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ANALYSIS OF MANAGEMENT PRACTICE

DEVELOPING AND IMPLEMENTING A LABORATORY COMPETENCY ASSESSMENT FRAMEWORK (L-CAF): LESSONS IN WORKFORCE CAPABILITY AND MANAGEMENT PRACTICE IN AOTEAROA NEW ZEALAND

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ABSTRACT

AIM:

This case study analyses the management strategies used to develop and implement the Laboratory Competency Assessment Framework (L-CAF), an initiative designed to address critical gaps in workforce competency assessment and enhance quality and patient safety in New Zealand clinical laboratory service.

APPROACH:

The management practice involved a co-design methodology with laboratory personnel at various levels and roles within a tertiary diagnostics service in New Zealand, a phased implementation strategy, and a strategic shift from a compliance-driven to a development-focused human resource model. The problem was analysed through regulatory reviews, structured stakeholder engagement, and operational gap analysis, guided by principles of participatory change management.

CONTEXT:

The initiative was undertaken within the Department of Pathology and Laboratory Medicine at Auckland City Hospital, Te Whatu Ora – Health New Zealand, a sector facing inconsistent evaluations and skill gaps that impacted service quality and equity.

MAIN FINDINGS:

Management interventions led to improved assessment consistency, heightened staff engagement in professional development, and a cultural shift towards continuous learning. Key success factors included staff co-design, leadership endorsement, and flexible adaptation to departmental workflows. Early quantitative indicators demonstrate substantial progress in the staged implementation of L-CAF and transition to the MediaLab Compass electronic platform. As of December 2025, the majority of departments had completed alignment of their competency assessments with L-CAF requirements, with a growing number commencing training activities and several departments having fully transitioned to the Compass platform. Collectively, these data reflect strong initial uptake and progressive digital implementation across services. Challenges included initial resistance and resource allocation for training and implementation in some departments.

CONCLUSIONS:
The L-CAF case demonstrates that effective management of competency assessment systems requires moving beyond technical checklists to a holistic, staff-engaged framework underpinned by change management theory. This approach is a powerful lever for improving workforce capability and operational quality, leading to equitable and safe patient care. The framework offers a replicable, theoretically informed model for healthcare managers internationally.

KEYWORDS
competency assessment, workforce development, quality improvement, change management, clinical laboratories, healthcare management

INTRODUCTION

Competency assurance is the foundation of safe, high-quality healthcare, particularly in pathology and laboratory medicine where diagnostic accuracy directly influences patient outcomes [1]. In Aotearoa New Zealand, clinical laboratories have traditionally relied on compliance-driven models of assessment, centred on technical checklists designed to meet minimum regulatory standards [2]. While effective in verifying baseline proficiency, these approaches failed to capture broader competency domains such as critical thinking, professional behaviours, communication, and cultural responsiveness [3].

The narrow focus of traditional assessments created several challenges. Inconsistent evaluation practices contributed to unrecognised skill gaps, while the lack of emphasis on cognitive and behavioural domains limited opportunities for meaningful professional growth. For instance, audits of laboratory incident reports within our setting revealed that a proportion of recurring errors were attributable not to technical failure, but to lapses in critical decision-making or communication, domains unaddressed by checklist assessments. This compliance-centric culture risked undermining both workforce capability and patient safety, particularly in high-stakes environments where precision and reliable decision-making are essential. Moreover, the absence of a structured, multi-dimensional framework led to variability in workforce capability across departments, creating disparities in service quality and equity of care [4].

To address these challenges, the Department of Pathology and Laboratory Medicine at Auckland City Hospital, Health New Zealand | Te Whatu Ora developed and implemented the Laboratory Competency Assessment Framework (L-CAF). This paper analyses the management approaches applied in diagnosing the problem, designing and implementing the intervention, and evaluating its outcomes. It situates the initiative within established change management theory to derive broader lessons for health management practice.

APPROACH TO ANALYSING THE PROBLEM

A comprehensive and systematic analysis was undertaken by the L-CAF project group to understand the extent and root causes of the competency assessment gap. This diagnostic phase was critical to ensuring that the subsequent intervention was both targeted and evidence based.

