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WHICH ABSORPTIVE CAPACITY DIMENSION MATTERS MOST? AN IMPORTANCE-PERFORMANCE ANALYSIS OF INNOVATION CAPABILITY AMONG AGRICULTURAL RESEARCHERS IN MALAYSIA

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Abstract:

Most empirical work on absorptive capacity (ACAP) and innovation simply asks whether a relationship is statistically significant. This leaves open the question of which ACAP dimension an organization should invest in first, and whether any dimension is a strict requirement rather than a mere helpful driver of innovation capability. Using a dataset of 118 Malaysian agricultural, this study considers all four dimensions of absorptive capacity (acquisition, assimilation, transformation and exploitation) as first order direct predictors of innovation capability. A disjoint two-stage partial least squares structural equation modeling (PLS-SEM) approach was used, where all four hypothesized paths were statistically significant (knowledge acquisition, $\beta = 0.174$, $p = .027$; assimilation, $\beta = 0.256$, $p = .008$; transformation, $\beta = 0.211$, $p = .019$; exploitation, $\beta = 0.269$, $p = .006$), explaining 61.7% of the variance of innovation capability together. Furthermore, the analysis was extended with an importance-performance map analysis (IPMA) and a necessary condition analysis (NCA) to go beyond significance to prioritization and necessity. All four dimensions were also statistically significant necessary conditions (permutation test, all $p \leq .001$). The largest necessity effect was for exploitation ($d = 0.289$) and the smallest, but significant, necessity effect was for acquisition ($d = 0.126$). The clear priority target for institutional investment was the assimilation of knowledge, with the second highest importance score (0.467) and the lowest performance

score (54.39) in the IPMA. The NCA results confirm this finding, showing an overall inefficiency of 54.3% in the outcomes related to knowledge assimilation. By contrast, exploitation combined the highest importance, performance and necessity scores, and thus represented a maintained strength. These findings are discussed in relation to recent microfoundations of absorptive capacity research, and Malaysia's evolving agricultural R&D policy context, with item-level practical recommendations offered for research-institution management.

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Keyword:

Absorptive Capacity, Agricultural R&D, IPMA, Innovation Capability, Knowledge Management,



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Introduction

The ability to recognise, assimilate, and exploit external knowledge (Cohen & Levinthal, 1990; Zahra & George, 2002) has remained a central concept in innovation and knowledge management research. However, a recent review spanning three decades of absorptive capacity research identifies the role of individuals and the microfoundations of the construct as important priorities for future research, alongside its multidimensional nature and its relevance in an increasingly digital environment (Arndt et al., 2023). Agricultural research and development (R&D) provide a particularly relevant context for examining these individual-level and multidimensional aspects of absorptive capacity. Agricultural researchers are the individuals who acquire, assimilate, transform, and exploit external scientific and technical knowledge while developing new ideas, practices, and innovations. Despite this, absorptive capacity research continues to focus predominantly on the organizational level (Kashan et al., 2025).

This issue is particularly relevant to the Malaysian agricultural R&D context. Malaysia's National Agrofood Policy 2.0 (2021–2030) identifies research, development, commercialisation, and innovation as key pillars in the modernization of the agrofood sector (Ministry of Agriculture and Food Security Malaysia, 2021). Similarly, the World Bank (2024) identifies greater investment in the innovation ecosystem, beyond investment in digital agriculture technologies alone, as one of three priority areas for sustaining the sector's growth. At the same time, a recent systematic review of Malaysia's agricultural economic sector highlights structural challenges, including labour shortages and low youth participation in agricultural careers, which place additional pressure on the existing human capital within the sector (Shariff et al., 2025). In this context, understanding how individual agricultural researchers acquire and make use of external knowledge is increasingly important. Their capacity to process and apply such knowledge may influence how effectively research

capabilities can be translated into innovation and, ultimately, contribute to the broader objectives of Malaysia's agrofood policy.

