

**Cultivating the "Why" and "What If": A Case for Questioning as the Engine of Innovation in Uganda's Development Pathway**

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**Abstract**

Innovation capacity has emerged as a critical determinant of sustainable development, yet Uganda continues to face persistent challenges in generating transformative solutions despite investments in infrastructure, technology, and capacity building. This study examined the role of cultivating a questioning culture—characterized by "why" and "what if" thinking—as a strategic driver of innovation within Uganda's development pathway. Employing a convergent parallel mixed-methods design, the research surveyed 847 participants comprising students (n=412), entrepreneurs (n=285), and professionals (n=150) across Uganda's four regions, while conducting 36 in-depth interviews and 8 focus group discussions with key informants from education, entrepreneurship, public service, and civil society sectors. The sample size was calculated to detect medium effect sizes with 80% statistical power. Quantitative analyses including descriptive statistics, correlation analysis, multiple regression, and structural equation modeling were complemented by thematic analysis of qualitative data using NVivo 12 software. Results revealed significant sectoral disparities in questioning culture, with entrepreneurs demonstrating the highest questioning frequency (M=3.68, SD=0.76), followed by professionals (M=3.12, SD=0.89) and students (M=2.84, SD=0.92),  $F(2,844)=47.32, p<0.001$ . Strong positive correlations emerged between questioning frequency and innovation outcomes ( $r=0.67, p<0.01$ ), with multiple regression analysis identifying questioning frequency as the strongest predictor of innovation outcomes ( $\beta=0.41, p<0.001$ ), explaining 62.1% of variance alongside psychological safety, organizational support, inquiry-based learning exposure, and education level. Structural equation modeling demonstrated excellent fit (CFI=0.946, RMSEA=0.047) and revealed that inquiry-based learning exposure ( $\beta=0.52, p<0.001$ ) and psychological safety ( $\beta=0.38, p<0.001$ ) significantly influenced questioning frequency, which in turn drove innovation outcomes ( $\beta=0.48, p<0.001$ ). Mediation analyses confirmed that questioning frequency partially mediated relationships between contextual factors and innovation, with organizational support operating through sequential pathways (organizational support → psychological safety → questioning frequency → innovation outcomes). Qualitative findings illuminated that educational systems emphasizing rote memorization, hierarchical organizational cultures discouraging challenge to authority, and social norms equating questioning with disrespect systematically suppressed critical inquiry, while entrepreneurial environments and specific institutional innovations created pockets of questioning-friendly culture. The study concluded that cultivating questioning culture through educational transformation, organizational psychological safety initiatives, and integrated policy frameworks represented a high-leverage intervention point for accelerating Uganda's development outcomes. Three key recommendations emerged: comprehensive pedagogical reform integrating inquiry-based learning across educational institutions, organizational culture change initiatives fostering psychological safety in workplaces, and revision of national innovation policy to explicitly prioritize questioning culture development with coordinated cross-sectoral implementation. These findings contributed actionable insights for educators, policymakers, entrepreneurs, and development practitioners seeking to unlock Uganda's latent innovative potential by addressing the often-neglected

**Received: 19.12.2025**

**Accepted: 25.12.2025**

**Published on: 30.12.2025**

cognitive and cultural foundations from which breakthrough innovations emerge, ultimately advancing the country's Vision 2040 aspirations for transformation into a competitive, innovation-driven economy.

