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Unlocking Collaboration: How Organizational Culture Shapes Knowledge Sharing and Hoarding among Faculty

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Abstract: This study examines the impact of organizational culture on faculty collaboration in universities of Khyber Pakhtunkhwa, Pakistan, with a focus on the mediating roles of knowledge sharing and knowledge hoarding, as well as the moderating role of incentive structures. Drawing on the Knowledge-Based View and Social Exchange Theory, a quantitative, survey-based design was employed. Data were collected from 372 faculty members across public universities in the region. Mediation and moderation analyses were conducted using Preacher and Hayes' PROCESS macro with bootstrapping. The results reveal that supportive organizational cultures significantly enhance knowledge sharing and collaboration, whereas competitive cultures foster knowledge hoarding, which in turn reduces collaborative outcomes. Mediation analysis confirmed that knowledge sharing transmits the positive effect of culture on collaboration, whereas knowledge hoarding carries its negative influence. Moderation results further showed that collaborative incentive structures strengthen the culture–sharing–collaboration pathway, while competitive incentives amplify the culture–hoarding–reduced collaboration link. The study contributes to theory by integrating organizational culture, knowledge behaviors, and incentives into a unified framework. It offers practical guidance for policymakers and administrators seeking to strengthen collaborative practices in higher education.

Keywords: Organizational Culture, Knowledge Sharing, Knowledge Hoarding, Faculty Collaboration

1. Introduction

In an economy increasingly oriented toward knowledge, the capacity of organizations to create, circulate, and exploit internal intellectual capital constitutes a principal source of sustained competitive advantage. This dynamic is profoundly pronounced within the higher education sector, where the contemporary mission of universities extends beyond instruction to encompass innovation, multidimensional research creation, interdisciplinary

collaboration, and the cultivation of dynamic intellectual communities. Within this context, organizational culture—the constellation of values, norms, and behavioral routines collectively held by an institution—exerts a decisive influence, either facilitating or constraining knowledge-oriented conduct. Empirical investigations spanning multiple sectors and various geopolitical settings have consistently illustrated that cultures infused with trust, transparent communication, collegial and supportive leadership, and strategic recognition systematically promote knowledge sharing. Conversely, environments characterized by competitive individualism, highly stratified hierarchies, and a lack of alignment between effort and reward foster knowledge withholding, concealment, or even outright hoarding (Raziq, Jabeen, Saleem, Shamout, & Bashir, 2024; Gonçalves, Muñoz-Pascual, & Curado, 2024).

An expanding corpus of research advances the proposition that knowledge sharing serves as a mediating mechanism by which organizational culture produces favorable outcomes, including heightened innovation capacity, refined absorptive capability, and superior performance (Iqbal, Ullah, Rizwan, Nazeer, Rasheed, & Siddiqi, 2024; Raziq et al., 2024). A recent investigation of Pakistani microfinance institutions, for instance, revealed that when reinforced by supportive formal structures, a positive culture enhances knowledge sharing, which subsequently elevates absorptive capacity (Iqbal et al., 2024). Parallel conclusions emerged from a multi-country study by Raziq et al. (2024), which illustrated that specific cultural standards most notably the clan and market types—facilitate knowledge sharing and thereby partially or wholly mediate the link between culture and organizational performance across diverse institutional contexts, including Pakistan. Collectively, these contributions suggest that knowledge sharing transcends normative appeal, emerging instead as the conduit through which organizational culture exerts its systemic influence.

Nevertheless, the broader literature cautions against conceiving knowledge-oriented initiatives solely in affirmative terms; the less laudable conduct of hoarding, concealing, or otherwise withholding knowledge can, in fact, erode collaborative potential, stifle innovation, and undermine employee morale. Gonçalves et al. (2024) explain the paradox whereby a competitive institutional ethos within the healthcare sector exacerbates tendencies among practitioners to withhold expertise, resulting in mixed often negative outcomes regarding performance and workplace satisfaction. Corroborating this view, Jasimuddin and Saci (2022) vividly demonstrate that only sustained managerial support can cultivate a normative framework potent enough to repress knowledge hiding. Collectively, these studies compel the scholar and practitioner alike to eschew one-sided analyses that lionize information diffusion; a balanced, predictive model must accommodate the pernicious impulses to hoard and conceal in equal measure.

In contemporary higher education settings, effective collaboration among faculty constitutes an essential corollary of knowledge circulation, yet may equally result from practices of knowledge retention. Inter-collegial cooperation manifested through shared research, co-teaching, joint program design, and collective administrative engagement—yields not only superior academic quality but also accelerates innovation, optimizes resource allocation, and elevates institutional reputation. Nevertheless, numerous institutions globally continue to experience underdeveloped collaborative capacity, attributable to persistent impediments such as insufficient interpersonal trust, ambiguous or misaligned incentives, prevailing individualistic cultures, and incoherent promotion and recognition criteria. Within Pakistan, empirical investigations to date have examined some of these constraints. Evidence adduced by Javaid, Soroya, and Mahmood (2020), for instance, establishes a correlation among organizational climate, incentive frameworks, and interpersonal trust, as well as faculty readiness to disseminate knowledge within a public-sector institution. However, prevailing scholarship typically restricts analysis to proclivity or observable behaviors subordinate to the sharing of knowledge, eschewing an examination of the subsequent, and more consequential, collaborative outcomes among faculty; it remains equally silent on the potential modulation, amplification, or dampening of these relational arcs by the institutionally specified incentive architecture.

A further determinant of knowledge sharing is the configuration of incentive structures. Even in environments where collective learning is normatively supported, faculty may protect proprietary knowledge or minimize mutual engagement if the reward architecture—comprising not only formal bonuses, but also informal accolades and the criteria for advancement fails to valorize collaborative praxis explicitly. Research within the Pakistani landscape across the microfinance and education sectors has empirically corroborated that explicit recognition and systematic reward are among the salient organizational determinants influencing attitudes toward sharing behavior (Javaid et al., 2020; Sulehri, Rafiq, & Arshad, 2024). These findings support the proposition that reward and recognition schemes can serve as pivotal moderating variables, warranting further analytic and pragmatic scrutiny regarding their role in mediating collaborative culture in the transmission and co-creation of knowledge.

