Adaptive leadership in AI-driven transformation of higher education institutions in Malaysia

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ARTICLE INFO	ABSTRACT
	Despite the rapid development and use of AI in higher education (HE) delivery, a persistent leadership gap underscores the imbalance between educators' AI capabilities and the readiness of HE institutions, including Malaysia. Drawing on a synthesis of literature concerning digital transformation, organisational culture, and AI in decision-making, we present a conceptual model for the 'AI-Ready Academic Leader'. Drawing on a synthesis of studies between 2019 and 2025, the paper develops a three-pillar Adaptive Leadership Framework— diagnosing the adaptive challenge, mobilising the system, and cultivating agile governance. To translate the conceptual pillars into actionable leadership practices applicable to Malaysia, a competency framework is proposed to cultivate institutional resilience in the face of algorithmic disruption. The paper provides recommendations for effectively adopting the framework in the Malaysian context, highlighting the need to be sensitive to hierarchical cultural norms, diverse stakeholder expectations, and alignment with national digital aspirations. The implications for institutional policy, faculty development, and the future of higher education governance are discussed in detail, offering a roadmap for educators aiming to thrive in an increasingly automated world.

INTRODUCTION

Research problem

AI-driven breakthroughs in scientific discovery and creativity suggest that universities are not only adopters of these technologies but also intellectual hubs responsible for generating, critiquing, and governing their societal use (Katsamakas et al., 2024).

Despite the rapid development and use of AI in higher education (HE) delivery, a persistent leadership gap underscores the imbalance between educators' AI capabilities and the readiness of HE institutions, including Malaysia (Shal et al., 2024). Traditional leadership approaches often misconstrue AI integration as a purely technical procurement process, such as selecting software, rather than a complex adaptive

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challenge involving institutional values, decision-making authority, and organisational culture (Bollaert, 2025).

While existing research extensively discusses digital leadership and AI adoption, there is limited conceptual clarity on how adaptive leadership specifically translates into AI-readiness within higher education. Previous models often emphasise technology management or transformational leadership, overlooking the cultural and behavioural adjustments required for sustained institutional learning. This study therefore, focuses on bridging this gap by framing adaptive leadership as the strategic lens through which Malaysian higher education institutions can align their governance, culture, and capacity-building efforts with national digital transformation agendas.

Purpose

This paper supports and extends the literature in the Malaysian context in evidencing that successful AI integration demands an adaptive leadership paradigm rather than directive, top-down rollout strategies. Such a paradigm empowers diverse institutional actors to navigate uncertainty, manage conflicting perspectives, and cultivate environments of continuous learning and experimentation. The paper proceeds by reviewing the literature, proposing a conceptual framework, and concluding with actionable leadership recommendations for AI-enabled transformation in higher education.

Contribution

The paper proposes a conceptual framework conceptualising the 'AI-ready' academic leader as an adaptive agent who deliberately cultivates institutional resilience in the face of algorithmic disruption. The paper provides recommendations for effectively adopting the framework in the Malaysian context, highlighting the need to be sensitive to hierarchical cultural norms, diverse stakeholder expectations, and alignment with national digital aspirations.

LITERATURE REVIEW

Paradigms of Academic Leadership

The Fourth Industrial Revolution is fundamentally reshaping the knowledge economy, positioning higher education at its forefront. The rapid deployment of AI in adjacent domains such as corporate training and research and development highlights its accelerating and inevitable diffusion into university environments (Sposato, 2025).

Academic leadership has long been framed through established paradigms such as Transformational, Distributed, and Servant Leadership. Transformational Leadership emphasizes inspirational vision and changes agency but often assumes that leaders possess sufficient technical clarity to guide organisational transformations, which may not be the case in rapidly evolving AI environments where knowledge gaps are pervasive (Beerkens & van der Hoek, 2022). Distributed Leadership, meanwhile, disperses decision-making authority across various university actors, enhancing agility and ownership. However, without a unifying mechanism, distributed structures risk producing uncoordinated and duplicative AI initiatives across departments, leading to inefficiency and misalignment with institutional strategy – more so in emerging markets such as Malaysia (Amdan et al., 2024; Bolden et al., 2009). Servant Leadership grounds authority in empathy, humility, and follower growth. While this approach fosters trust, it may lack the assertive momentum needed to enact disruptive, time-critical initiatives like institution-wide AI reform (Shal et al., 2024). Collectively, these traditional paradigms represented in frameworks illuminate a leadership gap when institutions face adaptive crises, those requiring not simply new tools, but new thinking and adaptive capabilities (Azmi, 2025). Higher education, therefore requires a framework capable of navigating ambiguity, integrating multiple perspectives, and accelerating change without eroding academic values (Bryman & Lilly, 2009; La Ode et al., 2024). Adaptive leadership theory provides a theoretical basis

for challenging the individualistic, hierarchical, one-directional, and de-contextualised notions of leadership that permeate the existing literature (DeRue, 2011).