This study addresses two related gaps in the absorptive capacity literature. First, it examines the four dimensions of absorptive capacity; acquisition, assimilation, transformation, and exploitation as distinct predictors of innovation capability among individual agricultural researchers, rather than combining them into the potential and realised absorptive capacity composites commonly used in previous research. This dimension level approach provides a more detailed understanding of how different knowledge processes contribute to innovation capability and allows the findings to inform more targeted managerial interventions.

Second, the study extends conventional significance-based analysis by applying Importance-Performance Map Analysis (IPMA) and Necessary Condition Analysis (NCA) to the same dataset. While the structural model establishes whether each absorptive capacity dimension is significantly associated with innovation capability, IPMA and NCA provide complementary insights into the relative priority and necessity of each dimension. Together, these analyses address two practically important questions: which knowledge process warrants greater attention based on its importance and current performance, and whether any dimension represents a necessary condition for achieving higher levels of innovation capability.

This analytical extension is relevant beyond methodological considerations. Technological advances are increasingly shaping how researchers acquire, process, and assimilate external knowledge, prompting recent knowledge management research to reconsider these processes rather than treating them as stable or context independent (Brusco Pletsch et al., 2026). Arndt et al. (2023) similarly identify absorptive capacity in the context of advanced intelligence as an emerging frontier for research. Against this backdrop, establishing an empirical baseline of absorptive capacity at the level of individual dimensions and individual researchers provides a useful foundation for examining how these knowledge processes may evolve in increasingly technology-mediated research environments.

Literature Review and Hypothesis Development

Knowledge Management

Knowledge management (KM) can be understood as the deliberate process through which individuals and organizations identify, acquire, share, and apply knowledge to achieve their objectives. Historically, KM research has placed considerable emphasis on organizational infrastructure, including knowledge systems, repositories, and formal knowledge-sharing routines. However, growing attention has been given to the individual cognitive and behavioural processes through which knowledge is interpreted and used. Regardless of how sophisticated an organization's KM infrastructure may be, knowledge can only contribute to innovation when individuals are able to recognize relevant external knowledge, understand its value, integrate it with what they already know, and apply it in their work. Absorptive capacity provides an important theoretical lens for examining these knowledge-processing activities at the individual level. This perspective is particularly relevant to knowledge-intensive occupations such as agricultural research, where researchers routinely encounter external scientific and technical knowledge and must determine how to interpret, integrate, and apply it within their own work (Arndt et al., 2023).

Agricultural Research and Development in Malaysia

The agriculture sector policy in Malaysia is at an important milestone. Research, development, commercialization, and innovation activities are listed as one of the main policy thrusts of the National Agrofood Policy 2.0 (2021–2030), which outlines a vision of a high-tech, resilient, and sustainable agrofood sector (Ministry of Agriculture and Food Security Malaysia, 2021). Without concurrent investment in the underlying innovation ecosystem that enables researchers and practitioners to develop, adapt, and deploy such innovations, digital agriculture technologies alone would not realize this objective (World Bank, 2024). This assessment is reinforced by a 2025 systematic review of the sector, which identifies a shortage of skilled labour and declining youth participation as recurring structural constraints across the literature (Shariff et al., 2025), constraints that place increasing pressure on the individual researchers who remain in the system to translate external knowledge into usable innovation. Agricultural research institutions such as MARDI, DVS, and MPOB sit at the front line of this policy agenda, making the individual level absorptive capacity of their researchers a direct, practical concern rather than a purely theoretical one.

