finally, the stratum 3 participants were invited to recommend 2 more peers from neighbouring cities (stratum 4). Sampling ended at the fourth stratum and only new samples from the same type of organisations were recommended at each stratum. Data collection took place between 8 October 2024 and 28 November 2024, with a total of 260 valid responses received.

The age group is predominantly 30 to 39 years old (42.3%), with 25.4% of the sample aged 20 to 29 years old and 25.4% aged 40 to 49 years old each. 75.8% had a bachelor's degree or above (meeting the requirements for university recruitment), and 44.3% had more than five years of work experience. These demographic characteristics both enhance the representativeness of the sample by matching the overall structure, and increase data accuracy and consistency due to the perceived stability of the highly educated and experienced group, whilst empirical weighting [38] (see Table I for full details).

B. Measures

The measurement scales and theoretical constructs used in this study were systematically extracted from well-established instruments in the previous literature and were carefully modified to ensure consistency with the particular research setting while retaining the measurement properties of the original constructs. All items are on a 5-point Likert scale.

To assess common method biases, multiple strategies based on established methodological recommendations were used. We conducted a Harman's one-way test, an unrotated exploratory factor analysis of all items, which resulted in the identification of multiple factors with eigenvalues greater than 1.0, and crucially, the largest factor with an eigenvalue below the 50% threshold, confirming that our results were not substantially affected by this methodological issue.

To assess non-response bias in the survey data, a one-way analysis of variance was conducted on respondents in strata 1, 2 and 3, 4 of the sample referral mechanism. The results of the analysis showed no statistically significant differences between these two groups (all p-values were greater than 0.05). The results suggest that non-response bias does not pose a substantial threat to the validity of our findings.

TABLE I. DEMOGRAPHIC INFORMATION

Variables	Definitions	Frequency	Percent %
Age	20-29=1	66	25.4
	30-39=2	110	42.3
	40-49=3	66	25.4
	50-59=4	12	4.6
	60 and above=5	6	2.3
Working experience	1 to 3 years=1	16	6.2
	3 to 5 years=2	129	49.6
	5 to 10 years=3	87	33.5
	10 years above=4	28	10.8
HEIs Type	Undergraduate =1	111	42.7
	Junior College =2	149	57.3
Total		260	100

Source: Own elaboration

C. Data Analysis

This study utilizes Partial Least Squares Structural Equation Modeling (PLS-SEM) in Smart-PLS 3.3.2 to investigate the causal relationships among variables [39]. Partial Least Squares Structural Equation Modeling (PLS-SEM) employs a Partial Least Squares (PLS) algorithm that fundamentally differs from traditional Ordinary Least Squares (OLS) in both its principles and applications. The core of the PLS algorithm is an iterative two-stage process designed to maximize the covariance between latent variable scores using manifest variable data. This allows simultaneous estimation of both measurement and structural models [40].

The first step is outer approximation. It uses outer weights to combine manifest variables into initial latent variable scores.

$$y_i = \sum(w_{ij} * x_{ij}) \quad (1)$$

y_i : external approximate score for the i -th latent variable;

w_{ij} : external weighting;

x_{ij} : the j th explicit variable of the i th latent variable;

The second step is inner approximation. It updates these scores by weighting them against adjacent latent variables based on structural relationships. These two steps repeat until the outer weights stabilize and converge.

$$z_i = \sum(e_{ik} * y_k) \quad (2)$$

Among them z_i : inner approximate score for the i -th latent variable;

$$e_{ij} = \begin{cases} \text{corr}(y_i, y_k) & \text{if latent variable } i \text{ is connected to } k \\ 0 & \text{others} \end{cases}$$

Unlike OLS, which minimizes the residual sum of squares for optimal unbiased estimates in single equations, PLS has different strengths. It does not require strict data distribution assumptions. After convergence, it calculates final path coefficients and loadings by using latent variable scores in OLS regressions.

$$\text{Regression 1: } KL = \beta_{ESP-KL} \cdot ESP + e_1 \quad (H3)$$

$$\text{Regression 2: } AC = \beta_{ESP-AC} \cdot ESP + e_2 \quad (H2)$$

$$\text{Regression 3: } SP = \beta_{ESP-SP} \cdot ESP + \beta_{KL-SP} \cdot KL + \beta_{AC-SP} \cdot AC + e_3 \quad (H1, H4, H5)$$

Therefore, PLS is variance-based and prediction-focused. It works well with small samples, non-normal data, and complex model development. OLS is parameter-based and requires strict assumptions. It suits causal testing in single equations meeting classical assumptions [41]. In this research, these PLS characteristics enable effective revelation of complex pathways. They show how external stakeholder pressure influences sustainable procurement through affective commitment and knowledge mediation.