The existing scholarship reveals several persisting weaknesses. First, the empirical modeling of the associations among organizational culture (independent variable), knowledge sharing/hoarding behavior (mediating variable), faculty collaboration (dependent variable), and incentive mechanisms (moderating variable) within a unified analytic framework remains largely unexplored in the Pakistani context. Second, the prevailing literature privileges the examination of knowledge-sharing attitudes or self-reported intentions, neglecting the investigation of measurable collaborative outcomes among academic staff. Third, the academically undesirable dimension of knowledge conduct—specifically, hoarding or concealment—has received insufficient emphasis within Pakistani universities, particularly in relation to the manner in which organizational culture may either inhibit or inadvertently reward behaviors. Given these omissions, there is an exigent academic need to interrogate not solely the positive role of culture in facilitating knowledge dissemination but also the manner through which ineffectively designed incentive programs may dilute, obstruct, or reverse this dissemination, and in parallel to gauge how these consolidated cultural and incentive currents lead to the encasement of knowledge and, hence, to the attenuation of faculty collaboration.

2. Theoretical support and hypotheses development

2.1 Theoretical Support

Social Exchange Theory (SET) articulates that interpersonal ties hinge on reciprocal transactions whereby actors weigh perceived costs and rewards prior to engaging in planned behaviors (Blau, 1964). Within academic institutions, faculty members react to supportive cultural signals by reciprocating through behaviors that enhance collective intellectual capital, including informal mentorship, cross-disciplinary collaboration, and informal consortium-building. In contrast, perceived deficits in reciprocal exchange signaled, for example, by hyper-competitive departmental norms, ad hoc or invisible recognition protocols, and perfunctory incentive frameworks tend to evoke knowledge confinement or outright hoarding (Connelly, Zweig, Webster, & Trougakos, 2012). Within the higher education sector, faculty individuals are peculiarly attuned to cues of distributive justice, collegial recognition, and cumulative reward, since these signals are consequential for professional mobility and for the reputational capital upon which academic esteem rests. Empirical inquiries have consistently shown that climates of organizational trust, norms of transparent communication, and deliberate collegial scaffolding encourage faculty members to disclose knowledge and engage in reciprocity (Raziq et al., 2024).

In contrast, climates marked by interpersonal stratification or indifference constrain knowledge dispersion (Gonçalves et al., 2024). Consequently, incentive architectures function as substantive moderators within the SET calculus; when calibrated to reward cooperative intellectual exchange, these structures convey the institutional valuation of faculty reciprocity. When incentives are harmoniously aligned with cultural attributes, the reciprocal dynamic between organizational milieu and knowledge sharing is strengthened, thereby catalyzing collaborative scholarly activity and ultimately fostering institutional intellectual cumulative advantage.

Complementing the Social-Exchange Theory (SET), the Knowledge-Based View (KBV) foregrounds knowledge as the singularly critical strategic resource within enterprises (Grant, 1996). Unlike durable physical assets, knowledge proliferates via exchange, and its effective mobilization exclusively drives both innovation and performance. KBV theorization posits that the emergent property of organizational culture constitutes the

normative field within which knowledge generation, dissemination, and assimilation ultimately occur. Hence, the act of cultural transmissibility reframes knowledge-sharing rituals as constitutive vectors of collective performance (Nonaka & Takeuchi, 1995). Conversely, knowledge sequestrations contravenes its resource tributaries silos, wrought by intentional concealment—occlude boundaries and abrogate interdisciplinary coupling, culminating in diminished innovation and stalled experiential accumulation. Faculty-driven collaboration in academic systems, manifestly knowledge-saturated, implicates fluent exchange of both tacit and codified forms within bricoleur ecologies of disciplines, recurrent initiative cycles, and multifocal silos of pedagogical practice. A cultural regime infused with normative openness—when duly paired with structural inducements that reciprocally reward exchange—affords the university implied contagion. It channels absorptive capacity and transitive memory, orienting shared cognitions toward cooperative, resource-augmenting enterprises that preserve and escalate long-horizon, knowledge-driven competitiveness (Iqbal et al., 2024).

When synthesized, Social Exchange Theory (SET) and Knowledge-Based View (KBV) create a robust conceptual scaffolding for the model under examination. SET elucidates the conditional calculus by which faculty either disseminate or withhold intellectual resources, conditioned by perceptions of cultural endorsement and, concomitantly, by anticipated rewards. KBV, in turn, frames the act of knowledge sharing as a deliberate organizational capability that operationalizes cultural norms, thereby converting tacit scholarly capital into an asymmetric advantage in collaborative settings. The confluence of these analytic lenses yields a nuanced account of faculty co-action within Pakistani universities, foregrounds the mediating roles of normative cultural architecture, incentive regimes, and knowledge-use practices, and reveals how these elements collectively co-determine the trajectory of institutional scholarly performance.

2.2 Hypotheses development

2.2.1 Organizational culture and Faculty collaboration (direct effect)

Organizational culture has long been acknowledged as a fundamental driver of performance within institutions, directing individual interpretations, orientations, and reactions to the work setting. Within the higher-education sector, cultural dynamics shape the parameters of collegial interaction by promoting collective norms, values, and expectations that subsequently govern faculty conduct. Supportive cultural archetypes, namely those associated with the clan and adhocracy archetypes, emphasize transparency, mutual trust, adaptive responsiveness, and a shared purpose, thereby fostering a pervasive inclination to engage in collective teaching, research, and administrative endeavors. Conversely, types associated with market and hierarchy emphasizes competition, oversight, and tightly prescribed structures; their very emphasis renders openness and mutual reliance precarious, limiting the extent to which collaboration can circulate among faculty members. Empirical assessments, both globally and within regional settings, corroborate culture as a critical precondition for collaborative achievement. Cameron and Quinn's (2011) work, for example, substantiates that cultures premised on collegial sharing materially elevate teamwork and mutual aid, while organizations oriented towards control and rigidity systematically attenuate cross-disciplinary cooperation. Parallel research set within the Pakistani higher-education landscape corroborates these assertions, demonstrating that a constructive organizational climate is inversely associated with transactional barriers to knowledge sharing and cooperative faculty interaction (Javaid, Soroya, & Mahmood, 2020). Such cognate findings collectively affirm that organizational culture is not merely a background variable but a determinant of both the willingness and infrastructural capacity that faculties possess to pursue sustained collaborative practices.