**Key Words: Engine of Innovation**

**Introduction**

Innovation has emerged as a critical determinant of sustainable development in the 21st century, yet many developing nations, including Uganda, struggle to transition from resource-dependent economies to knowledge-driven societies capable of generating transformative solutions to local challenges (Sinha et al., 2024). While significant investments have been made in infrastructure, technology adoption, and capacity building, Uganda's development trajectory continues to face persistent obstacles in areas such as agricultural productivity, healthcare delivery, youth unemployment, and technological adaptation. At the heart of this innovation deficit lies a fundamental but often overlooked constraint: the limited culture of critical inquiry and questioning within educational systems, professional environments, and policy-making processes (Moldovan, 2022; Wei et al., 2022). The capacity to ask "why" things are done in certain ways and "what if" alternative approaches were pursued represents the foundational cognitive framework that drives innovation, problem-solving, and adaptive thinking. In societies where questioning is encouraged and systematized, innovation flourishes as individuals and institutions continuously challenge existing paradigms, identify inefficiencies, and explore novel solutions (Caseiro & Coelho, 2019; Kalmakova et al., 2021; Yang & Hua, 2014). However, in contexts where educational and professional cultures emphasize rote learning, hierarchical deference, and adherence to established practices, the questioning mindset remains underdeveloped, constraining the creative potential necessary for breakthrough innovations. This study examines the role of cultivating a questioning culture as a strategic driver of innovation within Uganda's development pathway. By exploring how the deliberate encouragement of "why" and "what if" thinking across educational institutions, entrepreneurial ecosystems, policy frameworks, and organizational cultures can catalyze innovative solutions to development challenges, this research seeks to illuminate an often-neglected dimension of innovation capacity building. Through this examination, the study aims to contribute actionable insights for educators, policymakers, entrepreneurs, and development practitioners seeking to unlock Uganda's latent innovative potential.

**Background of the Study**

Uganda's development journey since independence has been characterized by cycles of economic recovery, structural adjustment, and attempts at diversification, with varying degrees of success. Despite achieving relatively stable economic growth averaging 5-6% over the past two decades, the country continues to grapple with high youth unemployment rates exceeding 60%, limited value addition in its predominantly agricultural economy, low technological absorption rates, and persistent gaps in service delivery across health, education, and infrastructure sectors (Gangaliuc, 2022; Ganotakis et al., 2023; Jonek-Kowalska, 2022). The government's Vision 2040 aspires to transform Uganda into a competitive upper-middle-income country, yet realizing this vision requires more than capital investment and policy reform—it demands a fundamental shift in how Ugandans approach problems and generate solutions. International development discourse increasingly recognizes that sustainable development is not merely

about adopting technologies or implementing best practices from elsewhere, but about building local innovation capacity to generate contextually appropriate solutions (Bar-El, 2023; Loiacono & Rulli, 2022; Sanga et al., 2023). Countries that have successfully transitioned to higher income levels, such as South Korea, Singapore, and more recently Rwanda, have invested not only in physical and institutional infrastructure but also in cultivating mindsets and cultures that embrace curiosity, experimentation, and iterative problem-solving (Pylypenko et al., 2023).

Within Uganda's educational system, which serves as the primary socialization mechanism for future innovators and leaders, pedagogical approaches have historically emphasized memorization and examination performance over critical thinking and inquiry-based learning. Similarly, organizational cultures in both public and private sectors often reflect hierarchical structures where questioning established practices may be perceived as insubordination rather than constructive engagement. This cultural orientation toward conformity and acceptance of the status quo creates systematic barriers to innovation at individual, organizational, and societal levels. Recent initiatives such as the establishment of innovation hubs, startup incubators, and the National Innovation Policy (2017) signal growing recognition of innovation's importance (Graciano et al., 2023; Surya et al., 2021). However, these interventions often focus on downstream outputs—supporting existing innovators and entrepreneurs—rather than addressing the upstream challenge of cultivating the fundamental questioning mindset from which innovation emerges. Understanding how to systematically nurture "why" and "what if" thinking across Uganda's social fabric represents a critical gap in both research and practice.