IV. RESULTS

A. Measurement Model

This study began by refining the quantitative data through certain data cleaning tests and procedures. The PLS-SEM includes both a measurement model and a structural model. The measurement model examines the relationship between constructs and their indicators, focusing on assessing convergent validity and discriminant validity. Measurement model analysis involves several steps and procedures. First, to determine convergent validity, three parameters were used: 1) factor loadings should be greater than 0.7; 2) composite reliability (CR) should be greater than 0.7; and 3) average variance extracted (AVE) should be greater than 0.5. To adjust the model according to these parameters, four reactive first-order constructs were used in the present study: the ESP, the AC, the KL, and the SP. The partial least squares algorithm was used with the maximum number of the partial least squares algorithm was calculated using the maximum number of iterations (up to 300 iterations, using a path-weighting scheme).

1) *Convergent validity (CV)*: To evaluate the measurement model, the CV should first be calculated based on three criteria: 1) factor loadings should be greater than 0.7; 2) Krbach's alpha and composite reliability (CR) should be greater than 0.7; and 3) the mean AVE value should be greater than 0.5 [40]. The results confirmed that all values were within the acceptable range (see Table II).

TABLE II. CONSTRUCT RELIABILITY AND VALIDITY

Construct	Indicators	Loading	Alpha	CR	AVE
ESP	ESP01	0.859	0.885	0.916	0.686
	ESP02	0.827			
	ESP03	0.786			
	ESP04	0.810			
	ESP05	0.855			
AC	AC01	0.838	0.903	0.925	0.674
	AC02	0.852			
	AC03	0.781			
	AC04	0.815			
	AC05	0.819			
	AC06	0.820			
KL	KL01	0.782	0.890	0.914	0.602
	KL02	0.756			
	KL03	0.753			
	KL04	0.788			
	KL05	0.790			
	KL06	0.767			
	KL07	0.758			
SP	SP01	0.788	0.913	0.928	0.591
	SP02	0.766			
	SP03	0.790			
	SP04	0.761			
	SP05	0.738			
	SP06	0.711			
	SP07	0.775			
	SP08	0.794			
	SP09	0.790			

Source: Own elaboration

2) *Discriminant validity*: Common discriminant validity was assessed based on three parameters: 1) Fornell and Lacker criterion, 2) cross-loading, and 3) HTMT [42].

The results in Table III confirm that the diagonal values (in bold) for each construct are greater than the inter-conceptual correlation values, which meet the Fornell and Lacker criteria and confirm the discriminant validity of the construct [10]. The cross-loading test also confirmed that each item loaded higher on this construct than the others; all values in the HTMT were less than the threshold value of 0.85 [46].

TABLE III. FORNELL AND LACKER

	AC	ESP	KL	SP
AC	0.821			
ESP	0.373	0.828		
KL	0.326	0.468	0.776	
SP	0.611	0.545	0.513	0.769

Source: Own elaboration

B. Structural Model

After measuring the model, the next step is to validate the structural model. This process consists of six key steps: 1) covariance assessment; 2) the path coefficient (β); 3) the coefficient of determination (R^2); 4) the predicted correlation

Q^2 ; 5) the effect size q^2 ; and 6) model fit following the guidelines proposed by Hair et al.[46] .

1) *Multicollinearity*: In this study, variance inflation factor (VIF) values were used to assess multicollinearity. Table IV shows that the VIF values for all constructs were below the critical value of 3.3 [46], thus confirming that the model does not suffer from covariance.