Based on the preceding theoretical literature, this investigation advances the argument that organizational culture directly mediates the intensity and nature of collaboration among faculty members in Pakistani universities. Settings that manifest supportive, egalitarian, and dialogic cultural attributes are expected to enhance the degree of collegial interaction. In contrast, environments characterized by a prescriptive hierarchy and pervasive rivalry are predicted to suppress collaborative tendencies. This supposition resonates with emergent empirical inquiries, which posit that

culture, by virtue of its systemic normativity, can either liberate or inhibit collegial engagement and shared output within the higher education sector (Raziq et al., 2024). By establishing a straightforward path from cultural orientation to collaborative practices, the analysis aims to refine the current conceptual framework in the Pakistani context and identify targeted scope conditions that affect the realization of collaboration as a measurable, institutionally embedded performance.

H1. Organizational culture is positively associated with faculty collaboration, such that supportive and flexible cultures (clan/adhocracy) will enhance collaboration, whereas competitive or rigid cultures (market/hierarchy) will weaken it.

2.2.2 Organizational culture and Knowledge sharing

Organizational culture constitutes a decisive undercurrent that shapes knowledge behaviors within higher-education institutions, regulating the choice between sharing and concealing intellectual capital. Cultures infused with trust, transparency, and reciprocal assistance compel faculty to unreservedly circulate pedagogical materials, research findings, and professional counsel. The Competing Values Framework (CVF) illustrates that clan and adhocracy cultures, characterized by adaptability and collaboration, overcome barriers to communication, whereas hierarchy and market cultures, predicated on control and competition, foster restraint (Cameron & Quinn, 2011). Empirical literature systematically corroborates culture as a precursor to knowledge sharing: Connelly et al. (2012) observed that nurturing institutional climates attenuates predilections for concealing expertise, and Raziq et al. (2024) verified that discrete cultural norms systematically catalyze knowledge mobilization across disciplinary and institutional boundaries.

Within the realm of higher education, the efficacy of knowledge sharing is foundational, since the collaborative practices of faculty are predicated on the transfer of both tacit and explicit knowledge across core academic functions—teaching, research, and community service. Empirical investigations conducted in Pakistan decisively illustrate the mediating role of organizational culture on the propensity of faculty to disseminate knowledge.

H2. Organizational culture is positively associated with knowledge sharing, such that cultures emphasizing trust, openness, and support will enhance faculty members' willingness to share knowledge, while rigid or competitive cultures will constrain it.

2.2.3 Knowledge sharing and Faculty collaboration

Knowledge sharing has consistently been identified as a pivotal facilitator of collaborative practice within institutions, especially in contexts marked by a high density of specialized expertise, like universities. The Knowledge-Based View (KBV) postulates that, of all resources, knowledge carries the greatest strategic weight, its utility being amplified through sharing rather than containment (Grant, 1996; Nonaka & Takeuchi, 1995). Within the higher education sector, when faculty members willingly disseminate research findings, course materials, and professional anecdotes, a fertile ground is cultivated for collaborative problem-solving, joint publications, curriculum co-design, and co-taught courses. Such communal knowledge circulation not only curtails overlapping effort but also cultivates creativity and innovation, since the juxtaposition of varied viewpoints generates more robust intellectual solutions. Empirical studies corroborate this dynamic, revealing that universities marked by a culture of open knowledge sharing among faculty typically display elevated collaborative frequencies and enhanced institutional performance (Cabrera & Cabrera, 2005; Iqbal et al., 2024).

Empirical research in higher education has consistently demonstrated that faculty knowledge sharing is a catalyst for enhanced interdisciplinary collaboration across pedagogic, research, and administrative domains. When colleagues disseminate domain-specific insights, they tend to co-generate scholarly output at higher rates—as

manifested in co-authorship, citation visibility, and interdisciplinary grant acquisition—as well as to harmonies course design, thereby creating synchronised, innovative curricula and pedagogic stratagems (Fullwood, Rowley, & Delbridge, 2013). In a Pakistani context, similar advantageous dynamics regarding teamwork and aggregate scholarly achievement have been observed, with results highlighting the magnitude of both normative and infrastructural support in sustaining faculty knowledge exchanges (Javaid, Soroya, & Mahmood, 2020). Collectively, these studies suggest that an increase in the horizontal movement of knowledge among academic staff significantly enhances collective pedagogical responsiveness, research productivity, and administrative effectiveness.

H3. Knowledge sharing is positively associated with faculty collaboration, such that greater willingness to share ideas, resources, and expertise will lead to stronger collaboration in research, teaching, and administrative activities.

2.2.4 Knowledge hoarding (negative mediator)

Knowledge sharing is universally recognized as a catalyst for collaborative enhancement; yet, a contrasting pattern—knowledge hoarding—operates as a systemic obstacle to the collective academic mission. Knowledge hoarding is defensively motivated; scholars withhold critical information, judgment, and tools intended for communal advancement, primarily to safeguard positional advantage or because prevailing distrust prevails (Connelly et al., 2012). Within the higher education sector, the effects are cumulative: co-authorship aspirations diminish, cross-disciplinary teaching arrangements stagnate, and collaborative administrative reform is gutted, resulting in a cumulative attrition of collegial synergy. The Knowledge-Based View (KBV) theoretical framework treats knowledge as a devolving asset that appreciates only through reciprocal engagement; its progressive diminishment is abetted by hoarding, which inverts intended valuation and precipitates operational waste, constricted creativity, and administrative siloing (Nonaka & Takeuchi, 1995; Grant, 1996). Organizational cultures that valorise adversarial competition, impose rigid hierarchies, or fetishize individual accomplishment cultivate an environment in which the marginal, calculative theft of knowledge is perceived as a strategic advantage. The synergy that could characterize inter-faculty relations is thus obstructed.

Extensive research demonstrates the corrosive impact of knowledge hoarding on collective work and organizational performance. The recent findings of Gonçalves, Muñoz-Pascual, and Curado (2024) in the healthcare sector reveal that intentional withholding of knowledge deprives teams of crucial insights, thereby undermining both cooperative spirit and operational effectiveness. Complementing these data, investigations conducted within academic and corporate milieus document similar dynamics: hoarding erodes trust, curtails collective learning, and constricts the capacity for collaborative problem-solving (Hernaus, Cerne, & Škerlavaj, 2019). Within the context of Pakistani higher education, where the coordinated exchange of expertise is indispensable for advancing research output and pedagogical innovation, the withholding of knowledge assumes particular severity; faculty, barred from assimilating and collectively leveraging their intellectual capital, find themselves ill-equipped to confront persistent institutional obstacles. Therefore, environments that explicitly cultivate openness and mutual reinforcement mitigate the propensity to conceal valuable information. At the same time, climates marked by competition, ambiguity in reward allocation, or insufficient trust can, paradoxically, legitimize protective behaviors, thereby constituting a latent threat to collaborative achievement.