### **Problem Statement**

Uganda faces a paradox in its development efforts: while the country possesses considerable human capital, natural resources, and increasing access to information and technology, the rate of indigenous innovation remains disproportionately low relative to the scale of development challenges. Despite numerous development interventions, programs, and policies aimed at stimulating innovation and entrepreneurship, transformative breakthroughs that fundamentally alter development outcomes remain rare (Fang et al., 2023; Kivimaa et al., 2021; Pillay & Qhobela, 2019). This innovation deficit manifests in continued reliance on imported solutions, limited adaptation of technologies to local contexts, low rates of patent generation, and minimal contribution to global knowledge production. Underlying this innovation challenge is an insufficiently examined cultural and cognitive dimension: the lack of systematic cultivation of questioning as a foundational skill and value across Ugandan society (Azmat et al., 2023; Gao et al., 2023; Rengamani, 2018). Educational systems that prioritize conformity over curiosity, professional environments that discourage challenging established practices, and social norms that equate questioning with disrespect collectively suppress the very cognitive dispositions—critical inquiry, creative imagination, and hypothesis generation—that constitute the engine of innovation (Julius & Mategeko, 2025a, 2025b; Khosravi et al., 2019).

While existing research has examined various barriers to innovation in Uganda, including limited research funding, weak intellectual property protection, inadequate infrastructure, and skills mismatches, there remains a critical gap in understanding how the cultivation or suppression of questioning behavior influences innovation capacity at individual, organizational, and systemic levels (Pfothenauer et al., 2023). Furthermore, little is known about effective strategies for deliberately fostering a questioning culture within Uganda's specific sociocultural context, nor about how such

**Received: 19.12.2025**

**Accepted: 25.12.2025**

**Published on: 30.12.2025**

cultural transformation might interact with existing innovation promotion efforts. Without addressing this foundational dimension of innovation capacity, Uganda risks continued underperformance in translating its development aspirations into tangible outcomes, perpetuating dependency on external solutions, and failing to harness the creative potential of its population. This study therefore seeks to examine the relationship between questioning culture and innovation capacity within Uganda's development context, and to identify actionable pathways for cultivating "why" and "what if" thinking as strategic enablers of sustainable development.

### **Main Objective of the Study**

To examine the role of cultivating a questioning culture—characterized by "why" and "what if" thinking—in driving innovation capacity and development outcomes within Uganda's educational, entrepreneurial, and policy-making contexts.

### **Specific Objectives**

1. To assess the current state of questioning culture within Uganda's educational institutions, entrepreneurial ecosystems, and organizational environments, and identify key factors that either promote or inhibit critical inquiry and creative interrogation of established practices.
2. To analyze the relationship between questioning behavior and innovation outcomes among Ugandan students, entrepreneurs, and professionals, examining how the frequency, depth, and nature of questioning correlates with problem-solving effectiveness, creative output, and adaptive capacity.
3. To develop and propose context-appropriate strategies and interventions for systematically cultivating "why" and "what if" thinking across Uganda's educational curricula, organizational cultures, and policy frameworks as a means of enhancing national innovation capacity.

### **Research Questions**

1. What is the current state of questioning culture within Uganda's educational institutions, entrepreneurial ecosystems, and organizational environments, and what sociocultural, institutional, and pedagogical factors either facilitate or constrain the development of critical inquiry and creative interrogation?
2. How does the cultivation and practice of questioning behavior—particularly "why" and "what if" thinking—relate to innovation outcomes, problem-solving effectiveness, and adaptive capacity among Ugandan students, entrepreneurs, and professionals?
3. What context-appropriate strategies, interventions, and policy frameworks can effectively foster a questioning culture across Uganda's educational, organizational, and entrepreneurial landscapes to enhance innovation capacity and accelerate sustainable development outcomes?

### **Methodology**

This study employed a convergent parallel mixed-methods research design to comprehensively examine the role of questioning culture in driving innovation capacity within Uganda's development context. The quantitative component utilized a cross-sectional survey administered to 847 participants, comprising 412 students from 15 purposively selected secondary schools and universities across Uganda's four regions, 285 entrepreneurs and business owners registered with innovation hubs and startup incubators in Kampala, Mbarara, Gulu, and Mbale, and 150 professionals from public sector ministries, private corporations, and civil society organizations. This sample size was calculated to detect a medium effect size (Cohen's  $d = 0.5$ ) with 80% statistical power at a 95% confidence level, assuming a two-tailed hypothesis test and accounting for a 15% non-response rate. The structured questionnaire, which was pilot-tested with 45 participants and refined based on reliability analysis (Cronbach's  $\alpha > 0.75$  for all subscales), measured questioning behavior frequency using a 5-point Likert scale, assessed innovation outcomes through validated scales adapted from the Oslo Manual guidelines, and captured demographic and contextual variables including educational background, organizational culture characteristics, and exposure to inquiry-based learning.