TABLE IV. MULTICOLLINEARITY (INNER VIF)

	AC	ESP	KL	SP
AC				1.202
ESP	1		1	1.376
KL				1.325
SP				

Source: Own elaboration

2) *The path coefficient*: The path coefficients represent the regression coefficients between the constructs in the structural model. In the regression analysis, the standardised beta (β) of the path coefficients ranged between 1 and β_1 . To further test the proposed hypotheses (H1, H2, H3, H4, H5, H6, and H7), 5000 iterations of the SEM were performed using Smart-PLS, and the path coefficients (β), t-values, confidence intervals, and p-values were computed, as shown in Fig. 2.

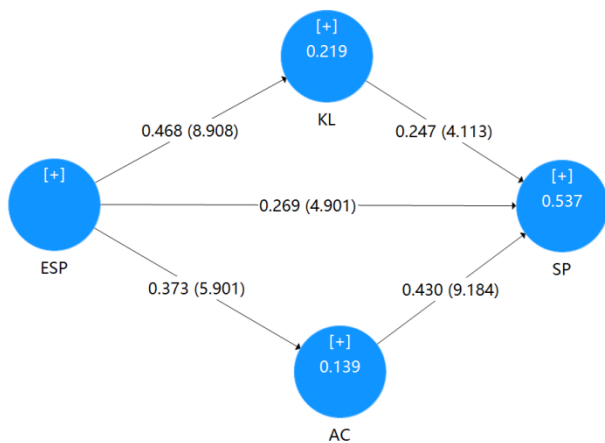


Fig. 2. Structural model.

As shown in Table V, we evaluated the five proposed direct effect hypotheses. H1: ESP was positively associated with SP ($\beta=0.269$; $t=4.901$, $p=0.000$); H2: ESP was positively associated with KL ($\beta=0.468$; $t=8.908$, $p=0.000$); H3: ESP was positively associated with AC ($\beta=0.373$; $t=5.901$, $p=0.000$); H4: KL positively correlated with SP ($\beta=0.247$; $t=4.113$, $p=0.000$); H5: AC positively correlated with SP ($\beta=0.430$; $t=9.184$, $p=0.000$). Also, the two-sided 95% confidence intervals of the above paths do not contain 0, which also confirms that the hypotheses (H1, H2, H3, H4, H5) are supported.

TABLE V. RESULTS OF DIRECT HYPOTHESIS TESTING

N o	Pat h	Estimate	2.50 %	97.50 %	t-value	p-value	Decision
H 1	ESP - >SP	0.269	0.157	0.373	4.901	0.000	Supported
H 2	ESP - >KL	0.468	0.359	0.566	8.908	0.000	Supported
H 3	ESP - >AC	0.373	0.241	0.489	5.901	0.000	Supported
H 4	KL - >SP	0.247	0.129	0.367	4.113	0.000	Supported
H 5	AC - >SP	0.430	0.333	0.516	9.184	0.000	Supported

Source: Own elaboration

The two indirect (mediating) hypotheses are discussed below. Two mediating path hypotheses were proposed in this study, namely: 1) H6: ESP $\rightarrow$ KL $\rightarrow$ SP; and 2) H7: ESP $\rightarrow$ AC $\rightarrow$ SP. As shown in Table VI, H6: KL mediates between ESP and SP (indirect $\beta = 0.116$; $t = 3.776$, $p = 0.000$); H7: AC mediates between ESP and SP (indirect $\beta = 0.160$; $t = 4.773$, $p=0.000$). Table VI shows that both mediating hypotheses (H6, H7) were supported.

The mediation hypothesis also requires a discussion of the strength of the mediating effect. In this study, VAF is used to indicate the proportion of the total effect of the independent variable on the dependent variable through the mediating variable. Commonly used criteria: a VAF > 80% indicates full

mediation, 20% = VAF $\geq$ 80% indicates partial mediation, and a VAF < 20% assumes no mediation [44]. Table VII summarises the results of the mediation effect strength (VAF) calculations for this study.