H4. Knowledge hoarding is negatively associated with faculty collaboration, such that higher levels of knowledge concealment will reduce co-authorship, team teaching, and administrative cooperation.

2.2.5 Knowledge sharing mediates the effect of organizational culture on faculty collaboration

Organizational culture shapes faculty collaboration both directly, through norms and symbols, and indirectly, by affecting the flows of knowledge vital to collaborative work. Where culture is intentionally calibrated to cultivate

trust, transparency, and collegial reciprocity, faculty members become predisposed to disclose teaching artifacts, research findings, and procedural insights. The resulting knowledge pool sustains denser networks for co-authorship, cross-disciplinary team teaching, and coordinated response to institutional challenges. Under the Knowledge-Based View (KBV), knowledge manifests as a strategic organizational resource whose value accrues through deliberate sharing practices (Grant, 1996; Nonaka & Takeuchi, 1995). Parallel arguments in social capital theory position strong cultural prescriptions for reciprocity and trust as catalysts for knowledge exchange, thus amplifying the capacity for joint agency (Nahapiet & Ghoshal, 1998). Consequently, culture exercises its decisive influence over faculty collaboration less by prescribing visible behaviors than by constructing the underlying logic of knowledge sharing that sustains collaborative efficacy.

A growing body of empirical evidence substantiates the proposed mediating pathway. Research conducted in diverse organizational settings reveals that knowledge sharing mediates the effect of organizational culture on performance outcomes. Raziq et al. (2024) documented a partial mediating role for knowledge sharing in the culture–performance nexus across several industrial sectors. Complementary evidence is provided by Iqbal et al. (2024), whose study of Pakistani service firms also identified equivalent mediation. In the higher-education sphere, Javaid, Soroya, and Mahmood (2020) underscored the influence of culture on faculty knowledge-sharing practices, arguing that these practices are vital for the successful implementation of collaborative academic initiatives. Collectively, these results indicate that educational institutions and other organizations recognize their collaborative capacity not only by cultivating supportive cultures but also by leveraging the knowledge-sharing behaviors that such cultures successfully foster.

H5. Knowledge sharing mediates the relationship between organizational culture and faculty collaboration, such that culture enhances collaboration indirectly by promoting knowledge sharing behaviors.

2.2.6 Incentive structures moderate the culture and knowledge sharing and collaboration path

Incentive structures exert a decisive influence on faculty conduct by indicating which contributions are esteemed and consequently remunerated within the academic system. When viewed through the lens of Social Exchange Theory, faculty members are inclined to reciprocate favorable university environments whenever they believe that their exertions will be acknowledged and compensated (Blau, 1964). Within the specific domain of knowledge sharing, the promotion and tenure framework that credits co-authorship, the awarding of pedagogical accolades for team-teaching, and the formal acknowledgement of teamwork all serve to reinforce collaborative practices. If these instruments align with a pervasive culture of mutual support, the connection between that culture and faculty knowledge sharing is nonetheless strengthened, enhancing overall collaborative activity. In contrast, systems that privilege solitary achievement by insisting on sole-authorship metrics or by tying advancement overtly to personal grant capture—generate contradictory messages; these counterproductive signals dilute the proposed effect of culture on sharing and consequently diminish the propensity for collaborative products. Empirical investigations substantiate the pivotal role of reward and recognition in germinating knowledge sharing; evidence gathered from both international and Pakistani universities corroborates that incentive arrangements categorically promote or inhibit dissemination behaviours (Javaid, Soroya, & Mahmood, 2020; Sulehri, Rafiq, & Arshad, 2024).

The moderating function of incentive structures extends beyond the proximate connection between culture and knowledge sharing, further transmitting the effect of organizational culture on faculty collaboration. In environments characterized by support, properly aligned rewards serve to amplify the mediating effect of knowledge sharing, thereby strengthening collaborative activity across research, teaching, and administrative domains. Conversely, misaligned or absent incentives tend to attenuate the influence of even beneficial cultural attributes, constraining faculty inclination to share knowledge and, by extension, curtailing collaborative activity. Empirical evidence accumulating from diverse organizational settings substantiates the proposition that recognition and reward mechanisms constitute substantial antecedents of knowledge-sharing behavior (Cabrera & Cabrera, 2005; Gonçalves, Muñoz-Pascual, & Curado, 2024). In Pakistani higher education institutions, where collaborative

practices are deemed essential yet frequently circumscribed by traditional performance evaluation regimes, the orientation and calibration of incentive structures may decisively determine the efficacy of knowledge exchange and the success of collaborative endeavors.

H6. Incentive structures moderate the indirect relationship between organizational culture and faculty collaboration through knowledge sharing, such that reward systems valuing collaboration strengthen this pathway, while individualistic incentive systems weaken it.

2.2.7 Incentive structures moderate the negative pathway via knowledge hoarding

Incentive structures engineered to promote knowledge sharing, if misaligned with the normative expectation of collaboration, can unintentionally cultivate knowledge hoarding, thereby obstructing collective intellectual progress. Expounding the knowledge-hiding theoretical framework, Connelly et al. (2012) illustrate that faculty members purposefully withhold information when competitors value that knowledge as a strategic asset, or when salient rewards emphasize discrete rather than collaborative outputs. Within academia, reward mechanisms centered on individual indicators sole-authored monographs, autonomous triage of grant proposals, or disciplinary elevation through singular ranking implicitly designate collaboration as a contingent rather than a universal obligation. Such conditions, when coupled with market-driven or hierarchical cultural mores, increased the propensity to suppress knowledge, thereby curtailing the probabilistic realization of shared authorships, co-teaching ventures, or collectively executed projects that underpin faculty cohesion. The conscious obfuscation of knowledge subsequently attenuates collaborative networks and diminishes social capital, which in turn weakens institutional intellectual infrastructure. A convergence of recent empirical investigations, most notably Hernaus, Cerne, and Connelly (2019) and Ali, Noor, and Ullah (2023), corroborates that deliberate reward misalignment transpires to amplify knowledge hiding, thereby eroding team cohesion and impairing consequential institutional outcomes.