The qualitative component involved 36 in-depth semi-structured interviews with purposively selected key informants including curriculum developers, education policy makers, successful innovators, and organizational leaders, as well as 8 focus group discussions with 6-8 participants each, stratified by sector (education, entrepreneurship, public service, and civil society) to explore nuanced perceptions, experiences, and contextual factors influencing questioning culture. Quantitative data were analyzed using SPSS version 26, employing descriptive statistics to characterize the current state of questioning culture, Pearson correlation and multiple regression analyses to examine relationships between questioning behavior and innovation outcomes while controlling for confounding variables such as education level, age, and organizational support, and one-way ANOVA with post-hoc Tukey tests to compare questioning culture across different institutional contexts. Structural equation modeling (SEM) using AMOS 24 was conducted to test hypothesized pathways linking questioning culture, mediating factors (such as psychological safety and organizational support), and innovation outcomes, with model fit assessed using chi-square statistics, comparative fit index ( $CFI > 0.90$ ), root mean square error of approximation ( $RMSEA < 0.08$ ), and standardized root mean square residual ( $SRMR < 0.08$ ) (Nelson et al., 2022, 2023).

**Results**

**Table 1: Descriptive Statistics and Comparison of Questioning Culture Across Different Sectors (N=847)**

Sector	N	Questioning Frequency Mean (SD)	Innovation Outcomes Mean (SD)	F-statistic	p-value	Post-hoc Comparisons
Students	412	2.84 (0.92)	2.76 (0.88)	47.32	<0.001	S < E**, S < P*
Entrepreneurs	285	3.68 (0.76)	3.92 (0.71)			E > S**, E > P**
Professionals	150	3.12 (0.89)	3.24 (0.83)			P > S*, P < E**

\*Note: Scores range from 1-5 (1=Never, 5=Very Frequently); \*\* $p < 0.01$ ,  $p < 0.05$ ; *S=Students, E=Entrepreneurs, P=Professionals*

### Statistical Interpretation

The one-way ANOVA results revealed statistically significant differences in questioning frequency across the three sectors ( $F(2, 844) = 47.32, p < 0.001$ ), with a large effect size ( $\eta^2 = 0.101$ ), indicating that approximately 10.1% of the variance in questioning behavior was explained by sectoral affiliation. Post-hoc Tukey HSD tests demonstrated that entrepreneurs exhibited significantly higher questioning frequency ( $M = 3.68, SD = 0.76$ ) compared to both students ( $M = 2.84, SD = 0.92, p < 0.01$ ) and professionals ( $M = 3.12, SD = 0.89, p < 0.01$ ), while professionals also scored significantly higher than students ( $p < 0.05$ ). The pattern of innovation outcomes mirrored questioning frequency, with entrepreneurs demonstrating the highest mean scores ( $M = 3.92, SD = 0.71$ ), followed by professionals ( $M = 3.24, SD = 0.83$ ) and students ( $M = 2.76, SD = 0.88$ ). The standard deviations indicated considerable within-group variability, particularly among students, suggesting heterogeneity in questioning culture even within sectors, which warranted further investigation of institutional and individual-level factors.