TABLE VI. SPECIFIC INDIRECT EFFECTS

N o	Pat h	Estimate	2.50 %	97.50 %	t value	p value	Decision
H 6	ESP - >KL - >SP	0.116	0.060	0.181	3.776	0.000	Supported
H 7	ESP - >AC - >SP	0.160	0.096	0.226	4.773	0.000	Supported

Source: Own elaboration

TABLE VII. MEDIATION

N o	Pat h	Direct	Indirect	Variance account for (VAF)	Mediation
H 6	ESP - >KL - >SP	0.269	0.116	Direct effect of ESP $\rightarrow$ SP = 0.269	Partial
				Indirect effect of ESP $\rightarrow$ KL $\rightarrow$ SP = 0.116	
				Total effect = 0.269 + 0.116 = 0.385	
				VAF=Indirect effect/total effect = 0.116/0.385=30.13%	
H 7	ESP - >AC - >SP	0.269	0.160	Direct effect of ESP $\rightarrow$ SP = 0.269	Partial
				Indirect effect of ESP $\rightarrow$ KL $\rightarrow$ SP = 0.160	
				Total effect = 0.269 + 0.116 = 0.429	
				VAF=Indirect effect/total effect = 0.160/0.429=37.30%	

Source: Own elaboration

Table VII shows that the direct effect of ESP on SP is 0.269. H6: The direct effect is 0.116, and the total effect is the sum of the direct and indirect effects, i.e., 0.385. The variance of the mediating effect accounts for 30.13%, which is between 20% and 70%, and is a partial mediating effect. The variance of the mediating effect is 37.30%, which is between 20% and 70%, and is a partial mediating effect.

3) *Explanatory power (R^2), and predictive relevance (Q^2):* The R^2 values of the endogenous latent variables (KL, AC and SP) reflect the explanatory power of the model, i.e., the extent to which the exogenous variable ESP explains the endogenous variables. The effects range from 0 to 1, where 1 indicates full predictive accuracy [46]. The R^2 value for SP is 0.537, which

means that ESP, KL and AC together explain 53.7% of the shift in SP.

Predictive relevance was evaluated via Q^2 , where values greater than 0.000, 0.250, and 0.500 signify small, medium, and large effects, respectively [45]. The results (see Table VIII) Q^2 in the endogenous variables (AC, KL, SPB) are positive and have the same trend as R^2 , indicating that the explanatory power of the model is stable in the study. Furthermore, the Q^2 value for SP is 0.308, which exceeds 0.25, suggesting that the predictive relevance of the PLS path model has reached a moderate effect.

TABLE VIII. EXPLANATORY POWER (R^2), AND PREDICTIVE RELEVANCE (Q^2)

Endogenous variables	R^2 values	Threshold	Q^2 values	Threshold
AC	0.139	small	0.091	>0 (small)
KL	0.219	small	0.125	>0 (small)
SP	0.537	moderate	0.308	>0.250 (medium)

Source: Own elaboration

4) *Effect size (q^2)*: The Q^2 value, although it shows the predictive relevance of the model to the endogenous latent variables, does not show the effect of the predictive relevance; the effect size (q^2) fills this gap. The effect size (q^2) is calculated by $q^2 = (Q^2 \text{ included} - Q^2 \text{ excluded}) / (1 - Q^2 \text{ included})$. Critical values of 0.02, 0.1, and 0.35 indicate that the structure has a small, medium, or large predicted correlation to the endogenous structure.

Table IX shows that when the structures KL, AC, and ESP were excluded, the predicted correlations (Q^2 excluded) of the model were 0.282, 0.219, and 0.277, with corresponding effect sizes q^2 of 0.038, 0.129, and 0.045, and the effect sizes were in the order of small, medium, and small effects. This result shows that AC ($q^2 = 0.129$) is at the medium effect level, which means that AC is relatively prominent in contributing to the predictive ability of the SP model and is a more important structure to maintain the predictive efficacy of the model; whereas the effect sizes of KL ($q^2 = 0.038$) and ESP ($q^2 = 0.045$) are small, which indicates that both of them have a weaker effect on the predictive ability of the SP model.