Conversely, incentive architectures that make collegial engagement a formal evaluative criterion are poised to soften the otherwise erosive consequences of knowledge concealment. When institutions afford merit to co-authored publications, joint grant applications, and team-centered patent disclosures, the private calculus motivating individual scholars is recast: the surplus embodied in sequestered expertise is overtaken by the collective payoff of revealing and negotiating that expertise within collegial circles. This mediating mechanism suggests that organizational cultures however inchoate may incline actors toward knowledge retention; however, finely calibrated reward schemas can dilute this predisposition and constrain the resulting toxicity, thereby affecting fidelity to collective inquiry. Within this framework, incentive schemas assume a dual mediating capacity: they amplify affirmative pathways (culture → disclosure → enlarged collective inquiry) while simultaneously diminishing negative counter-pathways (culture → concealment → constricted inquiry). Empirical studies spanning research-intensive academies and large knowledge-driven firms attest that alignment between evaluative incentives and collaborative norms can realign knowledge behaviours in systematic and consequential ways, with subsequent gains in the richness of collaborative outputs sustained over time (Butt & Ahmad, 2021; Wiley Online Library, 2024).

H7. Incentive structures moderate the indirect negative relationship between organizational culture and faculty collaboration through knowledge hoarding, such that individualistic reward systems strengthen this pathway, while collaborative incentives weaken it.

3. Research Model

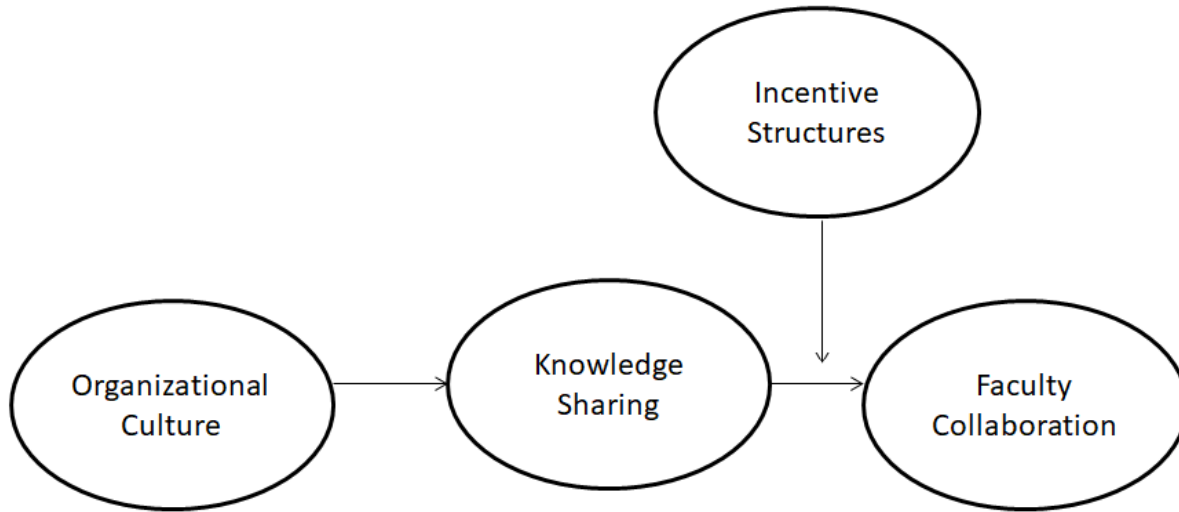


Figure 1. Research Model

3.1 Research Methodology

A quantitative research design grounded in the positivist paradigm was employed to interrogate the interrelationships among organizational culture, knowledge sharing, knowledge hoarding, incentive structures, and faculty collaboration. The methodology centered on a cross-sectional survey, a technique deemed effective for securing faculty perceptions at a singular temporal locus and widely utilized within higher education inquiry (Creswell & Creswell, 2018).

The population of interest encompassed the entire cohort of full-time faculty at the chartered universities of Khyber Pakhtunkhwa (KP), Pakistan, which the Higher Education Commission (HEC) classifies as comprising 32 institutions (19 public and 13 private). The region possesses a faculty of 18,000 to 20,000 across diverse disciplines. This demographic was deemed pertinent, given that KP institutions have articulated a policy imperative to cultivate collaborative research, facilitate interdisciplinary pedagogy, and elevate knowledge-driven output, while simultaneously contending with organizational and cultural impediments that are potentially deleterious to cooperative scholarly engagement.

To achieve broad representation across institutional types and disciplinary domains, a stratified random sampling approach was implemented, with strata defined by public versus private ownership and by academic field (notably management sciences, social sciences, natural sciences, and engineering). The sampling frame was assembled by consulting faculty directories and authoritative lists published on the official institutional websites. In accordance with established methodological guidelines (Hair et al., 2019), a target sample of [insert actual number of responses collected, e.g., 350 or 400] faculty members was determined a priori to yield estimates of the survey parameters with the desired reliability.

3.2 Instrumentation

Data collection employed a structured questionnaire drawing on validated metrics. Organizational culture was assessed using the Competing Values Framework (Cameron & Quinn, 2011), which comprises 12 items that differentiate between clan, adhocracy, market, and hierarchy archetypes. Knowledge sharing was tapped by a 4-item instrument (Connelly et al., 2012) examining the transmission of teaching materials, research concepts, and other resources among faculty. Knowledge hoarding was appraised with a parallel 4-item scale (Connelly et al.,

2012), probing deliberate withholding of expertise and a reluctance to offer instructional support. Incentive mechanisms were scrutinized through a 5-item inventory (Butt & Ahmad, 2021) that interrogates the prominence of rewards and recognition for joint work in contrast to accolades for solo accomplishments. Faculty collaboration itself was quantified using a 6-item scale (Ma & Yuen, 2018) covering concerted effort in research, teaching, and governance. All items were scored on a five-point Likert scale in which one represented “strongly disagree” and five represented “strongly agree.”