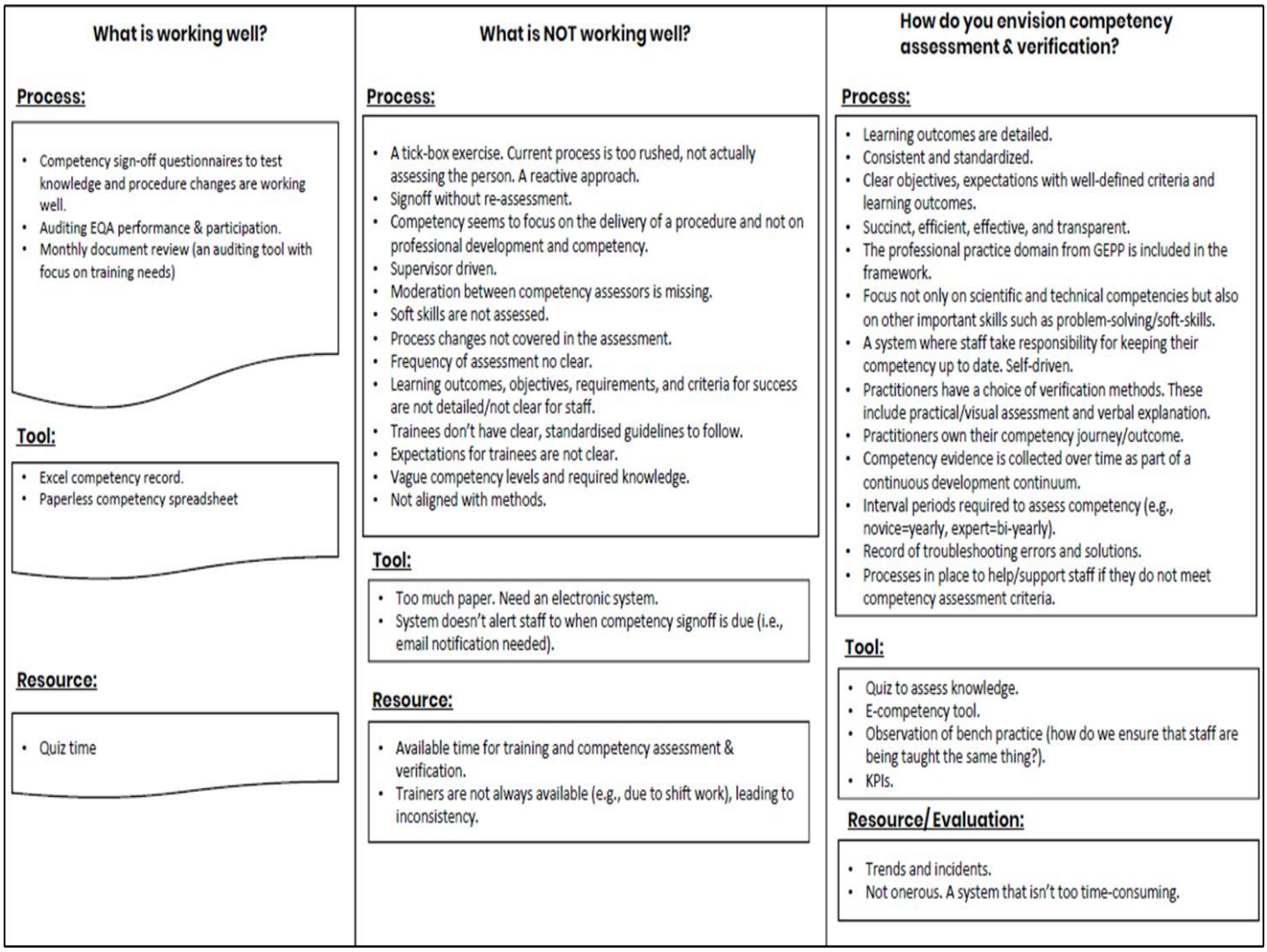
First, a regulatory and practice review was conducted, examining standards such as the Health Practitioners Competence Assurance Act (HPCAA) 2003 [5] and the Medical Sciences Council of New Zealand Competence Standards for Medical Laboratory Science Practitioners in Aotearoa New Zealand [6]. This review identified a significant inconsistency between the broad expectations of professional practice articulated in policy and the narrow, technical focus of real-world assessment tools.