TABLE IX. EFFECT SIZE (Q^2)

Construct	Q^2 included	Construct	Q^2 excluded	q^2	Rating
SP	0.308 (medium)	KL	0.282	0.038	small
		AC	0.219	0.129	medium
		ESP	0.277	0.045	small

Source: Own elaboration

5) *Model fit*: The results of SRMR and NFI together validate the reliability of the model in fitting the data. Standardised Root Mean Square Residual (SRMR) is an important measure of the absolute fit of the model and is usually judged as less than 0.08 as a good model fit [43]. In this model, the SRMR value is 0.053 (as shown in Table X), this result indicates that the overall fit of the model to the data is good, the

residuals are small, and it can effectively reflect the actual relationship between the variables. Meanwhile, the normative fit index (NFI) as another absolute fit index, the NFI value of this model is 0.845, which reaches an acceptable model fit level.

Taken together, the lower SRMR in this study indicates that the model has less error in interpreting the data, while the acceptable NFI further supports the consistency of the model structure with the observed data. This implies that the model is able to capture the potential relationships among variables more accurately, providing a solid fitting foundation for subsequent analyses based on the model, and enhancing the credibility of the study's conclusions.

TABLE X. A MODEL FIT

Fit	Saturated Model	Estimated Model
SRMR	0.053	0.063
d_ULS	1.050	1.478
d_G	0.485	0.492
Chi-Square	688.468	687.218
NFI	0.845	0.845

Source: Own elaboration

V. DISCUSSION

In this study, the research models were assessed by PLS-SEM for measurement and structural models, respectively. The results of the measurement model assessment showed that the convergent validity (factor loadings, CR, and AVE met the thresholds) and the discriminant validity (Fornell-Larcker criterion and HTMT test were passed) of all the constructs were at a desirable level, which indicated that the measurement tool had good reliability and validity. The results of structural model assessment showed that the explanatory power (R^2), predictive validity (Q^2), and overall goodness of fit (SRMR) of the model for the endogenous variables met the PLS-SEM assessment criteria, indicating that the model was set up reasonably and could effectively reflect the relationship between the variables. A total of seven hypotheses (five direct and two indirect) based on theoretical and empirical literature were proposed in this study all passed the significance test.

Hypothesis H1 confirms that external stakeholders' pressure directly fosters sustainable procurement in HEIs, with a path coefficient of 0.269 (95% CI [0.157, 0.373], $t = 4.901$, $p < 0.001$). This underscores that external demands serve as a tangible driver for HEIs to prioritize sustainability in procurement processes; specifically, greater external pressure corresponds to a higher level of emphasis and implementation of sustainability in the procurement processes of HEISs.

Hypothesis H2 reveals that external pressure exerts the strongest direct impact on affective commitment toward sustainable procurement (path coefficient = 0.468, 95% CI [0.359, 0.566], $t = 8.908$, $p < 0.001$). This path coefficient is the largest among all direct effects of ESP, demonstrating that external stakeholder pressure exerts the strongest driving force on the emotional investment (such as identification and sense of responsibility) of personnel in HEIs regarding sustainable

procurement, serving as a key external factor in stimulating affective commitment.

Hypothesis H3 demonstrates that external pressure promotes the accumulation of sustainable procurement knowledge in HEIs (path coefficient = 0.373, 95% CI [0.241, 0.489], $t = 5.901$, $p < 0.001$). This suggests that external demands prompt HEIs to proactively acquire and retain relevant knowledge, laying a foundational basis for practice.

Hypothesis H4 establishes that sustainable knowledge directly enhances sustainable procurement practices (path coefficient = 0.247, 95% CI [0.129, 0.367], $t = 4.113$, $p < 0.001$). Richer knowledge equips HEIs to implement sustainable procurement more effectively, emphasizing knowledge as a critical enabler.

Hypothesis H5 highlights that affective commitment is the strongest direct driver of sustainable procurement (path coefficient = 0.430, 95% CI [0.333, 0.516], $t = 9.184$, $p < 0.001$), outperforming the direct effect of knowledge. This indicates that the affective commitment of HEI personnel towards sustainable procurement is the most critical direct driver of promoting sustainable procurement practices, with a significantly stronger impact than the direct effect of knowledge factors on procurement practices.