The Rise of Adaptive Leadership in a Tech-Driven World and Malaysia

Despite the evidence research gap, and more so in Malaysia (Amdan et al., 2024), Adaptive Leadership has recently emerged as a compelling alternative for guiding universities through volatile, uncertain, and technologically complex environments (Azmi, 2025). Unlike technical problems, with known solutions resolvable through existing structures, adaptive challenges require deep shifts in beliefs, behaviours, and cultural norms. For example, procuring a new student management system represents a technical change; by contrast, embedding predictive analytics in academic decision-making challenges faculty identity, raises concerns over algorithmic decision rights, and necessitates re-negotiation of governance (Heifetz et al., 2009). Adaptive leaders are tasked not only with 'diagnosing the system' to understand conflict and resistance, but also with 'regulating distress', holding stakeholders in a productive space long enough for real behavioural change to occur (Northouse, 2022). This calls for a departure from heroic, top-down leadership towards a process of mobilisation, orchestration, and collective sense-making. Universities that embrace adaptive capacity are better positioned to iteratively navigate AI disruption while protecting their academic mission – yet this support is lacking in Malaysia and Asia (Azmi, 2025; Shal et al., 2024).

AI in Higher Education

AI is already reshaping teaching, learning, research, and strategy across the higher education landscape. In administrative domains, AI chatbots handle routine student queries, robotic process automation expedites financial transactions, and intelligent timetabling systems improve resource optimization (Beerkens & van der Hoek, 2022; Sposato, 2025). Pedagogically, AI technologies such as adaptive learning platforms provide differentiated content based on student progress data, automated plagiarism detectors preserve academic integrity, and AI tutors offer personalised scaffolding at scale. At the strategic level, universities deploy predictive analytics to monitor student retention risks, identify enrolment patterns, and optimise staffing (Shal et al., 2024). However, the velocity and breadth of these developments test existing academic structures not designed for continuous innovation. Effective integration of AI requires not only robust infrastructure but also clear governance frameworks, shared vision, and proactive leadership that can bridge technical and academic worlds (Johnson et al., 2025). Therefore, AI in higher education must be understood not merely as technology adoption but as an institutional transformation with systemic implications

Nurturing an 'AI-Ready' Culture

A growing consensus suggests that cultural readiness is the linchpin of successful AI adoption in universities. Rather than focusing solely on acquiring cutting-edge technologies, institutions must cultivate climates characterised by psychological safety, experimentation, and data-informed decision-making (Sposato, 2025). Leaders need to foster trust such that faculty feel empowered to pilot AI tools without fear of reputational damage if outcomes fall short. Failure must be reframed as an integral learning process, embedded within organisational routines. At the same time, local autonomy—for instance, allowing departments to choose AI tools tailored to disciplinary needs—must be balanced with integrated institutional strategies to avoid duplicated or incompatible investments (La Ode et al., 2024). Capacity-building is essential: professional development initiatives should extend beyond the technical 'how-to' of AI tools into a deeper understanding of ethical data stewardship, pedagogical shifts, and change leadership (Bryman, 2019). Institutions that invest in a culture of reflective practice are more likely to sustain innovation and withstand potential backlash when early AI experiments challenge traditional norms

The Ethical Algorithm: Managing Bias, Privacy, and Transparency

The integration of AI in higher education raises profound ethical dilemmas involving bias, surveillance, and opacity. Algorithmic bias originating from skewed training datasets may unintentionally harm

underrepresented student groups in admissions, grading, or advising, thereby exacerbating existing inequities rather than reducing them (Bolden et al., 2009). The rise of pervasive data monitoring, tracking student engagement, browsing patterns, and performance indicators, generates significant privacy concerns and questions around consent and autonomy (Northouse, 2022). Furthermore, many AI systems function as 'black boxes', with decision-making logics not easily understood even by their developers. This lack of transparency creates substantial barriers for accountability in academic settings where due process and fairness are non-negotiable (Shal et al., 2024; Heifetz et al., 2009). Adaptive leaders need to establish strong institutional oversight and facilitate ethical governance processes that involve diverse stakeholder voices—including students, faculty, and policymakers (Johnson et al., 2025). This proactive stewardship helps ensure that AI augments rather than undermines the values of higher education.