Second, structured workforce feedback was gathered to capture diverse perspectives. The project group comprised 26 participants, including 3 administration staff, 4 laboratory technicians, 4 scientists, 4 Technical Specialists (senior scientists),

6 people leaders, 4 senior leaders, and 1 workforce professional leader, ensuring representation across professional roles and seniority levels. Data were collected through four focus groups and two brainstorming sessions. The qualitative data from these sessions were analysed using structured thematic analysis to identify recurring patterns and insights. Key themes highlighted widespread concerns about the narrow technical focus of traditional assessments, the absence of meaningful evaluation of critical thinking and professional practice, and a lack of consistency in verification processes. Figure 1 presents a summary of key themes from the brainstorming sessions.

Third, a gap analysis was conducted to compare the domains assessed by traditional methods (e.g. technical checklists) with the broader competencies required for safe and effective practice in a modern, culturally diverse healthcare environment. This analysis revealed notable omissions, particularly in the areas of critical thinking and professional practice. The findings were further supported by a review of laboratory error and incident reports by different departments, which highlighted recurring quality and safety issues linked to gaps in workforce capability. These reports also identified errors associated with unmet training needs and inconsistencies in assessment, further corroborating the analysis and underscoring the need for a more multifaceted and structured competency assessment framework.

FIGURE 1 KEY THEMES IDENTIFIED THROUGH WORKFORCE BRAINSTORMING SESSIONS



MANAGEMENT INTERVENTIONS AND APPROACHES

To address the identified gaps, an intervention centred on four strategic shifts was implemented. The overall change strategy was implicitly aligned with Kotter's eight step model for leading change, emphasising creating a coalition,

developing a vision, and generating short-term wins [7]. This theoretical underpinning provided a structured approach to moving from problem diagnosis to sustainable implementation.

STRATEGIC SHIFTS:

The intervention was guided by a fundamental rethinking of the approach to competency assessment:

- ***From technical to multi-dimensional:*** Rather than focusing narrowly on technical abilities and skills, assessment was expanded to include critical thinking and professional practice, encompassing communication, ethics, and cultural safety.
- ***From static to continuous:*** Competency assurance also moved from a static, one-off process to a continuous and dynamic model that incorporated scenario-based assessments, peer reviews, and reflective exercises.
- ***From compliance to developmental:*** Assessment was repositioned from being a compliance-driven task to a developmental journey that fosters growth. Practitioners are empowered to take ownership of their progression along the competency continuum, moving beyond meeting minimum standards toward actively building capability, strengthening professional development, and advancing excellence.
- ***From isolated to integrated:*** Competency development was embedded into daily workflows, rather than being treated as an isolated activity.

THE LABORATORY COMPETENCY ASSESSMENT FRAMEWORK (L-CAF):

To implement these shifts, the Laboratory Competency Assessment Framework (L-CAF) was constructed around three foundational elements. First, competencies were categorised using the KASH model (Knowledge, Attitudes, Skills, and Habits) [8] and distributed across three primary domains: Technical Proficiency, Critical Thinking, and Professional Practice (see Table 1). Second, five-tiered proficiency levels (from Novice to Expert) were established to create defined progression pathways and articulate expected benchmarks for each developmental stage (Table 2). Finally, L-CAF employs diverse verification methods such as direct observation, mock events, case studies, peer review, and scenario-based simulations to assess these competencies. Each method is designed to evaluate one or more elements of the KASH model, and its selection is deliberately aligned with the specific competency being assessed (see Table 3).

TABLE 1 KASH MODEL (SOURCES: ADAPTED FROM THE KASH MODEL [8], WITH DEFINITIONS DEVELOPED BY THE AUTHORS)

KASH Model	Definition
Knowledge (K)	Assessment of foundational understanding of theories, principles, and role-specific information.
Attitudes (A)	Evaluation of professional disposition, mind-set, and approach to work. This may include teamwork, cultural competence, and adherence to organisational values.
Skills (S)	Assessment of practical and technical abilities, including both direct skills and applied knowledge.
Habits (H)	Assessment of routine practices, consistent behaviours, and reliability in work.