Hypothesis H6 confirms the knowledge's mediating role between external stakeholders' pressure (ESP) and sustainable procurement (SP) in HEIs. The indirect effect is 0.116, accounting for 30.13% of the total effect, with a 95% CI [0.060, 0.181] (excluding 0), $t = 3.776$, and $p = 0.000$, supporting the hypothesis. This result reveals the mechanism by which external pressure is transmitted through knowledge. External pressure first promotes higher education institutions to accumulate knowledge related to sustainable procurement, including policy standards and implementation methods. The accumulation and application of such knowledge further facilitate the implementation of sustainable procurement practices.

Hypothesis H7 verifies affective commitment (AC)'s mediation between ESP and SP. Its indirect effect is 0.160, comprising 37.30% of the total effect (0.429), with a 95% CI [0.096, 0.226] (excluding 0), $t = 4.773$, and a significant p -value, confirming partial mediation—consistent with prior studies [34-36]. External pressure can stimulate the intrinsic identification and sense of responsibility of personnel in higher education institutions towards sustainable procurement. Such emotional tendencies prompt them to more actively implement relevant practices.

By comparing the path coefficients, the influences on sustainable procurement (SP) in descending order are as follows: the direct impact of affective commitment (AC) (0.430) > the direct impact of external stakeholders' pressure (ESP) (0.269) > the direct impact of knowledge (KL) (0.247). In terms of mediating effects, the indirect impact of affective commitment (0.160) > the indirect impact of knowledge (0.116).

This ranking shows that affective commitment is the core factor driving sustainable procurement. Its direct effect is significantly higher than that of other variables, and it also plays a stronger role in transmitting external pressure through

mediating paths. Although external stakeholders' pressure directly promotes sustainable procurement, its effect is weaker than that of affective commitment. Moreover, part of its influence is achieved by stimulating affective commitment and accumulating knowledge.

This may be because affective commitment is an intrinsic driver, reflecting the active recognition and sense of responsibility of personnel in higher education institutions toward sustainable procurement. When procurement staff recognize sustainable goals at the value level, they will actively incorporate environmental protection and social responsibility into decision-making, and even maintain implementation efforts in the absence of external supervision. In contrast, the direct impact of external stakeholders relies more on external constraints (such as policy requirements and public supervision), which tend to lead to passive compliance and hardly meet the in-depth needs of practice optimization.

VI. CONCLUSION

A. Research Implications

The theoretical contributions of this study are mainly reflected in the precise deepening and innovative expansion of organizational sustainability theory, stakeholder theory, and institutional theory. External stakeholder pressure affects sustainable procurement through the dual mediating role of affective commitment and knowledge. This finding does not merely verify the correlation between variables but identifies the novel dual mediation mechanism of affective commitment plus knowledge, supplementing organizational sustainability theory with a specific transmission path of external pressure, internal capabilities, sustainable practices, and clarifying the core hub role of internal factors in pressure transformation.

From the perspective of stakeholder theory, unlike existing studies that mostly focus on enterprises or general public sectors, and traditional theories that adhere to the linear cognition of external pressure directly driving organizational behaviour, this study takes Chinese higher education institutions (HEIs) which integrate educational attributes and public functions as a unique contextual variable, and for the first time systematically verifies the integrated model of dual mediators (affective commitment and knowledge). It breaks through the singular cognition of traditional theories by revealing the key boundary condition that the intensity of stakeholders' influence depends on the depth of organizational members' affective identification. This clarifies the core path through which this study advances the theory by exploring the underexplored theoretical gap of the internal transformation mechanism of external pressure, it expands the application scenario of stakeholder theory from market-oriented organizations to non-market-oriented higher education institutions, and provides an empirically verifiable new perspective for understanding the boundary conditions of stakeholder organization interaction.