Microdimensions of Absorptive Capacity

Zahra and George (2002) reformulated the original construct of Cohen and Levinthal (1990) into two composites: potential absorptive capacity (acquisition and assimilation) and realized absorptive capacity (transformation and exploitation), a structure that has been widely adopted in subsequent firm-level research. However, at the individual level, combining these four processes into a composite can obscure the specific knowledge process that is driving (or not driving) innovation outcomes. This study therefore conceptualizes acquisition, assimilation, transformation, and exploitation as four distinct first-order reflective constructs that independently predict innovation capability. In line with this dimension-level perspective, this study operationalized knowledge acquisition as researchers' interaction with external partners, other departments and subject-matter experts, and their purposeful search for varied knowledge domains; assimilation as researchers' ability to connect seemingly unrelated information, interpret changes in the market and regulatory landscape, and transmit newly acquired knowledge to their colleagues; transformation as the reactivation of existing knowledge for new applications and generation of new insights through collegial discussion; and exploitation as the combination of new knowledge with product or process ideas and application of new knowledge directly to their work.

Innovation Capability

In this study, innovation capability is conceptualised as a composite construct comprising three distinct dimensions: change readiness, creative thinking, and empowerment. Change readiness refers to an employee's persistence in pursuing an idea despite challenges and setbacks. This behavioural capacity is important because employees who remain committed to implementing an idea when difficulties arise are more likely to carry the idea through to completion (Aditianto & Amir, 2022). The second dimension, creative thinking, represents the ability to generate novel approaches to problems, explore new techniques or technologies, and consider alternative or unconventional ways of working. The third dimension, empowerment, reflects an individual's perceived autonomy in performing their work, confidence in their own capabilities, and sense that their work is personally meaningful. Previous research has associated psychological empowerment with innovative work behaviour, suggesting that

empowered employees are more likely to take initiative, exercise discretion, and engage in creative problem-solving (Vu et al., 2025).

By modelling innovation capability as a composite of these three dimensions and applying the same disjoint two-stage approach used for the absorptive capacity constructs, this study captures innovation capability as a behavioural and dispositional outcome rather than as a purely cognitive construct. This conceptualisation complements the knowledge-processing perspective of absorptive capacity by recognising that acquiring and processing knowledge alone does not necessarily translate into innovation; individuals must also be willing and able to persist, think creatively, and exercise autonomy in applying knowledge within their work.

Absorptive Capacity and Innovation Capability

Every dimension of absorptive capacity reflects a different phase of the processing of external knowledge, including its recognition and acquisition, assimilation into preexisting knowledge, transformation into novel combinations, and application. Each dimension has been suggested to have a direct and independent impact on a researcher's innovation capability, which is defined here as their ability to act on their ideas with confidence (empowerment), generate new approaches (creative thinking), and persist in pursuing ideas (change readiness).

Hypothesis Development

- H1: Knowledge acquisition has a positive relationship with innovation capability.
- H2: Knowledge assimilation has a positive relationship with innovation capability.
- H3: Knowledge transformation has a positive relationship with innovation capability.
- H4: Knowledge exploitation has a positive relationship with innovation capability.

Microfoundations and Multidimensional of Absorptive Capacity Concepts

This dimension level individual focused paradigm is once again relevant due to two advances. First, the literature on the microfoundations of absorptive capacity has shifted from primarily conceptual roots to calls for more individual level empirical evidence (Arndt et al., 2023). A recent case study of an emerging economy of automotive and manufacturer industries illustrates how organizational absorptive capacity is supported by individual level knowledge processes of acquisition, assimilation, transformation, and exploitation, showing that the four processes function as distinct multidimensional rather than a single indistinguishable absorptive capacity (Kashan et al., 2025). Second, recent applications of absorptive capacity in the agribusiness sector (Akbari et al., 2026; Sulemana et al., 2025) further confirm the construct's ongoing relevance outside the manufacturing and services context, lending support to the case for the agricultural R&D context examined here.