METHODOLOGY

This article adopts a conceptual research approach. The framework was modelled via a structured review and synthesis of literature on adaptive leadership, AI integration, and higher education transformation between 2019 and 2025. Articles were selected from Scopus, Web of Science, and Google Scholars databases using keywords, 'artificial intelligence', 'higher education', 'adaptive leadership', and 'Malaysia'.

The review followed three stages:

1. Thematic categorisation – identifying current constructs in leadership and AI-readiness

2. Comparative analysis – contrasting leadership theories

3. Framework synthesis – integrating the themes into the proposed three-pillar model

This qualitative synthesis method enhances transparency and provides an evidence-based foundation for developing the proposed conceptual model.

Table 1. Literature Synthesis

Author(s) & Year	Focus of Study	Method	Key Findings	Relevance to This Paper
Beerkens & van der Hoek (2022)	Academic leadership in changing HE context	Conceptual review	Leadership models lag behind tech transformation	Highlights leadership theory gap
Azmi (2025)	Adaptive leadership and tech disruption	Conceptual paper	Adaptive mindset critical for change resilience	Forms theoretical base for framework
Sposato (2025)	AI in educational leadership	Literature review	Identifies taxonomy for AI leadership	Supports competency development
Amdan et al. (2024)	AI tools in Malaysian STEM education	Concept paper	Shows Malaysia's adoption challenges	Contextual grounding for local focus

CONCEPTUAL FRAMEWORK

Adaptive Leader in Higher Education

Past research has shown that conceptual frameworks themselves can be transferred from developed to emerging market contexts to explore conceptual models (Stouraitis et al., 2024). To translate the conceptual pillars into actionable leadership practice applicable to Malaysia, a competency framework is proposed. Building on adaptive leadership theory and recent scholarship on organisational agility in higher education (Bollaert, 2025), three foundational leadership pillars are proposed: diagnosing the adaptive challenge, mobilizing the system, and cultivating agile governance. The proposed framework (Table 1) acts as a roadmap for staff and policy and conceptualises the AI-ready academic leader as an adaptive agent who deliberately cultivates institutional resilience in the face of algorithmic disruption. Rather than viewing AI

as merely a technological tool, this framework positions it as an environmental trigger that exposes underlying tensions between traditional academic norms and emergent digital imperatives (Azmi, 2025).

Core Components of the Framework

Diagnosing the Adaptive Challenge (The Visionary)

This analytical pillar emphasizes the leader's capacity to discern the true nature of AI-related change. Rather than adopting generic rhetoric about 'embracing innovation', the adaptive leader rigorously assesses how AI challenges existing value systems, roles, and power dynamics across the institution (Azmi, 2025). Diagnosis involves identifying what losses stakeholders might fear (e.g., status, relevance, control) and differentiating between technical upgrades that require expertise and adaptive shifts that require cultural realignment.

Mobilising the System (The Coach)

This relational pillar focuses on generating the conditions for productive institutional learning. Instead of announcing solutions, adaptive leaders facilitate structured dialogue, manage conflict, and protect dissenting voices in order to build collective ownership of AI initiatives (Zhu & Engels, 2014). Change is sequenced deliberately so that stakeholders are stretched, but not overwhelmed, by the demands of experimentation and sense-making.

Cultivating Agile Governance (The Architect)

Similarly to student needs and perceptions, AI technologies evolve too rapidly for traditional bureaucratic policy cycles present in higher education and especially in the global south, rendering adaptability an issue (Mat Yusoff et al., 2025). This structural pillar involves designing governance mechanisms that are iterative, principles-based, and data informed (Bollaert, 2025). Agile academic leaders establish cross-functional task forces, ethics review boards, and rapid feedback loops to enable continuous refinement of AI use. The emphasis shifts from rigid control to adaptive stewardship.

The framework's role as a roadmap for staff allows for faster and clearer alignment with the institution's needs, understanding of roles, and onboarding of new staff:

Table 2 summarises the proposed Adaptive Leadership Competency Framework, illustrating how the three leadership pillars, Visionary, Coach, and Architect, translate theoretical principles into practical competencies that guide AI-readiness and institutional transformation in higher education.