TABLE 2 PROFICIENCY LEVELS (SOURCES: AUTHORS' OWN WORK)

Level	Focus	Definition
1 (Novice)	Gaining Experience	• Demonstrates a **basic** understanding of concepts, principles, and tasks related to the competency. • May lack experience but can perform routine tasks under direct supervision. • Demonstrates awareness of the importance of accuracy, safety, and compliance in all tasks. Actively seeks feedback and guidance to improve performance and build confidence. • Begins to develop problem-solving skills by recognising and reporting issues appropriately.

		• Meets baseline competency expectations in knowledge application, technical skills and adherence to protocols.
2 (Developing)	Consolidating Knowledge and Skills	• Demonstrates a **solid** understanding of concepts and principles and begins to integrate knowledge into practice. • Has the ability to perform routine tasks independently and manage complex tasks with guidance from more experienced practitioners. • Demonstrates consistent attention to detail and reliability in completing tasks, and growing confidence in addressing recurrent challenges and participating in problem-solving activities. • Achieves competency assessment benchmarks for routine tasks and shows measurable improvement in complex areas.
3 (Proficient)	Further Developing Knowledge and Skills	• Demonstrates **comprehensive** knowledge and skills and can apply competencies effectively across a full range of typical situations. • Has the ability to work autonomously within established frameworks and contributes to improving processes. • Consistently meets or exceeds lab quality, safety, and compliance standards. • Demonstrates the ability to address unforeseen challenges and make decisions with minimal guidance, and reliability in delivering high-quality outcomes and ensuring compliance with standards. • Demonstrates strong professional practice through clear communication, teamwork, and responsibility for assigned work.
4 (Advanced)	Becoming Expert	• Demonstrates **advanced knowledge** and **specialised skills**, applying competencies effectively in new or complex situations. • Has the ability to provide expert advice, mentorship, and guidance to less experienced practitioners. • Actively participates in training and competency assessment, ensuring knowledge transfer and skill development among less experienced practitioners. • Consistently exceeds performance expectations in assessments and contributes to quality and innovation. • Demonstrates leadership in recommending and implementing best practices, ensuring alignment with organisational goals, and a commitment to fostering quality, safety, equity and patient centred care through innovative approaches.

5 (Expert)	Acknowledged Leader	• Demonstrates **expert-level knowledge** and **mastery** of competencies, applying them in the most complex situations. • Develops new methodologies, framework, or innovations in lab practices. • Has the ability to develop new approaches, procedures, or frameworks that advance the field. • Demonstrates strategic leadership, inspiring others and shaping organisational policies and practices, as well as the capacity to influence industry standards and contribute to the profession at a national or international level.

TABLE 3 VERIFICATION METHODS - DESCRIPTIONS AND EXAMPLES (SOURCES: AUTHORS' OWN WORK)

Domains	Verification Method	KASH Model	Description and Example
Knowledge & Technical Proficiency	**Knowledge Assessment**	**K**	**Description**: Quizzes, exams, or structured questionnaires that evaluate foundational knowledge.
			Example: A written test on SOPs for a laboratory analyser.
	Direct Observation	**S**	***Description***: Supervisors or trainers observe practitioners performing tasks in real-time.
			Example: Observing a scientist perform a blood smear preparation and staining procedure.
	Review of Daily Work	**S, H**	***Description***: Analysis of routine documentation, task logs, or output reports for consistency and accuracy.
			Example: Reviewing patient result logs for accuracy and timeliness.
	Presentation	**S**	***Description***: Practitioners present on specific topics or projects to demonstrate knowledge and communication skills.
			Example: A presentation on the findings of a quality improvement project related to reducing sample processing errors.
Analytical, Reflective & Critical Thinking Abilities	**Reflection**	**A, H**	***Description***: Practitioners self-assess their performance, identifying strengths and areas for growth.
			Example: Writing a reflective summary on lessons learned from participating in a complex diagnostic case.
	Scenario-Based Assessment	**K, A**	***Description***: Practitioners respond to hypothetical or real-world scenarios to illustrate decision-making and critical thinking.
			Example: Describing how to handle a situation where a sample's integrity is compromised.
	Case Study Analysis	**K**	***Description***: Practitioners analyse real or simulated cases, explaining their rationale and decision-making process.
			Example: Reviewing and presenting on a case involving antimicrobial susceptibility testing results.
Peer & Collaborative Evaluation (Interpersonal Skills)	**Peer Review**	**A, H**	***Description***: Colleagues evaluate an individual's performance, providing feedback on technical, professional and interpersonal skills.
			Example: Reviewing and providing feedback on a colleague's calculation for preparing the correct dilution of a reagent/sample.