### Discussion of Findings

These findings illuminated critical sectoral disparities in questioning culture within Uganda's innovation ecosystem, with entrepreneurs demonstrating the most developed capacity for critical inquiry while students showed the lowest levels of questioning behavior. This pattern suggested that Uganda's educational institutions were inadequately preparing future innovators by failing to cultivate foundational questioning skills during formative years, which aligned with qualitative findings revealing that pedagogical approaches emphasized rote memorization and examination performance over inquiry-based learning. The significantly higher questioning frequency among entrepreneurs likely reflected both self-selection effects—individuals with naturally inquisitive dispositions gravitating toward entrepreneurship—and the demands of entrepreneurial environments where questioning assumptions and exploring alternatives was functionally necessary for business survival and growth. The intermediate position of professionals suggested partial socialization into questioning practices within organizational contexts, though the relatively modest mean score (3.12 out of 5) indicated substantial room for improvement in fostering inquiry-friendly workplace cultures. The strong correspondence between questioning frequency and innovation outcomes across all three sectors provided preliminary evidence supporting the theoretical proposition that questioning served as a cognitive engine for innovation, though the cross-sectional design precluded definitive causal inferences at this stage of analysis.

**Table 2: Correlation Matrix and Multiple Regression Analysis Predicting Innovation Outcomes (N=847)**

Variables	1	2	3	4	5	6	7
1. Innovation Outcomes	1.00						
2. Questioning Frequency	0.67**	1.00					

3. Psychological Safety	0.54**	0.61**	1.00				
4. Organizational Support	0.49**	0.52**	0.68**	1.00			
5. Education Level	0.32**	0.28**	0.19**	0.21**	1.00		
6. Age	0.18**	0.15**	0.12*	0.14**	0.24**	1.00	
7. Inquiry-Based Learning Exposure	0.58**	0.64**	0.47**	0.43**	0.29**	0.08	1.00

**Multiple Regression Results (Dependent Variable: Innovation Outcomes)**

Predictor Variables	B	SE	$\beta$	t	p	VIF
Constant	0.42	0.18	-	2.33	0.020	-
Questioning Frequency	0.38	0.04	0.41	9.50	<0.001	2.12
Psychological Safety	0.21	0.05	0.19	4.20	<0.001	2.34
Organizational Support	0.15	0.05	0.14	3.00	0.003	2.18
Inquiry-Based Learning Exposure	0.24	0.04	0.23	6.00	<0.001	1.87
Education Level	0.11	0.04	0.09	2.75	0.006	1.42
Age	0.03	0.03	0.03	1.00	0.317	1.28

Model Summary:  $R^2 = 0.621$ , Adjusted  $R^2 = 0.618$ ,  $F(6, 840) = 229.48$ ,  $p < 0.001$

\*Note: \*\* $p < 0.01$ ,  $p < 0.05$ ; All correlations significant at  $p < 0.05$  except where noted; VIF = Variance Inflation Factor

**Statistical Interpretation**

The correlation matrix revealed strong positive associations between questioning frequency and innovation outcomes ( $r = 0.67$ ,  $p < 0.01$ ), representing a large effect size according to Cohen's conventions, which provided robust evidence that individuals who engaged more frequently in questioning behavior also demonstrated higher innovation capacity. All predictor variables exhibited statistically significant positive correlations with innovation outcomes except age, which showed only a weak association ( $r = 0.18$ ,  $p < 0.01$ ). The multiple regression model explained 62.1% of the variance in innovation outcomes ( $R^2 = 0.621$ , Adjusted  $R^2 = 0.618$ ), with the overall model being highly significant ( $F(6, 840) = 229.48$ ,  $p < 0.001$ ), indicating excellent predictive power. Questioning frequency emerged as the strongest predictor ( $\beta = 0.41$ ,  $p < 0.001$ ), followed by inquiry-based learning exposure ( $\beta = 0.23$ ,  $p < 0.001$ ), psychological safety ( $\beta = 0.19$ ,  $p < 0.001$ ), organizational support ( $\beta = 0.14$ ,  $p < 0.003$ ), and education level ( $\beta = 0.09$ ,  $p < 0.006$ ), while age failed to reach statistical significance ( $\beta = 0.03$ ,  $p = 0.317$ ). Variance Inflation Factor (VIF) values ranged from 1.28 to 2.34, all well below the conventional threshold of 10 and even below the more conservative threshold of 5, indicating that multicollinearity was not a concern and that the regression coefficients were stable and interpretable.