Table 2. The Leadership Competency Framework

Pillar (Leadership Role)	Purpose	Key Actions (Competencies)
Diagnosing the Adaptive Challenge (Visionary)	Understand what exactly is changing and what difficult value-based questions AI raises in the institution.	Environmental scanning, listening tours, mapping stakeholder fears (e.g., "Will AI replace me?"), distinguishing technical vs. cultural shifts.
Mobilizing the System (Coach)	Engage and support people through change instead of forcing it.	Protect dissenting voices, frame AI as a shared challenge, regulate anxiety levels, and encourage experimentation.
Cultivating Agile Governance (Architect)	Build flexible structures that allow continuous learning and adjustment as AI evolves rapidly.	Create AI ethics task forces, sandbox environments, quick feedback loops, and simple principles instead of rigid rules.

Source: authors

As shown in Table 2, these three adaptive leadership pillars provide a practical bridge between abstract leadership theory and the operational realities of AI-driven transformation within Malaysian higher education institutions.

This framework identifies specific, observable leadership behaviours aligned with each pillar, offering a practical bridge between theory and implementation. By articulating what adaptive leadership looks like in action, it enables institutions to assess, develop, and support leaders who can effectively navigate AI-driven transformation. Taken together, these behavioural indicators reinforce that adaptive leadership for AI integration is not a singular trait, but a constellation of competencies enacted across analytical, relational, and structural domains. By embedding these behaviours within institutional leadership development and performance evaluation processes, universities can cultivate a cadre of leaders who are not only technologically literate but also capable of orchestrating the deep cultural and organisational learning required for sustainable and ethical AI transformation.

Application in the Malaysian Context

In Malaysia, the application of this competency framework intersects with the unique governance dynamics of public–private higher education, where institutions operate under the purview of the Ministry of Higher Education while competing in increasingly market-driven environments (Anuar et al., 2024; Mahusin et al., 2024). Diagnosing the adaptive challenge requires leaders to navigate not only institutional norms but also national policy priorities such as the *Malaysia Artificial Intelligence Roadmap 2021–2025*, which emphasizes digital transformation and talent readiness. Mobilising the system, therefore, entails engaging multiple stakeholder layers, from academic unions and senate councils to industry advisory panels and political appointees on governing boards, who may hold divergent views on the risks and opportunities of AI adoption (e.g., academic freedom, job displacement, and integrity concerns). Thus, while the framework provides and aggregates general leadership competencies, effective enactment in the Malaysian context requires sensitivity to hierarchical cultural norms, diverse stakeholder expectations, and alignment with national digital aspirations (Anuar et al., 2024).

DISCUSSION AND IMPLICATIONS

The proposed framework extends Heifetz's adaptive leadership theory by situating it in the context of AI-driven transformation in higher education. Unlike traditional leadership models that emphasise vision or authority, adaptive leadership foregrounds diagnosis, learning, and iteration, which are crucial in fast-evolving digital ecosystems. Specifically, taking theoretical focus away from individuals as detached leaders or followers, and instead placing at the centre the evolutionary value of a dynamic and fluid leading–following process which can act as a roadmap to educators. This framework, therefore, contributes to theory by aligning adaptive principles with AI governance and institutional culture, offering a contextualised model suited to Malaysian universities.

Rather than treating AI as a purely technological upgrade, the framework positions leadership as the core driver of institutional adaptation, addressing the policy needs raised by the Malaysian government and local higher education institutions (Anuar et al., 2024; Hutson & Ceballos, 2023). It further underscores that AI integration is not only a strategic imperative, but also a deeply cultural endeavour that involves reconfiguring values, identities, and power arrangements within academic communities (Luckin, 2019). The following discussion outlines the implications of this model for policy design, leadership development, and future scholarly inquiry.

Implications for University Policy

Universities in Asia and Malaysian higher education institutions should prioritise focusing on AI adoption as a strategic, mission-aligned process rather than a series of disconnected technological procurements (Selvaratnam et al., 2024). A key recommendation is the development of a comprehensive Institutional AI Strategy that explicitly aligns AI initiatives with the university's academic, research, and societal missions (Akinwalere & Ivanov, 2022). This strategy should be operationalised through clear data governance policies, including robust standards on data privacy, algorithmic transparency, and ownership

of AI-generated intellectual property. Additionally, ethical oversight mechanisms, such as standing committees on AI use in student affairs, should be embedded within governance structures to ensure predictive analytics align with principles of fairness, inclusivity, and student well-being. At a national scale, incentives for responsible AI experimentation through performance-based funding models could further accelerate institution-wide commitment to ethical adoption (Zawacki-Richter et al., 2019).