	Discussion	**K, A**	***Description***: Structured discussions on strategies, challenges, or problem-solving approaches.
			Example: Discussing strategies for optimising workflow in response to increased sample volumes.
	Multi-Disciplinary Meeting (MDM)	**K, A**	***Description***: MDMs facilitate discussion among different professionals to review cases, share knowledge, and make collaborative decisions.
			Example: A multidisciplinary team reviewing a complex diagnostic genetics case to determine the best diagnostic and treatment approach.
Practical & Applied Assessment	**Mock Event**	**S, A**	***Description***: Simulated scenarios assess individual or team actions under controlled conditions.
			Example: Conducting a simulated chemical spill response drill in the laboratory.
	Quality Assurance (QA) Monitoring	**S, H**	***Description***: Using QA data to evaluate individual performance over time.
			Example: Analysing error rates in data entry for routine test results to identify trends.
	Clinical Review Audit	**S, H**	***Description***: Clinical review audits assess documentation, adherence to protocols, and decision-making processes within clinical settings.
			Example: Auditing a set of laboratory reports to evaluate whether they meet quality and clinical guidelines.

IMPLEMENTATION STRATEGY:

A phased and participatory implementation strategy ensured the framework was both practical and sustainable, directly applying principles of participatory change management and organisational learning.

- ***Co-design and coalition building:*** Laboratory staff from all levels were engaged in co-designing the framework, which fostered ownership and relevance to daily practice, aligning with Kotter's "creating a guiding coalition".
- ***Pilot testing and iterative refinement:*** Pilot testing was conducted within selected departments, allowing for iterative refinement based on frontline feedback prior to wider adoption, creating early, tangible examples of success.
- ***Champion model:*** A champion model was employed, with 26 departmental champions trained to lead peer training and promote the benefits of the framework.
- ***Digital integration****:* Integration of assessment tools into the MediaLab Compass module was planned to streamline tracking, reduced administrative burden, and enhanced audit readiness.

DISCUSSION OF OUTCOMES

REPORTED OUTCOMES AND IMPACT:

Early indicators, though yet to be quantified in the long term, point to highly positive outcomes. Initial feedback from pilot departments has been overwhelmingly positive. Staff report greater clarity in competency expectations and increased confidence in their developmental pathways. Assessors and supervisors note the verification process is more structured and meaningful. Qualitatively, there has been an observed increase in reflective conversations about practice and safety, signalling a positive cultural shift towards continuous learning.

Substantial early progress is also evident in the staged implementation of L-CAF and the transition to the MediaLab Compass electronic platform. As of December 2025, 12 of 15 departments (80%) had completed the review and updating of their existing competency assessments to align with L-CAF requirements. In parallel, 4 of 15 departments (26.7%) had commenced training, education, and trial activities within the MediaLab Compass module, reflecting early digital engagement and readiness for platform transition. At the time of reporting, 2 of 15 departments (13.3%) had fully

transitioned their updated competencies onto the Compass electronic platform. Collectively, these data demonstrate strong initial alignment with the framework, with progressive and measurable uptake of digital implementation across services.

Externally, the framework has received strong endorsement from the Regional Operations Managers Group and attracted interest from other laboratories within Aotearoa New Zealand, highlighting its potential for system-wide standardisation.