Research Methodology

Sample and Instrument

Employing a quantitative research design with purposive sampling, this study evaluated individual agricultural researchers in Malaysia as the unit of analysis. A self-administered five-point Likert questionnaire was used to acquire data from 118 researchers at five important institutions: the Malaysian Agricultural Research and Development Institute (MARDI),

Department of Veterinary Services (DVS), Malaysian Palm Oil Board (MPOB), Universiti Teknologi MARA (UiTM), and Universiti Putra Malaysia (UPM). The instrument examined four absorptive capacity dimensions; acquisition (6 things), assimilation (7 items), transformation (4 items), and exploitation (5 items) alongside three innovation capability sub-dimensions; change readiness (5 items), creative thinking (5 items), and empowerment (3 items). To ensure sample adequacy for structural model estimation, an a priori power analysis was undertaken using G*Power 3.1 (Faul et al., 2009). A significance level of $\alpha = 0.05$, a target statistical power of 0.90, a medium impact size ($f^2 = 0.15$), and four primary.

Structural Model Analysis

A disjoint two-stage approach was used in SmartPLS 4. In Stage 1, latent variable scores were estimated for each four absorptive capacity dimensions (acquisition, assimilation, transformation, exploitation) and for each of the three innovation capability sub dimensions (change readiness, creative thinking, empowerment) from their respective reflective indicators. In Stage 2, the four absorptive capacity dimension scores were designated as direct predictors of innovation capability (H1–H4), and the three-innovation capability sub dimension scores performed as reflective indicators of a single higher-order innovation capability construct. Path significance was evaluated using bootstrapping 5,000 subsamples, two-tailed, $\alpha = .05$ (Hair et al., 2022).

Importance-Performance Map Analysis

Using the same Stage 2 latent variable scores, an IPMA was conducted with innovation capability as the target construct. Each predictor's total effect on innovation capability served as its importance score; each predictor's rescaled 0–100 mean score served as its performance score. Quadrants were defined at the sample mean of importance (0.413) and performance (58.70) across the four dimensions, following standard IPMA convention (Ringle & Sarstedt, 2016).

Necessary Condition Analysis

The same Stage-2 latent variable scores were re-analysed with NCA using the ceiling envelopment–free disposal hull (CE-FDH) technique, appropriate for the ordinal, Likert-origin data underlying the constructs (Dul, 2016). Effect sizes (d) were interpreted following Dul's (2016) benchmarks; small ($0 < d \leq 0.1$), medium ($0.1 < d \leq 0.3$), large ($0.3 < d \leq 0.5$) and statistical significance of each effect size was assessed with a permutation test (Dul et al., 2020).

Result

Respondent Profile

Table 1: Respondent Demographic Profile (N = 118)

Questions	Category	n	%
Gender	Male	48	40.7
	Female	70	59.3
Age group (years)	21–30	39	33.0

	31–40	50	42.3
	41–50	18	15.3
	51–60	11	9.3
Highest education	Diploma	9	7.6
	Bachelor's	60	50.8
	Master's	34	28.8
	PhD	9	7.6
	Professional cert.	4	3.4
	Other	2	1.7
Research category	Food Science	12	10.2
	Plant Science	49	41.5
	Soil Science	6	5.1
	Animal Science	33	28.0
	Others	18	15.3

Measurement Model Analysis

Table 2: Reliability and Convergent Validity

Construct	Cronbach's α	rho_a	rho_c	AVE
Knowledge Acquisition	0.877	0.879	0.907	0.62
Knowledge Assimilation	0.89	0.892	0.914	0.602
Knowledge Exploitation	0.877	0.879	0.91	0.67
Knowledge Transformation	0.725	0.728	0.828	0.547
Innovation Capability	0.854	0.866	0.911	0.774

All five constructs exceeded the standard thresholds for internal consistency reliability (Cronbach's α and rho_c > 0.70) and convergent validity (AVE > 0.50). Indicator loadings ranged from 0.704 to 0.850, all exceeding the conventional 0.70 threshold.