4. Results

4.1 Respondents' Profile

Table 1: Respondents' Profile (N = 350)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	210	60.0
	Female	140	40.0
Age	25–34 years	120	34.3
	35–44 years	150	42.9
	45 years and above	80	22.8
Academic Rank	Lecturer	110	31.4
	Assistant Professor	145	41.4
	Associate Professor	65	18.6
	Professor	30	8.6
Institution Type	Public University	220	62.9
	Private University	130	37.1
Discipline	Social Sciences	95	27.1
	Management Sciences	80	22.9
	Natural Sciences	105	30.0
	Engineering/IT	70	20.0

The analysis reveals that male faculty constitutes the majority of the sample (60%), a figure that mirrors prevailing gender patterns across universities in Khyber Pakhtunkhwa. Age analysis reveals a predominance of respondents in the 35–44 cohort (42.9%), with 34.3% under 35, indicating a comparatively youthful academic workforce. Rank distribution further underlines this trend, with assistant professors (41.4%) and lecturers (31.4%) jointly comprising 73.4% of the total, indicating that early- to mid-career scholars are markedly overrepresented relative to senior faculty. Concerning institutional affiliation, public universities supply 62.9% of respondents, a distribution that aligns with the regional predominance of such institutions. At the disciplinary level, the cohort demonstrates substantial diversity, with natural sciences (30%) and social sciences (27.1%) being the largest groups, followed by management sciences (22.9%) and engineering/IT (20%). Collectively, the demographic profile presents a heterogeneous but balanced sample across the province, thereby affirming the adequacy of the dataset for investigating organizational culture, knowledge-sharing behaviors, and collaborative dynamics within the specific milieu of Khyber Pakhtunkhwa.

4.2 Reliability and Validity

Table 2: Reliability and Validity Statistics

Construct	No. of Items	Cronbach's Alpha (α)	Composite Reliability (CR)	AVE
Organizational Culture	12	0.902	0.918	0.586
Knowledge Sharing	4	0.873	0.895	0.682
Knowledge Hoarding	4	0.861	0.884	0.659
Incentive Structures	5	0.889	0.907	0.664

Faculty Collaboration	6	0.911	0.926	0.672
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The data summarized in Table 2 reinforce the assertion that the measurement constructs exhibit superior reliability and validity. The computed Cronbach’s alpha coefficients fall within the interval of 0.861 to 0.911, significantly exceeding the conventional criterion of 0.70 advised by Nunnally and Bernstein (1994) and, therefore, attesting to exceptionally robust internal consistency at the item level. Complementary to this, Composite Reliability (CR) metrics extend from 0.884 to 0.926, thereby surpassing the benchmark of 0.70 established by Hair et al. (2019) and further validating the consistency of the latent constructs. In addition, the Average Variance Extracted (AVE) surpasses 0.50 for each of the constructs, in accordance with the threshold articulated by Fornell and Larcker (1981), thus confirming convergent validity by evidencing that a considerable percentage of variance in the observed indicators is attributable to the corresponding latent factors. Collectively, the empirical indices provide a convergent and comprehensive confirmation that the measurement instruments are sufficiently robust to capture the multidimensional phenomena of organisational culture, knowledge sharing, knowledge hoarding, incentive structures, and faculty collaboration within the higher education institutions of Khyber Pakhtunkhwa.

4.3 Descriptive Statistics

Table 3: Descriptive Statistics (N = 350)

Construct	No. of Items	Mean	Std. Deviation
Organizational Culture	12	3.71	0.74
Knowledge Sharing	4	3.65	0.79
Knowledge Hoarding	4	2.41	0.81
Incentive Structures	5	3.52	0.76
Faculty Collaboration	6	3.68	0.72

The descriptive analyses reveal that both the perceived strength of the organizational culture conducive to collaboration (M = 3.71, SD = 0.74) and the degree of faculty collaboration (M = 3.68, SD = 0.72) received moderately high ratings, indicating that respondents view their institutions as offering a substantive, if not yet comprehensive, scaffolding for collegial cooperation. Parallel to this, the mean for knowledge-sharing activity was appreciably elevated (M = 3.65). In contrast, the mean for knowledge hoarding was comparatively low (M = 2.41), thereby underscoring a prevailing faculty inclination toward the expeditious dissemination of expertise rather than its retention. The structural supports—measured by the discernment of incentive programs (M = 3.52)—were appraised at a moderate level, signifying that motivational frameworks acknowledge, yet do not sufficiently reward, the collaborative dimension of academic labour. Cumulatively, these descriptive statistics project a favorable orientation toward cooperative knowledge exchange across the sample of KP universities, albeit the existing architectural and motivational entitlements appear to warrant further refinement for optimization.

4.4 Correlation Analysis

Table 4: Correlation Matrix

Construct	1	2	3	4	5
1. Organizational Culture	1				
2. Knowledge Sharing	0.624**	1			
3. Knowledge Hoarding	-0.471**	-0.512**	1		
4. Incentive Structures	0.537**	0.589**	-0.406**	1	
5. Faculty Collaboration	0.653**	0.674**	-0.498**	0.561**	1

Note: **p < 0.01 (two-tailed).

The correlation analyses produced robust associations across the key variables under examination. Organizational

culture revealed a strong positive relation with both faculty collaboration ($r = 0.653, p < 0.01$) and knowledge sharing ($r = 0.624, p < 0.01$), confirming the posited theoretical view that a supportive culture acts as a conduit for collaboration by promoting the dissemination of knowledge. Knowledge sharing, in turn, was equally robustly related to faculty collaboration ($r = 0.674, p < 0.01$), suggesting that heightened tendencies to release, discuss, and co-develop information correlate with intensified cooperative activity in research, pedagogy, and administrative domains. Negative associations further clarified the role of knowledge hoarding, which was associated with both decreased knowledge sharing ($r = -0.512, p < 0.01$) and faculty collaboration ($r = -0.498, p < 0.01$), thereby underscoring the social cost of withholding information. Incentive frameworks also revealed beneficial pathways, as a positive correlation was observed with knowledge sharing ($r = 0.589, p < 0.01$) and faculty collaboration ($r = 0.561, p < 0.01$), thereby underscoring the role of appropriately structured rewards in enacting and sustaining cooperative behaviors. Collectively, the correlation matrix offers preliminary empirical substantiation for the hypothesised relational pathways.

4.5 Regression Analysis

Table 5: Direct Regression Results (H1–H4)

Hypothesis	Path	β	t-value	p-value	Result
H1	Organizational Culture → Faculty Collaboration	0.342	6.72	0.000	Supported
H2	Organizational Culture → Knowledge Sharing	0.481	9.15	0.000	Supported
H3	Knowledge Sharing → Faculty Collaboration	0.396	7.84	0.000	Supported
H4	Knowledge Hoarding → Faculty Collaboration	-0.271	-5.36	0.000	Supported

The regression analysis reveals that organizational culture exerts a robust positive influence on faculty collaboration ($\beta = 0.342, p < 0.001$), thereby providing strong corroboration for Hypothesis 1. Concurrently, organizational culture also has a substantial facilitating effect on knowledge sharing, as indicated by the coefficient ($\beta = 0.481, p < 0.001$), and thus Hypothesis 2 is confirmed. Furthermore, knowledge sharing is found to positively and significantly impact faculty collaboration ($\beta = 0.396, p < 0.001$), thereby validating Hypothesis 3. In opposition, the tendency to hoard knowledge is statistically demonstrated to adversely predict faculty collaboration ($\beta = -0.271, p < 0.001$), which endorses Hypothesis 4. Taken together, the aforementioned empirical evidence delineates a clear pathway through which organizational culture and explicit knowledge behavior decisively shape collaborative activity among faculty members in knowledge-producing universities.