From the perspective of institutional theory, addressing the limitation of existing studies that regard institutional pressure internalization as a single process without distinguishing the differential roles of cognitive and emotional dimensions, this study innovatively links the dual mediators to the institutional internalization process, identifying the dual paths of cognitive

internalization (knowledge mediator: rational absorption of norms) plus emotional internalization (affective commitment mediator: emotional recognition of values). This novel division of mediating mechanisms not only confirms the dynamic and synergistic process of institutional pressure internalization but also clarifies that emotional internalization is the core driver for organizations to move from passive compliance to active practice (path coefficient 0.430 is much higher than knowledge's 0.247). By refining the micro mechanism of institutional legitimacy formation, this finding fills the research gap of differentiation of internalization paths in institutional theory within the field of sustainable management. It not only provides a new theoretical perspective for understanding the internal driving logic of sustainable practices but also offers replicable methodological insights for interdisciplinary integration in organizational behaviour analysis.

B. Practical Implications

Based on empirical findings, this study offers targeted implications for the sustainable procurement practices of Chinese higher education institutions (HEIs): First, strengthen the cultivation of affective identification and integrate sustainable development values into the training and incentive systems for procurement personnel. The direct effect (path coefficient = 0.430) and mediating strength (37.30%) of affective commitment both rank first, indicating that procurement personnel's value recognition and sense of responsibility toward sustainable goals are the key to breaking through "surface compliance". Managers can interpret the campus value of sustainable procurement through induction training and enhance identity resonance with typical university-specific cases; in incentive design, directly link sustainable procurement performance to performance promotion and merit evaluation, which not only meets procurement personnel's professional sense of achievement but also strengthens their emotional bond with organizational goals.

Second, establish a collaborative mechanism between external collaboration and internal capabilities. The dual mediation empirical results show that external pressure can only fully exert its effect through the two-way transformation of knowledge accumulation and affective identification, with significant synergistic effects between the two. Therefore, HEIs cannot promote sustainable procurement in isolation and need to build an internal-external linkage transformation platform: externally, collaborate with government departments and environmental organizations to conduct policy and practical training, and simultaneously organize face-to-face communication between procurement personnel, communities, and suppliers to not only accurately transmit external pressure but also enhance emotional connection by perceiving stakeholders' demands; internally, establish a sustainable procurement knowledge base integrating policy standards, successful cases, and supplier technical resources, and require suppliers to incorporate sustainable production training into cooperation obligations to ensure the practicality and continuity of knowledge accumulation.

Third, adapt to the administrative and policy-driven characteristics of Chinese HEIs, integrate sustainable procurement into HEIs' governance and inter-departmental assessment, formulate special procurement lists and green

clauses, and establish a supplier sustainability rating system to consolidate practical results at the governance and process levels. These implications provide an actionable framework for HEIs to address the dilemma of "surface compliance" and improve the quality of sustainable procurement.

C. Limitations and Future Directions

This study inevitably has some limitations. In terms of sample selection, the study sample is mainly from higher education institutions in a specific region, which may be affected by geographical policy differences, and the applicability of the conclusions to education organisations in other regions or privately-run is yet to be verified, and it is recommended that multi-stage stratified sampling be used in the follow-up to expand the coverage of the sample. In terms of data collection, this study uses cross-sectional data, which makes it difficult to capture the dynamic relationship of variables. The interaction of external stakeholder pressure, affective commitment, etc., with sustainable procurement may evolve over time, and it is recommended that a longitudinal tracking design be adopted to clarify the long-term mechanism of action. There is a simplification of the measurement dimensions of the variables, and the measurement of affective commitment and knowledge focuses on the overall level without subdividing the subdimensions, which may overlook the heterogeneity of the mediating effect. It is recommended that the measurement of the constructs be refined in the future to improve the precision of the mechanism analysis.

In the future, research can focus on specific types of HEIs and conduct comparative studies from the perspectives of curriculum design, training programs, and management strategies. This approach can address the limitation of sample homogeneity and deepen the understanding of the context, mechanisms, and practical implications of sustainable procurement. Classify HEIs by disciplinary characteristics, operational orientation, and institutional nature—different types have distinct procurement needs and implementation foundations due to attribute differences. Compare the depth of knowledge integration in curricula, methods of enhancing affective identification, and differences in strategy implementation paths across institutions to clarify the impact of these initiatives on dual mediators and the performance mechanism. This will provide targeted solutions for various HEIs and refine and expand the theoretical model through contextual segmentation.

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