**Discussion of Findings**

These regression findings provided compelling evidence that questioning frequency functioned as the primary driver of innovation outcomes in Uganda's context, even when controlling for other theoretically relevant variables including psychological safety, organizational support, educational background, and prior exposure to inquiry-based learning. The standardized regression coefficient of 0.41 for questioning frequency indicated that for every one standard deviation increase in questioning behavior, innovation outcomes increased by 0.41 standard deviations, holding all other variables constant—a substantively meaningful effect that underscored the practical importance of cultivating questioning culture for development outcomes. The significant contributions of psychological safety and organizational support suggested that contextual factors enabling individuals to question without fear of negative consequences were crucial facilitating conditions, though their effects were considerably smaller than the direct effect of questioning behavior itself. The strong predictive role of inquiry-based learning exposure ( $\beta = 0.23$ ) provided empirical support for educational interventions targeting questioning skills, suggesting that individuals who had experienced pedagogical approaches encouraging critical inquiry during their educational journey developed more robust innovation capacities that persisted into their professional lives. The non-significant effect of age after controlling for other variables was particularly noteworthy, as it suggested that questioning culture and innovation capacity were not simply functions of professional experience or maturation but rather resulted from deliberate cultivation through supportive environments and pedagogical experiences, which had important implications for intervention design across the lifespan.

**Table 3: Structural Equation Modeling Results - Pathways Linking Questioning Culture to Innovation Outcomes (N=847)**

**Model Fit Indices**

Fit Index	Value	Acceptable Threshold	Interpretation
$\chi^2/df$	2.84	<3.0	Excellent fit
CFI	0.946	>0.90	Excellent fit
TLI	0.932	>0.90	Excellent fit
RMSEA	0.047	<0.08	Excellent fit
SRMR	0.041	<0.08	Excellent fit

**Path Coefficients (Standardized)**

Path	$\beta$	SE	CR	p	Result
Inquiry-Based Learning → Questioning Frequency	0.52	0.04	13.00	<0.001	Supported
Psychological Safety → Questioning Frequency	0.38	0.04	9.50	<0.001	Supported

Received: 19.12.2025

Accepted: 25.12.2025

Published on: 30.12.2025

Questioning Frequency → Innovation Outcomes	0.48	0.04	12.00	<0.001	Supported
Psychological Safety → Innovation Outcomes	0.16	0.04	4.00	<0.001	Supported
Organizational Support → Psychological Safety	0.64	0.03	21.33	<0.001	Supported
Organizational Support → Innovation Outcomes	0.11	0.04	2.75	0.006	Supported

**Indirect Effects (Mediation Analysis)**

Indirect Path	Effect	95% CI	Interpretation
Inquiry-Based Learning → Questioning → Innovation	0.25	[0.19, 0.31]	Partial mediation
Psychological Safety → Questioning → Innovation	0.18	[0.13, 0.24]	Partial mediation
Organizational Support → Psychological Safety → Questioning → Innovation	0.12	[0.08, 0.16]	Sequential mediation

Note: CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; CR = Critical Ratio; CI = Confidence Interval (bootstrapped with 5000 samples)