Table 3: Discriminant Validity (Heterotrait-Monotrait Ratio, HTMT)

	Acquisition	Assimilation	Exploitation	Transformation
Assimilation	0.674			
Exploitation	0.631	0.804		
Transformation	0.714	0.891	0.899	
Innovation Capability	0.684	0.796	0.799	0.858

The Heterotrait-Monotrait ratio of correlations (HTMT) was used to assess discriminant validity. A liberal threshold of 0.90 is suitable for closely related sub-dimensions of the same overarching construct, according to Henseler et al. (2015) and Hair et al. (2022). In this study, the four dimensions of absorptive capacity represent closely interrelated phases of an underlying knowledge-processing chain. The HTMT values between Knowledge Acquisition, Assimilation, and Exploitation and Transformation remained well within the accepted threshold for conceptual sub-dimensions, confirming that the constructs retain sufficient empirical distinctiveness for structural modelling.

Structural Model Analysis

Table 4: Structural Path Results

Path	β	T statistic	p	Decision
H1 Knowledge Acquisition → Innovation Capability	0.174	2.22	.027	Supported
H2 Knowledge Assimilation → Innovation Capability	0.256	2.657	.008	Supported
H3 Knowledge Transformation → Innovation Capability	0.211	2.349	.019	Supported
H4 Knowledge Exploitation → Innovation Capability	0.269	2.729	.006	Supported

All four hypothesised paths were statistically significant at $\alpha = .05$, with knowledge exploitation carrying the largest path coefficient ($\beta = 0.269$), followed closely by knowledge assimilation ($\beta = 0.256$), knowledge transformation ($\beta = 0.211$), and knowledge acquisition ($\beta = 0.174$, the weakest but still significant path).

Importance-Performance Map Analysis

Table 5: IPMA Importance and Performance Scores

Construct	Importance	Performance	Quadrant
Knowledge Acquisition	0.303	62.063	Low importance / High performance
Knowledge Assimilation	0.467	54.389	High importance / Low performance
Knowledge Transformation	0.391	55.354	Low importance / Low performance
Knowledge Exploitation	0.492	63.002	High importance / High performance

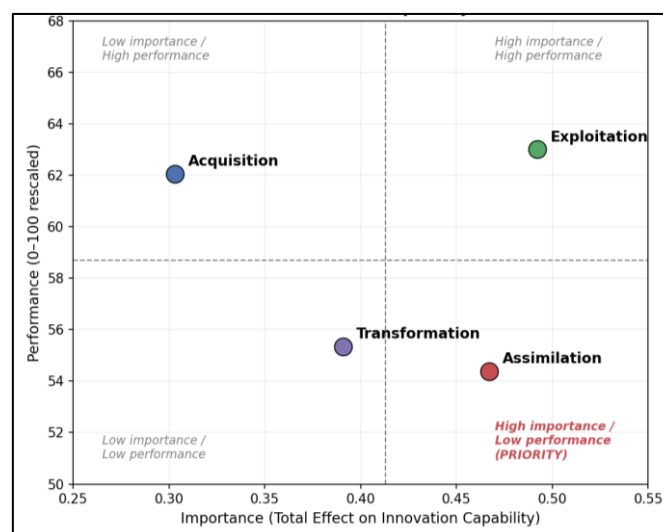


Figure 1: Importance-Performance Map of ACAP Dimensions on Innovation Capability

Source: Adapted from SMARTPLS IPMA Result

Knowledge assimilation emerged as the clear priority target: the second-highest importance score (0.467) combined with the lowest performance score (54.39) of the four dimensions. Knowledge exploitation, by contrast, combined the highest importance (0.492) and highest performance (63.00), marking it a maintained strength rather than an intervention target. Knowledge acquisition performed well (62.06) despite low importance, and knowledge transformation was reasonably placed on both dimensions.