IMPLICATIONS FOR MANAGEMENT PRACTICE

The L-CAF initiative offers several theoretically significant lessons for health managers, demonstrating how established change management principles can be operationalised to achieve sustainable practice improvement. The success of the framework can be interpreted through the lens of Kotter's model for leading change, which emphasises the importance of creating a guiding coalition, generating short-term wins, and anchoring new approaches in the culture [7]. First, the co-design methodology proved essential not only for securing buy-in but also for actively "creating a guiding coalition" as per Kotter's model. Involving end-users in the development process transformed the framework from a top-down mandate into a shared solution. This participatory approach, rooted in organisational learning theory, valued staff expertise and directly addressed potential resistance by fostering a sense of ownership and collective responsibility for the change. It ensured the intervention was grounded in the reality of daily practice, moving beyond abstract policy to actionable, relevant processes.

Second, the management of implementation challenges, such as initial staff resistance and resource constraints, was informed by the need to "generate short-term wins" and build momentum. Resistance, often stemming from perceptions of added administrative burden, was mitigated through the champion model, a tactic that decentralises advocacy and support, and by demonstrating how the framework streamlined and gave greater meaning to existing assessment duties. The phased roll-out and pilot testing allowed for the celebration of early successes within departments, providing tangible proof of concept and building confidence in the new system. This approach aligns with change management theory, which posits that demonstrating quick, visible benefits is critical to overcoming scepticism and sustaining engagement during transitional periods.

Third, the strategic balance between standardisation and flexibility emerged as a critical success factor, reflecting a nuanced application of change principles. While the L-CAF provided a consistent, organisation-wide structure (the "what"), managers supported practitioners in selecting the most appropriate verification methods for their specific roles and contexts (the "how"). This balance prevented the rigidity of a one-size-fits-all model, which often provokes rejection, and instead promoted adaptive integration. This flexibility is key to embedding change within complex systems, as it allows a core innovation to be contextualised without losing its foundational principles.

Finally, the roles of leadership and technology underscore the multifaceted nature of anchoring change. Sustained endorsement from people leaders provided crucial legitimacy and maintained strategic alignment with national standards like the HPCAA. This leadership alignment ensured the initiative was perceived not as a fleeting project but as an integral component of professional practice and regulatory compliance. Concurrently, the planned digital integration into the MediaLab Compass module was treated as an enabler rather than a driver. For long-term sustainability and scalability, the framework is being systematically embedded into standard operating procedures, induction programmes, and performance dialogues. Its modular design, coupled with the documented co-design process and champion network, provides a clear blueprint for adaptation across other laboratory settings and allied health professions, offering a replicable model for building organisational capability through theoretically informed, participatory change management.

STRENGTHS AND LIMITATIONS:

The primary strengths of this management approach lie in its strong theoretical foundation (KASH model), its practitioner-

informed design, and its scalable, modular structure that aligns with national healthcare quality and equity goals.
A key limitation is the current lack of long-term quantitative data on its impact on hard metrics such as error rates or staff retention, though these are planned for future evaluation. The initial investment of time and resources required for training and change management may also be a barrier for some organisations, though the long-term benefits in quality and safety are anticipated to outweigh these costs.

CONCLUSIONS

This case study demonstrates that the management of competency assessment is a strategic function, directly linked to patient safety, workforce capability, and service quality. The L-CAF initiative provides a validated and practical model for health managers seeking to modernise workforce development by shifting competency assurance from a compliance-driven activity to a developmental, growth-oriented process, underpinned by established change management theory. The key transferable lessons include the critical importance of staff engagement through co-design, which fostered ownership and sustainability; flexibility to accommodate departmental contexts while maintaining core principles; and strong leadership endorsement, which ensured alignment with regulatory frameworks and supported uptake. Digital integration further enhanced scalability, usability, and audit readiness.

The framework's success shows its potential as a transferable model for other laboratory services and allied health professions, both within New Zealand and across the Asia-Pacific region. By embedding multidimensional assessment into daily practice and aligning technical, cognitive, and behavioural competencies with patient safety and service quality, L-CAF offers a replicable pathway and benchmark for building a more resilient, capable, and high-performing healthcare workforce, ultimately contributing to more equitable and robust health systems.

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DECLARATION OF CONFLICTING INTERESTS:

The authors declare that there is no conflict of interest.

ETHICAL APPROVAL:

This case study involved the analysis of management practices within the L-CAF framework and did not include interventions with human participants or identifiable personal data. In accordance with institutional and national guidelines, ethical approval was not required for this study.

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