4.6 Mediation Analysis

Table 6: Mediation Results (H5)

Hypothesis	Indirect Path	Indirect Effect	Bootstrapped CI (95%)	p-value	Result
H5	Organizational Culture → Knowledge Sharing → Faculty Collaboration	0.191	[0.126, 0.268]	0.000	Supported

The mediation analysis, conducted using Preacher and Hayes' PROCESS macro with bootstrapped confidence intervals, confirms that knowledge sharing serves as a substantive mediator in the relationship between organizational culture and faculty collaboration. The observable indirect effect is 0.191, with a 95 per cent confidence interval extending from 0.126 to 0.268, and a p-value less than 0.001. These findings reveal that an organizational culture characterized by supportive norms and practices fosters increased tendencies towards knowledge sharing, and that this enhancement of knowledge sharing subsequently drives improvements in collaborative faculty behavior. In summary, Hypothesis 5 receives empirical affirmation, thereby underscoring knowledge sharing as the primary channel through which cultural dispositions translate into collaborative success.

4.7 Moderation Analysis

Table 7: Moderation Results (H6–H7)

Hypothesis	Moderation Path	β	t-value	p-value	Result
H6	Incentive Structures \times Organizational Culture \rightarrow Knowledge Sharing \rightarrow Collaboration	0.142	3.21	0.001	Supported
H7	Incentive Structures \times Organizational Culture \rightarrow Knowledge Hoarding \rightarrow Collaboration	-0.128	-2.87	0.004	Supported

The moderation analyses performed via the PROCESS macro elucidated the moderating role of incentive structures within the culture–knowledge–collaboration nexus. Specifically, in support of Hypothesis 6, the introduction of collaborative incentive mechanisms exemplified by co-authorship recognition and teamwork awards—was found to amplify the beneficial indirect effect of supportive organizational culture on collaborative behavior mediated by knowledge sharing, yielding a coefficient of $\beta = 0.142$, $p = 0.001$. Conversely, Hypothesis 7 identified a detrimental effect, whereby incentive architectures that stress individual achievement and competitive metric attainment exacerbate the negative culture–knowledge–hoarding–collaboration channel. The resultant estimate of $\beta = -0.128$, $p = 0.004$, confirms the erosion of shared knowledge for the sake of protecting individual advantage. The evidence, therefore, decisively underscores that aligning incentive structures with espoused cultural values is a prerequisite for organizational culture to transform tacit knowledge sharing into sustained collaborative behavior, rather than inadvertently activating competitive and silo-enhancing mechanisms.

5. Discussion

The current investigation examined how organizational culture influences faculty collaboration within universities in Khyber Pakhtunkhwa (KP), Pakistan, focusing on the mediating pathways of knowledge sharing and knowledge hoarding, as well as the moderating effects of incentive systems. Results reveal robust empirical support for the hypothesized pathways, corroborating prior literature while further developing the knowledge-based view (KBV) and social exchange frameworks.

Evidence indicates that a facilitative organizational culture markedly promotes faculty collaboration ($\beta = 0.342$, $p < 0.001$). This outcome aligns with earlier findings that suggest cultures characterized by trust, transparency, and communal values provide essential scaffolding for academic collaboration (Cameron & Quinn, 2011; Hofstede, 2010). Within the Pakistani higher education context, extant research has documented that a collaborative orientation cultivates teamwork, particularly across instructional and research spheres (Khan & Rasheed, 2016). Consequently, the present study reaffirms culture as a mediating force that reliably influences collaborative effectiveness, thus consolidating existing theoretical and empirical knowledge.

Organizational culture emerges as a robust positive predictor of knowledge sharing among faculty ($\beta = 0.481$, $p < 0.001$), corroborating the knowledge-based view articulated by Grant (1996) that situates culture as a conduit for

the circulation of intellectual assets. Empirical studies have underscored that cultures characterized by trust and collectivism demonstrably foster knowledge-sharing behavior within educational environments (Al-Alawi et al., 2007; Akhavan & Hosseini, 2016). Parallel evidence from Pakistan recorded by Shujahat et al. (2019) illustrates a similarly pronounced influence, thus supporting the proposition that institutional culture constitutes a decisive antecedent of knowledge-sharing behavior within university settings.

The analysis further discloses that knowledge sharing exerts a significant positive effect on faculty collaboration ($\beta = 0.396$, $p < 0.001$). Past literature has repeatedly shown that the transfer of knowledge fortifies teamwork, facilitates co-authorship, and promotes co-teaching arrangements (Wang & Noe, 2010; Kianto et al., 2016). Investigation conducted within the Pakistani higher education landscape by Ahmad and Karim (2019) corroborates that faculty who engage in the reciprocal sharing of pedagogical and research practices exhibit heightened collaborative efficacy. Taken cumulatively, the evidence affirms that knowledge sharing operates as a fundamental mechanism for the amplification of collaborative activity within academic institutions.

Conversely, the investigation evidences an appreciable adverse linkage between knowledge hoarding and faculty collaboration ($\beta = -0.271$, $p < 0.001$). Such a result corroborates the advantageous theme emergent from Connelly et al. (2012) and Serenko & Bontis (2016), whose work characterized knowledge concealment as a liability for cooperative effort and broader organizational effectiveness. Within the university milieu, hoarding frequently derives from heightened competition and diminished trust, conditions that inhibit the formation of co-authored outputs and the practice of mutual instructional provision (Zhao et al., 2016). The observed association revalidates the cumulative literature and reaffirms the constraining influence of concealed knowledge upon the collaborative routine expected of academic personnel.