Necessary Condition Analysis

Table 6: NCA Ceiling Envelopment (CE-FDH) Results

Construct	Effect size (d)	Accuracy (%)	Condition inefficiency	Outcome inefficiency	Rel. inefficiency
Knowledge Acquisition	0.126	100	0	23.785	23.785
Knowledge Assimilation	0.162	100	11.562	54.286	59.572
Knowledge Transformation	0.149	100	0	23.785	23.785
Knowledge Exploitation	0.289	100	0	23.785	23.785

Table 7: NCA Permutation Test Results

Construct	Observed d	95% threshold	Permutation p
Knowledge Acquisition	0.126	0.096	.001
Knowledge Assimilation	0.162	0.08	<.001
Knowledge Transformation	0.149	0.052	<.001
Knowledge Exploitation	0.289	0.166	<.001

All four dimensions emerged as statistically significant necessary conditions for innovation capability (permutation test, all $p \leq .001$). Exploitation showed the largest necessity effect ($d = 0.289$), approaching Dul's (2016) threshold for a large effect, followed by assimilation ($d = 0.162$), transformation ($d = 0.149$), and acquisition ($d = 0.126$). Assimilation was the only dimension exhibiting non-trivial condition inefficiency (11.6%) alongside a markedly higher outcome inefficiency (54.3%, versus 23.8% for the other three dimensions), indicating that even researchers who meet the necessary threshold for knowledge assimilation frequently fail to translate it into high innovation capability.

Discussion

These findings provide three different analytical perspectives on the same concept. In the structural model, knowledge exploitation and knowledge assimilation have the two largest statistically significant path coefficients for innovation capability (H4 and H2, respectively). The IPMA further clarifies these findings from a managerial perspective. Knowledge exploitation shows both high importance and high performance, suggesting that it represents a

strength that institutions should maintain. In contrast, knowledge assimilation records the lowest performance among the four dimensions, indicating that it may require greater institutional attention and support. The NCA provides a different perspective on the same issue. Among the four dimensions, only knowledge assimilation shows a significant inefficiency pattern, suggesting that higher levels of assimilation do not necessarily correspond to higher innovation capability.

Knowledge acquisition presents a more interesting pattern. Although it shows relatively good performance, it has the lowest importance and the weakest, although still statistically significant, path coefficient among the four dimensions. It also records the lowest necessity effect and IPMA importance score. Taken together, these findings suggest that Malaysian agricultural researchers are generally capable of identifying and acquiring external knowledge but may face greater difficulties in assimilating that knowledge into their existing understanding. This includes making connections between seemingly unrelated information, reconciling new knowledge with what they already know, and translating newly acquired knowledge into forms that can be understood and used by their peers. Therefore, knowledge assimilation appears to be an area where targeted institutional support could potentially make the greatest contribution to strengthening innovation capability.

These findings contribute to the microfoundations literature on absorptive capacity (Arndt et al., 2023; Kashan et al., 2025) by providing dimension specific evidence at the individual level within a developing country agricultural R&D context. This setting remains relatively played down in a literature that has largely focused on firm level and manufacturing oriented studies. The findings are also consistent with recent efforts to extend absorptive capacity theory to agribusiness contexts (Akbari et al., 2026; Sulemana et al., 2025). Beyond the theoretical contribution, the findings have implications for strengthening the R&D ecosystem under Malaysia's National Agrofood Policy 2.0 (Ministry of Agriculture and Food Security Malaysia, 2021). In particular, this contributes in identifying a specific knowledge process that may require greater institutional support, rather than making a general call for increased R&D funding.

Contributions

Theoretical Contributions

This study contributes to absorptive capacity theory by disaggregating the construct into its four constituent dimensions at the individual level, rather than relying on the aggregated potential and realised absorptive capacity composites commonly used in organizational-level research. In doing so, the study responds to calls for greater attention to the individual-level microfoundations of absorptive capacity. The findings further demonstrate that the four dimensions are not interchangeable. Each dimension exhibits a distinct pattern of importance, performance, and necessity, providing a level of differentiation that would have been obscured in an aggregated model. The study also contributes a composite, behaviourally grounded operationalization of innovation capability comprising change readiness, creative thinking, and empowerment. This approach extends the conceptualization of innovation capability beyond measures focused primarily on cognitive attributes or innovation outputs.