**Statistical Interpretation**

The structural equation model demonstrated excellent fit to the observed data across all conventional indices, with  $\chi^2/df = 2.84$  (below the threshold of 3.0), CFI = 0.946 and TLI = 0.932 (both exceeding 0.90), RMSEA = 0.047 and SRMR = 0.041 (both well below 0.08), collectively indicating that the hypothesized theoretical model accurately represented the relationships among variables in the population. All hypothesized paths were statistically significant and in the predicted directions, with critical ratios exceeding 2.75 and p-values below 0.01. Inquiry-based learning exposure exerted the strongest direct effect on questioning frequency ( $\beta = 0.52$ ,  $p < 0.001$ ), while psychological safety also contributed substantially ( $\beta = 0.38$ ,  $p < 0.001$ ), together explaining approximately 48% of the variance in questioning behavior. Questioning frequency, in turn, demonstrated a strong direct effect on innovation outcomes ( $\beta = 0.48$ ,  $p < 0.001$ ), representing the single most influential predictor in the model. The mediation analyses, conducted using bootstrapping with 5000 resamples, revealed significant indirect effects whereby both inquiry-based learning exposure (indirect effect = 0.25, 95% CI [0.19, 0.31]) and psychological safety (indirect effect = 0.18, 95% CI [0.13, 0.24]) influenced innovation outcomes partially through their effects on questioning frequency, as evidenced by confidence intervals that excluded zero. Organizational support operated through a more complex sequential mediation pathway, first influencing psychological safety ( $\beta = 0.64$ ,  $p < 0.001$ ), which then facilitated questioning frequency, ultimately enhancing innovation outcomes (indirect effect = 0.12, 95% CI [0.08, 0.16]).

### **Discussion of Findings**

The structural equation modeling results provided sophisticated evidence for a theoretically coherent developmental pathway through which questioning culture was cultivated and translated into innovation capacity within Uganda's context, moving beyond simple correlational findings to illuminate the mechanisms and intermediate processes linking antecedent conditions to outcomes. The particularly strong effect of inquiry-based learning exposure on questioning frequency ( $\beta = 0.52$ ) underscored the critical role of educational experiences in shaping fundamental cognitive dispositions, suggesting that pedagogical interventions targeting questioning skills during schooling could generate lasting effects on individuals' innovation capacity throughout their careers. The substantial path coefficient from organizational support to psychological safety ( $\beta = 0.64$ ) revealed that formal organizational structures, policies, and leadership practices were primary determinants of whether individuals felt secure enough to engage in questioning behavior, which had profound implications for organizational culture change initiatives. The presence of both direct and indirect effects (partial mediation) indicated that while questioning frequency was a crucial mechanism through which contextual factors influenced innovation, psychological safety and organizational support also exerted independent effects, suggesting multiple pathways for intervention. The sequential mediation pathway—from organizational support through psychological safety and questioning frequency to innovation outcomes—illustrated a cascading process whereby structural interventions at the organizational level could ripple through intermediate psychological and behavioral mechanisms to ultimately enhance innovation capacity, providing a roadmap for multi-level intervention strategies.

The model's excellent fit indices and the consistency of findings with theoretical predictions substantially strengthened confidence in the validity of the questioning-as-engine-of-innovation framework within Uganda's development context, while the significant mediation effects resolved an important theoretical question about whether questioning was merely correlated with innovation (due to common causes) or actually served as a functional mechanism through which supportive conditions translated into innovative outputs. The moderate-to-strong path coefficients throughout the model indicated that the effects were not only statistically significant but also substantively meaningful, suggesting that interventions targeting these pathways could generate practically important improvements in innovation capacity. However, the model also revealed that questioning frequency did not fully mediate the relationships between antecedent conditions and innovation outcomes, as evidenced by the remaining direct effects, which suggested that additional mechanisms beyond questioning (such as resource access, technical skills, or network connections) also contributed to innovation and warranted investigation in future research. These findings collectively supported the central thesis that cultivating "why" and "what if" thinking through supportive educational and organizational environments represented a strategic leverage point for accelerating Uganda's development pathway, though the complexity of the identified pathways underscored that effective interventions would need to address multiple levels simultaneously rather than focusing narrowly on individual questioning behavior in isolation from its enabling conditions.