Adopting mediation analysis, the study establishes that sharing knowledge operates as a conduit between organizational culture and collaborative practice (indirect effect = 0.191, $p < 0.001$). The evidence suggests that culture exerts its power indirectly through the customary encouragement of knowledge-provision behaviors. The interpretation finds early corroboration in works by Chang & Chuang (2011) and Kianto et al. (2016), both of which illustrated that a supportive culture achieves performance improvement by energizing knowledge interchange. Circumscribed to the Pakistani tertiary sector, Shujahat et al. (2019) similarly documented knowledge-sharing mediation. Consequently, the present investigation augments the antecedent evidence by reasserting that sharing knowledge persists as the essential transmission mechanism through which culture operates to amplify faculty collaborative effort.

The moderated-path analysis evidences that properly designed incentive systems intensify the culture \rightarrow sharing \rightarrow collaboration trajectory, yielding a standardized coefficient of $\beta = 0.142$ ($p = 0.001$). Such a finding corroborates Social Exchange Theory, which posits that the entrenchment of reciprocal actions is catalyzed by material and symbolic rewards (Blau, 1964). Empirical research has documented that formalized recognition and reward mechanisms invoke a propensity among employees to transmit knowledge and coordinate action (Cabrera & Cabrera, 2005; Bartol & Srivastava, 2002). Within the Pakistani academic milieu, earlier evidence suggested that performance appraisal and promotion protocols that applaud collective effort systematically galvanize faculty collaboration (Rasheed et al., 2016). Collectively, these observations substantiate the assertion that congruence between cultural norms and incentive architectures constitutes a decisive lever for bolstering culture-driven collaboration.

Concurrently, the analysis establishes that individually-oriented competitive incentive devices intensify the culture \rightarrow hoarding \rightarrow diminished collaboration pathway, with a standardized coefficient of $\beta = -0.128$ ($p = 0.004$). This evidence substantiates the theoretical postulates of Connelly et al. (2012) and Černe et al. (2014), which contend that the translation of rewards into exclusive, individualistic performance metrics inclines employees to sequester knowledge that could confer a personal strategic advantage. Within higher-educational environments, the

embedding of incentive criteria in single-author publications or mono-research grants has repeatedly been shown to drain the propensity for collegial knowledge exchange (Zhao et al., 2016). The present investigation contributes to the academic literature by reiterating that incentive architectures misaligned with desired collaborative outcomes can, as unintended contingencies, inadvertently foster knowledge hoarding behaviors, thereby eroding institutional collaborative capacity.

6. Implications of the Study

6.1 Theoretical implications

This investigation deepens the scholarship on organizational culture, knowledge management, and collaboration by jointly examining knowledge sharing and knowledge hoarding as mediating variables within the culture–collaboration nexus. The analysis furthers both Social Exchange Theory and the Knowledge-Based View (KBV) by illustrating the moderating role of incentive structures on the impact of cultural attributes on faculty conduct. Earlier scholarship has typically scrutinized culture or knowledge sharing independently; by positioning these elements within a single, cohesive framework, the present inquiry provides a more comprehensive account of how cultural prescriptions, knowledge exchange tendencies, and reward architectures jointly influence collaborative outputs among academic staff. The contribution thus intersects with ongoing discourses in organizational behaviour and the management of higher education, as noted in the foundational contributions by Grant (1996), Blau (1964), and Connelly et al. (2012).

6.2 Practical implications

The data presented here call on university leaders and policy designers to intentionally nurture organizational cultures characterized by support and interpersonal trust as prerequisites for effective collaboration across pedagogical, investigative, and administrative domains. Khyber Pakhtunkhwa institutions, and Pakistani higher education more generally, should therefore recalibrate their reward frameworks to make explicit and tangible recognition of behavioral collaboration—including co-authored publications, team-taught courses, and inter-departmental joint ventures. Concomitantly, reward structures must de-emphasize the hyper-individualization of academic esteem, so that tacit knowledge concealment is no longer incentivized. Faculty development initiatives, targeted seminars on collaborative scholarship, and curated digital repositories for resource sharing are poised to routinize and extend these practices into the institutional architecture.

6.3 Policy implications

At the national governance level, the Higher Education Commission of Pakistan can ensure the systemic embedding of collaborative performance modalities within its accreditation, promotion, and funding distribution frameworks. Specifically, funding criteria and accreditation standards that reward demonstrable output from cross-institutional research consortia, interdisciplinary programs, and joint curricula design will reciprocally improve institutional capability and embed domestic practice within emergent benchmarks of worldwide academic cooperation. Concurrently, the unwinding of reward regimes that fetishize solitary publication metrics in favor of collective scholarly production shall attenuate proprietary orientations to knowledge, thereby reinforcing the normative and practical underpinnings of an activated and expansive inter-institutional research milieu.

7. Limitations and Future Research Directions

The findings of this investigation are constrained by the exclusive examination of institutions situated within Khyber Pakhtunkhwa, thereby curtailing the applicability of the results to variables that may prevail in other geographical contexts. The use of self-administered questionnaires as the primary data-collection instrument invites caution since reliance on retrospective self-judgment can introduce measurement error. Furthermore, the adoption of a cross-sectional framework prevents the establishment of temporal precedence, thereby limiting interpretative leverage in terms of causality. To strengthen the empirical foundations, subsequent inquiries are encouraged to incorporate multi-provincial samples, longitudinal or convergent parallel designs, and variables that may confound

the results, including administrative leadership, information technology infrastructure, and psychometric or organizational workload. Investigative trajectories that juxtapose public and private sector theatres may offer the additional analytic leverage required to elucidate the cultural and architectural determinants that mold collaborative practices among the academic faculty.

8. Conclusion

This investigation elucidated how organizational culture directs faculty collaboration across Khyber Pakhtunkhwa universities, highlighting the intermediary roles of knowledge sharing and hoarding, as well as the contingent effect of incentive systems. Evidence suggests that supportive cultures foster knowledge sharing and collaborative engagement, whereas competitive environments tend to orient faculty towards hoarding, thereby reducing joint scholarly output. Incentive frameworks are shown to operate as reinforcement or dampening agents of these cultural pathways, thereby affirming their strategic significance in higher education governance. By synthesizing the Knowledge-Based View with Social Exchange Theory, the discussion enhances theoretical comprehension and concurrently provides actionable guidance for institutional executives and policymakers. Collectively, the conclusions suggest that the deliberate cultivation of collaborative cultural attributes, strategic alignment and institutional calibration of reward mechanisms to collective rather than individual outcomes, and the systematic discouragement of knowledge hoarding are vital interventions for strengthening scholarly collaboration and advancing institutional efficacy in Pakistan's higher education landscape.

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