Methodological Contributions

Methodologically, this study is among the early applications of Importance-Performance Map Analysis (IPMA) and Necessary Condition Analysis (NCA) jointly to individual level absorptive capacity dimensions. Previous applications of these approaches have been concentrated primarily at the firm level. The study also demonstrates a disjoint two-stage PLS-SEM procedure followed by IPMA and NCA re-analysis using a purposively sampled dataset of modest size ($n = 118$). This provides an empirical example of how complementary analytical approaches can be combined to examine not only whether knowledge processes are associated with innovation capability, but also their relative importance, current performance, and necessity.

Managerial Contributions

The results identify knowledge assimilation as a specific area that may warrant greater institutional attention. The combination of its comparatively lower performance and the findings from the IPMA and NCA suggests that strengthening researchers' ability to assimilate external knowledge could potentially contribute to improvements in innovation capability. Rather than calling broadly for increased R&D investment, the findings point to several targeted interventions that are directly linked to the assimilation behaviours measured in this study.

First, institutions could establish structured cross-disciplinary discussion forums or journal clubs to strengthen researchers' ability to identify connections between seemingly unrelated findings and to consider different points of view. These correspond to the two lowest performing assimilation behaviours identified in the instrument. Second, regular market and policy scanning briefings could help researchers interpret changes in market demand, competitive conditions, and regulatory requirements, rather than relying exclusively on management to undertake such interpretation. Third, knowledge translation workshops, coaching, or peer mentoring could help researchers communicate newly acquired knowledge in ways that colleagues can readily understand and apply. This recommendation directly addresses the instrument item concerning researchers' ability to translate new knowledge for their colleagues.

At the same time, the findings suggest that existing strengths in knowledge acquisition and knowledge exploitation should be maintained. Knowledge acquisition, reflected in behaviours such as engagement with external partners, cross departmental contact, and stakeholder meetings, demonstrates relatively good performance. Similarly, knowledge exploitation, including the application of newly acquired knowledge and the combination of new technologies with product ideas, also performs well. These areas may therefore be better supported through existing institutional mechanisms rather than being treated as immediate priorities for additional investment. This does not imply that support for these activities should be reduced; rather, the findings suggest that resources could be directed more selectively towards areas where greater improvement appears to be needed.

Recommendations concerning knowledge transformation should be interpreted more cautiously. Given the measurement characteristics of this dimension, interventions such as structured ideation sessions based on behaviours such as working with colleagues to generate new ideas should be regarded as provisional until the measurement of transformation is further

refined. In contrast, the recommendations concerning knowledge assimilation are more directly grounded in the observed measurement patterns and can therefore provide a clearer basis for institutional action.

For innovation capability itself, the underlying change readiness, creative thinking, and empowerment items suggest complementary interventions: persistence building support during idea implementation (change readiness), protected time or forums for unconventional problem solving (creative thinking), and greater researcher autonomy over how their own work is organised (empowerment).

Limitations and Future Research

This study's cross-sectional, single-country design limits causal inference and generalisability. Future research should refine and replicate the model in other agricultural R&D contexts, including other Southeast Asian settings facing similar National Agrofood-style policy pressures, to test the generalisability of the assimilation as priority finding.

Conclusion

Disaggregating absorptive capacity into its four constituent dimensions, and extending PLS-SEM with importance-performance and necessary condition analysis, reveals a differentiated picture that an aggregated model would have concealed that knowledge assimilation is both a priority target for institutional investment and the dimension with the least efficient translation into innovation capability, while knowledge exploitation is a maintained strength that is simultaneously the strongest necessary condition. These converging results extend absorptive capacity theory to the individual level in a developing country agricultural R&D context, state directly to Malaysia's National Agrofood Policy 2.0 innovation agenda, and provide a concrete, dimension specific empirical baseline for the field's growing interest in the microfoundations of absorptive capacity.

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