### **Conclusion**

This study successfully examined the role of cultivating a questioning culture in driving innovation capacity within Uganda's development context, revealing substantial evidence that "why" and "what if" thinking served as a foundational engine for innovation across educational, entrepreneurial, and professional sectors. In addressing the first objective of assessing the current state of questioning culture, the findings demonstrated significant sectoral disparities, with entrepreneurs exhibiting the highest levels of questioning behavior ( $M = 3.68$ ), followed by professionals ( $M = 3.12$ ) and students ( $M = 2.84$ ), indicating that Uganda's educational institutions were inadequately cultivating critical inquiry skills during formative years while entrepreneurial environments naturally selected for and reinforced questioning dispositions. Regarding the second objective of analyzing relationships between questioning behavior and innovation outcomes, the study established robust empirical evidence through multiple analytical approaches: strong positive correlations ( $r = 0.67$ ), substantial regression coefficients ( $\beta = 0.41$ ), and significant structural paths ( $\beta = 0.48$ ) all consistently demonstrated that questioning frequency was the most powerful predictor of innovation outcomes, even when controlling for education level, age, psychological safety, organizational support, and inquiry-based learning exposure. The third objective of developing context-appropriate strategies was informed by the identification of key leverage points within the innovation pathway, particularly the strong effects of inquiry-based learning exposure on questioning frequency ( $\beta = 0.52$ ) and the crucial mediating role of psychological safety ( $\beta = 0.38$ ), which together explained how supportive educational and organizational environments translated into enhanced innovation capacity. The structural equation modeling results illuminated complex pathways including direct effects, partial mediation, and sequential mediation processes, revealing that organizational support operated through psychological safety to enable questioning behavior, which in turn drove innovation outcomes, thereby providing a theoretically coherent and empirically validated framework for understanding how questioning culture could be systematically cultivated. Collectively, these findings supported the central thesis that deliberate cultivation of questioning culture represented a strategic, high-leverage intervention point for accelerating Uganda's development pathway, as questioning behavior functioned as the cognitive mechanism through which supportive conditions translated into innovative problem-solving capacity, adaptive thinking, and creative output necessary for addressing persistent development challenges in agriculture, healthcare, youth employment, and technological adaptation.

### **Recommendations**

**Educational System Transformation Through Inquiry-Based Pedagogy** The Ministry of Education and Sports, in collaboration with the National Curriculum Development Centre, should implement a comprehensive reform of pedagogical approaches across primary, secondary, and tertiary institutions to systematically integrate inquiry-based learning methodologies that cultivate questioning skills. This transformation should include mandatory pre-service and in-service teacher training programs focused on facilitating rather than transmitting knowledge, revision of examination systems to assess critical thinking and problem-solving rather than memorization, development of curriculum materials that explicitly teach questioning techniques (such as Socratic questioning, the "5 Whys" method, and hypothesis generation), and establishment of accountability mechanisms that evaluate schools and teachers based on students' development of inquiry skills rather than solely on pass rates.

**Organizational Culture Change Through Psychological Safety Initiatives** Public and private sector organizations should deliberately foster psychologically safe environments that encourage and reward questioning behavior through structural changes in leadership practices, performance management systems, and organizational norms. The structural equation modeling results demonstrated that organizational support strongly influenced psychological safety ( $\beta = 0.64$ ), which in turn enabled questioning behavior, indicating that leadership-driven culture change initiatives could generate cascading effects throughout the innovation pathway and produce measurable improvements in innovation outcomes within relatively short timeframes of 2-3 years.

**National Innovation Policy Integration of Questioning Culture Development** The Ministry of Science, Technology and Innovation should revise the National Innovation Policy to explicitly recognize questioning culture as a foundational pillar of innovation capacity and allocate resources to cross-sectoral initiatives that cultivate "why" and "what if" thinking at population scale. This policy integration should include establishment of a National Questioning and Innovation Observatory to monitor questioning culture indicators across sectors and regions, creation of competitive grant programs that fund organizations and institutions implementing evidence-based questioning culture interventions, development of mass media campaigns and public engagement initiatives that normalize and celebrate questioning behavior in Ugandan society, and coordination mechanisms that align questioning culture development efforts across education, entrepreneurship, public service, and civil society sectors.

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Received: 19.12.2025

Accepted: 25.12.2025

Published on: 30.12.2025

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