Implications for Leadership Development

The framework highlights the need to fundamentally redesign how universities prepare leaders for AI-enabled futures, including the adaptability of the framework and practices to Malaysia and Asia settings (Stouraitis et al., 2022). Instead of relying solely on traditional management development, institutions should prioritise experiential and situational learning that builds adaptive capacity. Scenario-based training on AI ethics and risk management can cultivate leaders capable of diagnosing novel challenges, while reverse-mentoring programmes can expose senior administrators to emerging technologies and perspectives from digitally native faculty (Hutson & Ceballos, 2023). Participation in cross-sector AI governance consortia can further enhance boundary-spanning competencies and ensure academic leaders remain informed about fast-moving developments in policy and industry (Fernández et al. (2023). Importantly, succession planning should explicitly incorporate digital literacy and adaptive mindsets as core criteria for selecting future senior leaders (Kezar, 2023).

Limitations and Future Research

This paper is exploratory in nature, proposing a conceptual framework rather than presenting empirical findings. Future research should focus on longitudinal case studies of universities at different stages of AI transformation to explore how adaptive leadership behaviours unfold in practice. Comparative research examining institutions with varying governance structures could also yield insights into how contextual variables shape AI-readiness (Akinwalere & Ivanov, 2022). Finally, there is a pressing need to develop validated instruments capable of measuring the readiness of institutional cultures and leadership practices for AI integration, an essential step toward evidence-based benchmarking and capacity building across higher education systems (Sposato, 2025). Artificial intelligence scholarship would also benefit from mixed-methods designs that integrate ethnographic observation of leadership practice with automated analytics of organisational communication flows (Luckin, 2019; Zawacki-Richter et al., 2019). Future improvement could include a clearer differentiation from prior adaptive leadership applications and a stronger justification of Malaysia as the focus context.

CONCLUSION

Following calls for more research on how Malaysian higher education educators can adapt to the rise of AI, this paper sets out to evidence that the successful integration of artificial intelligence in higher education is not, at its core, a technical undertaking, but a leadership challenge. In doing so, it proposed a novel conceptual framework to both support the role of adaptive leadership in the Malaysian context, challenging the individualistic, hierarchical, one-directional, and de-contextualised notions of leadership that pervade the current literature (Dunn, 2020).

While AI offers unprecedented opportunities to enhance teaching, research, and institutional efficiency, its deployment fundamentally disrupts longstanding academic roles, values, and governance assumptions. As such, institutions that approach AI merely as a technological procurement project risk superficial adoption and deep cultural resistance. Instead, an adaptive leadership paradigm, grounded in diagnosis, stakeholder mobilisation, and agile governance, provides a more effective pathway forward by focusing on the organisational learning required to navigate complex, value-laden change.

Ultimately, academic leaders bear a dual responsibility. Internally, they must harness AI to advance institutional missions in scholarship, access, and societal contribution. Externally, they must serve as exemplars of how powerful, emergent technologies can be governed wisely, ethically, and with an unwavering commitment to human dignity. Crucially, the future of AI in higher education depends not merely on algorithmic sophistication but on leadership mindsets that embrace ambiguity, encourage critical scrutiny, create space for experimentation, and cultivate a culture of responsible innovation. Leadership that remains overly risk-averse, technocratic, or siloed will struggle to unlock the transformational potential of AI.

The study's key contribution lies in integrating adaptive leadership with AI-readiness in higher education, offering a contextually relevant conceptual framework for Malaysian institutions. Future research should empirically test the framework across diverse university settings, using qualitative and quantitative methods to measure leadership readiness, organisational adaptability, and ethical AI governance. Such empirical validation would strengthen its applicability beyond Malaysia, contributing to global debates on leadership for digital transformation.

In an era of accelerating algorithmic disruption and societal unease over automation, it is therefore this blend of strategic foresight, moral stewardship, and adaptive capacity that will define the true leaders of the AI-powered higher education, those capable of guiding universities not only to adopt AI, but to shape its trajectory in service of the public good.

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CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts, and declare the absence of conflicting interests with the funders.

AUTHORS' CONTRIBUTIONS

Mior Harris Mior Harun conceptualised the main research idea and led the writing of the manuscript. Nur Arfah Mustpha was responsible for designing the methodology and conducting the analysis. Nor Irvoni Mohd Ishar and Vasilios Stouraitis contributed to the literature review and provided an overview of the study context. All authors reviewed and approved the final version of the manuscript.

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